

# **CODE OF PRACTICE**

## **Conditions for Acceptance of Radioactive Waste (Issue 4)**

New issue to reflect change of ownership

### **PURPOSE**

To ensure that radioactive waste arriving at the High Temperature Incinerator at Fawley is in a suitable condition to allow receipt and disposal of the waste.

### **SCOPE**

These Conditions for Acceptance represent the requirements of Tradebe for receipt and disposal of radioactive waste at their Fawley facility.

### **RESPONSIBILITY**

It is the responsibility of The Consignor delivering Radioactive Waste to Fawley to ensure that the requirements of this document are met.

### **TRAINING / COMPETENCE**

Tradebe, through your Account Manager or the Customer Services office, will provide guidance on the requirements of this document. See section 7 for Tradebe contact information.

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## 1. Introduction

- 1.1 These Conditions for Acceptance represent the requirements for receipt and disposal of radioactive waste at Tradebe's Fawley facility.
- 1.2 Consignors requiring advice on disposal of radioactive wastes to Tradebe should consult a suitable RPA and, if necessary, the EA or SEPA. Please note that where a certificate of authorisation under RSA93 requires the undertaking disposing of radioactive wastes to consult a suitable RPA or other qualified expert - Tradebe does not offer advice in this capacity.
- 1.3 The information provided in this document has been prepared in consultation with Tradebe's own RPA, but is not intended to provide a definitive statement of regulatory requirements and it must not be treated as such.
- 1.4 Organisations wishing to consign radioactive wastes to Tradebe will need to approach the EA or SEPA to obtain their own authorisation issued under the RSA93. Tradebe can provide the necessary information concerning its waste disposal service that the consignor will require to complete such an application, in the form of a 'Letter of Intent'.
- 1.5 Tradebe will only accept radioactive waste for disposal at its Fawley facility providing it meets the specification laid out in this document. Waiver or alteration from this specification will only be granted with the prior written consent of Tradebe.

## 2. Suitability of Wastes for Disposal at Fawley Incinerator

- 2.1 Tradebe's authorisation permits the processing of radioactive wastes through the following two routes:
- ✓ Drum hoist of radioactive wastes direct into the incinerator
  - ✓ Direct Injection for liquid radioactive wastes prior to the hoisting of the empty container
- 2.2 Consignors of waste to Tradebe must ensure that suitable and relevant containers are used in accordance with current legislation. Due to the mechanics of Fawley's operation the individual package size must not exceed that of a 210 litre (45 gallon) container and for solid radioactive wastes the maximum permitted weight of any one individual package must not exceed 150Kg.
- 2.3 Only waste covered by a current authorisation issued by the EA or SEPA will be accepted. The customer will have in place the necessary arrangements for the return to the customer of any non-compliant consignment, or part thereof, delivered to Tradebe for disposal at Fawley.
- 2.4 The following types of radioactive wastes are routinely accepted for disposal at Tradebe's Fawley incinerator.
- 2.4.1 Packaged solid radioactive wastes.
  - 2.4.2 Packaged liquid radioactive wastes (e.g. organic scintillant in vials within outer packaging)
  - 2.4.3 Bulk liquid radioactive wastes.
- 2.5 Aqueous radioactive solutions may be accepted with the prior written consent of Tradebe.
- 2.6 Wastes of a putrescent nature may be accepted with the prior written consent of Tradebe.
- 2.7 Radioactive wastes must be suitable for handling and treatment in the incinerator at Fawley. Consignors must describe their waste in sufficient detail using the form shown in Appendix 1 – Application for Radioactive Disposal Form (ARDF). Consignors should be aware that heavy metallic and some other items may require to be excluded since they will physically damage the incinerator.
- 2.8 Attention is drawn to the requirement on the ARDF form for details of external dose rates for each waste package. A statement of the maximum surface dose rate in microSieverts per hour at the external surfaces of the package measured using a suitable hand held radiation dose rate monitor is required.
- 2.9 Radioactive wastes that are transferred under an RSA93 authorisation are exempt from the Hazardous Waste (England & Wales) Regulations 2005, and Special Waste Amendment (Scotland) Regulations 2004. However, if the radioactive waste is exempt from RSA93 and would otherwise be a Hazardous Waste because of its other properties, it must be declared and treated as such and these regulations will be applied in full.

