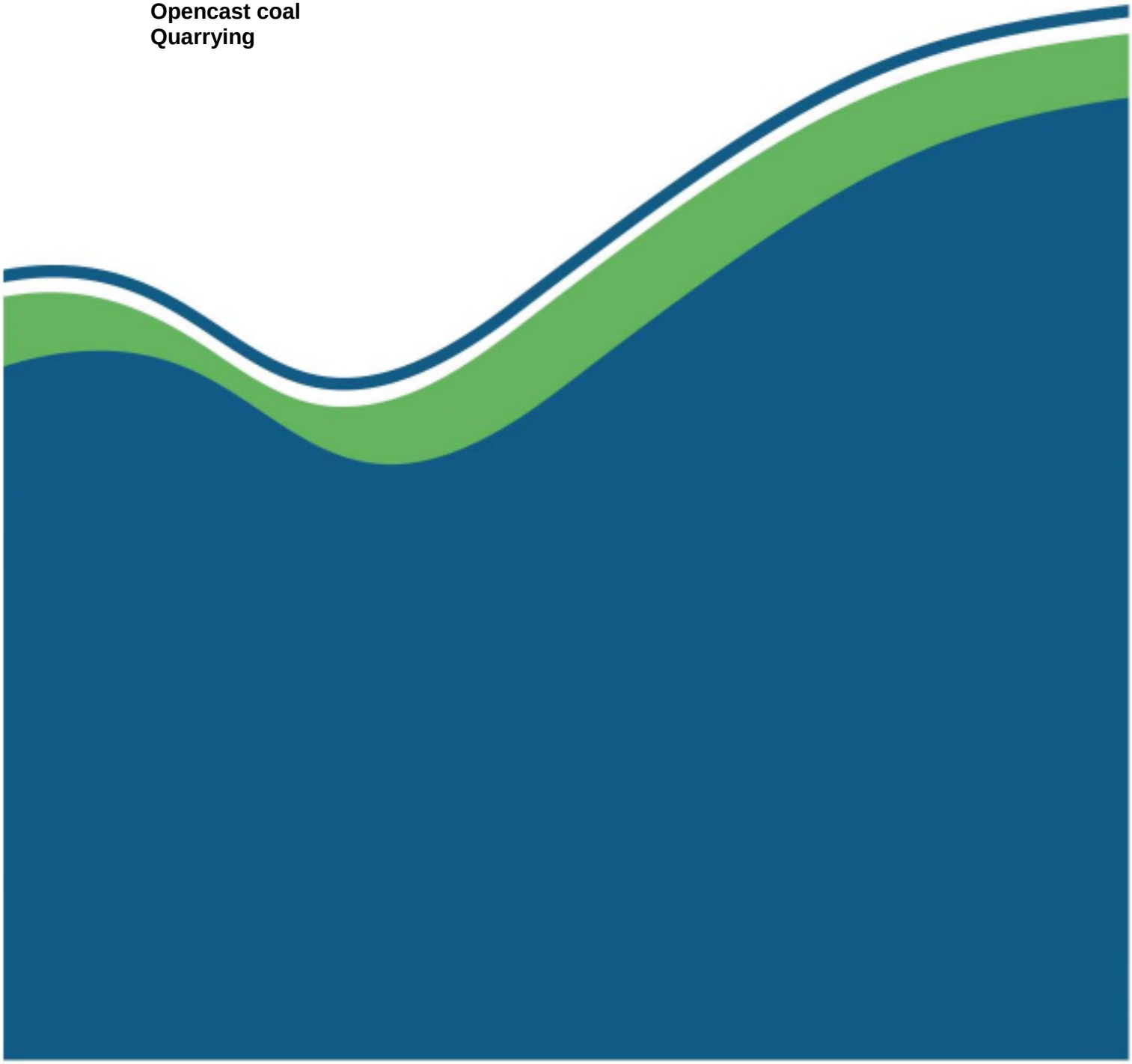
Scottish Pollutant Release Inventory Reporting

SPRI Sector (smaller-scale activities) Guidance Note

2019

Intensive agriculture
Landfill
Opencast coal
Quarrying



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1 Introduction and scope

The Scottish Pollutant Release Inventory (SPRI) is a publicly accessible electronic database of annual mass emissions from industrial and other activities within Scotland. The inventory is compiled by SEPA on behalf of the Scottish Government from annual operator data returns submitted in response to a legal Notice.

2 Purpose

This guidance is intended to assist operators of the following industrial sectors:

- Intensive agriculture
- Landfills
- Opencast coal
- Quarrying.

This guidance will allow operators to comply with the requirements of the European Pollutant Release and Transfer Register (**E-PRTR**). It has been produced to aid consistency in reporting for your sector and you are encouraged to use this guidance when completing your SPRI return. More detailed information is available from the SPRI General Guidance Document which can be obtained from the SEPA Website.

3 Important points for operators to note

- The annual reporting period to make your SPRI return to SEPA is from the **1st January to 28th February**;
- **Do not use previous versions of this guidance to make your data return to SEPA. Note that emission factors for Intensive Agriculture pig farms have changed since 2018.**
- Returns should only be made via the official internet based electronic form. The electronic form is available at SEPA's SPRI website and the paper form is available from SPRI administration on request;
- Further information on how to report electronically to the SPRI is available from the Operating Reporting System Guidance Document;
- The user name and password you have been sent will allow you to log onto the site and complete the form. Where you have reported in previous years your log-in details remain unchanged;
- All substances which you are required to consider reporting to the SPRI are contained within the current year's Schedule. You do not need to give information on all the pollutants listed in the pollutant schedule to the notice; only those which you emit from your activity. This guidance document will help direct you to the limited number of pollutants which you are likely to need to report against. Full lists of pollutants which may be released from the various sectors are provided in tables contained within this document;
- Where you require further information then contact the SPRI team at SPRIAdministration@SEPA.org.uk or contact the local SPRI officer at

4 How to contact SEPA's SPRI team for help

Enquiries about any aspect of the SPRI can be made to the following e-mail address. Note that there is no weekend cover available to any SPRI enquiries made: SPRIAdministration@SEPA.org.uk.

During all correspondence please quote your company's/organisation's registered name and your unique NIC (National Identity Code) number, this will help us to deal more efficiently with your enquiry.

You can also contact your local SPRI pollutant inventory support officer at the following office locations:

SEPA Stirling Office
Strathallan House
Castle Business Park
Stirling
FK9 4TZ

Tel No: 01786 457700

5 Guidance on completion of form

For a step-by-step guide on how to report using the SPRI Operator Reporting Website you can consult the SPRI Operator Reporting System Guidance Document.

The reporting form consists of Sections A to G as follows:

Section A – Address and contact information

All fields within this section should be completed, where changes are required within the electronic form use the "Submit Changes to SEPA" button. Please allow 14 days for the updates to be made. **Please Note:** If no changes have been requested you are not required to click the "Submit" button.

Site name
This section should already be completed on your behalf and the details should describe the site that your SPRI return relates to, this should match existing permit(s)/licence(s) details held by SEPA.

Company Details
Often the Registered Company details may be similar to those for the site but for some operators the Registered Company name and address differ. As with the site details this information should be the same as those recorded in your permit(s)/licence(s) where applicable.

Contact Details
This refers to the name and contact details of the person filling in the form. SEPA will use the contact e-mail address to contact your company regarding the SPRI return so please check that this information is correct.

Section B – Economic activity and process information

All fields within this section should be completed. **Please note** that you cannot type directly into the box. Choices should be made from the dropdown list or search menu. More detail on this section is available from the SPRI Operator Reporting System Guidance Document.

Main Economic Activity (UKSIC)
This section identifies the main economic activity or activities of the site reporting to the SPRI. This is done by assigning the appropriate UK Standard Industrial Classification of Economic Activities code (UKSIC) code. Within the electronic form this is copied forward into future years.

A comprehensive list of SIC codes are shown on the SEPA website and information on how to enter this is available in the SPRI Operator Reporting System Guidance Document.

To select the correct SIC code:

1. If using the electronic reporting form the description column will be populated automatically. If you do not agree with this description then use the search box to select an appropriate code.
2. Identify the sector that is most relevant to your site's main activity.
3. Choose the SIC code that best describes the main economic activity of your site.

Main economic activity at installation (PRTR code)
This is the main activity undertaken at the installation. A comprehensive list of codes is shown on the SEPA website.

PRTR Sub-activity at installation
A sub-activity is a process technically associated with the main primary activity and which has an effect on emissions and pollution from the site. If this is the case for your site a sub-activity should also be selected.

Section C – Pollution releases to air

In this section you are asked to tell us about your emissions (in kg) to the atmosphere during the calendar year. Releases to air means those releases from atmospheric discharge points specified in the permit(s)/licence(s) (including incinerator stacks), together with fugitive releases. Although there are a large number of pollutants listed in section C you are likely to only have to report against some of these.

Points to Note:

- The figures returned should include emissions from point and diffuse (non-point) sources as well as accidental emissions such as from a leak, spill, or fire (these are unplanned events out with the normal process of site operation);
- Values should be reported to 3 significant figures;
- You need only record a return against pollutants you emit. Where you do not release a particular pollutant to the atmosphere, please select as "No Longer Applicable" where previously reported or delete;
- Please also review the SPRI General Guidance Document and the SPRI Operator Reporting System Guidance Document for further information;
- Where you do emit a listed pollutant and the quantity is below the reporting threshold record this as BRT (Below Reporting Threshold);
- If you enter BRT or an actual value within Section C you should also provide a Method Description of how you determined your emission figure. This description should include any UK or International standards used during your determination and fully describe the methodology used to produce your emission figure;
- The SPRI electronic reporting system may require a "Qualification" to be entered by you during data entry. The qualification statement which you are prompted to enter should fully explain the reason for the pollutant change for your site;
- Where you are reporting for the first year to the SPRI you will have a list of pollutants which have been added by the electronic system as indicative pollutants; i.e. is likely to be emitted from your sector. If these were not emitted during the reporting year select the delete button; and
- All operators should look through the entire pollutant list table and report against pollutants they release.

Section C – Radionuclide emissions to air for premises with nuclear and non-nuclear authorisations

It is not anticipated that any operator of these activities would need to record anything against any of the pollutants in this table. However, where a landfill is authorised to accept radioactive waste, these substances may have to be considered.

Section C – Pollutant releases to water

Water emissions from your site cover direct discharges from the site to nearby rivers, groundwater, lochs, wetlands, estuaries or coastal waters (these water bodies are termed “the water environment”). All of these emission points should be mentioned in your site’s licence(s)/permit(s).

Section C – Radionuclide emissions to water for premises with nuclear and non-nuclear authorisations

It is not anticipated that any operator of these activities would need to record anything against any of the pollutants in this table. However, where a landfill is authorised to accept radioactive waste, these substances may have to be considered.

Section C – Pollutant releases to land

These releases only apply to the pollutants in waste which is subject to disposal operations, land treatment or deep soil injection. This does not include the application of manures and slurries to land for agricultural benefit which is not normally considered to be a waste operation and therefore can be excluded from reporting to the SPRI.

Section C – Pollutant releases to waste water

This is a reference to waste waters being removed from your installation by public or private sewer. Where tankered waste is destined to be treated at a Waste Water Treatment Plant (WWTP) out with your site it should be recorded within this section. If you do not dispose of any waste water from the site in this manner, or have stopped this process, please select “No Longer Applicable” or leave the columns blank. Please note: you are NOT expected to report on discharges of sewage from offices and canteens.

