DSG(2012)C078.

SEPA
Scottish Environment Protection Agency

Our Ref: SEPA/Dounreay/PC

Dounreay Stakeholder Group
c/o June Love
Dounreay Site
Thurso
KW14 7TZ

If telephoning ask for:
Linda Buchan

2 October 2012

Dear Sir

RADIOACTIVE SUBSTANCES ACT 1993:

Application made by Dounreay Site Restoration Limited under the Radioactive Substances Act 1993 in respect of premises at Dounreay.

Application has been made to the Scottish Environment Protection Agency (SEPA) by Dounreay Site Restoration Limited (DSRL) for the disposal of radioactive waste arising from the decommissioning of the Nuclear Licensed site at Dounreay. An application to dispose of radioactive waste under Section 13 of the Radioactive Substances Act 1993 (RSA 93) and accumulate radioactive waste under Section 14 of RSA 93 was received in April 2010. Additional correspondence providing amendments and additions to this application was received from DSRL in May 2010, June 2010, August 2010, February 2011, May 2011, August 2011, September 2011, January 2012 and August 2012.

The original application and the amendments and additions detailed in the correspondence received from DSRL, are being taken together under this consultation.

The applicant has applied to dispose of liquid and gaseous waste to the local environment. The applicant has also applied to dispose of combustible waste to Tradebe Fawley Limited (Southampton) for incineration and to dispose of metals to the operator of the Low Level Waste Repository (LLWR) at Drigg in Cumbria. The applicant has also applied to dispose of surface contaminated metal to: Studsvik UK Limited Metal Recycling Facility at Lillyhall in Cumbria for cleaning / treatment; Studsvik Nuclear AB in Sweden for smelting for reuse; CARLA Melting Plant in Germany for smelting and reuse and EnergySolutions in Oak Ridge, USA for smelting and reuse.

In addition to the above named routes, the company has applied to dispose of low level radioactive waste to any suitably licensed facility. This would include disposal of solid low level radioactive waste to the proposed new low level waste facility that is currently being constructed on land adjacent to the Dounreay Nuclear Licensed Site, in the event that this facility is authorised to accept the waste.

I would like to draw your attention to changes to the conditions in SEPA authorisations covering the disposal of radioactive waste by transfer from nuclear sites. The disposal of Low Level Waste (LLW) will be authorised to any holder of a suitable permit under the Environmental Permitting (England and Wales) Regulations 2010 or under the Radioactive Substances Act 1993. This approach to authorising the disposal of waste is intended to aid the implementation of the Governments UK strategy for the management of solid low level radioactive waste from the nuclear industry. The Governments strategy is detailed in the consultation document attached to this letter.

Cont'd / . . .

East Kilbride Office
Redwood Crescent, Peel Park, East Kilbride G74 5PP
tel 01355 574200 fax 01355 574688
www.sepa.org.uk

Dounreay Stakeholder Group
Thurso

2 October 2012

In England to support the introduction of the Environmental Permitting Regulations the Department of Energy & Climate Change published[1] draft guidance to the Environment Agency. This guidance stated that:

"*For solid waste disposals to another permitted operator, it is no longer necessary in most cases to specify in the permit the specific site at which the waste will ultimately be disposed of. Permits can allow transfer to any site where the operator of that site holds a permit to accumulate or dispose of the relevant type of waste. Records of waste transfers must be kept by both the consignor and the receiving site operator.*"

The Environment Agency in England has made such changes to its nuclear permits.

It is not SEPA's intention to carry out a change to all the authorisations held by nuclear sites in Scotland to permit the disposal of waste to holders of suitable permits or authorisations. Should nuclear sites wish these changes to be made now, then applications for variation can be made to SEPA. Any new authorisations that SEPA issue will be based upon the nuclear template which is included in the consultation package and which contain this change.

Also, in the nuclear template the disposal of radioactive waste by transfer to a person outwith the United Kingdom will be authorised where this is the best practicable means for the disposal of that type of waste, only for the purpose of treatment followed by return of any radioactive waste arisings and only in accordance with an authorisation granted under the Transfrontier Shipment of Radioactive Waste Regulations. This approach is in line with the Low Level Waste Policy 2007 that sets out Government policy on the import and export of LLW, as detailed in the consultation document attached to this letter.

The applicant has also applied for a continued route for return by transfer of solid intermediate level waste arising from the on-site destruction of sodium metal to AEA Technology or to Forschungszentrum Karlsruhe GmbH; for a continued route for return of waste to the countries of origin, under the terms of existing commercial contracts and for a continued route of transfer of samples of radioactive wastes to external laboratories.

The applicant has applied for accumulation of redundant aqueous radioactive liquid waste disposal system pipework, off the Nuclear Licensed Site.

As a result of the detection of fragments of irradiated nuclear fuel on beaches around Dounreay, SEPA has required DSRL to undertake a monitoring programme to detect and recover fuel fragments from the beaches. The monitoring programme is specified within the liquid waste authorisation (RSA/N/50011/99) held by DSRL. The current specified monitoring programme has been in force since 2002 and is being reviewed as part of SEPA's determination of the application by DSRL for a revised authorisation for the disposal of radioactive waste.

Cont'd / . . .

[1] Environmental Permitting. Environmental permitting guidance Radioactive Substances Regulation (RSR) For the Environmental Permitting (England and Wales) Regulations 2010. Draft guidance for Consultation – May 2009. DECC.

Dounreay Stakeholder Group
Thurso

2 October 2012

SEPA has undertaken an assessment of the beach monitoring requirements and as a consequence is proposing that the monitoring programme is revised. As part of this consultation SEPA is seeking views on the proposed revised beach monitoring programme. A copy of SEPA's review of the beach monitoring programme for fragments of irradiated nuclear fuel has been included (as Paper 7) within this consultation.

Under section 16 of the Radioactive Substances Act 1993 (RSA 93) SEPA carries out discretionary and public consultation on any application for radioactive disposals from nuclear licensed sites as part of its determination of such applications.

This consultation seeks your views on the application made by Dounreay Site Restoration Limited to the Scottish Environment Protection Agency (SEPA), for an authorisation under Section 13 of the above Act to dispose of radioactive waste from the premises at Dounreay and under Section 14 of the above Act to accumulate radioactive waste.

In undertaking this consultation SEPA is looking for information relevant to this application. Specifically SEPA would like to be informed of any matters that your organisation are aware of that could influence SEPA's decision to grant an authorisation and the limitations and conditions of the nuclear template.

I attach a paper copy of SEPA's consultation document and the application made by Dounreay Site Restoration Limited. The supporting documents can be found on the enclosed disk.