- 2.10 Tradebe's authorisation requires that solid ash from the incinerator be disposed of as solid very low level waste, with a limit of 40 KBq in any single item in this waste. Accordingly, wastes in which the radioactivity content will not be adequately dispersed by the incineration process must be excluded from the incinerator. Consignors must consult their own RPA and Tradebe if in any doubt about the suitability of a particular item or waste stream.
- 2.11 For the reason described above it is not possible for Tradebe to accept sealed radioactive sources in the form of ceramic beads/pellets or metal capsules that are likely to remain intact in the incineration process. Some types of low activity sources may be acceptable when present with other radioactive wastes. However, these must always be declared and will only be accepted with Tradebe's prior written consent.
- 2.12 The following types of radioactive wastes must generally be excluded from wastes sent to Fawley incinerator. Waiver or alteration from this specification will only be granted with the prior written consent of Tradebe.
- ✓ Uranium and thorium compounds in jars, bottles, etc.
  - ✓ Pieces of uranium metal including shielding from sealed source containers, etc.
  - ✓ Items manufactured using thorium or thorium compounds including gas mantles.
  - ✓ Smoke detectors containing radioactive sources.
  - ✓ Radioactive luminous articles such as old clocks and watches and radioactive luminous "EXIT" signs and similar.
  - ✓ Radioactive lightning conductors.
  - ✓ Anti-static devices that use a radiation source (e.g. polonium-210)
  - ✓ Any sealed radioactive sources, for example, sources comprising cobalt-60, caesium-137, americium-241 and nickel-63 whether present as capsules or foils.
  - ✓ Lead metal including the shielding in sealed source containers and in some types of plastic containers used to hold vials of radioactive solutions (e.g. iodine-125 and phosphorus-32).
  - ✓ Large metallic objects such as piping, ducting and flanges.
- 2.13 Fawley is authorised to handle wastes containing low levels of alpha emitting radionuclides. Particular attention will be paid to the physical form of this type of activity in bulk liquids so as to ensure that there is no unacceptable contamination of Tradebe's facilities by, for example, insoluble particles suspended in the liquid wastes.

### 3. Activity per Consignment and per Container

3.1 Tradebe's RSA93 authorised monthly limits and standard package and consignment limits appear in the following table. All values quoted are in MegaBecquerels (MBq).

Categories and individual radionuclides		Authorised monthly limit	Consignment limit	Package limit		
1	Tritium	1,200,000	800,000 total (max. 600,000 C-14 / H-3)	100,000		
2	Carbon-14					
3	Iodine-125 and iodine-131	1000	1000	40		
	<sup>125</sup> I				100	10
	<sup>131</sup> I				500	40
4	Beta and weak gamma emitters <sup>33</sup> P, <sup>36</sup> Cl, <sup>45</sup> Ca, <sup>51</sup> Cr, <sup>55</sup> Fe, <sup>63</sup> Ni, <sup>90</sup> Sr, <sup>109</sup> Cd, <sup>129</sup> I, <sup>147</sup> Pm	500	500	40		
5	Medium gamma emitters <sup>57</sup> Co, <sup>65</sup> Zn, <sup>75</sup> Se, <sup>85</sup> Sr, <sup>86</sup> Rb, <sup>95</sup> Zr, <sup>103</sup> Ru, <sup>106</sup> Ru, <sup>133</sup> Ba, <sup>137</sup> Cs, <sup>203</sup> Hg					
6	Strong gamma emitters <sup>22</sup> Na, <sup>46</sup> Sc, <sup>54</sup> Mn, <sup>59</sup> Fe, <sup>56</sup> Co, <sup>58</sup> Co, <sup>60</sup> Co, <sup>110m</sup> Ag, <sup>124</sup> Sb, <sup>134</sup> Cs, <sup>152</sup> Eu, <sup>154</sup> Eu					
7	Other isotopes not listed (excluding alpha emitters)					
8	Alpha emitters	40	5	0.5		

3.2 The authorised limits in the above table refer to Tradebe's own RSA93 authorisation. Consignors must ensure that the wastes to be transferred fall within the limits and conditions of their own transfer authorisation.

3.3 For wastes containing mixed radionuclides the total activity from all listed radionuclides in each separate category (1-8) must be summed. It is permitted to have activity up to the relevant category limits from more than one category within the same package.

