RADIOACTIVE SUBSTANCES ACT 1993

CERTIFICATE OF AUTHORISATION
AND
INTRODUCTORY NOTE

ACCUMULATION AND DISPOSAL
OF RADIOACTIVE WASTE

SABIC UK PETROCHEMICALS

WILTON INTERNATIONAL MANUFACTURING SITE
PO BOX 99
WILTON
MIDDLESBROUGH
TS10 4YA

AUTHORISATION NUMBER
BL8775 / CB1532

INTRODUCTORY NOTE

IN 1. This Note does not form part of the Certificate of Authorisation.

IN 2. The following certificate contains details of an authorisation issued by the Environment Agency under the provisions of Sections 13 and 14 of the Radioactive Substances Act 1993 ("the Act"). The authorisation permits the accumulation and disposal of the specified radioactive wastes from the specified premises.

The Certificate of Authorisation includes a signed Certificate together with schedules. The Certificate includes the date from which the Authorisation shall take effect. Schedule 1 contains general conditions relating to all waste streams. Schedule 2 specifies the categories of radioactive waste that are authorised for accumulation and disposal. Schedules 3 to 7 contain limitations and conditions on the physical nature and radionuclide content of individual waste streams. Schedule 8 contains any further conditions and modifications or deletions of the conditions in earlier schedules.

IN 3. The Radioactive Substances Act 1993 is concerned with the control of radioactive material and any subsequent accumulation and disposal of radioactive waste. The conditions attached to the authorisation are concerned with the control and security of the accumulated radioactive waste and its subsequent disposal.

IN 4. The holding and use of radioactive materials from which the radioactive waste covered by this authorisation is generated, is under the terms of a certificate of registration issued under sections 7 and/or 10 of the Act.

IN 5. The authorisation does not permit contravention of any other enactment or any order made, granted or issued under any enactment; nor does it permit any contravention of any rule of law or breach of any agreement.
In particular any requirements governing the use of radioactive material under the Health & Safety at Work etc Act 1974 will additionally need to be observed.

IN 6. The undertaking to which this certificate relates may accumulate and dispose of the radionuclides in Schedules 2 to 5 The radioactive waste included in the provisions of this certificate results from the use of registered open sources which are in the form of solutions or solids that may be divided (e.g. dilution). Such materials are used for the purposes of industrial process tracer test and environmental tracer test, where there is a need to manipulate the radioactive materials themselves, rather than simply exploit the properties of their radiations. In performing these operations, a variety of radioactive waste is generated, including laboratory trash, and residues of the registered open sources.

RADIOACTIVE SUBSTANCES ACT 1993

Authorisation to Accumulate and Dispose of Radioactive Waste

SABIC UK PETROCHEMICALS

BL8775 / CB1532

This certifies that the Environment Agency ("the Agency") in exercise of its powers under sections 16(2) and 16(8) of the Radioactive Substances Act 1993 ("the Act") has authorised

SABIC UK PETROCHEMICALS

Company Registered No 3767075

("the user")

whose Registered Office is

Wilton International Manufacturing Site
PO Box 99
Wilton
Redcar
TS10 4YA

under sections 13(1), 13(3) and 14 of the Act, to accumulate the radioactive waste specified in paragraph 1 of Schedule 2 to this certificate on the premises (with a view to its subsequent disposal) and to dispose of the radioactive waste specified in paragraph 2 of Schedule 2 to this certificate, from the premises used by him at

Wilton International Manufacturing Site
PO Box 99
Wilton
Redcar
TS10 4RF

subject to the limitations and conditions in the Schedules to this Certificate of Authorisation.

This Authorisation shall come into effect on 03 September 2007

Signed .....

S Firth

Authorised to sign on behalf of the Environment Agency

Dated the .....

Schedule 1

STANDARD CONDITIONS AND LIMITATIONS

MANAGEMENT

1. The user shall have a management system, organisational structure and resources which are sufficient to achieve compliance with the limitations and conditions of this Authorisation and which include:

   a) provision for consultation with such suitable RPAs, or other such qualified experts as the Agency may approve in writing, as are necessary for the purpose of advising the user as to compliance with the limitations and conditions of this Authorisation and, in particular, on the matters addressed in paragraphs 2 and 4 in this Schedule;

   b) written operating procedures;

   c) adequate supervision of the disposal of radioactive waste by suitably qualified and experienced persons, whose names shall be clearly displayed with each copy of the Certificate of Authorisation that is posted on the premises as required by section 19 of the Act.

DISPOSAL OF RADIOACTIVE WASTE

2. The user shall use the best practicable means to:

   (a) minimise the activity in all disposals of radioactive waste;

   (b) where authorised, minimise the volume of radioactive waste disposed of by transfer to other premises;

   (c) dispose of radioactive waste at times, in a form, and in a manner so as to minimise the radiological effects on the environment and members of the public.

3. The user shall maintain in good repair the systems and equipment provided:

   (a) to meet the requirements of paragraph 2 in this Schedule;

   (b) for the disposal of radioactive waste.

4. The user shall check, at an appropriate frequency, the effectiveness of systems, equipment and procedures provided:

   (a) to meet the requirements of paragraph 2 in this Schedule;

   (b) for the disposal of radioactive waste.

ACCUMULATION OF RADIOACTIVE WASTE

5. The user shall so far as is reasonably practicable prevent -

   (a) the loss or escape of any accumulated radioactive waste; and

   (b) the access to any accumulated radioactive waste by any person not authorised by the user.