Written representations concerning the application should be made to The Registrar, Scottish Environment Protection Agency, Dingwall Office, Graesser House, Fodderty Way, Dingwall or to registrydingwall@sepa.org.uk and will be considered by SEPA when determining the application. Comments are invited on the understanding that they may be made public by SEPA. Comments will only be treated as "not for publication" if a specific request to that effect is made to SEPA. The CLOSING DATE for this consultation is the 30 November 2012.

Yours sincerely

Linda H Buchan

Linda H Buchan
Radioactive Substances Unit
Operations Directorate

Enc

SCOTTISH ENVIRONMENT PROTECTION AGENCY

RADIOACTIVE SUBSTANCES ACT 1993

Application by Dounreay Site Restoration Limited for Authorisation under Section 13 of The Radioactive Substances Act 1993 to Dispose of Radioactive Wastes from the Decommissioning of the Nuclear Licensed Site at Dounreay, Caithness, Scotland and under Section 14 of the Radioactive Substances Act 1993 to Accumulate Radioactive Waste.

CONSULTATION DOCUMENT FOR DISCRETIONARY CONSULTEES AND THE PUBLIC

1 PURPOSE OF THIS DOCUMENT

Application has been made to the Scottish Environment Protection Agency (SEPA) by Dounreay Site Restoration Limited (DSRL) for the disposal of radioactive waste arising from the decommissioning of the Nuclear Licensed site at Dounreay. An application to dispose of radioactive waste under Section 13 of the Radioactive Substances Act 1993 (RSA 93) and accumulate radioactive waste under Section 14 of RSA 93 was received in April 2010. Additional correspondence providing amendments and additions to this application was received from DSRL in May 2010, June 2010, August 2010, February 2011, May 2011, August 2011, September 2011, January 2012 and August 2012.

Under section 16 of the Radioactive Substances Act 1993 (RSA 93) SEPA carries out discretionary and public consultation on any application for radioactive disposals from nuclear licensed sites as part of its determination of such applications.

The original application and the amendments and additions detailed in the additional correspondence received from DSRL, are being taken together under this consultation.

The main purpose of this document is to help consultees understand why they are being consulted and what they are being consulted upon. It summarises SEPA's general remit, gives further detail on the specific remit for the regulation of radioactive substances in Scotland and sets down the general framework in the UK and European Community within which SEPA will determine whether or not to grant authorisation to the applicant. This document should be read in conjunction with the application, its accompanying documents and the further papers enclosed for consultation.

Your comments are being sought by SEPA as part of the 'Discretionary Consultation' on this application.

Section 16 4A of RSA 93 requires SEPA to consult with the Food Standards Agency (FSA) and Health and Safety Executive (HSE) whenever an application is received by SEPA from a nuclear licensed site. Further administrative arrangements are in place to consult the Scottish Government to ensure that Scottish Ministers have the opportunity to call in the application for determination. SEPA has consulted with the FSA, HSE (Office for Nuclear Regulation (ONR), formerly Nuclear Installations Inspectorate (NII)) and Scottish Government. Additionally the FSA carried out a prospective dose assessment of the likely impact of the disposal of liquid and gaseous waste on the safety of food.

Further detail on the consultation process is given later in this document. In accordance with the requirements of Section 16(5) of RSA 93, SEPA is specifically consulting with the following bodies:

- Caithness West Community Council;
- Committee on Medical Aspects of Radiation in the Environment;
- Copeland Borough Council;
- Cumbria County Council;
- Dounreay Stakeholder Group;
- Environment Agency;
- Hampshire County Council;
- Health Protection Agency;
- Highland Council;
- NHS Highland;
- Nuclear Decommissioning Authority;

- Orkney Island Council;
- Particles Retrieval Advisory Group (Dounreay);
- Scottish Natural Heritage;
- Scottish Water;
- Shetland Islands Council;

In order to draw the consultation to the attention of the public in the area local to the Dounreay site, from which the waste is being disposed, the consultation is being advertised in:

- Caithness Courier
- John O'Groats Journal
- Press & Journal
- Edinburgh Gazette

The consultation package can be viewed at:

SEPA
Thurso office
Strathbeg House
Clarence Street
Thurso
KW14 7JS

SEPA
Dingwall office
Graesser House
Fodderty Way
Dingwall Business Park
Dingwall
IV15 9XB

And at SEPA's web site, at **www.SEPA.org.uk** under the "Consultations" section.

In undertaking this consultation SEPA is looking for information relevant to this application. Specifically SEPA would like to be informed of any matters that your organisation or you as an individual are aware of that could influence SEPA's decision to grant an authorisation to dispose of radioactive waste. There are some matters that SEPA might particularly invite certain consultees to comment on because SEPA believes their expertise or knowledge could be particularly helpful or important. When this is the case SEPA will write to these consultees asking for such comment. Consultees are of course free to make any comments they wish that are relevant to this application.

1.1 Consultation Process

The following papers are enclosed for consultation:

Main consultation documents
Paper 1A: Application form, including maps;
Paper 1B: (Parts 1-4): Correspondence received by SEPA from DSRL providing amendments to the application

Paper 2: Information in Support of an Application for Authorisation for the Disposal of Liquid, Gaseous and Solid Radioactive Wastes from Dounreay, by DSRL (Ref RSA Authorisation (09)INFO);
Paper 3: Estimated Releases of Radioactivity to the Environment, Justification and the Uncertainty Related to the Estimates by DSRL, (Ref RSA Authorisation (09)Estimate);
Paper 4: Prospective dose assessment by the Food Standards Agency;
Paper 5: Dose assessment to non-human species for the Dounreay nuclear licensed site;
Paper 6: SEPA's standard nuclear template;
Paper 7: SEPA's review of beach monitoring programme for fragments of irradiated nuclear fuel (particles)

Additional information documents

Paper 8: Studsvik Metal Treatment – Customer Owned Waste Service, Waste Acceptance Criteria (Reference WAC/MM/UK);
Paper 9: TRADEBE, Code of Practice – Conditions of Acceptance of Radioactive Waste (issue 4);
Paper 10: An assessment of the Radiological Impacts of Proposed Atmospheric and Liquid Radioactive Waste Disposals from Dounreay by DSRL (Ref RSA Authorisation (09)DOSE);
Paper 11: Glossary of Terms Used in the Documents Applying for an Authorisation to Dispose of Radioactive Wastes on or from the Premises at Dounreay, by DSRL (Ref RSA Authorisation (09)Glossary);
Paper 12: The 2008 DSRL Site Waste BPEO (Best Practicable Environmental Option) (Ref DEC(09)P196;
Papers 13A & B: Best Practicable Environmental Option Study for the Management of Radioactive Waste Arising from the Dounreay Site Restoration Plan, June 2003, including Tables A3;
Paper 14: A review of National and International Best Practice on Waste Minimisation by DSRL (Ref DEC(09)P175);
Paper 15: Dounreay "Interim" Integrated Waste Strategy, March 2010 (Ref WSU/Strategy/P033(08));

The consultation procedure is as follows:

Operators wishing to dispose of radioactive waste must apply to SEPA for an authorisation. For applications received for the disposal of waste originating at nuclear licensed sites, Section 16 of RSA93 requires that SEPA consults with the Health and Safety Executive (Nuclear Installations Inspectorate (NII)) and the Food Standards Agency (FSA) before deciding whether to grant an authorisation. The application is also provided to the Scottish Government to allow Scottish Ministers to exercise their powers under Section 24 of RSA93 to call in the application.