Section C – Radionuclide emissions to waste water for premises with nuclear and non-nuclear authorisations

It is not anticipated that any operator of these activities would need to record anything against any of the pollutants in this table. However, where a landfill is authorised to accept radioactive waste, these substances may have to be considered.

Section D – Off-site transfer of waste

In this section you are asked to report waste or tankered liquid waste removed from the site. All sites are likely to produce some waste and should address this issue. You are required to report waste transfers from your site where the reporting thresholds of 2 tonnes/yr for hazardous waste and/or 2,000 tonnes/yr for non-hazardous waste are exceeded. If you do not breach these thresholds you should tick the “Not Applicable” box □ within the operator electronic form front screen.

Any transfer of waste off-site to a third party is covered by the Duty of Care provisions of the Environmental Protection Act 1990. This includes the requirement to describe the waste and record the quantity. You should therefore use data generated in compliance with Duty of Care requirements to complete the SPRI return.

If tankered waste is to be further processed, such as, dewatering of oily waste by a specialist waste contractor, it should be recorded within this Section. However, where tankered waste is destined to be treated at an Urban Waste Water Treatment Plant (UWWTP) out with your site it should be recorded with **Section C** “Waste Water”.

In general terms if the material is going for recycling, or reuse, in some way it should be considered as recovery (**R**), if the material is going for incineration or landfill it should be considered as disposal (**D**).

Non-hazardous Wastes
For non-hazardous waste you should have paperwork (a transfer note) from the organisation collecting the materials.

Hazardous Wastes
Hazardous waste is often described as “special” waste and includes oils, asbestos and certain chemicals. To remove these materials from site you will have needed to use special paperwork (a special waste consignment note). Details of quantities removed and the disposal site should be on this paperwork.

Please Note: Where the disposal site for hazardous wastes is outwith the UK, the name and address of the recipient should be entered into your SPRI return.

Section E – Ignore this section (as currently not in use)

Section F – Ignore this section (as currently not in use)

Section G – Voluntary Information

As the title implies the completion of this part of the return is voluntary. However, you should use this section to tell us any additional information that may justify changes that affect the values reported in your return; e.g. Site not operational for 3 months.

6 Intensive agriculture sector

This section covers activities that are regulated as “Intensive farming” activities under the Pollution Prevention and Control (Scotland) Regulations 2012 (as amended; PPC Regulations). Included within the scope are Part A prescribed/listed activities regulated under Chapter 6, Section 6.9 of the PPC Regulations.

7.1 UKSIC and PRTR codes

For farms the relevant codes are likely to be:

		Code	Activity Description
Main Economic Activity	UK SIC	01.47	Raising of poultry.
Main Economic Activity	UK SIC	01.46	Raising of swine/pigs.

Main primary activity at Installation (PRTR code)
This is the main activity undertaken at the installation.

For farms the relevant codes are likely to be:

For poultry		Code	Description
Main primary activity at Installation	PRTR	7(a).i	Installations for the intensive rearing of poultry, exceeding 40,000 places.

For pigs		Code	Description
Main primary activity at Installation	PRTR	7(a).ii	Installations for the intensive rearing of pigs, exceeding 2,000 pigs (over 30kg)
Main primary activity at Installation	PRTR	7(a).iii	Installations for the intensive rearing of pigs, exceeding 750 places for sows

PRTR Sub-activity at Installation
For farm sites it is unlikely that you will have to enter details into this section of your form, unless you have an additional activity which is directly associated to your main reporting site. For farms the relevant codes are likely to be:

For poultry		Code	Description
Sub-activity	PRTR	7(a).i	Installations for the intensive rearing of poultry, exceeding 40,000 places

For production pigs		Code	Description
Sub-activity	PRTR	7(a).ii	Installations for the intensive rearing of pigs, exceeding 2000 pigs (over 30kg)

Or for sows		Code	Description
Sub-activity	PRTR	7(a).iii	Installations for the intensive rearing of pigs, exceeding 750 places for sows

Example 1 shows how to choose the relevant codes.

Example 1
Where you are permitted to undertake two listed activities on the one farm; e.g. both production of pigs and breeding pigs (over the relevant thresholds) you should record the second activity in the "Sub-Activities at the Installation". In this case the main activity would be recorded as the **principal permitted activity** which is:

7(a).ii - Installations for the intensive rearing of pigs, exceeding 2,000 pigs (over 30kg).

and for the **sub-activity** this would be:

7(a).iii - Installations for the intensive rearing of pigs, exceeding 750 places for sows.

7.2 Pollutant releases to air

We are only interested in actual emissions from farming-related activities and should include on site activities relating to intensive agriculture operations.

Most intensive agricultural installations are only likely to need to report a figure against the following substances:

- Ammonia (NH_3);
- Methane (CH_4);
- Particulate matter (below 2.5 and 10 microns in diameter PM_{10} and $_{2.5}$); and
- Particulate matter – Total.

Where an installation has emissions from an animal remains incinerator, power generation or formaldehyde fumigation the following substances will also need to be considered:

- Oxides of sulphur (SO_2 and SO_3 as SO_2);
- Hydrogen chloride (HCl);
- Carbon monoxide (CO);
- Oxides of nitrogen (NO_x);
- Non-methane volatile organic compounds (NMVOCs);
- Dioxins and Furans (as I-TEQ and WHO-TEQ);
- Carbon dioxide (CO_2); and
- Formaldehyde.

As it is unlikely that you will have direct measurement of any of the substances mentioned to air, you are going to have to calculate your releases in each case from the appropriate emission factors contained in this guidance. All calculations should be based on the actual numbers of animals you have had on site averaged over the year, not on the theoretical maximum your installation can hold.

You should report the most reliable data for your SPRI return and you are NOT required to initiate extra sampling to produce your SPRI return. Where you have measured data this should be used in preference to estimated emission factors. Where you do not have directly measured results for any of

the pollutants mentioned above, you are required to calculate your releases for each pollutant from appropriate emission factors listed in the tables in this section.

You should quote any quality standards, such as British Standards (BS) or equivalent European Standards used during your SPRI data return. **Please Note**: where such standards are quoted some have the option of being selected from the drop down menu for the pollutant being recorded.

At the end of this section you will find a series of emission factors for intensive agriculture activities. To calculate the emission from your installation you should multiply up the appropriate emission factors to get your total annual emission. The general emission equation for this is:

Equation 1

Emissions per year = activity rate x emission factor for pollutant

Ammonia (NH_3)
Ammonia is released from all intensive agriculture operations and all operators should address this in their return.

In Table 1 (page 15) you will find a series of emission factors for pig and poultry housing and manure handling. For 2019, please note that a 20% reduction in ammonia emissions has been applied to all pig emission factors by SEPA to reflect the accepted 2% reduction in dietary crude protein since the original emission factors were published.

To estimate the emissions from your installation you should multiply up the appropriate emission factors, after considering your farms hardware and management practices, to get your total annual emission. This is illustrated in Example 2.

Example 2
A pig producer has calculated the following for their farm:

- (W1) = 1000 weaners on fully slated floor (ammonia [NH_3] emission factor = 0.23kg NH_3 per animal place per year);
- (S2) = 200 sows on solid floor – straw system (emission factor = 3.66kg NH_3 per animal place per year);
- (Fin1) = 2000 finishers on fully slated floor (emission factor = 3.31kg NH_3 per animal place per year);
- (M5) A slurry lagoon of 43m^2 with no cover (emission factor = 1.4kg NH_3 per m^2 per year);
- (M4) Manure heap holding an average of 113 tonnes (emission factor = 1.49 per tonne per year).

Calculation to work out the total ammonia emission

Weaners – (1000 x 0.23) = 230 +
Sows – (200 x 3.66) = 732 +
Finishers – (2000 x 3.31) = 6620 +
Slurry – (43 x 1.4) = 60.2 +
Manure – (113 x 1.49) = 168.37

Total ammonia release = 7810.57 kg NH_3 per year which is 7810kg rounded to 3 significant figures. This is above the reporting threshold for ammonia which is 1000kg/yr.

Within the above example under Measurement Type and Method the letter "**C**" indicates that you have made a calculation and "**MAB**" (**M**ass **B**alance method which is accepted by the competent authority) designates the method used. In the Method Description the phrase "Emission factors given in SPRI Sector Guidance year 2017" should be used where your calculation is based on this guidance. Please show your working in full; specifically provide the code (given in the left hand column of the tables in the appendices to this document) and the number of animals and tonnes by which you are multiplying the emission factor.

If your ammonia emissions had been calculated at less than the 1000kg/yr reporting threshold you should record this as Below Reporting Threshold (BRT).

Methane (CH_4)

Methane is released from all pig premises and from poultry sites that store manure/litter on site. Poultry farmers who do not store manure on site, that is where it is not stored outside the poultry housing, do not need to report against methane.

In Table 2 to this document you will find emission factors for enteric fermentation (methane produced by the animals themselves) and manure handling. To estimate emissions from your installation you should multiply up the appropriate emission factors to get your total emissions. Note that for pigs you need to add the emissions from manure management and emissions from the animals themselves. When giving a "brief description of the method" record that the emission factors were obtained from this guidance and include the relevant code (contained in Table 2) and the number of animals.

Example 4

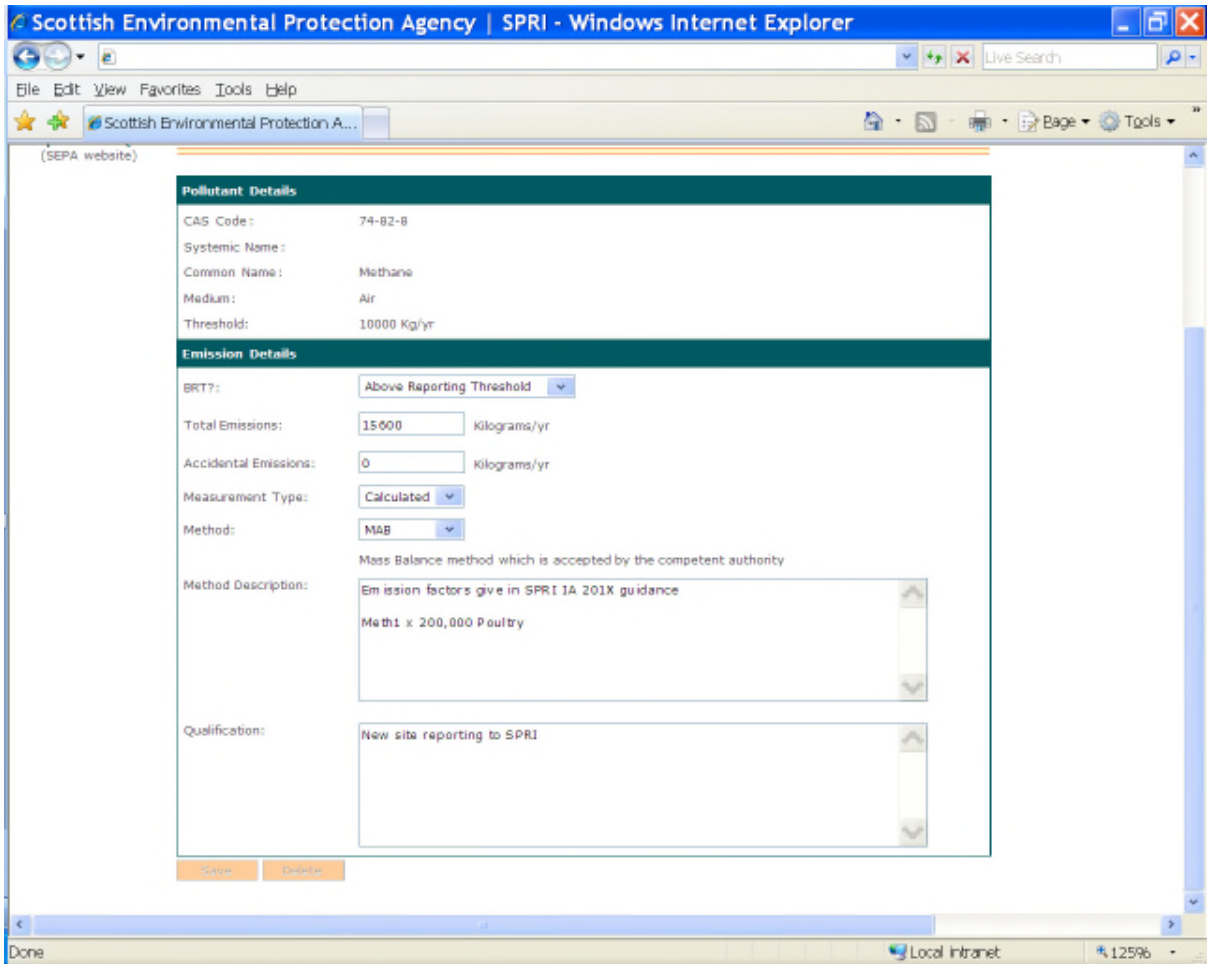
For a poultry producer storing manure on site with places for 200,000 birds the calculation would be as follows:

(Meth1) 200,000 x 0.078 = 15,600kg of methane per year.