6. The user shall so far as is reasonably practicable ensure that accumulated radioactive waste is kept either:

   (a) in a suitable container under continuous surveillance; or

   (b) in a suitable container in a suitable store both of which -

      (i) are so constructed, maintained and used so as to prevent the loss or unauthorised removal of the waste; and

      (ii) are constructed of non-combustible materials; and

      (iii) do not contain nor are located close to any corrosive, explosive or flammable material; and

      (iv) are clearly and legibly marked with the word 'Radioactive' and with the ionising radiation symbol complying with BS 3510: 1968 or ISO 361 and any other information necessary for the identification of the waste present.

7. The user shall so far as is reasonably practicable ensure that all relevant parts of the premises are constructed, maintained and used in such a manner that -

   (a) they do not readily become contaminated; and

   (b) any contamination which does occur can be easily removed.

LOSS OF ACCUMULATED RADIOACTIVE WASTE

8. If the user believes or has reasonable grounds for believing that any accumulated radioactive waste has been lost or stolen he shall -

   (a) without delay inform the Police and the Agency;

   (b) so far as is reasonably practicable recover the waste; and

   (c) as soon as is practicable notify the Agency in writing of the circumstances of the occurrence and the means taken to recover the waste.

ESCAPE OF ACCUMULATED RADIOACTIVE WASTE

9. If the user believes or has reasonable grounds for believing that any radioactive waste is escaping or has escaped from any container or location in which it is accumulated he shall -

   (a) without delay inform the Agency;

   (b) so far as is reasonably practicable:-

      (i) prevent any further escape; and

      (ii) minimise the spread of any contamination;

   (c) ensure that any discharge of radioactive gas to the atmosphere is made in a manner which prevents so far as is reasonably practicable its entry into any building; and

   (d) as soon as is practicable report the circumstances in writing to the Agency.

ACCUMULATION OR DISPOSAL NOT IN COMPLIANCE WITH AUTHORISATION

10. If the user believes or has reasonable grounds for believing that the accumulation or disposal of radioactive waste is occurring, has occurred or might occur which does not comply with the limitations and conditions of this authorisation he shall -

   (a) without delay inform the Agency;

   (b) so far as is reasonably practicable prevent the further accumulation or disposal of radioactive waste; and

   (c) as soon as is practicable report the circumstances in writing to the Agency.

CHANGE OF NAME OR CESSATION OF ACCUMULATION AND DISPOSAL

11. The user shall inform the Agency in writing, at least 28 days in advance or, where this is not possible, without delay, of his intention to -

   (a) change the name of the user; or

   (b) cease to occupy the premises; or

   (c) cease to accumulate and dispose of radioactive waste.

RECORDS

12. The user shall make, on the day of accumulation or disposal as appropriate, clear and legible records of accumulation and of disposal of radioactive waste.

13. The user shall, subject to paragraph 16 in this Schedule:

(a) make and retain records sufficient to demonstrate whether the limitations and conditions of this Authorisation are complied with;

(b) retain records made in accordance with any previous Authorisation issued to the user and related to the premises covered by this Authorisation;

(c) retain records transferred to the user by any predecessor user which were made in accordance with any previous Authorisation related to the premises covered by this Authorisation.

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14. If the user amends any record made in accordance with this Authorisation it shall ensure that the original entry remains clear and legible.

15. If required by the Agency, the user shall keep the records referred to in paragraph 12 and 13 in this Schedule in a manner and place approved by the Agency.

16. The user shall retain the records referred to in paragraphs 12 and 13 in this Schedule until notified in writing by the Agency that the records no longer need to be retained.

PROVISION OF INFORMATION

17. The user shall supply such information in such format and within such time as the Agency may specify.

SAMPLING AND ANALYSIS OF WASTE AND OTHER SUBSTANCES

18. The user shall:

(a) take and analyse such samples of waste and conduct such other tests and surveys as the Agency may require;

(b) make and keep a record of each such analysis, test or survey; and

(c) retain such samples as may be directed by the Agency.

19. If required by the Agency, the user shall, as the Agency specifies -

(a) provide samples;

(b) dispatch samples for tests at a laboratory and ensure that the samples and residues thereof are collected from the laboratory within three months of receiving written notification that testing and repackaging in accordance with the appropriate transport regulations are complete.

INTERPRETATION

20. (1) In this Certificate of Authorisation -

"activity", expressed in becquerels, means the number of spontaneous nuclear transformations occurring in a period of one second in a radioactive substance;

"aqueous waste" means radioactive waste in the form of a continuous aqueous phase together with any entrained solids, gases and non-aqueous liquids;

"Bq, kBq, MBq, GBq, TBq and PBq" are used as abbreviations meaning becquerels, kilobecquerels, megabecquerels, gigabecquerels, terabecquerels and petabecquerels respectively;

"consignment" means an individual shipment of radioactive waste not greater in volume than 40 cubic metres or such lesser volume as specified in writing by the Agency;

"day" means a period of twenty-four consecutive hours commencing at midnight;

"decay products" means in relation to any radionuclide, the radionuclides succeeding it in the radioactive series in which it and they occur;

"drainage system" means any drainage system normally used for the disposal of foul water or trade effluent arising on the premises;

"half life" means the time taken for the activity of a radionuclide to lose half its value by decay;

"gaseous waste" means radioactive waste in the form of gases and associated mists and particulate matter;

"licensed landfill site" means a place where the deposit of waste is authorised by a waste management licence issued under Part II of the Environmental Protection Act 1990 or by a permit issued under The Pollution Prevention and Control (England and Wales) Regulations 2000;