SEPA is also required to consult with such public bodies as it sees proper to consult regarding the application before granting any authorisation. SEPA also believes that this consultation should be advertised for public comment.

Following this consultation, SEPA is required to consult again with the FSA on the terms and conditions of any authorisation it proposes to grant and to send a copy of any authorisation which it proposes to grant to the FSA. Consultation is also carried out with the HSE under formal working arrangements. Finally, consultation is carried out with Scottish

Ministers who have powers to direct SEPA to add, remove or alter any condition or limit specified in the authorisation.

Any authorisation for the disposal of radioactive waste from a nuclear licensed site that SEPA is minded to grant is prepared along with a document (known as a "decision document") setting out SEPA's considerations and the rationale for its decision to issue an authorisation. That document supports the final consultation with Scottish Ministers. The document will be made available on SEPA's web site.

Your response to this consultation should be returned to the following address:

The Registrar
Scottish Environment Protection Agency
Graesser House
Fodderty Way
Dingwall
IV15 9XB

registrydingwall@sepa.org.uk

Responses should be made to SEPA by 30 November 2012 at the above address. Following the closing date, all responses will be considered prior to the determination of the application.

SEPA may wish to include responses to this consultation document in its decision document. If so, all responses will be made public unless a respondent specifically asks for their response to be treated confidentially. Confidential responses may be included in any statistical summary of numbers of responses received or views expressed.

Respondents should be aware that SEPA is subject to the provisions of the Freedom of Information (Scotland) Act 2002 and would therefore have to consider any request made to it under the Act for information relating to responses made.

2 SEPA'S REMIT AND DUTIES

The Scottish Environment Protection Agency (SEPA) is the body responsible for environmental protection in Scotland. Its main aim[1] is to:

> *"provide an efficient and integrated environmental protection system for Scotland that will improve the environment and contribute to the Scottish Ministers' goal of sustainable development"*

SEPA was established by the Environment Act 1995 and became operational on 1 April 1996. The Environment Act 1995 also sets out SEPA's powers and responsibilities.

In broad terms SEPA regulates:

- activities that may pollute water
- activities that may pollute air
- storage, transport and disposal of waste
- keeping, use and disposal of radioactive substances

The control over Radioactive Substances, including the disposal of radioactive waste, in Scotland, is exercised via the Radioactive Substances Act 1993 (RSA 93). Section 13 of RSA 93 makes it an offence to dispose of any radioactive waste, or permit it to be disposed of, unless it is in accordance with an authorisation granted under that Section, or it falls into one of the categories of radioactive waste specifically exempted from the requirements of this Section. Section 14 of RSA 93 makes it an offence to accumulate any radioactive waste, or permit it to be accumulated, unless it is in accordance with an authorisation granted under that Section, or it falls into one of the categories of radioactive waste specifically exempted from the requirements of this Section. SEPA is the body in Scotland charged with granting authorisations under Section 13 and Section 14.

[1] SEPA's Vision for Regulation 2005. www.sepa.org.uk

3 APPLICATION PROCESS

3.1 Background to the Application

This section is intended to provide some background information to assist consultees and members of the public to understand the information provided by Dounreay Site Restoration Limited (DSRL).

The current authorisations were granted to the United Kingdom Atomic Energy Authority (UKAEA) in 1999 for the disposal of radioactive waste from the premises at Dounreay in Caithness.

Following the Government announcement in 2001 that no more fuel reprocessing would be undertaken at Dounreay, decommissioning of the site has commenced.

The nuclear licensed site at Dounreay is owned by the Nuclear Decommissioning Authority (NDA) and is being decommissioned on their behalf by DSRL. The authorisations granted to UKAEA were transferred to DSRL on 1 April 2008.

DSRL have applied for a new authorisation appropriate for the decommissioning of the Dounreay site.

3.2 Existing Authorisations

DSRL holds the following authorisations permitting the disposal of radioactive waste from the Dounreay site:

Certificate Number*	**Effective Date**	**Description**
RSA/N/50010/99	16/08/1999	Disposal of gaseous waste on or from the premises
RSA/N/50011/99	16/08/1999	Disposal of liquid waste on or from the premises
RSA/N/50012/99	16/06/1999	Disposal of solid waste on or from the premises

*The limitations and conditions of the above authorisations have been subject to variation.

The actual disposals over the last 5 years 2007 – 2011 are given in the Tables below. These quantities of waste may not be representative of future decommissioning activities.

Gaseous Discharges[2]

Annual Gaseous Discharges

Gas	2007	2008	2009	2010	2011
Alpha	9.11E-03	1.22E-02	1.22E-02	1.00E-02	1.34E-02
Beta	1.54E-01	2.02E-01	1.83E-01	1.63E-01	1.08E-01
Tritium	3.21E+02	2.59E+02	4.82E+02	2.60E+02	1.93E+02
Krypton-85	1.72E-03	5.24E-03	1.65E-03	0.00E+00	2.14E-03
Strontium-90	3.50E-02	4.78E-02	4.36E-02	3.40E-02	1.55E-02
Ruthenium-106	6.32E-03	7.73E-03	5.78E-03	5.07E-03	3.03E-03
Iodine-129	1.06E-01	1.05E-01	9.09E-02	6.62E-02	5.41E-02
Iodine -131	6.62E-02	6.80E-02	3.26E-02	1.27E-02	8.42E-03
Caesium-134	8.23E-04	1.02E-03	7.56E-04	6.29E-04	3.91E-04
Caesium-137	5.92E-03	1.42E-02	1.13E-02	1.85E-03	5.14E-04
Cerium-144	4.85E-03	6.31E-03	4.30E-03	3.54E-03	2.54E-03
Plutonium-241	2.78E-03	3.52E-03	3.98E-03	1.07E-03	7.45E-04
Curium-242	5.51E-05	2.32E-05	2.62E-05	1.92E-05	4.30E-06
Curium-244	4.55E-06	3.52E-06	2.68E-06	2.06E-06	8.18E-07

Gaseous waste disposed - GigaBecquerels. Data source (2007-2011): RIFE series.