3.4 These package limits are based on Tradebe's processing constraints, including RSA93 authorised daily limits and limits on concentrations in solid waste arisings from the incinerator. They do NOT necessarily imply that these activities can be transported in

individual packages declared as "excepted packages" or "industrial packages" under the current Transport Regulations or other applicable regulations. Consignors must ensure that they address this issue themselves. Note that the limits for C-14, tritium and some alpha emitters in excepted packages are lower than stated above, especially in the case of liquid wastes.

- 3.5 Package and consignment limits for radionuclides in the "other beta/gamma" category are restricted so as to facilitate compliance with the concentration limits applied to solid arisings including ash from the incinerator. For gamma emitting isotopes in Categories 5 and 6 additional restrictions are imposed to control external radiation levels and the exposure of workers at the Fawley site.
- 3.6 Package limits for gamma emitters in Categories 5 and 6 above are based on calculations of dose rates for a nominal 200 litre cylindrical waste volume. For smaller packages these (Category 5 and 6) activity limits should be reduced pro-rata.
- 3.7 Activity in excess of the stated package and consignment limits may be acceptable subject to Tradebe's prior written agreement. One criterion that will be considered will be the external radiation levels around waste packages. As a general guide, Tradebe are unlikely to accept any single package with a surface dose rate in excess of 7.5 microSieverts per hour or any package with a Transport Index in excess of 0.3.
- 3.8 Consignors must declare the activity of all radionuclides in waste that they send to Fawley for incineration for each consignment. When declaring activity in waste containers, consignors must complete the ARDF form shown in Appendix 1 and note the following points.
  - ✓ Tritium and carbon-14 must be declared separately.
  - ✓ Activity in radioactive wastes which could otherwise be disposed of as solid very low level waste according to RSA93 authorisations MUST be declared - these wastes must NOT be treated as "non-active" for the purpose of calculating the total activity in a container or consignment.
  - ✓ Likewise any activity in wastes that could otherwise be disposed of under the provisions of one of the Exemption Orders to RSA93 must be declared. Note that not all wastes of this type may be sent to Fawley incinerator (see previous section on suitability of wastes for disposal at Fawley incinerator). A list of the exemption orders is shown in Appendix 2.
  - ✓ Declared activities must include those of all decay products known or likely to be present in the wastes at the time of processing at Tradebe. This includes wastes containing natural radionuclides.
  - ✓ If in doubt about what to declare consult your RPA and Tradebe.

#### 4. Preparation of radioactive wastes for consignment to Tradebe's Fawley incinerator.

- 4.1 Consignors are responsible for preparing and packaging radioactive wastes for transport to Fawley but are also required to meet minimum standards set by Tradebe that are aimed at ensuring that the risks to its own personnel are suitably controlled.
- 4.2 The following minimum standard of waste packages must be met for acceptance of wastes at the Fawley plant:
- ✓ Metal drums, not greater than 210-litre capacity, in good condition with well fitting lids. Lids must be secure in transit but should not be fixed down in such a way that prevents their being loosened immediately prior to loading into the incinerator. (This is necessary to avoid build-up of air pressure in metal drums.)
  - ✓ Plastic carboys and drums, not greater than 210 litre capacity, in sound condition with good fitting lids which must be secure in transit but should not be fixed down in such a way that prevents their being loosened immediately prior to loading into the incinerator. (This is necessary to avoid build-up of air pressure in plastic drums.)
  - ✓ The maximum volume of solid waste in an individual container is 210 litres (45 gallon). To avoid damage to the brick lining of the kiln the maximum weight of such waste in any one container shall be no greater than 150Kg.
  - ✓ The maximum volume of non-pumpable sludge waste in an individual container is 20 litres.
  - ✓ The maximum volume of free liquid flammable waste in an individual container shall not exceed 10 litres for materials suitable to be hoisted into the incinerator. "Free liquid" does not refer to small volumes contained within individual scintillation vials and similar where the limit is increased to 30 litres.
  - ✓ Liquids delivered to Fawley in 210 litre (45 gallon) closed head or bung top containers will be processed using a direct injection system prior to the empty container being hoisted in to the incinerator. Such wastes must, as far as possible, be free of suspended solids and should, if necessary, be filtered prior to transfer to Fawley. Any remaining suspended solids shall be no greater than 3mm.
  - ✓ **Deviations from the above will be considered and only accepted with the prior written agreement of Tradebe.**
- 4.3 The maximum volume that can be accepted in each consignment is 30 cubic metres.
- 4.4 Except for bulk liquids in drums, waste containers are accepted on the basis that they will be introduced unopened into the incinerator at Fawley. Prospective consignors are encouraged to study the package and consignment limits in Section 3 *before* packaging their wastes since Tradebe does not have facilities at Fawley for handling radioactive wastes retrieved from individual packages delivered to the site.