"LLWR" means Low Level Waste Repository

"LLWR Operator" means the current holder of a site licence issued under the Nuclear Installations Act 1965 for the Low Level Waste Repository at Drigg;

"modifications" includes additions, alterations and omissions;

"month" means calendar month (ie 1-31 January, 1-28/29 February, 1-31 March, etc);

"operating procedures" means procedures for carrying out any operation that may have an effect on compliance with this Authorisation;

"organic liquid waste" means radioactive waste in the form of liquid, not being aqueous waste, containing one or more organic chemical compounds;

"period of accumulation" means the length of time that waste remains accumulated on the premises with a view to its subsequent disposal;

"radionuclide" means a species of atom characterised by its mass number and atomic number and subject to radioactive decay;

"record of accumulation" means a record made in such a manner as the Agency may require showing the origin, nature, volume and location of the accumulated waste together with such other information as may be specified by the Agency;

"record of disposal" means a record made in such a manner as the Agency may require showing the date, location, radioactive content of each disposal and in the case of waste transferred for the purpose of final disposal at the Low Level Waste Repository at Drigg, the nature of the waste, its weight and volume, together with such other information as may be specified by the Agency;

"relevant parts of the premises" includes for the purposes of paragraph 7 of this Schedule, the floor, ceiling, walls, fittings and furniture in any area where radioactive waste is accumulated or disposed of, and any associated drainage and ventilation systems;

"residual ash" includes cinders and other debris;

“RPA” means a Radiation Protection Adviser appointed under Regulation 13 of the Ionising Radiations Regulations 1999;

"Schedule" means a Schedule which forms part of this certificate;

"Sellafield Site Operator" means the current holder of a site licence issued under the Nuclear Installations Act 1965 for the Sellafield Site ;

"solid waste" means radioactive waste in the form of a solid and includes very low level waste;

"the Act" means the Radioactive Substances Act 1993;

"the Agency" means the Environment Agency;

"very low level waste" means waste in the form of solid, together with refuse which is not radioactive waste, in which at the time of removal from the premises either -

(i) there are no alpha emitting radionuclides, the sum total of kilobecquerels of all other radionuclides in any 0.1 cubic metres of the whole mass of radioactive waste and refuse does not exceed 400 and the sum total of kilobecquerels of all other radionuclides in any one item of waste does not exceed 40; or

(ii) the sum total of megabecquerels of all the carbon 14 and tritium in any 0.1 cubic metres of the whole mass of radioactive waste and refuse does not exceed 4, the sum total of kilobecquerels of carbon 14 and tritium in any one item of the waste does not exceed 400 and there are no other radionuclides;

"waste collection authority" has the same meaning as in Part II of the Environmental Protection Act 1990;

"year" means calendar year.

(2) (a) In determining whether particular means are the "best practicable" for the purposes of this authorisation, the user shall not be required to incur expenditure whether in money, time or trouble which is, or is likely to be, grossly disproportionate to the benefits to be derived from, or likely to be derived from, or the efficacy of, or likely efficacy of, employing them, the benefits or results produced being, or likely to be, insignificant in relation to the expenditure;

(b) Where reference is made to the use of "best practicable means" in this Certificate of Authorisation, the means to be employed shall include:

(i) the provision, maintenance and manner of operation of any relevant plant, machinery or equipment;

(ii) the supervision of any relevant operation.

Schedule 2

1. RADIOACTIVE WASTE AUTHORISED FOR DISPOSAL

Gaseous Waste
Aqueous Waste

Schedule 3

GASEOUS WASTE

DISPOSAL OF GASEOUS WASTE

1. The user may only dispose of gaseous waste if -

a. it is disposed of by the route specified in Table 1 of this paragraph in a manner which prevents so far as is reasonably practicable its entry into any building;

b. in any day the total activity of any radionuclide or group of radionuclides in the waste listed in Column 1 of Table 2 of this paragraph does not exceed the relevant daily disposal limit specified in Column 2 of that Table;

c. in any year the total activity of any radionuclide or group of radionuclides in the waste listed in Column 1 of Table 2 of this paragraph does not exceed the relevant annual disposal limit specified in Column 3 of that Table; and

d. it contains only the radionuclides listed in Column 1 of Table 2 of this paragraph other than decay products in amounts which could be present through radioactive decay of a listed radionuclide in the waste.

Table 1

Authorised Gaseous Disposal Route
Numerous process stacks on the site. Height above the ground is 25 - 76m. Height above the highest part of the building roof not less than 20m

Table 2

Gaseous Waste Disposal Limits		
Column 1 Radionuclides	Column 2 Daily Disposal Limits	Column 3 Annual Disposal Limits
Krypton 85	185 GBq	1480 GBq
Tritium	148GBq	1184 GBq
Krypton 79	37 GBq	296 GBq
Bromine 82	4 GBq	32 GBq

Schedule 4

AQUEOUS WASTE

DISPOSAL OF AQUEOUS WASTE

1. The user may only dispose of aqueous waste if -

   a. it is disposed of by the route specified in Table 1 of this paragraph;

   b. so far as is reasonably practicable, all entrained solids, gases and non-aqueous liquids have been excluded;

   c. in any month the total activity of any radionuclide or any group of radionuclides in the waste listed in Column 1 of Table 2 of this paragraph does not exceed the relevant monthly disposal limit in Column 2 of that Table; and

   d. it contains only the radionuclides listed in Column 1 of Table 2 of this paragraph other than decay products in amounts which could be present through radioactive decay of a listed radionuclide in the waste.