Liquid Discharges[3]

Annual Liquid Discharges

Liquid	2007	2008	2009	2010	2011
Alpha	3.12E-01	1.60E-01	2.58E-01	1.99E-01	2.13E-01
Beta	2.95E+00	1.99E+00	6.05E-01	5.45E-01	5.05E-01
Tritium	1.18E+02	9.61E+01	1.04E+02	9.13E+01	7.68E+01
Sodium-22	6.81E+01	2.10E+01	1.19E-02	0.00E+00	0.00E+00
Caesium-137	1.04E+01	8.05E+00	6.18E+00	5.15E+00	5.24E+00
Strontium-90	4.57E+01	3.14E+01	3.09E+01	3.23E+01	3.20E+01

[2] The current gaseous waste authorisation, authorises the discharge of gaseous waste from 20 stacks across the Dounreay site. The current gaseous waste authorisation specifies annual discharge limits for 6 groups of stacks.

[3] The current liquid waste authorisation specifies annual discharge limits for 2 parts of the premises, namely the “Liquid Metal Disposal Plant at the Prototype Fast Reactor” and “All other parts excluding the Liquid Metal Disposal Plant at the Prototype Fast Reactor”. The liquid waste from both parts of the premises is discharged into the North Atlantic Ocean using the same pipeline.

Liquid waste disposed – GigaBecquerels. Data source (2007-2011): RIFE series.

Solid Waste
Solid waste is currently being accumulated on site pending the identification of suitable disposal routes.

3.3 Current Application

On 7 April 2010 SEPA received an application for authorisation under Section 13 of RSA 93 to dispose of radioactive waste from the Dounreay site and under Section 14 of RSA 93 to accumulate radioactive waste. Further information providing clarification on the quantities and types of waste that the operator proposes disposing off the nuclear licensed site dated 19 May 2010, 3 June 2010 and 18 August 2011 was received.

SEPA has received correspondence from DSRL requesting amendments to the application. These letters have been included as Paper 1B within this consultation.

The company has applied to dispose of the various waste types listed below via the identified routes. Some of these disposal routes are currently used and some are new routes. The company has proposed annual limits for key radionuclides associated with the waste and where they believed applicable annual limits on volumes of radioactive waste to be disposed. The company has based the proposed annual limits on estimated discharges arising from the site's decommissioning programme.

The disposal routes listed below are those SEPA understand DSRL have applied for and which will form the basis for SEPA's determination of this application.

Gaseous Waste

Continued disposal to air:

Radionuclide	Current Authorised Annual Limits (Bq/yr)	Predicted Annual Discharges (Bq/yr)	Applied for Annual Limits (Bq/yr)
All alpha emitting radionuclides associated with particulate matter taken together	1.01E+9	3.73E+06	7.28E+6
All beta emitting radionuclides associated with particulate matter (excluding tritium and Kr-85) taken together	4.7E+10	7.34E+08	2.94E+9
Tritium	1.7E+13	5.19E+13	7.82E+13
Krypton-85	3.01E+15	5.76E+14	5.76E+14
Iodine-129	1.10E+9	1.00E+09	1.0E+9

The predicted annual discharges are taken from DSRL's estimated releases of radioactivity to the environment document (updated version included within Paper 1B). The applied for overall discharge limits are (with the exception of tritium) lower than those contained in the current authorisation. An increase in the overall discharge limit for tritium has been applied for. SEPA note that DSRL's estimated releases indicate that tritium discharges will peak over a 2 year period, and the applied for tritium limit is based upon this maximum discharge.

DSRL's estimated releases indicate that outwith this peak period, the tritium discharges will be lower.

Setting of a site limit

The current gaseous waste authorisation specifies annual discharge limits for 6 groups of stacks. DSRL have requested that the proposed limits be applied to the Dounreay site as a whole, and are not applied to any specified facility groupings and have advised that "*The setting of a site limit will assist the decommissioning of the site by affording a degree of flexibility, within the bounds of BPM, that DSRL believes is required for the decommissioning of the site*."[4]

As part of the determination process SEPA will give consideration to setting a total limit on the amount of radioactivity that can be disposed of from the site and to setting subsidiary limits to underpin and drive BPM.

Aqueous Waste

Continued disposal down the long outfall to the North Atlantic Ocean:

Radionuclide	Extant Annual Limits (Bq/yr)	Estimated Annual Discharges (Bq/yr)	Proposed Annual Limits (Bq/yr)
All alpha emitting radionuclides taken together	1.1E+11	2.43E+09	3.67E+9
All beta and gamma emitting radionuclides taken together (excluding tritium)	4.37E+12	1.48E+12	2.73E+12
Strontium-90	7.7E+11	1.66E+11	2.74E+11
Caesium-137	1.07E+12	6.51E+11	1.27E+12
Sodium-22	1.8E+12	6.61E+09	1.3E+10
Tritium	6.9E+12	5.13E+13	1.02E+14
Americium-241	N/A	1.00E+07	1.5E+7

The applied for overall discharge limits are (with the exception of tritium and Caesium-137) lower than those contained in the current authorisation. An increase in the overall discharge limit for tritium has been applied for. SEPA note that DSRL's estimated releases indicate that tritium discharges within aqueous waste will peak over a 2 year period, and the applied for tritium limit is based upon this maximum discharge. A limit for Americium-241 has also been applied for.

A small increase in the discharge limit for Caesium-137 has been applied for, although the applied for total beta and gamma (excluding tritium) limit is lower than that within the current authorisation. SEPA note that both Strontium-90 and Caesium-137 can be abated using ion exchange processes and as part of the determination process, SEPA will obtain further

[4] Paper 2, Information in Support of an Application for Authorisation for the Disposal of Liquid, Gaseous and Solid Radioactive Wastes from Dounreay, by DSRL (Ref RSA Authorisation (09)INFO), Section 10

information from DSRL on the planned abatement processes and the basis for the estimated discharges of these radionuclides.

Disposal by transfer off-site

Combustible waste

Proposed disposal route – Tradebe Fawley Limited (Southampton) for incineration.

(1) Solvents, Oils, Zinc Bromide, Scintillants

Radionuclide	Proposed Annual Limit	Annual volume m^3
Alpha	4 GBq	50 – liquids
Beta (excluding Tritium)	12 GBq	
Tritium	100 GBq	

Low level waste

Surface contaminated metal[5]

Disposal route (1) **Proposed** disposal to Studsvik UK Limited Metal Recycling Facility at Lillyhall, Workington, Cumbria for cleaning / treatment

(2) **Proposed** disposal to Studsvik Nuclear AB in Sweden for smelting for reuse.