As the threshold for Methane is 10,000kg poultry producers with 128,206 or fewer places for birds would report BRT in the form.

The screen shot number 4 below shows how this would be recorded within the form.

Screen-shot 4



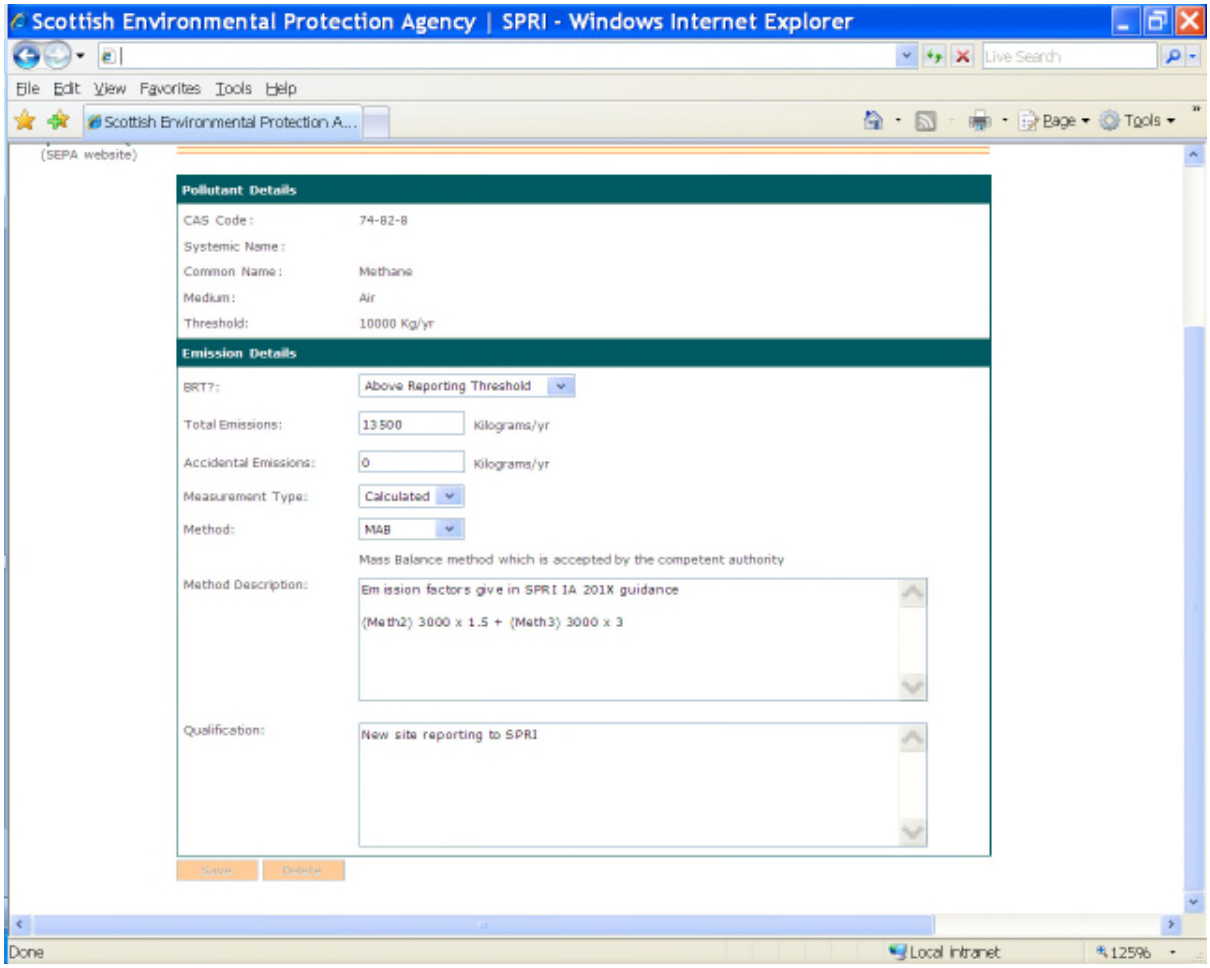
Example 6
A pig producer has places for 3000 production pigs over 30kg.

Methane emissions from the pigs (Meth2) 3000 x 1.5 = 4,500kg/yr.
+
Emissions from manure management (Meth3) 3000 x 3 = 9,000 kg/yr.

Total = 13,500kg of methane per year.

The data return for screen shot number 6 would be recorded as follows:

Screen-shot 6



Particulate matter (PM)
Particulate matter (dust) is released from all intensive agricultural operations and all operators should address this in their return. Within the return you are asked to report on three different categories of particulate matter; total particulate matter (**TPM**), $PM_{2.5}$ and PM_{10} (particulate matter below 2.5 and 10 microns in diameter respectively).

In Table 3 to this document you will find emission factors for different poultry housing techniques. To estimate the TPM emitted from your installation you should multiply the total number of places on the installation by the appropriate emission factors to get your total emission. To get a figure for PM_{10} divide this number by three.

The Measurement Type should be recorded as "Calculated"(C), the method as MAB. For the method description record "*Emission factors obtained from SPRI Sector Guidance 2017 calculation used is PM3 x 200,000*" and a summary of your calculation (see screen shot below). The emission factor code is given in the left hand column of Table 3.

Example 8
A poultry producer with places for 200,000 broilers.

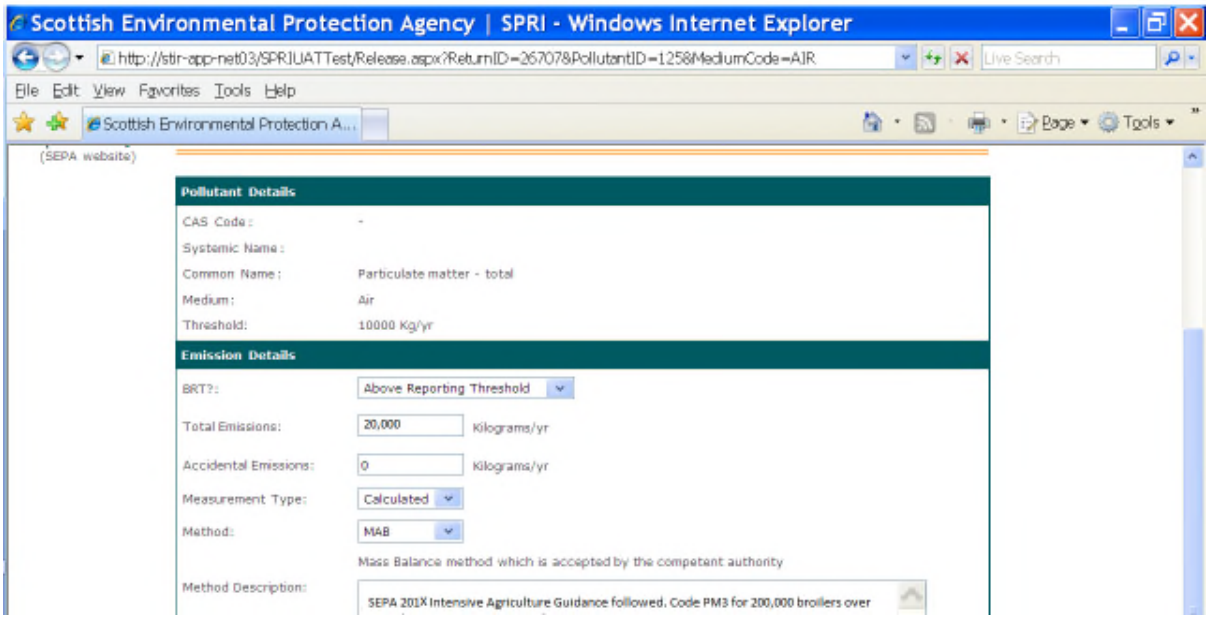
(PM3) 200,000 x 0.1 = 20,000kg of TPM per year.

This figure must be divided by three to determine the release of PM_{10}

20,000kg of TPM/3 = kg of PM_{10} per year which is 6,667kg rounded to three significant figures.

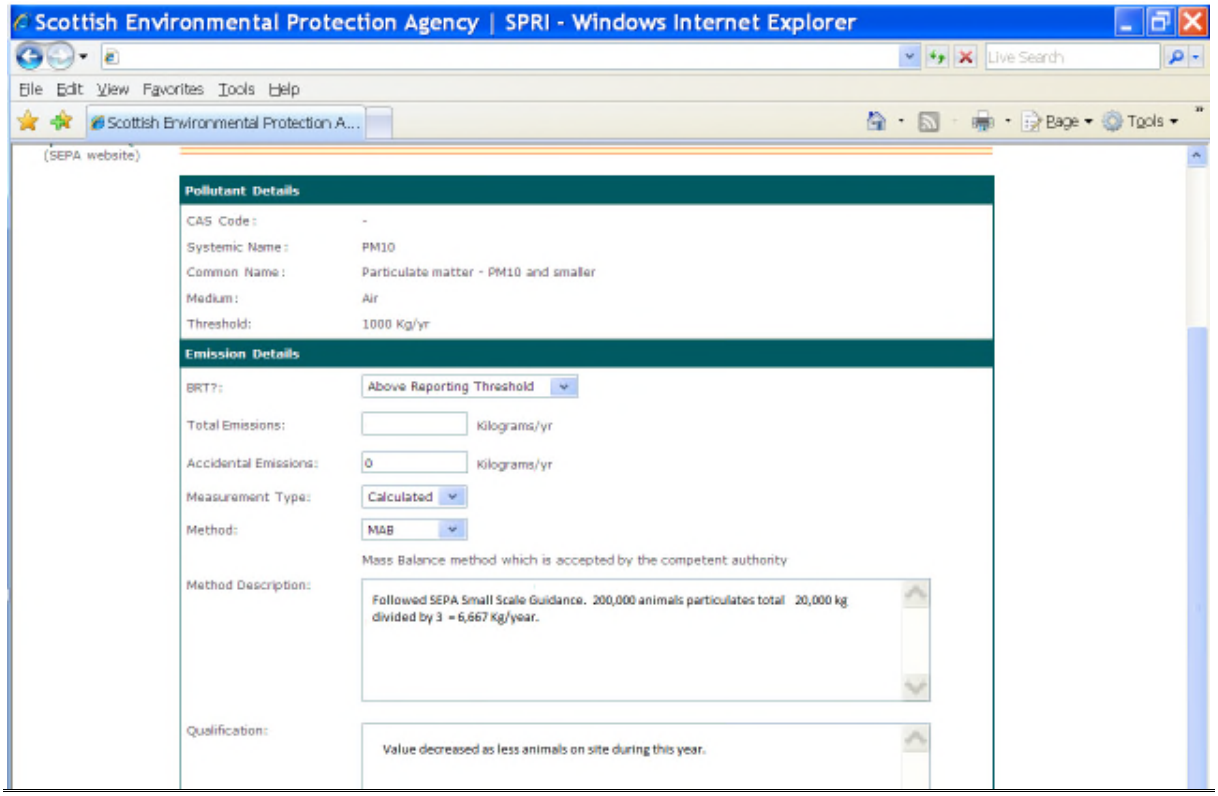
The data return for Example 8 (TPM) would be filled in as follows:

Screen-shot 7



The data return for Example 8 (PM_{10}) would be recorded as follows in screen-shot 8:

Screen-shot 8



Formaldehyde

Some operators are known to use preparations containing formaldehyde (also called methanal) for the fumigation of animal housing. Emissions from this into the atmosphere should be calculated. A brief description of how this calculation was arrived should be given under the Method Description. The threshold for reporting this substance is 10kg/yr.