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Table 1

Authorised Aqueous Disposal Route
Discharged to the Enron Teesside Operations Limited Site effluent system and eventually discharged to the River Tees at map reference NZ561241

Table 2

Aqueous Waste Disposal Limits	
Column 1 Radionuclides	Column 2 Monthly Disposal Limits
Tritium Other non-alpha emitting isotopes	160 GBq 40 GBq total

Schedule 8

FURTHER CONDITIONS

None

RADIOACTIVE SUBSTANCES ACT 1993

ENVIRONMENT AGENCY SPECIFICATION

Made under

AUTHORISATION NUMBER: BL8775 / CB1532

Issued to

SABIC UK PETROCHEMICALS

for the

DISPOSAL OF RADIOACTIVE WASTE FROM

Wilton International Manufacturing Site
PO Box 99
Wilton
Redcar
TS10 4RF

Authorisation Condition

Schedule **1,** Paragraph **17**

The User shall supply such information in such format and within such time as the Agency may specify.

Environment Agency Specification

The Environment Agency specifies that:

1. The User shall supply information relating to disposals of radioactive waste as specified in the attached Reporting Form, referenced PI-2(RAS)v061, taking account of the guidance provided in the Reporting Form, and in accordance with the following:

   (a) the information shall be provided not later than 28 February each year for disposals made during the preceding calendar year.

   (b) the information shall be provided by:

      (i) electronic data capture (on-line form or XML file transfer) at www.environment-agency.gov.uk/pi ; or

      (ii) sending 1 paper copy of the completed Reporting Form to:
      Swan House, Merchants Wharf, Westpoint Road, Thornaby, Stockton-on-Tees, TS17 6BP

   (c) the information provided on release quantities shall be the User's best estimate achievable with the time and resources available. The User is not required to perform additional monitoring, beyond any demanded by the RSA93 authorisation, in order to complete the Reporting Form.

This specification is effective from 03 September 2007

Signed .....
S Firth

Authorised to sign on behalf of the Environment Agency

Dated the .....

Pollution Inventory reporting form for radioactive waste

Annual disposals (including transfers)

Radioactive Substances Act 1993

Please read the guidance notes on this form carefully before you complete it.

You may make an electronic return using an on-line web form or XML file transfer (details available by following the links from www.environment-agency.gov.uk/pi) instead of using this paper form.

This reporting form is published by the Environment Agency for the purpose of obtaining information from operators on annual activity releases of radioactive wastes to air, water and sewer and annual transfers of radioactive wastes to other sites or operators (**see note 1 on the scope of reporting**).

The form consists of six parts:

Part 1 About the report, declaration and confidentiality
Part 2 Releases to air
Part 3 Releases to sewer
Part 4 Releases to controlled water
Part 5 Transfers of radioactive waste and
Part 6 Guidance notes

Which part of the form to fill in

Everyone must fill in Part 1, questions 1.1 – 1.7, completing releases on other Parts as appropriate. Return to Part 1, then fill in and sign questions 1.8 – 1.9 'Disclosure of information' and 'Declaration'. Part 1 *will help you to decide which other parts you need to complete.*

1 About the report

1.1 Authorisation number (see note 2)

Reference number of authorisation for site

1.2 Operator's details

Operator's name

Address

Postcode

Contact points

Phone
Fax
Email

1.3 Year this report covers

Releases to the environment

Releases to the environment are those releases which are made directly to the environment and not transferred to another organisation first for them to make the release.

1.4 Releases to air (*see note 3)*

Does your authorisation(s) allow the release of radioactive waste directly to air, including by on-site incineration, (ie not transferred to another organisation or site which then releases to air) ?

No ☐ *go to question 1.5*

Yes ☐ *please complete* Part 2 *of this form and then go to question 1.5*

1.5 Releases to sewers *(see note 3)*

Does your authorisation(s) allow the release of radioactive waste directly to sewer (ie not transferred to another organisation or site which then releases to sewer) ?

No ☐ *go to question 1.6*

Yes ☐ *please complete* Part 3 *of this form and then go to question 1.6*

1.6 Releases to controlled water (*see note 3)*

Does your authorisation(s) allow the release of radioactive waste directly to controlled water (ie not transferred to another organisation or site which then releases to controlled water) ?

No ☐ *go to question 1.7*

Yes ☐ *please complete* Part 4 *of this form and then go to question 1.7*

Transfers of Radioactive Waste

1.7 Transfers of radioactive waste

Do your authorisation(s) allow for the transfer of radioactive waste to another organisation or site?

No ☐ *go to question 1.8*

Yes ☐ *please complete* Part 5 *of this form and then go to question 1.8*

The Data Protection Act 1998

The information provided will be processed by the Environment Agency to fulfil its regulatory and monitoring functions, and for maintaining the relevant public register(s).

We may also process and/or disclose it in connection with the following:

- offering/providing you with our literature/services relating to environmental matters
- consulting with the public, public bodies and other organisations (eg Health and Safety Executive Local Authorities, Emergency Services, Defra, National Assembly for Wales) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law and taking any resulting action
- preventing breaches of environmental law
- Assessing customer service satisfaction and improving our service
- Responding to requests for information under the Environmental Information Regulations or Freedom of Information Act.

We may pass it on to our agents/representatives to do these things on our behalf.

You should ensure that any persons named on this form are informed of the contents of this Data Protection Notice.