Steel, cast iron, aluminium, copper, lead, brass, cables

Radionuclide	Proposed Annual Limit	Annual Volume, m^3
Total Alpha	690 GBq	20
Total Beta/gamma	2070 GBq	

Disposal route (3) **Proposed** disposal to CARLA Melting Plant, Siempelkamp Nukleartechnik GmbH in Germany for smelting and reuse.

Steel, cast iron, aluminium, copper, lead, brass, cables

Radionuclide	Proposed Annual Limit	Annual Volume, m^3
Alpha	138 GBq	4
Beta/gamma	414 GBq	

Disposal route (4) **Proposed** disposal to EnergySolutions in Oak Ridge, USA for smelting and reuse.

Steel, cast iron, aluminium, copper, lead, brass, cables

Radionuclide	Proposed Annual Limit	Annual Volume, m^3
Total Alpha	138 GBq	4

[5] Taking account of metal density, based on an average density value of 8600 kg/m^3m the disposed limits used would be low level waste

Beta/gamma	414 GBq	

Disposal route (5) **Proposed** disposal to the operator of the Low Level Waste Repository at Drigg in Cumbria

Steel, cast iron, aluminium, copper, lead, brass, cables, mercury

Radionuclide	Proposed Annual Limit	Annual Volume, m^3
Alpha	276 GBq	8
Beta/gamma	828 GBq	

In cases where waste is sent abroad for treatment, it is Government Policy that in cases where these processes would add materially to the wastes needing to be disposed of in the country of destination, the presumption should be that they will be returned to the UK. The conditions contained within SEPA's standard authorisation template reflect this presumption of the return of waste to the UK.

Low level waste to holders of suitable permits or authorisations

Proposed route: In addition to the above named routes, the company has applied to dispose of low level radioactive waste to any suitably licensed facility (i.e. holders of suitable permits or authorisations). This would include disposal of solid low level radioactive waste to the proposed new low level waste facility that is currently being constructed on land adjacent to the Dounreay Nuclear Licensed Site, in the event that this facility is authorised to accept the waste. It is envisaged that the majority of low level waste arising from the decommissioning of the Dounreay site will be disposed of to the proposed new dedicated low level waste facility.

Solid intermediate level waste

Continued route for return by transfer of waste arising from the on-site destruction of sodium metal (imported from Forschungszentrum Karlsruhe GmbH for treatment at Dounreay in accordance with Transfrontier Shipment agreement) to AEA Technology or to Forschungszentrum Karlsruhe GmbH

(1) Ion exchange resin

Radionuclide	Proposed Limit
Caesium-137	500 GBq

Continued route for return of waste to the countries of origin, under the terms of existing commercial contracts for the reprocessing of spent nuclear fuel at Dounreay.

(1) Cemented Material Test Reactor Raffinate[6]

Description of Radioactive Waste
Cemented Material Test Reactor Raffinate

[6] The current solid waste authorisation specifies a volume limit of $250m^3$ for the return of Cemented Material Test Reactor Raffinate to the countries of origin.

Samples

Continued transfer of samples of radioactive wastes, for analytical and characterisation purposes, to external laboratories.

Accumulation of solid waste off the Nuclear Licensed Site

Proposed storage of redundant aqueous radioactive liquid waste disposal system pipework (cast iron pipes and mild steel up-risers). The pipework will be stored in-situ in the subsurface tunnel in which they are laid whilst the disposal options are investigated. The storage is an accumulation (as defined in the Radioactive Substances Act 1993) due to the pipework being located beyond the licensed site boundary[7].

Radionuclide	Maximum Activity (Bq)	Maximum time of accumulation	Estimated mass of steel
Total Alpha	1 TBq	15 years	1731 tonnes
Total Beta/gamma	10 TBq	15 years	

Question: Do you have any comment on the proposed Authorised Limits or disposal routes (where identified)?

3.4 Responses Received from Consultees

SEPA has consulted with the FSA, and as a result the FSA carried out a prospective dose assessment on the likely impact of the disposal of liquid and gaseous waste on the safety of food. A copy of the assessment summary report is included as Paper 4 as part of this consultation. FSA states within its response "*The Food Standards Agency in Scotland has assessed the potential impact to the food chain arising from the proposed limits. The potential dose to the public via the food chain could be up to 8.7 microsieverts for the revised discharge limits, a reduction from the 21.4 microsieverts for the current limits. Given the nature of the application and the limits being proposed by Dounreay, the Food Standards Agency in Scotland has no objection to the granting of this Authorisation on the grounds of food safety*."

SEPA note that potential doses arising from external exposure are higher than the potential doses arising from the consumption of food.

SEPA consulted with the Health and Safety Executive (Office for Nuclear Regulation formerly the Nuclear Installations Directorate (NII)). The HSE states within its response "*I have consulted colleagues and we believe that DSRL may have made an incomplete Application. This is because the application does not include disposal of radioactive waste on the licensed site: an activity DSRL have declared publically they plan to do by leaving radioactive waste that has leaked from buildings during operation into the ground with no intention to retrieve such waste*."

[7] The Office for Nuclear Regulation (ONR) is responsible for regulating the accumulation of radioactive waste on nuclear licensed sites.

SEPA does not believe that the application is incomplete. SEPA is aware that ONR considers radioactively contaminated soil on a nuclear licensed site to be an accumulation of nuclear matter. Waste legislation does not consider contaminated soil in-situ to be waste, and it is only when the soil is excavated does it become waste. The issue of contaminated ground is currently being progressed by SEPA who are formulating a policy on the revocation of licenses held for the disposal of radioactive waste.

SEPA consulted with Scottish Government. Scottish Government. Scottish Government responded that it was content with the application but raised a query regarding the impact of the application upon the site Article 37 update. This is covered within section 4.1.9 of this document.

3.5 Other Matters

Beach monitoring programme

Under SEPA's standard authorisation template, it is the responsibility of the operator to establish an environmental monitoring programme to assess compliance with the requirements to:

- Use best practicable means in the minimisation and disposal of radioactive waste
- Maintain systems and equipment provided to meet the best practicable means requirements and maintain systems and equipment provided for the disposal of radioactive waste
- Check the effectiveness of systems and equipment provided to meet the best practicable means requirements and check the systems and equipment provided for the disposal of radioactive waste

Fragments of irradiated nuclear fuel (particles), generally similar in size and density to grains of sand, but containing minute fragments of irradiated nuclear fuel, were generated by historic practices at Dounreay. Particles were released from Dounreay into the marine environment primarily via the discharge system. Particles have been detected and recovered from publically accessible beaches and the seabed around Dounreay. The probability of encounter with a particle has been estimated to be very low[8].

Currently DSRL is recovering fragments of irradiated nuclear fuel from the seabed. The recovery of fragments of fuel from the seabed is underpinned by the Best Practicable Environmental Option (BPEO)[9], which was developed by DSRL and involved input from local shakeholders.