Emissions from animal remains Incinerators

All of the following substances will be released from an animal remains incinerator:

- Oxides of sulphur (SO_2 and SO_3 as SO_2);
- Hydrogen chloride (HCl);
- Carbon monoxide (CO);
- Oxides of nitrogen (NO_x);
- Non-methane volatile organic compounds (NMVOCs);
- Dioxins and Furans (as I-TEQ and WHO-TEQ);
- Carbon dioxide (CO_2).

If you operate an animal remains incinerator you will need to make an entry against each of these substances. However please note that you could run 4 incinerators, 24 hours a day, 365 days a year and still not exceed the reporting thresholds for any of the substances mentioned above, therefore you are unlikely to need to calculate actual emissions. Should you wish to do so, details of average emissions from a small (<50kg hr^{-1}) animal remains incinerator both with, and without, afterburners can be found in Table 3 on page 14 of "Atmospheric Emissions from Small Carcass Incinerators" a document prepared for Defra

To calculate your emissions you need to multiply the emission factor by the number of hours you operated your incinerator(s).

As you are unlikely to exceed the threshold it is expected these pollutants would be reported as BRT.

Emissions from on-site combustion
Many operators will have backup energy generators or space heaters which burn fossil fuels. All of these will release carbon dioxide, however the threshold is 10,000,000 kg/year and it is unlikely that any farm will exceed the CO_2 threshold so this should recorded as BRT.

7.3 Pollutant releases to waste water

This is a reference to waste waters (as opposed to fertilisers) being removed from the PPC permitted part of your farm by public or private sewer and or where there is treatment by a raised infiltration mound (an artificial soakaway). For treatment of waste water which is passed through an artificially created raised mound (or drainage field) out with your PPC farm site, this waste water treatment transfer should be recorded as "Waste Water" within Section C of your data return to SEPA. It is likely that your trade effluent consent will contain information on the contents of any waste water which leaves your farm. Please note you are NOT expected to report on discharges of domestic sewage.

Table 1 – Ammonia emissions

Ammonia – poultry		
Code	**Housing type**	**Ammonia emission factor (kg NH_3/animal place/year)**
	Layers	
L1	Cage with deep pit manure storage beneath.	0.29
L2	Ventilated deep pit.	0.20
L3	Manure removal twice a week by manure belt.	0.035
L4	Vertical tiered cages with forced air drying once a week removal.	0.035
L5	Vertical tiered cages with whisk forced air drying once a week removal.	0.09
L6	Vertical tiered cages with manure belt with drying tunnel over cages 24-36 hour removal.	0.035
	Barn and free range	
BF1	Perchery with deep litter.	0.29
BF2	Litter system with forced air drying.	0.12
BF3	Litter system with perforated floor and forced air drying.	0.10
BF4	Aviary system.	0.08
	Broilers	
B1	Naturally ventilated, fully littered floor, non-leaking drinkers.	0.034
B2	Fan ventilated, fully littered floor, non-leaking drinkers.	0.034
	Pullets	
P1	Naturally ventilated, fully littered floor, non-leaking drinkers.	0.06
P2	Fan ventilated, fully littered floor, non-leaking drinkers.	0.06
	Turkeys	
T1	Male.	0.45
T2	Female.	0.23
D1	Ducks.	0.11
	Manure Storage (outside buildings)	**(kg NH3/tonne fresh manure)**
M1	Manure belts.	2.38
M2	Manure deep pit.	2.38
M3	Other litter.	1.74
Ammonia – pigs		
Code	**Housing type**	**Ammonia emission factor kg NH_3/animal place/year**
	Sows	
S1	Fully Slatted Floor (FSF).	2.41
S2	Solid Floor – straw system.	3.66
S3	Part-Slatted Floor (PSF) with reduced manure pit.	1.93
S4	FSF with vacuum system for frequent slurry removal.	1.81
	Farrowers	
F1	Fully Slatted Floor (FSF).	4.67
F2	Solid Floor – straw system.	7.10
F3	FSF/PSF with combination of water and manure channel.	2.24
F4	FSF/PSF with flushing system with manure gutters.	1.87
F5	FSF/PSF with manure pan underneath.	1.63
	Weaners	
W1	Fully Slatted Floor (FSF).	0.23
W2	Sold Floor – straw system.	0.17
W3	Pen/flatdeck with FSF/PSF with vacuum system for frequent slurry removal.	0.18
W4	Pen/flatdeck with FSF beneath where there is concrete sloped floor to separate faeces or urine.	0.16

W5	Pen with PSF (2-climate system).	0.15
W6	Pen with PSF and sloped or convex solid floor.	0.14
W7	Pen with PSF with triangular slats and manure channel with sloped side-walls.	0.06
	Growers	
G1	Fully Slatted Floor (FSF).	1.27
G2	Solid Floor – straw system.	0.91
G3	FSF with vacuum system for frequent slurry removal	0.95
G4	PSF with reduced manure pit including slanted walls and vacuum system.	0.51
G5	PSF with central convex solid floor at front and manure gutters with slanted side walls and sloped manure pit.	0.51
	Finishers	
Fin1	Fully Slatted Floor (FSF).	3.31
Fin2	Solid Floor – straw system.	2.38
Fin3	FSF with vacuum system for frequent slurry removal.	2.49
Fin4	PSF with reduced manure pit including slanted walls and vacuum system.	1.33
Fin5	PSF with central convex solid floor at front and manure gutters with slanted side walls and sloped manure pit.	1.33
	Slurry and Manure storage	**(kg NH_3/tonne fresh manure)**
M4	Manure heap.	1.49
	Slurry storage	
M5	Circular store – no cover.	1.4
M6	Circular store – rigid cover.	0.28
M7	Circular store – floating cover.	0.7
M8	Circular store – low tech cover.	1.05
M9	Lagoon – no cover.	1.4
M10	Lagoon – rigid cover.	0.28
M11	Lagoon – floating cover.	0.56
M12	Lagoon – low tech cover.	0.84

Table 2 – Methane emissions

Code	Activity	Emission factor kg CH_4/animal/year
Meth1	Poultry, manure management.	0.078
Meth2	Pigs, enteric fermentation.	1.5
Meth3	Pigs, manure management.	3.0

Table 3 – Dust emissions (total particulate matter [TPM])

Code	Poultry type (for pigs should report "BRT" for particulates)	Emission factor kg dust/animal place/year
PM1	Layers, perchery or aviary.	0.1
PM2	Layers, cage.	0.05
PM3	Broilers.	0.1
PM4	Turkeys (male).	0.9
PM5	Turkeys (female).	0.5
PM6	Ducks.	0.2
PM7	Pullets.	0.1

7 Landfill sector

This Section is intended to assist operators of landfill sites and allow them to comply with the requirements of the E-PRTR.

These activities may be regulated as "Landfill and disposal to land" activities under the Pollution Prevention and Control (Scotland) Regulations 2012 (as amended; PPC Regulations) or the Waste Management Licensing (Scotland) Regulations 2011. Included within the scope of this legislation are Part A prescribed activities regulated under Chapter 5, Section 5.2 of the PPC Regulations.

Landfills (excluding landfills of inert waste) receiving 10 tonnes of waste per day or with a total capacity of 25,000 tonnes are required to report annually to the SPRI.

8.1 Changes from previous years

There have been no changes to the guidance from the previous year.

8.2 UKSIC and PRTR codes

For landfill sites the relevant codes are likely to be:

		Code	Activity description
Main economic activity	UK SIC	38.21	Treatment and disposal of non-hazardous waste.
Main economic activity	UK SIC	38.22	Treatment and disposal of hazardous waste.

Main primary activity at installation (PRTR)
This is the main activity undertaken on the installation.

		Code	Activity description
Primary activity at installation	PRTR	5(d)	Landfills (excluding landfills of inert waste).

8.3 Reporting for landfills

You should report the most accurate information available to you. Therefore measured data should be reported in preference to calculated or estimated data which may be derived from an estimation model, such as GasSim.

Section C – Pollutant releases to air

In section C you are asked to tell us about your emissions (in kg) to the atmosphere during the calendar year. All landfills will need to address air emissions and after reviewing the current year's Schedule of pollutants you should report gas emissions. Where you do not have measured values you should rely on running the most up to date estimation model available to you and at a minimum this should be GasSimLite 1.5.

Section C – Radionuclide emissions to air for premises with nuclear and non-nuclear authorisations

It is anticipated that most operators of landfill installations will not need to record anything against any of the pollutants in this part of the Schedule pollutant list; however where a landfill is authorised to accept radioactive waste, these substances may have to be considered.

Groundwater
It is anticipated that correctly engineered and lined landfills will collect all waste water and hence groundwater emissions can be excluded from being reported. Where your landfill site is not engineered to prevent the release of leachate this will have to be determined as part of your SPRI data return.

Section C – Radionuclide emissions to water for premises with nuclear and non-nuclear authorisations

It is anticipated that most operators of landfill installations will not need to record anything against any of the pollutants in this part of the Schedule pollutant list; however where a landfill is authorised to accept radioactive waste, these substances may have to be considered.

Section C – Pollutant releases to land

These releases only apply to the pollutants in waste which is subject to disposal operations to land, or deep injection of waste. This will not apply to any landfill site.

Section C – Pollutant releases to waste water

Waste water is defined as effluent which is discharged from the landfill site via a sewer to be further treated outwith the landfill site. If you do not dispose of any waste water from the site in this manner please select "No Longer Applicable" or delete the pollutant. **Please Note –** you are NOT expected to report on discharges of sewage from offices and canteens.

For leachate emissions to water and waste water Table 4 gives a list of likely substances released to water and or waste water.

Section C – Radionuclide emissions to waste water for premises with nuclear and non-nuclear authorisations

It is anticipated that most operators of landfill installations will not need to record anything against any of the pollutants in this part of the Schedule pollutant list; however where a landfill is authorised to accept radioactive waste, these substances may have to be considered.

8.4 How to determine water and waste water annual releases

The next section describes how you can calculate leachate releases from a landfill based on total leachate volume, any applied leachate treatment and consulting Tables 4 and 5. Where you have both water and waste water discharges you should consider and report them separately when producing your SPRI return within section C.