Disclosure of information

The Radioactive Substances Act 1993 (RSA93) places the Environment Agency under an obligation to make the information you have provided on this form publicly available. The only exceptions to this obligation are

- *where the Secretary of State or the National Assembly for Wales has decided to restrict access to the information on the grounds of national security*
- *trade secrets and information about 'relevant processes'. RSA93 defines a 'relevant process' as 'any process applied for the purposes of, or in connection with, the production or use of radioactive material'.*

If you consider that any information on this form is confidential, because it is covered by one of the above exceptions, you should:

- enclose a letter giving your reasons in full
- check the 'confidential' box next to the items on the form which you think are confidential.

If information is withheld from the public regster for one of the above reasons, the Agency may still be obliged to release it under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004. If the information relates to an emission into the environment, it cannot be withheld from disclosure on the grounds of commercial confidentiality.

1.8 Do you consider any of the information reported in the attached tables is confidential?

No ☐

Yes ☐ *please give details*
- ☐ some of the information
- ☐ all of the information

please remember to include a letter giving your reasons.

Declaration

1.9 Please ensure you have completed all parts of the form and sign below.

Signature

Name

Position

Date

If the person completing the form has good reason for not wishing to sign the form (eg personal security) then the form should be passed to a senior manager who is willing to sign the form. If this is not possible you will need to write to your local Agency office to explain your concerns and seek agreement that both a signed and unsigned form can be submitted. The unsigned form will be placed on the public register.

What happens next?

Please make one copy of the completed form.
Send the original form back to your local Environment Agency office. The copy should be retained for your own records.
If you need to find out where your local office is, please contact us on 08708 506506.

Part 2 Releases to air starts on the next page

Part 2 Releases to air (see note 3)

Please refer to the guidance notes in Part 6

Please use units of Bq and scientific notation (eg 4.2 10^9 Bq or 4.2 E9 Bq).

Annual reporting threshold	Radionuclide	Release to air		Confidential?
		Total release (Bq)	Method	*reasons should be provided*
		N/A, BRT or release (see note 4)	*M, C or E (see note 5)*	Tick if claimed
1 10^{11} Bq (100 GBq)	**Tritium**			
1 10^{9} Bq (1 GBq)	**Carbon-14**			
1 10^{11} Bq (100 GBq)	**Fluorine-18**			
1 10^{8} Bq (100 MBq)	**Sulphur-35**			
1 10^{12} Bq (1 TBq)	**Argon-41**			
1 10^{12} Bq (1 TBq)	**Krypton-85**			
1 10^{12} Bq (1 TBq)	**Technetium-99m**			
1 10^{9} Bq (1 GBq)	**Ruthenium-106**			
1 10^{7} Bq (10 MBq)	**Iodine-125**			
1 10^{6} Bq (1 MBq)	**Iodine-129**			
1 10^{7} Bq (10 MBq)	**Iodine-131**			
1 10^{12} Bq (1 TBq)	**Xenon-133**			
1 10^{8} Bq (100 MBq)	**Caesium-137**			
1 10^{9} Bq (1 GBq)	**Radon-222 (see note 6)**			
1 10^{7} Bq (10 MBq)	**Uranium alpha**			
1 10^{6} Bq (1 MBq)	**Plutonium alpha**			
1 10^{6} Bq (1 MBq)	**Americium-241**			
Please account for any other releases, which you have not reported above:				
1 10^{6} Bq (1 MBq)	**Other Alpha Particulate *(see note 8)***			
1 10^{6} Bq (1 MBq)	**Other Beta/Gamma Particulate *(see note 8)***			

Part 3 Releases to sewer is on the next page

Part 3 Releases to sewer (see note 3)

Please refer to the guidance notes in Part 6

Please use units of Bq and scientific notation (eg 4.2 10^9 Bq or 4.2 E9 Bq).

Annual reporting threshold	Radionuclide	Release to sewer		Confidential?
		Total release (Bq)	Method	*reasons should be provided*
		N/A, BRT or release (see note 4)	*M, C or E (see note 5)*	Tick if claimed
1 10^6 Bq (1 MBq)	**Total Alpha** ***(see note 7)***			
1 10^6 Bq (1 MBq)	**Total Beta/Gamma (excl tritium)** ***(see note 7)***			
1 10^{11} Bq (100 GBq)	**Tritium**			
1 10^8 Bq (100 MBq)	**Carbon-14**			
1 10^{10} Bq (10 GBq)	**Fluorine-18**			
1 10^8 Bq (100 MBq)	**Sodium-22**			
1 10^6 Bq (1 MBq)	**Phosphorus-32**			
1 10^7 Bq (10 MBq)	**Phosphorus-33**			
1 10^7 Bq (10 MBq)	**Sulphur-35**			
1 10^7 Bq (10 MBq)	**Chromium-51**			
1 10^7 Bq (10 MBq)	**Cobalt-57**			
1 10^6 Bq (1 MBq)	**Cobalt-58**			
1 10^6 Bq (1 MBq)	**Cobalt-60**			
1 10^8 Bq (100 MBq)	**Gallium-67**			
1 10^6 Bq (1 MBq)	**Selenium-75**			
1 10^9 Bq (1 GBq)	**Strontium-89**			
1 10^7 Bq (10 MBq)	**Strontium-90**			
1 10^9 Bq (1 GBq)	**Yttrium-90**			
1 10^6 Bq (1 MBq)	**Zirconium-95**			
1 10^6 Bq (1 MBq)	**Niobium-95**			
1 10^6 Bq (1 MBq)	**Technetium-99**			
1 10^{10} Bq (10 GBq)	**Technetium-99m**			
1 10^8 Bq (100 MBq)	**Ruthenium-106**			
1 10^8 Bq (100 MBq)	**Indium-111**			
1 10^8 Bq (100 MBq)	**Antimony-125**			
1 10^9 Bq (1 GBq)	**Iodine-123**			
1 10^8 Bq (100 MBq)	**Iodine-125**			
1 10^7 Bq (10 MBq)	**Iodine-129**			
1 10^8 Bq (100 MBq)	**Iodine-131**			
1 10^7 Bq (10 MBq)	**Caesium-134**			
1 10^7 Bq (10 MBq)	**Caesium-137**			
1 10^8 Bq (100 MBq)	**Cerium-144**			