- 4.5 To minimise the risks to its own operators, Tradebe will not without prior written approval accept the use of returnable containers that require their contents emptying at Fawley site.
- 4.6 All waste containers are monitored for external dose rate upon arrival at Fawley site. The external dose rate on the surface of any package must not exceed 5 microSieverts per hour. Attention is drawn to this also being the limit normally appropriate to transport of wastes in "excepted packages". Waiver or alteration from this specification, for example in situations where wastes contain gamma emitters and are being transported under the Low Specific Activity (LSA) category and contained in Industrial Packages, will only be granted with the prior written consent of Tradebe.
- 4.7 All consignments of radioactive wastes are checked upon arrival for evidence of external radioactive contamination. In order to comply with transport requirements waste consignors should ensure that there is no contamination on the outside of waste packages. Instances of contamination on the outside of waste containers will be raised with the consignor.



## 5. Labelling of Radioactive Waste Containers

- 5.1 Note that this section does not seek to provide a definitive statement of the requirements of the relevant transport regulations and in some cases Tradebe's requirements exceed these. For example, while the regulations may not demand "radioactive" markings on the outside of some types of package containing low levels of radionuclides, Tradebe does require this to assist in recognition of these packages at its own site.
- 5.2 All containers of radioactive waste must be labelled in accordance with current legislation. As a minimum requirement we ask for the following:
- ✓ Class 7 warning diamonds appropriate to the designation of the package for the purpose of the transport regulations or, for example in the case of "excepted packages", alternative warning signs including the radiation trefoil and the word "radioactive".
  - ✓ Additional warning signs appropriate to any other hazardous properties of the waste.
  - ✓ The consignor's or consignee's name and address.
  - ✓ The names of the radionuclides in the wastes and the activities of each present. It is not necessary to list minor components in the wastes or decay products although these must be declared on the ARDF form.
- 5.3 Consignors must consult their RPA or DGSA if clarification is required.

## 6. Transport documentation

- 6.1 Consignors will be required to complete a signed declaration on the ARDF form relating to the packaging and transport of their wastes. This declaration is for Tradebe's purposes and its completion does not imply that the consignor has necessarily discharged their responsibility to provide a "transport document" in connection with the transport regulations. Consignors must consult their RPA, DGSA or Waste Carrier if they are in doubt as to how to meet this requirement.
- 6.2 Consignors should submit this declaration to Tradebe who will then issue the consignor shipping approval and an agreed date for acceptance of wastes at Fawley.
- 6.3 For the benefit of both Tradebe and the carrier of their wastes, consignors are strongly recommended to include with their consignment written information giving details of who within their organisation can be contacted in the event of accidents or queries involving their wastes.
- 6.4 To avoid unnecessary delays or refusal of access onto site, consignors wishing to bring their own wastes to Tradebe's Fawley site should consult the site in advance for information about deliveries of wastes.

## 7. Tradebe Fawley Contact Information

For Sales and Technical Advice:	To arrange the collection and/or delivery of a consignment to Fawley
<p>Nicki Green            Business Manager / RPS            Tradebe Fawley            Charleston Road            Hardley, Hythe            Southampton            SO45 3NX</p> <p>Tel: 023 8088 3018            Mobile: 07917 533386            Fax: 0238 088 3010            E-mail: nicki.green@tradebe-fawley.co.uk</p>	<p>Customer Services            Tradebe Fawley            Charleston Road            Hardley, Hythe            Southampton            SO45 3NX</p> <p>Tel: 023 8088 3000            Fax: 0238 088 3010            E-mail: sales@tradebe-fawley.co.uk</p>