Transfers of liquid waste by road tanker or other liquid container (out with the SPRI site on the reporting year) should be reported within Section D – Waste Transfers in tonnes per year.

In order to determine pollutants release values you should:

1. Calculate the annual leachate volume in cubic metres (m^3) discharged to water and/or to waste water. This annual leachate figure should exclude any leachate reported in Section D – Waste Transfers.
2. If the calculated leachate volume for water and waste water lies between **zero and 90,900m^3** then all the pollutants in Table 4 can be reported as BRT. This calculation has to be completed for any water and waste water discharges.
3. All landfills should consider reporting total organic carbon (TOC) which for organic loads can be calculated by dividing the chemical oxygen demand (COD) by 3 and also report nitrogen-total as N.
4. Where the calculated discharge volume is **more than 90,900 m^3** you should read columns 2 – 5 in Table 4.
   These provide the treatment options for the leachate, that is, **R**, **T1**, **T2**, **T3** and **T4**.
5. For each pollutant listed in Table 4 compare your total annual leachate volume (m^3) with the stated values, any pollutant which you have calculated as having an annual leachate volume greater than those listed in Table 4 will breach the SPRI threshold and should be reported as above reporting threshold (ART).
6. You should now refer to Table 5 to find the concentration of these pollutants. This will be dependent on the biochemical status of the leachate (acetogenic or methanogenic**) and the treatment type.
7. Within Table 5 identify the concentration (mg/m^3) of each substance and multiply it by the annual emission volume in cubic metres (m^3) before dividing by 1,000,000 to give a value in kilograms/year (kg/yr).
8. Where you have both water and waste water release values, you will report these separately within the relevant sections of Section C of the SPRI form.

Example 9 below gives more details on this calculation.

Example 9

A landfill has a total calendar year leachate volume of 550,000 m^3.

The leachate characteristics are methanogenic, as the BOD/COD is <0.4; COD is <5,000mg/l and the pH is >6.5.

This effluent is treated by methane stripping for around 45 minutes before being discharged to a foul sewer (waste water transfer).

What should be reported for the SPRI return?

From Table 4 the treatment type is methane stripping for at least 30 minutes (T1) and the volume indicates that the site should report a value for all substances up to pentachlorophenol. The other remaining substances can be reported as BRT.

The next stage is to estimate the emissions for the reportable substances and the following table gives a summary of what is required to be reported in Example 9.

Example 9 (Cont'd) Substance	**Calculation for T1**	**Value reported to SPRI (kg/y)**
Mecoprop	11 x 550,000/1,000,000	6.0
DEHP	1 x 550,000/1,000,000	0.56
PAHs	5.25 x 550,000/1,000,000	3.0
Xylenes	21 x 550,000/1,000,000	12
Nickel-(methanogenic leachate)	55 x 550,000/1,000,000	30
Chromium	50 x 550,000/1,000,000	28
Lead	50 x 550,000/1,000,000	28
Toluene	15.75 x 550,000/1,000,000	9
Pentachlorophenol and the other substances within Table 5	0.1 x 550,000/1,000,000	0 (BRT reported)

The electronic form should be completed as follows for Example 9 for lead:

- "**Measurement Type**" - the letter "C" indicates that you have made a calculation.
- "**Method**" – select **MAB** which is "Mass Balance method which is accepted by the competent authority".
- "**Method Description**" – please provide the calculation used and use a phrase such as "**Emission factors given in SEPA Sector Guidance 2017 T1 50 mg/m^3 x 550,000/1,000,000**" where your calculation is based on any of the factors given in this guidance.

Completion of the electronic form is fully explained within the SPRI Operator Reporting System Guidance Document.

Example 10

A landfill operator has determined that in 2017 the total year's leachate volume was 80,900m^3/year.

The leachate characteristics are acetogenic.

Leachate treated is by a reed bed system before being discharged to a foul sewer (waste water transfer).

What substances should be reported for the SPRI return?

The annual volume of leachate lies between zero and 90,900 m^3/year so the operator can report all the substances in Table 4 as being below reporting threshold (BRT).

8.5 Useful references

GasSim landfill estimation model.

Environment Agency Technical Report P1-496/TR. Pollution inventory discharges to sewer or surface waters from landfill leachates. Knox K. and Robinson H.D, 2001.

Robinson, H.D – A review of the composition of leachates from domestic wastes in landfill sites. Report No. CWM 072/95, published by the Waste Technical Division of the Environment Agency, in the series 'The technical aspects of controlled waste management', 500pp, August 1996, available priced £75 from Environment Agency Dissemination Centre, c/o WRc plc, tel 01793 511711, or by e-mail from publications@wrcplc.co.uk.

Environment Agency Technical Report P1-496/TR(2). Updating the landfill leachate Pollution Inventory reporting tool. Knox K. and Robinson H.D., 2003.

Table 4 – Leachate volumes in cubic meters/year (m^3/year) and the estimated pollutant concentration in milligrams per cubic meter (mg/m^3)

For all leachate types except where stated in brackets	Raw effluent (mg/m^3) (R)	Methane stripping for at least 30 minutes (mg/m^3) (T1)	Treatment is a reed bed (mg/m^3) (T2)	Single stage aerobic biological treatment (mg/m^3) (T3)	T3 plus final polishing, such as wetland, ozone, activated carbon, reverse osmosis, irrigation (mg/ m^3) (T4)
Mecoprop	90,900	90,900	181,800	9,090,900	18,181,800
DEHP	100,000	100,000	100,000	1,000,000	2,000,000
Nickel-(acetogenic leachate)(**)	117,000	117,000	117,000	146,200	146,200
Zinc-(acetogenic leachate)(**)	150,000	150,000	1,500,000	500,000	500,000
PAHs	190,000	190,000	190,000	380,000	380,000
Xylenes	280,000	466,700	280,000	700,000	1,120,000
Nickel-(methanogenic leachate)(**)	360,000	360,000	360,000	450,000	450,000
Chromium	400,000	400,000	400,000	571,400	571,400
Lead	400,000	400,000	400,000	400,000	400,000
Toluene	470,000	626,700	470,000	2,350,000	2,350,000
Pentachlorophenol	500,000	500,000	500,000	1,000,000	1,250,000
Arsenic	625,000	781,300	1,250,000	2,083,300	2,083,300
Phenols	670,000	670,000	670,000	6,700,000	6,700,000
Zinc-(methanogenic leachate)(**)	1,000,000	1,000,000	10,000,000	3,333,300	3,333,300
Aniline	1,000,000	1,000,000	1,000,000	5,000,000	10,000,000
MTBE	1,000,000	1,000,000	1,000,000	10,000,000	10,000,000
Cyanides	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Nonylphenols	1,000,000	1,000,000	1,000,000	20,000,000	20,000,000
Ethyl benzene	1,000,000	1,666,666	1,000,000	5,000,000	5,000,000
Phosphorus	1,666,666	1,666,666	1,666,666	Use site data	Use site data
Chlorides	1,746,700	1,746,700	1,746,700	1,746,700	1,746,700
Copper	1,800,000	2,000,000	2,250,000	3,600,000	3,600,000
Naphthalene	2,170,000	4,340,000	2,170,000	43,400,000	43,400,000
Fluorides	3,100,000	3,100,000	3,100,000	3,100,000	3,100,000
Halogenated organics (AOX)	5,600,000	5,600,000	5,600,000	5,600,000	5,600,000
MCPA	10,000,000	10,000,000	10,000,000	200,000,000	200,000,000
Organotin compounds	25,000,000	25,000,000	25,000,000	25,000,000	25,000,000

(**) Biochemical status*:*

acetogenic: if any of the following leachate conditions apply:

- BOD/COD >0.4
- COD >5000 mg/l
- pH <6.5

methanogenic: if none of the above applies.

Table 5 – Substance concentration in (mg/m^3) for different landfill leachate treatment types

For all leachate types except where stated in brackets.	Raw effluent (R)	Methane stripping for at least 30 minutes (T1)	Treatment is a reed bed (T2)	Single stage aerobic biological treatment (T3)	T3 plus final polishing, such as wetland, ozone, activated carbon, reverse osmosis, irrigation (T4)
Nickel-(acetogenic)(**)	170	170	170	136	136
Zinc-(acetogenic)	660	660	66	198	198
Nickel-(methanogenic)(**)	55	55	55	44	44
Zinc-(methanogenic)(**)	99	99	9.9	29.7	29.7
For all leachate:					
Aniline	1	1	1	0.2	0.1
MTBE	1	1	1	0.1	0.1
Cyanides	50	50	50	50	50
DEHP	1	1	1	0.1	0.05
Fluorides	650	650	650	650	650
Halogenated organics (AOX)	177	177	177	177	177
MCPA	0.1	0.1	0.1	0.005	0.005
Organotin compounds	0.2	0.2	0.2	0.2	0.2
Phenols	30	30	30	0.3	0.3
PAHs	5.25	5.25	5.25	2.625	2.625
Nonylphenols	1	1	1	0.05	0.05
Arsenic	8	6.4	4	2.4	2.4
Chlorides	1,145,000	1,145,000	1,145,000	1,145,000	1,145,000
Chromium	50	50	50	35	35
Copper	11	9.9	8.8	5.5	5.5
Ethyl benzene	10	6	10	2	2
Lead	50	50	50	50	50
Mecoprop	11	11	5.5	0.11	0.055
Naphthalene	0.46	0.23	0.46	0.023	0.023
Pentachlorophenol	0.1	0.1	0.1	0.05	0.04
Phosphorus	3000	3000	3000	Use site data	Use site data
Toluene	21	15.75	21	4.2	4.2
Xylenes	35	21	35	14	8.75

(**) Biochemical status*:*

acetogenic: if any of the following leachate conditions apply:

- BOD/COD > 0.4
- COD > 5 000 mg/l
- pH < 6.5

methanogenic: if none of the above applies.

8 Opencast coal sector

This Section is intended to assist operators of opencast coal sites (OCCS) and allow them to comply with the requirements of the E-PRTR. Only OCCS with an active working area of greater than 25 hectares (10,000 square metres) are required to report annually to SPRI. You are NOT required to report for areas of your site under rehabilitation or areas not designated for future mineral extraction.

These activities may be regulated as "Other mineral activities" under the Pollution Prevention and Control (Scotland) Regulations 2012 (as amended; PPC Regulations). Included within the scope are Part B prescribed/listed activities regulated under Chapter 3, Section 3.5(b) of the PPC Regulations.

9.1 UKSIC and PRTR codes

For OCCS the relevant codes are likely to be:

		Code	Activity Description
Main economic activity	UK SIC	05.10/2	Mining of hard coal from opencast coal working (surface mining).

Main primary activity at installation (PRTR code)
This is the main activity undertaken at the installation.

For OCCS the relevant codes are likely to be:

OCCS		Code	Description
Main primary activity at Installation	PRTR	3(b)	Opencast mining.

PRTR Sub-activity at Installation
For OCCS sites it is unlikely that you will have to enter details into this section of your form, unless you have an additional activity which is directly associated to your main reporting site. If this is the case a sub-activity should also be selected.

9.2 Pollutant releases to air

We are only interested in actual emissions from OCCS-related activities and should include on-site activities relating to OCCS operations (this includes on-site extraction, mineral treatment, transport and mineral storage). Releases to air mean those releases from atmospheric discharge points, permitted activities together with fugitive emissions.

Most OCCS sites are only likely to need to report a figure against the following substances:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Particulate matter (below 2.5 and 10 microns in diameter PM_{10} and $_{2.5}$); and
- Particulate matter – Total.