As a result of the detection of fuel fragments on the beaches around Dounreay, SEPA has required DSRL to undertake a specific monitoring programme to detect and recover particles from the beaches. The monitoring programme is specified within the liquid waste authorisation (RSA/N/50011/99) held by DSRL.

[8] DPAG 4th Report. www.sepa.org.uk
[9] www.Dounreay.com

The current specified beach monitoring programme is as follows:

Monitoring Type	Sampling Location	Area to be Monitored	Frequency of Monitoring
Large area gamma survey using Groundhog Evolution equipment or a system of equivalent or higher overall performance	Sandside Bay	All of the sandy areas between National Grid Reference 295700, 966280 and 296690, 965780 that can be accessed by a vehicle from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water.	Monthly
	Sandside Bay	Accessible sandy areas between National Grid Reference 295700, 966280 and 296690, 965780 which do not permit vehicle access including north beach, harbour, sandy areas below Fresgoe House, bands of sand north east of the beach below the public lavatories and the sandy areas north of Isauld Burn,	Monthly
	Sandside Bay	Strandline that can be accessed by vehicle between National Grid Reference 295700, 966280 and 296690, 965780	Fortnightly
	Thurso Bay	All of the sandy areas between National Grid Reference 311360, 968960 & 312070, 968850 that can be accessed by a vehicle from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water	Three times per year
	Scrabster Bay	All of the sandy areas between National Grid Reference 310040, 970180 & 310605, 969170 that can be accessed by a vehicle from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water	Three times per year
	Crosskirk Bay	All accessible sandy areas between National Grid Reference 302860, 969900 & 302970, 970250 from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water	Six times per year
	Brims Ness	All accessible sandy areas between National Grid Reference 304250, 971270 & 304410, 971030 from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water	Six times per year
	Dounreay East Foreshore	All accessible sandy areas between National Grid Reference 298650, 967410 & 299020, 967670 from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water	Fortnightly except during the period 1 May to 31 August
	Dounreay West Foreshore	All accessible sandy areas between National Grid Reference 298190, 967029 & 298340, 967095 from mean high water springs to as near as reasonably practicable to mean low water springs, but at least to neap low water	Fortnightly except during the period 1 May to 31 August

SEPA is minded to include a specific requirement for beach monitoring for fragments of irradiated nuclear fuel within any authorisation it is minded to grant. This is to ensure the

public is well protected from such transient occurrences and public reassurance is maintained. SEPA has undertaken an assessment of the beach monitoring requirements and as a consequence is proposing that the monitoring programme is revised. As part of this consultation SEPA is seeking views on the proposed revised beach monitoring programme.

A copy of SEPA's review of the beach monitoring programme for fragments of irradiated nuclear fuel (particles) has been included (as Paper 7) within this consultation. The proposed beach monitoring programme is as follows:

Sandside
Reduction from current monthly monitoring programme to a quarterly monitoring programme, using Groundhog Evolution 2 detection system, with the existing detection capability.

Other beaches

Dounreay Foreshore
Retention of the current fortnightly monitoring programme.

Murkle
Annual monitoring, utilising the Groundhog Evolution 2 detection system.

Crosskirk
Reduction from current six times per year monitoring programme to an annual monitoring programme, using Groundhog Evolution 2 detection system.

Dunnet
SEPA is of the view that the beach does not require routine monitoring, however this will be kept under review.

Melvich
Monitoring of the beach once every five years, utilising the Groundhog Evolution 2 detection system.

Brims Ness, Scrabster, Thurso & Peedie
SEPA is of the view that these beaches do not require routine monitoring.

The beach monitoring programme will establish if there is any step change in particle numbers being detected or increased hazard, which would necessitate additional monitoring being carried out.

Following the specification and implementation of the revised beach monitoring programme, it is SEPA's intention to undertake a future review of the programme to establish if it is appropriate for the monitoring to be further reduced. The mechanism for SEPA to implement a further reduction in the monitoring programme would be by SEPA undertaking a variation to Dounreay's authorisation for the disposal of radioactive waste.

The overall long term objective is that monitoring of local public beaches will no longer be necessary and this will be considered periodically by reviewing the monitoring requirements.

Question: Do you have any comment on the proposed revised beach monitoring programme?

3.6 Determination Process

SEPA will consider the application and arrive at its decision on whether or not to grant an authorisation giving consideration to the following:

1. Details contained in the application
2. Responses from consultees and members of the public
3. Further information that SEPA may have sought from the applicant
4. Findings of SEPA inspections carried out at the applicant's premises
5. Government Policy (including that contained in Cm 2426[10] Cm2919[11] and the Policy Statement on long term management of LLW in the UK)[12]
6. The UK strategy on the discharge of radioactive waste[13] and Statutory Guidance[14]
7. The Radioactive Substances (Basic Safety Standards) (Scotland) Direction 2000 including assessment of doses to members of the critical group* in the vicinity of the site and an assessment of the collective dose
8. Data relating to disposals of radioactivity from the site
9. Habits survey data
10. Environmental monitoring data and assessment

* Some members of the public close to nuclear installations are assumed to receive higher doses than other members of the population. This is due to their higher than average consumption of certain foodstuffs (as established by habits surveys), frequenting certain areas or living in close proximity to the site. In predicting radiological impacts to man, the concept of critical group is used. For a given source of radioactive discharges, this is the small number of members of the public who are likely to receive the highest radiation dose as a result of that source. By ensuring that the critical group is not exposed to unacceptable levels of radiation as a result of discharges, the wider population is also protected. Critical group methodology is used in two ways: *prospectively* to estimate the radiation dose that will be received by the critical group; and *retrospectively* to determine the actual dose that was received.

SEPA will take cognisance of any changes to government policy, legislation, European Directives etc. that occur during the period over which the application is determined.

[10] Sustainable Development: The UK Strategy. Cm 2426. HMSO 1994 ISBN 0 10 124262 X
[11] Review of Radioactive Waste Management Policy: Final Conclusions (Cm2919). HMSO. July 1995
[12] Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom. March 2007. See www.defra.gov.uk
[13] UK Strategy for Radioactive Discharges 2001-2020
[14] Environment Act 1995. The UK Strategy for Radioactive Discharges. Statutory Guidance 2008

If SEPA is minded to grant an authorisation, then the conditions and limitations of that authorisation will be set having due regard to any comments received during the consultation and any further information that SEPA may seek as part of its determination process.