Annual reporting threshold	Radionuclide	Release to sewer		Confidential?
		Total release (Bq)	Method	*reasons should be provided*
		N/A, BRT or release (see note 4)	*M, C or E (see note 5)*	Tick if claimed
1 10^8 Bq (100 MBq)	**Samarium-153**			
1 10^{11} Bq (100 GBq)	**Erbium-169**			
1 10^9 Bq (1 GBq)	**Thallium-201**			
1 10^7 Bq (10 MBq)	**Thorium-230**			
1 10^7 Bq (10 MBq)	**Thorium-232**			
1 10^8 Bq (100 MBq)	**Uranium alpha**			
1 10^7 Bq (10 MBq)	**Neptunium-237**			
1 10^7 Bq (10 MBq)	**Plutonium alpha**			
1 10^8 Bq (100 MBq)	**Plutonium-241**			
1 10^7 Bq (10 MBq)	**Americium-241**			
1 10^8 Bq (100 MBq)	**Curium-242**			
Please account for any other releases, which you have not reported above:				
1 10^6 (1 MBq)	**Other Alpha *(see note 8)***			
1 10^6 (1 MBq)	**Other Beta/Gamma *(see note 8)***			

Part 4 Releases to controlled water starts on the next page

Part 4 Releases to controlled water (see note 3)

Please refer to the guidance notes in Part 6

Please use units of Bq and scientific notation (eg 4.2 10^9 Bq or 4.2 E9 Bq)

Annual reporting threshold	Radionuclide	Release to controlled water			Confidential?
		Total release (Bq)	Method	Media	*reasons should be provided*
		N/A, BRT or release	*M, C or E (see note 5)*	R, E or S (see note 3)	Tick if claimed
1 10^6 Bq (1 MBq)	**Total Alpha *(see note 7)***				
1 10^6 Bq (1 MBq)	**Total Beta/Gamma (excl tritium) *(see note 7)***				
1 10^{12} Bq (1 TBq)	**Tritium**				
1 10^8 Bq (100 MBq)	**Carbon-14**				
1 10^{10} Bq (10 GBq)	**Sulphur-35**				
1 10^7 Bq (10 MBq)	**Cobalt-60**				
1 10^8 Bq (100 MBq)	**Strontium-90**				
1 10^9 Bq (1 GBq)	**Yttrium-90**				
1 10^9 Bq (1 GBq)	**Zirconium-95**				
1 10^8 Bq (100 MBq)	**Niobium-95**				
1 10^9 Bq (1 GBq)	**Technetium-99**				
1 10^9 Bq (1 GBq)	**Ruthenium-106**				
1 10^{10} Bq (10 GBq)	**Antimony-125**				
1 10^8 Bq (100 MBq)	**Iodine-129**				
1 10^7 Bq (10 MBq)	**Caesium-134**				
1 10^8 Bq (100 MBq)	**Caesium-137**				
1 10^9 Bq (1 GBq)	**Cerium-144**				
1 10^7 Bq (10 MBq)	**Thorium-230**				
1 10^7 Bq (10 MBq)	**Thorium-232**				
1 10^8 Bq (100 MBq)	**Uranium alpha**				
1 10^8 Bq (100 MBq)	**Neptunium-237**				
1 10^8 Bq (100 MBq)	**Plutonium alpha**				
1 10^{10} Bq (10 GBq)	**Plutonium-241**				
1 10^8 Bq (100 MBq)	**Americium-241**				
1 10^{10} Bq (10 GBq)	**Curium-242**				
Please account for any other releases, which you have not reported above:					
1 10^6 (1 MBq)	**Other Alpha *(see note 8)***				
1 10^6 (1 MBq)	**Other Beta/Gamma *(see note 8)***				

Part 5 Transfers of radioactive waste starts on the next page

Part 5 Transfers of radioactive waste (see note 9)

Please refer to the guidance notes in Part 6
Please note that transfers of VLLW (ie waste disposed of as normal refuse under the terms of your authorisation) and transfers of waste sealed sources for disposal should not be reported

Please use units of Bq and scientific notation (eg 4.2 10^9 Bq or 4.2 E9 Bq).