Where particulate matter PM_{10} is defined as particulate matter of a diameter less than or equal to 10 micrometers (microns) in size (10,000 kg threshold) this should not be confused with Particulate Matter – Total which is particulate matter of all sizes (50,000 kg threshold) or Particulates - $PM_{2.5}$ and smaller (1,000 kg threshold).

In Tables 6 and 7 you will find a series of emission factors. To calculate the emission from your installation you should multiply up the appropriate emission factors to get your total annual emission. The general emission equation for this is:

Equation 2

Emission per year = Activity rate x emission factor for pollutant

Example 11

An OCC extracted 1 million tonnes of coal in the year 2017.
The emission factor for Methane is 0.17 kiloton/megaton which is 170 tonnes/megaton.

What is the annual methane gas emission in kg?

Methane emission = Annual emission factor (methane) x annual production in million tonnes for the OCC site

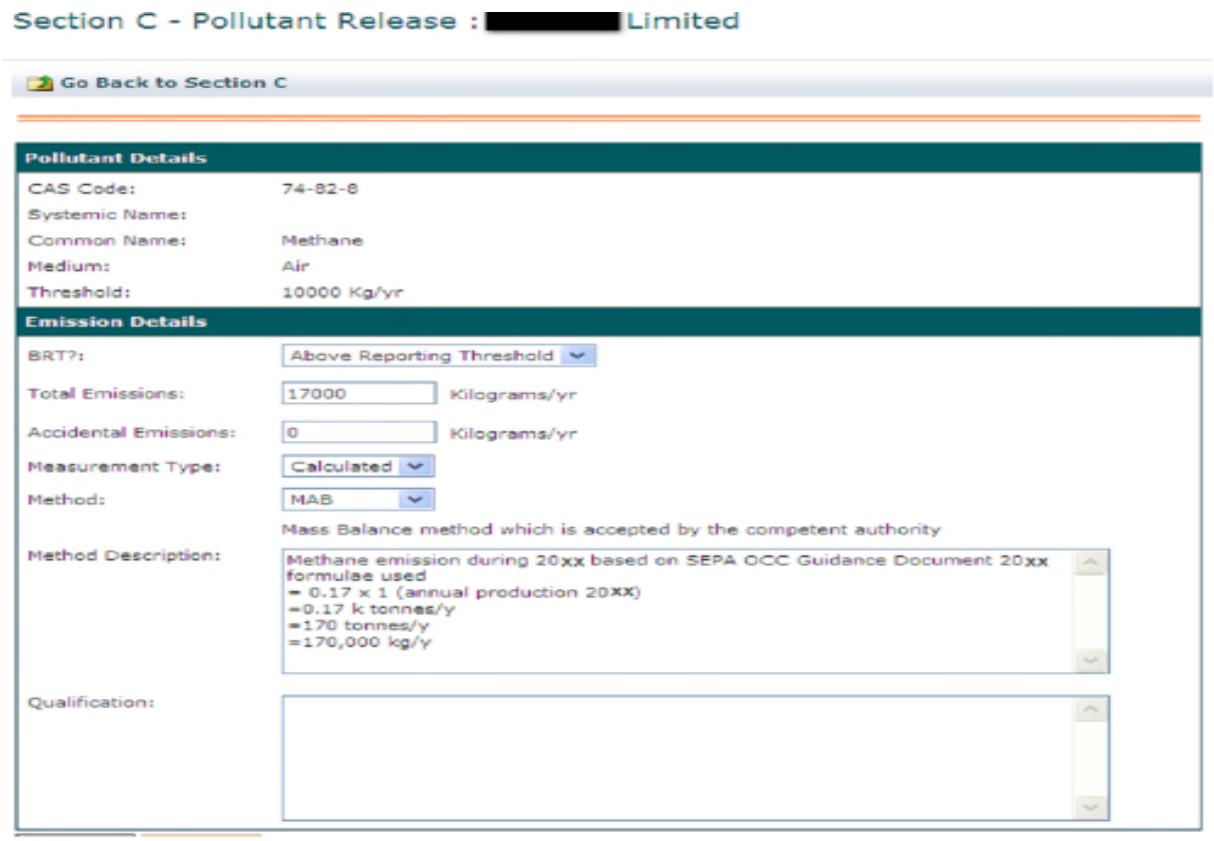
Methane emission = 0.17 x 1
= 0.17 ktonnes/year
= 170 tonnes/year
= 170,000 kg/year

This is above the reporting threshold of 10,000 kg/year.

The electronic form should be completed as follows:

- "**Measurement Type**" the letter "C" indicates that you have made a calculation.
- "**Method**" select **MAB** which is "Mass Balance method which is accepted by the competent authority".
- "**Method Description**" please provide the calculation used and use the phrase "**Emission factors given in SEPA Sector Guidance 2017**" where your calculation is based on any of the factors given in this guidance.
- Completion of the electronic form is fully explained within the SPRI Operator Reporting System Guidance Document

How to submit Example 11 within the electronic form is shown in the screenshot shown below.



If your methane emissions have been calculated at less than the 10,000 kg/year a reporting threshold of “BRT” should be recorded within the electronic form and the “Total Emissions” box should be left blank.

Example 12

An open cast coal site used a total of 350,000 litres of diesel for all on-site transport.
The emission factor for diesel is 2.6300 kg of CO_2 released per litre of fuel combusted.

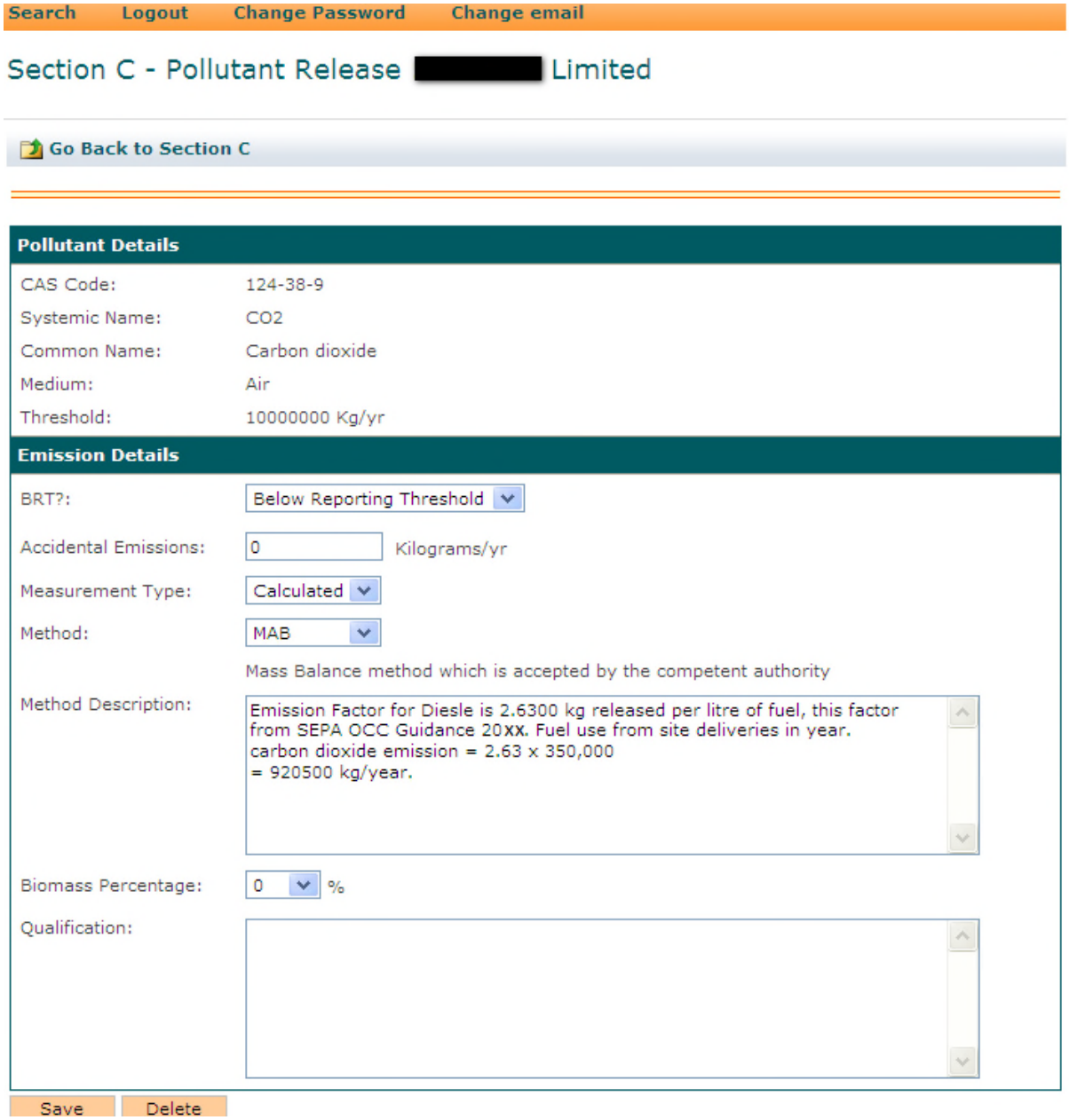
What is the annual carbon dioxide emission in kg?

Carbon dioxide emission = annual emission factor (carbon dioxide) x annual volume of diesel used on-site

Carbon dioxide emission = 2.63 x 350,000
= 920,500 kg/year

This is below the reporting threshold of 10,000,000 kg/year for carbon dioxide.

The electronic form should be completed as previously described and would be filled in as follows for Example 12:



For carbon dioxide if your annual diesel consumption is greater than 3,802,281 litres then you would breach the 10,000,000 kg/year threshold and should record a value within your SPRI return.

Example 13

An OCC site had an annual production of 1 Mt.
The emission factor for PM10 is 0.028 kilotonne/million tonnes of coal produced

PM_{10} emission = annual emission factor (PM_{10}) x annual OCC coal production

PM_{10} emission = 0.028 x 1
= 1 kilotonnes/year

This is above the reporting threshold for PM_{10} and should be reported.

The electronic form should be completed as previously described.

9.3 Pollutant releases to water

This is a reference to direct emissions from water treatment within your OCC site from treatment, such as lagoons or artificial wetlands made direct to watercourses; e.g. lochs, rivers, coastal waters or groundwater. Table 9 shows the major pollutants you may have to consider reporting. All emission points should be mentioned in your site's licence under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) and samples obtained as part of the licence conditions may be useful when determining SPRI data.

It is unlikely that you would be discharging any of the pollutants mentioned in Table 9 in quantities above the reporting threshold, however if you do have discharges to the water environment you should consider reporting these pollutants as BRT where you believe the pollutant may be present.