If an authorisation is granted as a result of this application it would be SEPA's intention to revoke the existing authorisations listed in section 3.2 and issue a new authorisation. This would be based upon SEPA's standard authorisation for nuclear sites. A copy of this is given in paper 6. It should be noted that SEPA has recently updated this template and in particular has changed the way in which the disposal of low level radioactive waste by transfer from the premises is specified. This is supported by a SEPA Policy on the Regulation of Disposal of Radioactive Low Level Waste from Nuclear Sites[15]. In essence the disposal of LLW will be authorised to any holder of a suitable permit under the Environmental Permitting (England and Wales) Regulations 2010 or Authorisation under the Radioactive Substances Act 1993 (a waste permitted person). This approach to authorising the disposal of waste is intended to aid the implementation of the Government UK Strategy for the Management of Solid Low Level Radioactive Waste from the nuclear industry (see section 4.1.4).

To aid transparency in this process, it is SEPA's intention to publish annually the quantities and routes for the disposal of low level waste from nuclear sites in Scotland.

As stated above, SEPA's standard authorisation does not specify the individual waste recipient(s) for disposals of low level radioactive waste. DSRL's original application, that included specified waste recipients for the off-site disposals of low level radioactive waste, predates SEPA's recent update to the authorisation template. It should be noted that DSRL has also applied to dispose of low level radioactive waste to any suitably licensed facility (see section 3.3).

Previously when individual waste recipients were specified within SEPA's authorisations, SEPA consulted with the relevant planning authorities. As recipients for low level radioactive waste will no longer be routinely specified within SEPA's authorisations SEPA will no longer routinely consult with planning authorities. As stated in SEPA's Policy on the Regulation of Disposal of Radioactive Low Level Waste from Nuclear Sites[15] SEPA believes that the most appropriate and meaningful consultation in relation to sites that receive treat and dispose of LLW is that which is carried out at the time that these facilities apply for planning permission and their Environmental Permit or Authorisation for the disposal of radioactive waste. However, as DSRL's original application included specified waste recipients, SEPA has decided to include consultation with the relevant local authorities for the specified waste disposal recipients which are within the United Kingdom, as part of this consultation process.

Also, in SEPA's standard authorisation for nuclear sites the disposal of radioactive waste by transfer to a person outwith the United Kingdom will be authorised where this is the best practicable means for the disposal of that type of waste, only for the purpose of treatment followed by return of any radioactive waste arisings and only in accordance with an authorisation granted under the Transfrontier Shipment of Radioactive Waste Regulations. This approach to authorising the disposal of waste is in line with the Low Level Waste Policy 2007 that sets out Government policy on the import and export of LLW (see section 4.1.5).

SEPA's standard authorisation does not specify the individual waste recipient(s) for disposal by transfer to a person outwith the United Kingdom, for the purpose of treatment. DSRL's

[15] in SEPA's Policy on the Regulation of Disposal of Radioactive Low Level Waste from Nuclear Sites, www.SEPA.org.uk

original application, that included specified waste recipients outwith the United Kingdom predates SEPA's recent update to the authorisation template.

SEPA has not included consultation with the competent authorities for the waste recipients which are outwith the United Kingdom, as part of this consultation process. It should be noted that the disposal of radioactive waste by transfer to a person outwith the United Kingdom will need to be accompanied by an authorisation granted under the Transfrontier Shipment of Radioactive Waste Regulations. Hence the mechanism for SEPA consulting with the relevant competent authorities for waste recipients which are outwith the United Kingdom will be the consultation undertaken on any future application for authorisation under the Transfrontier Shipment of Radioactive Waste Regulations.

3.7 Dealing with future changes to the authorisation

Periodically it may be necessary to make changes to the authorisation. In cases where this is not relaxing the limits and conditions contained within the authorisation then SEPA would not propose carrying out public consultation. Within the authorisation SEPA will give consideration to setting a total limit on the amount of radioactivity that can be disposed direct to the environment. Subsidiary limits to underpin and drive BPM may be placed upon some parts of the nuclear site. In cases where increases in the total radioactivity to be disposed direct to the environment are proposed or a relaxation is proposed such as the disposal of liquid waste to a different location, or the disposal of solid waste to a new disposal facility then SEPA would undertake discretionary and public consultation. If it was proposed to increase a subsidiary limit or to include for example a new facility's gaseous release point but where the overall site Annual Limit is not increased then SEPA would propose to carry out statutory consultation only. In cases where further restrictions for regulatory purposes were considered necessary then SEPA would only carry out statutory consultation. If public consultation was carried out for every change then delays in decommissioning or improving regulation may occur. SEPA does not believe there is any benefit in such delays.

Question: Do you have any comment on SEPA's proposals for dealing with future changes to the authorisation?

4 DETERMINATION CONSIDERATIONS

SEPA is required to carry out its regulatory duties in accordance with legislation, taking account of Government policy, SEPA's own principles for open, fair and consistent regulation and the over-arching principles of radiation protection. Policy is set out in a variety of documents and a number of these are summarised below to outline the framework within which SEPA operates when considering applications for authorisation under RSA93.

4.1 Policy and Legal Considerations

4.1.1 Sustainable Development

The UK Sustainable Development Strategy was updated in 2005 with the publication by the Government of *The UK Government's Sustainable Development Strategy* (March 2005), Cm 6467. This states that "*Our [UK] Strategy for sustainable development aims to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations*" and introduces five guiding principles. These are:

• Living Within Environmental Limits
Respecting the limits of the planet's environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

• Ensuring a Strong, Healthy and Just Society
Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

• Achieving a Sustainable Economy
Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.

• Using Sound Science Responsibly
Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.

• Promoting Good Governance
Actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy and diversity.

These principles[16] underpin the 2004 Statutory Guidance issued to SEPA.

4.1.2 Review of Radioactive Waste Management Policy

Government Policy on the management of radioactive waste in Scotland is set out in a number of policy documents including the Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom 26 March 2007 and Scotland's Higher Activity Radioactive Waste Policy 2011.

[16] Scottish Executive (2004). The Scottish Environment Protection Agency and Sustainable Development, Statutory Guidance to SEPA made under Section 31 of the Environment Act 1995. Paper 2004/21.