Part 5a Transfers of radioactive waste for incineration

Annual reporting threshold	Radionuclide	Total transfer (Bq) *N/A, BRT or release (see note 4)*	Method *M, C or E (see note 5)*	Confidential? *reasons should be provided* Tick if claimed
1 10^6 (1 MBq)	**Total Alpha** ***(see note 7)***			
1 10^6 (1 MBq)	**Total Beta/Gamma (excl tritium)** ***(see note 7)***			
1 10^{11} (100 GBq)	**Tritium**			

Part 5b Transfers of radioactive waste for controlled burial at a landfill site specified in authorisation

Annual reporting threshold	Radionuclide	Total transfer (Bq) *N/A, BRT or release (see note 4)*	Method *M, C or E (see note 5)*	Confidential? *reasons should be provided* Tick if claimed
1 10^6 (1 MBq)	**Total Alpha** ***(see note 7)***			
1 10^6 (1 MBq)	**Total Beta/Gamma (excl tritium)** ***(see note 7)***			
1 10^{11} (100 GBq)	**Tritium**			

Part 5c Transfers of radioactive waste for disposal at Drigg

Annual reporting threshold	Radionuclide	Total transfer (Bq) *N/A, BRT or release (see note 4)*	Method *M, C or E (see note 5)*	Confidential? *reasons should be provided* Tick if claimed
1 10^6 (1 MBq)	**Total Alpha** ***(see note 7)***			
1 10^6 (1 MBq)	**Total Beta/Gamma (excl tritium)** ***(see note 7)***			
1 10^{11} (100 GBq)	**Tritium**			

Part 5d Other transfers of radioactive waste

Annual reporting threshold	Radionuclide	Total transfer (Bq) *N/A, BRT or release (see note 4)*	Method *M, C or E (see note 5)*	Confidential? *reasons should be provided* Tick if claimed
1 10^6 (1 MBq)	**Total Alpha** ***(see note 7)***			
1 10^6 (1 MBq)	**Total Beta/Gamma (excl tritium)** ***(see note 7)***			
1 10^{11} (100 GBq)	**Tritium**			

Part 6 Guidance notes

Note Ref.	Subject	Guidance
1	**Scope of reporting**	Reports should be provided by all persons holding a radioactive waste disposal authorisation. Reports will not be required for disposal of radionuclides which fall below the Schedule 1 limits in the Radioactive Substances Act 1993. Similarly, reports will not be required for the disposal of radioactive waste covered by exemptions orders.
2	**Authorisation Number**	Please enter the authorisation number for the main Radioactive Substances Act 1993 authorisation for the organisation on the site (ie the authorisation covering the majority of the disposal routes). Nuclear sites should enter the number used for charging purposes for the site. Please contact your local Agency office if you do not have this number.
3	**Releases to air, sewer and controlled waters**	• **Releases to air** - Releases to air means those releases from atmospheric discharge points specified in the authorisation(s) (including incinerator stacks), together with fugitive releases. • **Releases to sewer** - Discharges to sewer are those for which the non-radioactive component is controlled under Section 118 of the Water Industry Act 1991. This section states that effluent from trade premises may only be discharged to a public sewer with the consent of the sewerage undertaker. Such consent is made in the form of a 'trade effluent consent' issued by the undertaker upon application by the occupier of the trade premises. • **Controlled waters** - Controlled waters are as defined in Section 104 of the Water Resources Act 1991. The emissions medium should be specified as sea/coastal waters (S), estuary (E) or river/inland water (R). Definitions to be used for the purposes of this form are outlined below: – ***Sea or Coastal waters*** are those waters up to three miles from the coast. The detailed definition is: 'A coastal water means all the water on the landward side of a line every point of which is at a distance of three nautical miles on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate in the case of watercourses, up to the outer limit of the estuary.' The baseline referred to here is an outline round the coast of the United Kingdom which coincides with the outer edge of all estuaries and which 'rounds off' the details of the coast. Maps of the baseline are held by the Environment Agency. – ***Estuary*** is defined in line with the Urban Waste Water Treatment Directive (91/271/EEC): 'estuary means the transitional area at the mouth of a river between fresh water and coastal waters. Member states shall establish the outer (seaward) limits of estuaries for the purpose of this Directive…'. Estuary boundaries have been established by the United Kingdom in pursuance of this definition, and maps of these boundaries are held by the Environment Agency. – ***Rivers and inland waters*** include surface fresh waters which are defined, by default, as those inland surface waters which are not part of an estuary.
4	**Release, BRT or NA**	An entry is required for each and every radionuclide listed, in the 'Total release' column. You must put either release data, 'BRT' or 'NA' in each box: • **Release** – where a release occurs the amount released should be reported as radioactivity in units of Becquerel (Bq) and scientific notation (eg 4.2 10^9 Bq or 4.2 E9 Bq). The Agency recommends that two significant figures are used when reporting the quantity of activity released (ie 4.2 10^9 rather than 4.21 10^9). When rounding figures to achieve two significant figures, round up from the number 5 or above, and down from the figure 4 or below (eg 1.55 10^9 would be rounded up to 1.6 10^9 and 1.54 10^9 would be rounded down to 1.5 10^9). • **BRT** – below reporting threshold level: Where the release has been determined and is found to be below the indicated annual reporting level thresholds this may be entered on the reporting form as BRT. The threshold reporting levels for a given radionuclide to a particular medium are outlined in the reporting form for each individual radionuclide to the medium concerned. If you would prefer to report the actual release to the Agency, then you may do so. However, the release will be reported as less than the relevant threshold when it is reported on the Agency's website. • **NA** – not applicable: Where no release of this radionuclide occurs to that medium this should be entered on the reporting form as N/A.

5 **Measurement, Calculation and Estimation**

The reporting form requires that the operator state how each release has been primarily determined. There are three ways of determining the release, which are by:

- Measurement (M) - releases derived from direct monitoring results, based on actual monitoring of a radionuclide via a given discharge route.
- Calculation (C) - releases based on calculation from plant/operation specific data.
- Estimation (E) - releases based on best estimates.