9.4 Useful references

Update of Estimated Methane Emissions from UK Abandoned Coal Mines (Department of Energy and Climate Change 25th May 2012)

Particulate matter quarry emission factors from National Atmospheric Emissions Inventory UK Emission Factor Database Website

Table 6 – Pollutant to Air Emission Factors for OCC Sites

Pollutant (air)	Emission factor (kilo tonnes/million tonnes of coal produced)
Methane (CH_4)	0.17
$PM_{2.5}$	0.0029
PM_{10}	0.029

Table 7 – Carbon dioxide emission factors for combustion of fuel

Fuel type used	Kg of CO_2 released per unit
Natural Gas	0.1850 per kWh
Gas Oil	0.2510 per kWh
	3190.0000 per tonne
	2.6740 per litre
Diesel	0.2490 per kWh
	3164.0000 per tonne
	2.6300 per litre
Petrol	0.2400 per kWh
	3135.0000 per tonne
	2.3150 per litre
Fuel Oil	0.2670 per kWh
	3223.0000 per tonne
Burning Oil (kerosene)	0.2450 per kWh
	3150.0000 per tonne
	2.5180 per litre
LPG	0.2140 per kWh
	1.4980 per litre

Table 8 – Indicative emissions to air for OCC sites

Pollutant	Threshold (kg/year)
Methane	10,000
Carbon monoxide	100,000
Arsenic	1
Carbon dioxide	10,000,000
Nitrogen oxides, NO and NO_2 as NO_2	100,000
Sulphur oxides, SO_2 and SO_3 as SO_2	100,000
Cadmium	1
Chromium	20
Copper	20
Lead	20
Cl and total inorganic chlorine compounds – as HCl	10,000
Zinc	100
Particulate matter – $PM_{2.5}$ and smaller	1,000
Particulate matter – PM_{10} and smaller	10,000
Particulate matter – Total	50,000
Nickel	10

Table 9 – Indicative emissions to water and waste water at OCC sites

Pollutant	Threshold (kg/year)
Total nitrogen	50,000
Total phosphorus	5,000
Arsenic and compounds (as As)	5
Cadmium and compounds (as Cd)	1
Chromium and compounds (as Cr)	20
Copper and compounds (as Cu)	20
Nickel and compounds (as Ni)	20
Lead and compounds (as Pb)	20
Zinc and compounds (as Zn)	100
Total organic carbon (TOC) (as total C or COD/3)	50,000
Chlorides (total as Cl)	2,000,000

9 Quarrying sector

This Section is intended to assist operators of quarry sites and allow them to comply with the requirements of the E-PRTR. Only quarries with an active working of greater than 25 hectares are required to report annually to SPRI. You are NOT required to report for areas of your site under rehabilitation or areas not designated for future mineral extraction.

These activities may be regulated as "Other mineral activities" under the Pollution Prevention and Control (Scotland) Regulations 2012 (as amended; PPC Regulations). Included within the scope are Part B prescribed/listed activities regulated under Chapter 3, Section 3.5(a) of the PPC Regulations.

10.1 Changes from previous years

There are no changes to the reporting thresholds for data reporting year 2017.

10.2 UKSIC and PRTR codes

For quarry sites the relevant codes are likely to be:

		Code	Activity Description
Main economic activity	UK SIC	08.11	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate.
Main economic activity	UK SIC	08.12	Operation of gravel and sand pits; mining of clays and kaolin.
Main economic activity	UK SIC	08.99	Other mining and quarrying n.e.c.
Main economic activity	UK SIC	09.90	Support activities for other mining and quarrying.

Main primary activity at installation (PRTR code)
This is the main activity undertaken at the installation.

For quarry sites the relevant codes are likely to be:

OCCS		Code	Description
Main primary activity at Installation	PRTR	3(b)	Opencast mining.

PRTR Sub-activity at Installation
For quarry sites it is unlikely that you will have to enter details into this section of your form, unless you have an additional activity which is directly associated to your main reporting site. If this is the case a sub-activity should also be selected.

10.3 Pollutant releases to air

We are only interested in actual emissions from quarry-related activities and should include on-site activities relating to quarry operations (this includes on-site extraction, mineral treatment, transport and mineral storage). Releases to air mean those releases from atmospheric discharge points, permitted activities together with fugitive emissions

Most quarry sites are only likely to need to report a figure against the following substances:

- Particulate matter (Total, PM_{10} and $_{2.5}$); and
- Carbon dioxide.

Where particulate matter PM_{10} is defined as particulate matter of a diameter less than or equal to 10 micrometers (microns) in size (10,000 kg threshold) this should not be confused with Particulate Matter – Total which is particulate matter of all sizes (50,000 kg threshold) or Particulates - $PM_{2.5}$ and smaller (1,000 kg threshold).

In Tables 10 and 11 you will find a series of emission factors. To calculate the emission from your installation you should multiply up the appropriate emission factors to get your total annual emission. The general emission equation for this is:

Equation 3

Emission per year = Activity rate x emission factor for pollutant

Example 14

A quarry extracted 1 million tonnes of coal in the year 20XX.
The emission factor for PM_{10} is 0.029 kiloton/megaton which is 29 tonnes/megaton.

What is the annual PM_{10} emission in kg?

PM_{10} emission = Annual emission factor (methane) x annual production in million tonnes for the OCC site

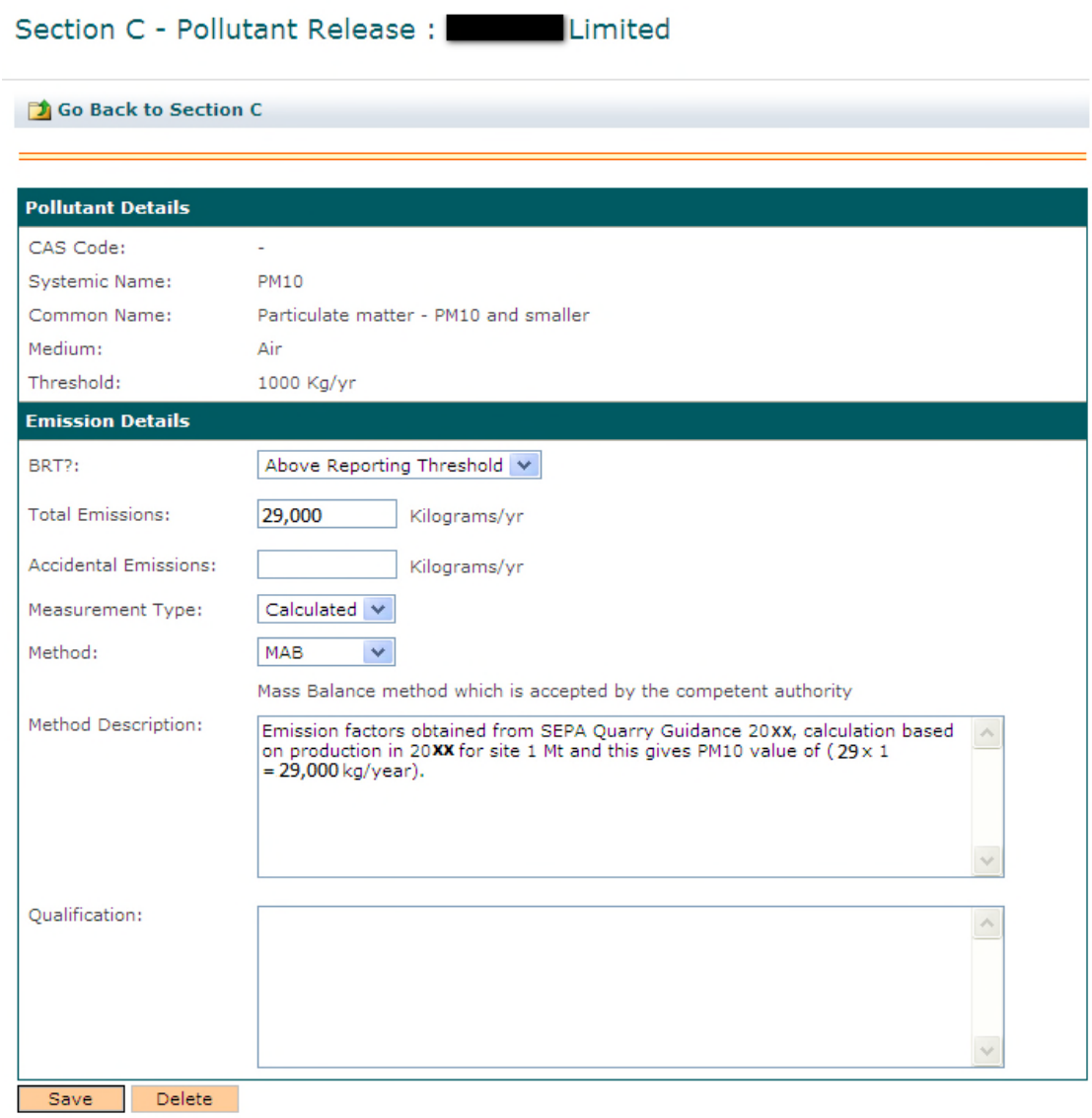
PM_{10} emission = 29 x 1
= 29 tonnes/year
= 29,000 kg/year

This is above the reporting threshold of 10,000 kg/year for PM_{10}.

The electronic form should be completed as follows:

- "**Measurement Type**" the letter "C" indicates that you have made a calculation.
- "**Method**" select **MAB** which is "Mass Balance method which is accepted by the competent authority".
- "**Method Description**" please provide the calculation used and use the phrase "**Emission factors given in SEPA Sector Guidance 2017**" where your calculation is based on any of the factors given in this guidance.
- Completion of the electronic form is fully explained within the SPRI Operator Reporting System Guidance Document

How to submit Example 14 within the electronic form is shown in the screenshot shown below.



If your emissions have been calculated at less than the 10,000kg/year reporting threshold the BRT should be recorded within the electronic form.

Example 15

A quarry used a total of 60,000 litres of diesel for product processing within the site in 20XX. The emission factor for CO_2 is 2.63 kg released per litre combusted.

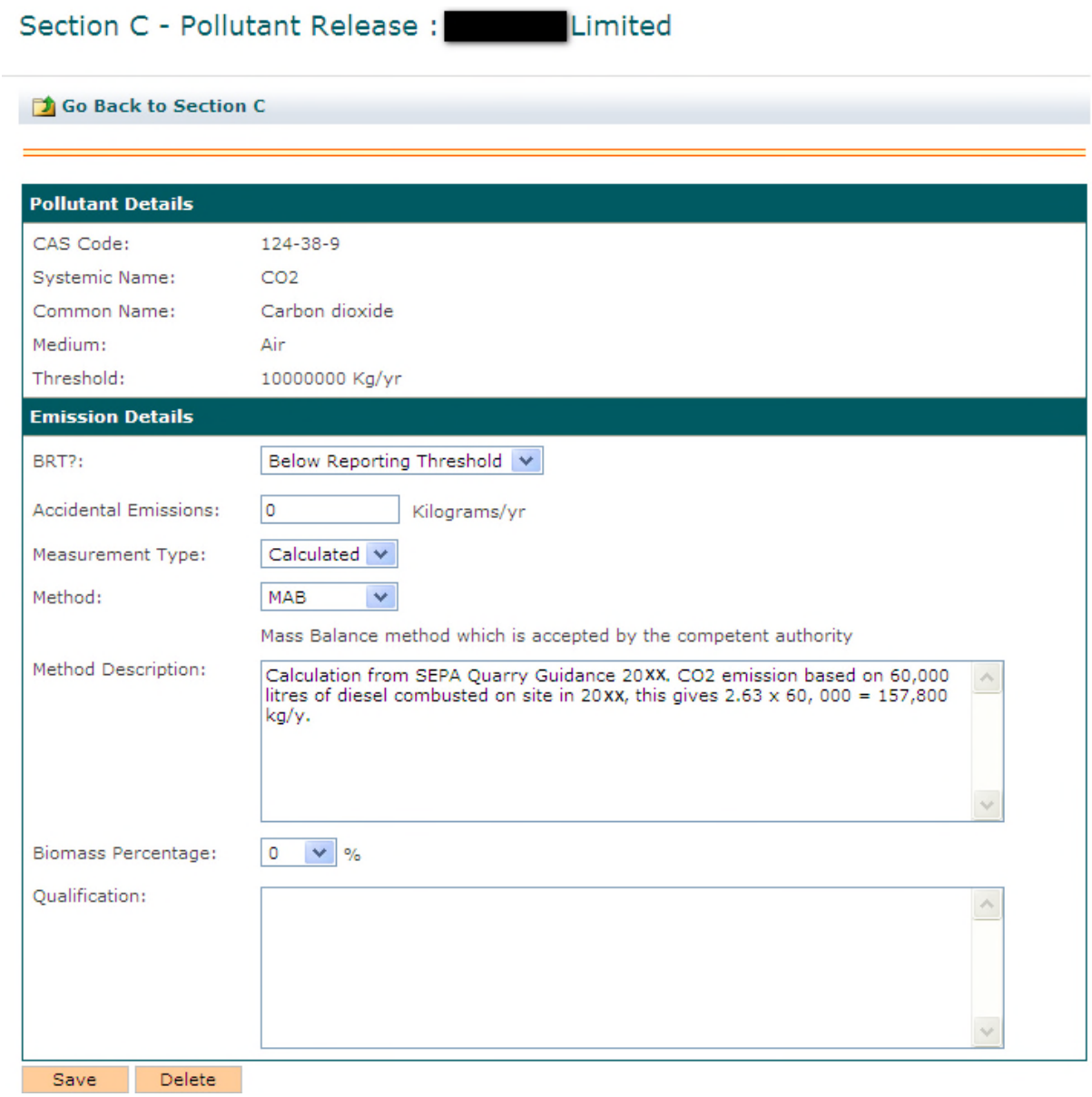
What is the annual CO_2 emission in kg?