## 8. Glossary of Terms

Activity	Measure of an amount of a radionuclide. Describes the rate at which transformations occur in it. Unit Becquerel. Symbol Bq. 1 Bq = 1 transformation per second. Multiples: kiloBecquerel (kBq, 10 <sup>3</sup> Bq), megaBecquerel (MBq, 10 <sup>6</sup> Bq) and gigaBecquerel (GBq, 10 <sup>9</sup> Bq).
Consign	In the context of waste, means the transfer to Tradebe for the purpose of disposal at Fawley.
Consignment	A single shipment of waste and packaging with a maximum volume of 30m <sup>3</sup> received from a single customer.
EA	Environment Agency of England and Wales.
Free Liquid	Liquid that is present in a separate phase.
DGSA	Dangerous Goods Safety Adviser.
HPA	Health Protection Agency (formerly NRPB).
RAMRoad	The Radioactive Material (Road Transport) Regulations 2002 (and any subsequent amendments)
RPA	Radiation Protection Adviser. Person or body appointed in accordance with the Ionising Radiations Regulations (1999) to give advice on radiation protection.
RPS	Radiation Protection Supervisor. Person appointed in accordance with the Ionising Radiations Regulations (1999) who is responsible for the day-to-day supervision of work with ionising radiation.
RSA93	Radioactive Substances Act (1993).
SEPA	Scottish Environment Protection Agency.
Hazardous Waste Regulations	Hazardous Waste (England & Wales) Regulations (2005) including any current amendments thereto or any re-enactment thereof.

Approved by:

Nicki Green

Business Manager / RPS



### Appendix 1 – ARDF Form

<b>APPLICATION FOR RADIOACTIVE DISPOSAL FORM</b>	<b>TRADEBE REFERENCE NUMBER</b>	
	<b>FAWLEY</b>	

**PART 1**

**This form must accompany radioactive waste consigned to Tradebe's Fawley site for disposal, in accordance with an authorisation issued under Sections 13 and 14 of the Radioactive Substances Act 1993.**

1.	Name and address of consignor	
2.	Telephone number of consignor (in case of accident)	
3.	Name and address of haulier	
4.	Reference and / or date of the Consignor's Certificate of Authorisation	
5.	Principal radionuclides and activity of each discrete package / container tabulated below:	

Description		Liquid / Solid	Radionuclides / Activities				
			Megabecquerels				
Drum ID	Specify container type / size, surface dose rate and form of waste		<sup>14</sup> C	<sup>3</sup> H	<sup>125</sup> I / <sup>131</sup> I / <sup>32</sup> P / <sup>35</sup> S	Others excluding α Specify	α Specify
TOTAL							
LIMITS on any one package / container			100,000		See CFA	See CFA	0.5
LIMITS on any one consignment			600,000	600,000	See CFA	See CFA	5

NOTE: Collective listing is only permitted for package / containers identical in content.

		<b>Y/N</b>
6.	Does your Certificate of Authorisation allow transfer of Radioactive Waste to Tradebe, Fawley?	
7.	Has each discrete package / container been labelled with the principal radionuclides and activity content?	

I certify that the necessary checks have been carried out on the abovenamed goods:

- (a) are the material described
- (b) are properly described and are packed and marked in accordance with the application of The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2007, and are in a proper condition for transport.
- (c) are free from external contamination, and (if carried other than by Tradebe's carriers contracted to Tradebe) are being transported in a properly prepared vehicle that is free from external contamination.
- (d) will not when transported or disposed of contravene any enactment such as the Hazardous Waste (England & Wales) Regulations 2005 or order, regulation or other instrument made, granted or issued under any enactment, will not contravene any rule of law or breach any agreement.

To be completed and signed by a person authorised by the Consignor, competent to secure compliance with the conditions of transport and disposal and responsible for the consignment.

Signed	
Position	
Date	



## Appendix 2 – List of Exemption Orders

The following are the exemption orders currently in operation:

Electronic Valves (1967)  
Exhibitions (1962)  
Gaseous Tritium Light Devices (1985)  
Geological Specimens (1962)  
Hospitals (1990, amended 1985)  
Lead (1962)  
Luminous Articles (1985)  
Phosphatic Substances (1962)  
Precipitated Phosphate (1963)  
Prepared Uranium and Thorium (1962)  
Schools (1963)  
Smoke Detectors (1980, amended 1991)  
Storage in Transit (1962)  
Substances of Low Activity (1986, amended 1992)  
Testing Instruments (1985)  
Uranium and Thorium (1962)  
Waste Closed Sources (1963)