The Agency does not consider that there is a hierarchy in terms of quality of data obtained by measurement, calculation or estimation.

Measurement includes:

- Spot sampling and analysis of effluent held in a tank prior to discharge.
- Flow proportional sampling of effluent during discharge and subsequent analysis.

Calculation includes:

- Derivation of total activity which has been released to sewer from records of the volumes of laboratory solutions and their reference activity concentration which have been disposed of to drain via a laboratory sink.
- Assessment of the releases to sewer from the recorded activity of radio-pharmaceutical products which have been administered to patients, combined with well characterised excretion rates for these products from patients. Use of the excretion rates contained within the Agency's Radioactive Substances Act Guidance (RASAG) may be considered to fall within this category.
- Use of well characterised radionuclide specific incinerator partitioning factors along with data on input activities to the incinerator which have been derived through calculation or measurement. In this case, measurement means sampling and analysis of the waste to be incinerated and calculation means, for example, recorded volumes and activity concentrations of waste radiochemical products.
- Use of nuclear codes to assess activity of noble gases present in fuel elements and assumption that this inventory is released to air during processing.
- Calculation of total alpha and total beta/gamma releases by summation of the individual releases of radionuclides, where the majority of these releases have been determined by measurement or calculation.

Estimation includes:

- Derivation of releases to air and sewer based on previous experience of the likely proportion of activity released to air and sewer from a particular type of experiment and the number of such experiments performed in a year.
- Use of incinerator partitioning factors along with data on input activities to the incinerator which have been derived through estimation. Estimation in this case includes bags of clinical waste which have been monitored with portable radiological instruments and activity content assigned on the basis of conversion factors from counts per second or dose rate to activity.
- Derivation of total alpha and total beta/gamma releases by summation of the individual releases of radionuclides, where the majority of these releases have been determined by estimation.

Where a key part of the derivation of a release is based on estimation, then the release should be considered to have been estimated, whether or not, measurement and calculation have also been used.

6 **Radon-222**

It is only necessary to report radon-222 releases to air where there is a specific limit for this radionuclide in your authorisation. The intention is to only report process releases of radon-222. However, it is technically challenging to separate natural releases of radon-222 (eg from building materials and underlying bedrock) from process releases. There are a few significant process related releases of radon-222 in England and Wales. These are recognised by authorisation limits being placed on this particular radionuclide.

7 **Total alpha and total beta/gamma (excl tritium)**

The Agency is requiring that all operators report the total alpha and total beta/gamma (excluding tritium) releases to controlled water or sewer. This is to enable release data to be collated so that compliance with the targets in the UK Discharge Strategy 2002 - 2020 can be assessed. Releases of total alpha and total beta/gamma to air are not required as there are no targets for these in the UK Discharge Strategy. Some operators already have authorisations which contain total alpha and total beta/gamma limits and undertake monitoring against these limits. However, for many operators, some calculation of the total alpha and total beta/gamma releases will need to be made.

- **Sites measuring releases of total alpha, total beta/gamma or other activity**

(normally nuclear sites) - Where total alpha or total beta/gamma is measured to determine compliance with an authorisation, then best practicable means will be employed to measure the site specific mix of radionuclides. For this reason, some operators will use gas proportional counting for total beta/gamma measurements, for example, and others will use liquid scintillation counting. Whatever the method used, you should report these measurements of total alpha and/or total beta/gamma.

- **No measurements of total alpha or total beta/gamma (normally non-nuclear sites) -** Where no measurements of total alpha or total beta/gamma activity are made, then the sum of the individual releases of alpha-emitting and beta/gamma emitting radionuclides (excluding tritium) should be calculated for reporting purposes. You should report all non-alpha emitting radionuclides in the total beta/gamma category, except tritium. For example, positron emitters and electron-capture radionuclides should be reported as total beta/gamma. Tritium is excluded from the beta/gamma category because of the relatively large releases and significantly lower radiological impact compared to other beta/gamma radionuclides.

8 **Other alpha and other beta/gamma**

You may have authorised releases of other radionuclides which are not listed on the form. These releases should be accounted for under the generic categories of other alpha and other beta/gamma. You should report all non-alpha emitting radionuclides in the other beta/gamma category. For example, positron emitters and electron-capture radionuclides should be reported as other beta/gamma. The purpose of reporting against this category is to enable the Agency to identify any significant reporting omissions.

For releases to air, the categories of other alpha particulate and other beta/gamma particulate are specified. It has been judged to be unreasonable to expect nuclear operators to quantify all their releases of short-half-life noble gases under an other alpha or beta/gamma category. Hence the other alpha and other beta/gamma categories are limited to particulate releases. For some radionuclides, releases could be in either particulate or gaseous form. If you would prefer to assume that all other alpha and beta/gamma releases are particulate then you may do so rather than take disproportionate efforts in attempting to exclude the gaseous components.

9 **Transfers of radioactive waste**

Transfers of radioactive waste in any form (ie solid, liquid or gaseous) should be reported for waste movements only. This does not cover movement of radioactive substances. As indicated under note 1, transfers of radioactive waste covered by exemption orders should not be reported. Transfers of waste sealed sources should not be reported. All other transfers between different organisations or sites (ie inter-site transfers), not covered by 5a, 5b or 5c, should be reported under Part 5d Other Transfers. This will include reporting of transfers of liquid waste made via a pipeline from one organisation to another under Part 5d Other Transfers.

End of form