Carbon dioxide emission = Annual emission factor (CO_2) x annual diesel consumption for the quarry site

CO2 emission = 2.63 x 60,000
= 157,800 kg/year

This is below the reporting threshold of 10,000,000 kg/year for CO_2.

The electronic form should be completed as previously described.



For CO_2 if your annual diesel consumption is greater than 3,802,281 litres then you would breach the 10,000,000 kg/year threshold and should record a value within your SPRI return.

10.4 Pollutant releases to water

This is a reference to direct emissions from water treatment within your quarry site from treatment, such as lagoons or artificial wetlands made direct to watercourses; e.g. lochs, rivers, coastal waters or groundwater. Table 13 shows the major pollutants you may have to consider reporting. All emission points should be mentioned in your site's licence under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) and samples obtained as part of the licence conditions may be useful when determining SPRI data.

It is unlikely that you would be discharging any of the pollutants mentioned in Table 13 in quantities above the reporting threshold, however if you do have discharges to the water environment you should consider reporting these pollutants as BRT where you believe the pollutant may be present.

10.5 Useful references

Particulate matter quarry emission factors from National Atmospheric Emissions Inventory UK Emission Factor Database Website

Table 10 – **Pollutant to air emission factors for quarry sites**

Pollutant (air)	Emission factor (kilo tonnes/million tonnes produced)
$PM_{2.5}$	0.0029
PM_{10}	0.029

Table 11 – Carbon dioxide emission factors for combustion of fuel

Fuel type used	Kg of CO_2 released per unit
Natural gas	0.1850 per kWh
Gas oil	0.2510 per kWh
	3190.0000 per tonne
	2.6740 per litre
Diesel	0.2490 per kWh
	3164.0000 per tonne
	2.6300 per litre
Petrol	0.2400 per kWh
	3135.0000 per tonne
	2.3150 per litre
Fuel oil	0.2670 per kWh
	3223.0000 per tonne
Burning oil (kerosene)	0.2450 per kWh
	3150.0000 per tonne
	2.5180 per litre
LPG	0.2140 per kWh
	1.4980 per litre

Table 12 – Indicative emissions to air for quarry sites

Pollutant	Threshold (kg/year)
Methane	10,000
Carbon monoxide	100,000
Arsenic	1
Carbon dioxide	10,000,000
Nitrogen oxides, NO and NO_2 as NO_2	100,000
Sulphur oxides, SO2 and SO_3 as SO_2	100,000
Cadmium	1
Chromium	20
Copper	20
Lead	20
Cl and total inorganic chlorine compounds – as HCl	10,000
Zinc	100
Particulate matter – Total	50,000
Particulate matter – PM_{10} and smaller	10,000
Particulate matter – $PM_{2.5}$ and smaller	1,000
Nickel	10

Table 13 – Indicative emissions to water and waste water for quarry sites

Pollutant	Threshold (kg/year)
Total nitrogen	50,000
Total phosphorus	5,000
Arsenic and compounds (as As)	5
Cadmium and compounds (as Cd)	1
Chromium and compounds (as Cr)	20
Copper and compounds (as Cu)	20
Nickel and compounds (as Ni)	20
Lead and compounds (as Pb)	20
Zinc and compounds (as Zn)	100
Total organic carbon (TOC) (as total C or COD/3)	50,000
Chlorides (total as Cl)	2,000,000

10 General references and useful information

The following are general references and further information you may find useful. Any references specific to a particular sector will be contained in the relevant section of this guidance note.

- Scottish Pollutant Release Inventory website
- SCIAL (Simple Calculation of Atmospheric Impacts Limits)
- The Pollution Prevention and Control (Scotland) Regulations 2012 (as amended) SSI 2012 No. 360
- SEPA Scottish Pollutant Release Inventory General Guidance Document
- Scottish Pollutant Release Inventory (SPRI) Operator Guidance on Release Estimation Techniques (RET)
- Scottish Pollutant Release Inventory (SPRI) Operator Reporting System Guidance 2017
- SPRI Schedule to notice
- UK-PRTR website
- E-PRTR website
- European Commission
- EC Aarhus Convention

11 Glossary

ACI	Animal Carcass Incineration
ALT	Alternative (measurement method)
AOX	Adsorbable Organic Halogens
APC	Air Pollution Control
ART	Above Reporting Threshold
As	Arsenic
BaP	Benzo(a)pyrene
BAT	Best Available Techniques
BCA	British Cement Association
BDEs	Brominated Diphenylethers
BOS	Basic Oxygen Steelmaking
BRT	Below Reporting Threshold
BS	British Standard
BSI	British Standards Institute
BTX	Benzene, Toluene, Xylene
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2011
CCGT	Combined Cycle Gas Turbine
CCU	Catalytic Cracking Unit
CEMS	Continuous Emission Monitoring System
CEN	European Committee for Standardisation
Cd	Cadmium
CF	Conversion Factor
CFCs	Chlorofluorocarbons
CH4	Methane
CHP	Combined Heat and Power
CO	Carbon Monoxide
CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
CoT	Committee on Toxicity
CN	Cyanide
Cr	Chromium
CRM	Certified Reference material
Cu	Copper
CWI	Clinical Waste Incineration
D&R	Disposal and Recovery
DI	Drum Incineration
EAF	Electric Arc Furnace
EC	European Commission
EEA	European Environment Agency
EF	Emission Factor
EGR	Exhaust Gas Recirculation
EIA	Environmental Impact Assessment
ELV	Emission Limit Value
EPER	European Pollutant Emission Register
ESI	Electricity Supply Industry
ESP	Electrostatic Precipitator
ETP	Effluent Treatment Plant
EU	European Union
EU ETS	European Union Emissions Trading System
E-PRTR	European Pollutant Release and Transfer Register
ESP	Electrostatic Precipitator
EWC	European Waste Catalogue
FCCU	Fluidised Catalytic Cracking Unit
FGD	Flue Gas Desulphurisation
FGR	Flue Gas Recirculation
FSF	Fully Slatted Floor
GCV	Gross Calorific Value

FID	Flame Ionisation Detector
GHG	Greenhouse Gas
HCFCs	Hydrochlorofluorocarbons
HCl	Hydrogen Chloride
HCN	Hydrogen Cyanide
HF	Hydrogen Fluoride
HFCs	Hydrofluorocarbons
HFO	Heavy Fuel Oil
Hg	Mercury
H2S	Hydrogen Sulphide
HW	Hazardous Waste
HWI	Hazardous Waste Incineration
IBC	Intermediate Bulk Container
IED	Industrial Emissions Directive
INT	Internationally Approved (measurement standard)
IOWWTP	Independently-operated Waste water Treatment Plant
IPC	Integrated Pollution Control
IPPC	Integrated Pollution Prevention and Control
I-TEF	International Toxicity Equivalency Factor
I-TEQ	International Toxicity Equivalents of Dioxins
JEP	Joint Environment Programme
K	Kelvin (unit of temperature)
LOD	Limit of Detection
LPG	Liquefied Petroleum Gas
LRTAP	Long-range transboundary air pollution (convention on)
LVOC	Large Volume Organic Chemicals
MAB	Mass Balance Method
MBq	Mega Becquerel
MCERTS	(Environment Agency's) Monitoring Certification Scheme
Mg(OH)2	Magnesium Hydroxide
Mn	Manganese
MRR	Monitoring and Reporting Requirements
MSW	Municipal Solid Waste
MWI	Municipal Waste Incineration
NAEI	National Atmospheric Emissions Inventory
NCV	Net Calorific Value
Ni	Nickel
NH3	Ammonia
NIC	National Identity Code
NLA	No Longer Applicable
NOx	Oxides of nitrogen (mixture of NO and NO2)
NO2	Nitrogen Dioxide
NO	Nitric Oxide
N2O	Nitrous Oxide
NRB	National or Regional Binding (measurement method)
OCC	Opencast Coal
OTH	Other (measurement method)
NMVOCs	Non-methane Volatile Organic Compounds
PAHs	Polycyclic Aromatic Hydrocarbons
Pas	Publically Available Standard
Pb	Lead
PCBs	Polychlorinated Biphenyls
PCDDs	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
PER	Measurement method already prescribed by the competent authority (SEPA) in a license or permit for that facility
PF	Pulverised Fuel
PFBC	Pulverised Fluid Bed Combustion
PFCs	Polyfluorinated Hydrocarbons
PI	Pollution Inventory
PM	Particulate Matter
PM2.5	Particulate Matter (<2.5µm aerodynamic diameter)

PM10	Particulate Matter (<10µm aerodynamic diameter)
PPC	Pollution Prevention and Control (Scotland) Regulations 2012 (as amended)
Ppm	Parts per million
Ppmv	Parts per Million by Volume
PSF	Partially Slatted Floor
PVC	Polyvinyl Chloride
RCF	Recycled Fibre
RET	Release Estimation Technique
RS	Radioactive Substances
Sb	Antimony
SCIAL	Simple Calculation of Atmospheric Impacts Limits
SCR	Selective Catalytic Reduction
SIC	Standard Industry Classification
SLF	Substitute Liquid Fuel
Sn	Tin
SNCR	Selective Non-catalytic Reduction
SOx	Oxides of Sulphur (mixture of SO2 and SO3)
SO2	Sulphur Dioxide
SO3	Sulphur Trioxide
SRU	Sulphur Recovery Unit
SSC	Sector Specific Calculation
SSI	Sewage Sludge Incineration
SWS	Sour Water Scrubber
SPRI	Scottish Pollutant Release Inventory
TOC	Total Organic Carbon
TPM	Total Particulate Matter
TSS	Total Suspended Solids
UKSIC	United Kingdom Standard Industry Classification
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USEPA	United States Environmental Protection Agency
UWWTP	Urban Waste water Treatment Plant
V	Vanadium
VC	Vinyl Chloride
VDU	Vacuum Distillation Unit
VOCs	Volatile Organic Compounds
WESP	Wet Electrostatic Precipitator
WEWS	Water Environment and Water Services (Scotland) Act 2003
WHO	World Health Organisation
WHO-TEF	WHO Toxicity Equivalency Factor
WHO-TEQ	Toxicity Equivalents of Dioxins
WML	Waste Management Licence
WWTP	Waste water Treatment Plant
Zn	Zinc