In addition to these documents the government has also published revisions to the Cm2919 policy statements dealing with decommissioning in their document entitled "*The decommissioning of the UK nuclear industry's facilities, 2004*"

4.1.3 Low Level Waste Policy

The Low Level Radioactive Waste Policy 2007 (LLW Policy) provides a statement of UK Government and devolved administrations' policy for the long term management of the UK's solid low level radioactive waste. This policy statement amends or replaces relevant parts of the 'Review of Radioactive Waste Policy: Final Conclusions (Cm2919)

For the purposes of minimising the arising of radioactive waste the policy states:

> "*To ensure that arisings of LLW and the requirements for its disposal are minimised, LLW managers should plan to manage their waste in accordance with the waste management hierarchy principles set out in UK waste strategy document[17]. For LLW this means:*
>
> - *not creating waste where practicable ("avoidance");*
> - *reducing waste arisings (both by activity and by mass) to the minimum through the appropriate design and operation of processes and equipment and making effective use of techniques such as waste characterisation, sorting and segregation, volume reduction and surface contamination removal;*
> - *otherwise minimising quantities of LLW requiring disposal through decay storage, re-use and/or recycling, and incineration (under appropriately regulated circumstances);*
> - *disposal (which may, for some waste forms, include incineration)."*

The Government went on to say:

> "*Preparation of plans for the management of LLW must be based on an assessment of all practicable options for its long term management. Any implementation of options under this policy will be subject to a satisfactory risk assessment and optimisation study, as required by relevant regulatory bodies. Government believes that disposal to an appropriately engineered facility, either below or above ground, with no intent to retrieve should be the end point for LLW that remains following the application of the waste hierarchy. This position is held on the basis that new disposal facilities will be of sufficiently robust design such that risks to the public in the future will be within the post-closure risk target, and therefore that postponing final disposal to future generations is unjustified. With regard to LLW and VLLW disposal to landfill, Government sees no reason to preclude controlled burial of radioactive waste from nuclear sites from the list of options to be considered in any options' assessment, provided the necessary safety assessments can be carried out to the satisfaction of the environmental regulators This supersedes paragraph 117 of Cm2919*".

The Government then confirmed the role of the Nuclear Decommissioning Authority:

[17] NDA Strategy, Nuclear Decommissioning Authority, 2006.

"*Government wishes to ensure that there are disposal routes available for the long term management of LLW arisings from both the nuclear and non-nuclear industries in the UK, including Ministry of Defence LLW. Under the Energy Act 2004, the NDA has direct responsibility for the UK's civil public sector nuclear liabilities. Wherever appropriate and practicable, the NDA will also make LLW management and disposal facilities available to other nuclear and non-nuclear industry managers of radioactive waste, on the basis of suitable commercial terms. These arrangements will appropriately complement other forms of LLW disposal provision by other organisations, e.g. landfill and incinerator operators*".

4.1.4 UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry

In 2009 the Government consulted on a draft strategy for the management of solid low level radioactive waste from the nuclear industry[18]. This identified a need for flexibility in the approach to managing radioactive waste.

SEPA responded to the consultation and in respect to flexibility stated:

"*SEPA notes that the Strategy refers to the UK Government policy in having flexibility in managing solid LLW radioactive wastes. The LLW Repository Limited has recently been granted a change to their RSA 93 authorisation that will allow the transfer of metallic LLW from their site to the Metals Recycling Facility (MRF) at Lillyhall, operated by Studsvik UK Limited, for treatment (including decontamination) to enable recycling of the metal, with remaining radioactive wastes being returned to the LLWR for disposal. SEPA supports this flexibility in waste management arrangements and is to undertake work to consider how best to regulate transfer of radioactive waste for treatment and subsequent disposal within the UK"*.

In England to support the introduction of the Environmental Permitting Regulations the Department of Energy & Climate Change published[19] draft guidance to the Environment Agency. This guidance stated that:

"*For solid waste disposals to another permitted operator, it is no longer necessary in most cases to specify in the permit the specific site at which the waste will ultimately be disposed of. Permits can allow transfer to any site where the operator of that site holds a permit to accumulate or dispose of the relevant type of waste. Records of waste transfers must be kept by both the consignor and the receiving site operator*."

In 2010 the Government published[20] the UK strategy for the management of solid low level radioactive waste from the nuclear industry which was developed to reflect and implement Government Policy. The aim was to provide a high level framework within which low level radioactive waste (LLW) management decisions could be taken flexibly to ensure safe,

[18] UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry, Consultation Document June 2009

[19] Environmental Permitting. Environmental permitting guidance Radioactive Substances Regulation (RSR) For the Environmental Permitting (England and Wales) Regulations 2010. Draft guidance for Consultation – May 2009. DECC.

[20] UK strategy for the management of solid low level radioactive waste from the nuclear industry. NDA 2010.

environmentally acceptable and cost-effective management solutions that reflect the nature of the LLW concerned. The guidance stated that:

> "*To deliver this aim, three strategic themes have guided the development of this strategy:*
>
> *I. the waste hierarchy;*
> *II. the best use of existing LLW management assets;*
> *III. and the need for new fit-for-purpose waste management routes.*
>
> *The strategy is to apply the waste hierarchy more effectively to the management of LLW. We have set out the preference for managing LLW at higher levels of the hierarchy, which will mean a move away from the past focus on disposal. In turn, this will make the best use of the Low Level Waste Repository (LLWR) and ensure the UK's capacity for the management of LLW. Being able to manage the UK's LLW is vital for the nuclear industry, plant operation, decommissioning, power generation (existing and new) and also for other LLW producers, such as hospitals and universities.*
> *Where the preference for higher levels of the waste hierarchy cannot be met and disposal is necessary, it must be optimised to minimise the overall impact of LLW management on people and the environment. We believe that:*
>
> • *Waste prevention is a fundamental principle for the operation and decommissioning of nuclear facilities*
> • *There are resource and cost benefits in minimising the amount of LLW we have to manage*
> • *Reuse defers waste production and extends the life of resources*
> • *Recycling is the preferred way forward for the treatment of metallic LLW*
> • *Volume reduction ensures best use of disposal capacity*
> • *Disposal capacity is a precious resource and it must be used sparingly and as a last resort*
>
> *The LLW Strategy requires that managing LLW should not be separated from managing other radioactive wastes and non-radioactive wastes (Controlled wastes) and implementation will require an integrated waste management approach. LLW producers and managers should develop plans for the management of LLW that are informed by the waste hierarchy, the proximity principle and the need for early solutions. Affordability will be a key consideration in the implementation of the strategy. It will be crucial that lifecycle environmental and social benefits of managing waste at higher levels of the waste hierarchy are compared with direct disposal. Decision making should be supported by sound business cases to identify the most advantageous option and should be completed in an open and transparent manner. To make suitable arrangements in the determination of treatment and disposal routes, robust decision making and early dialogue with communities affected by waste management activities are needed and should consider all viable options. This may include in-situ disposal; development of new facilities on or adjacent to sites to manage waste from that site; or extended to manage waste from a number of sites; or the development of facilities away from nuclear sites. There is considered to be sufficient capability in the nuclear estate (including the supply chain) for the provision of waste management, treatment and disposal services and the strategy proposes continued utilisation of this capability rather than investment in centralised facilities in the near term.*

However, the strategy does report the need for robust information to underpin these assessments (i.e. volume and radioactivity content and forecast arisings). The strategy presents the drivers for continual improvement in quality of information, principally the need to continually assess the availability of capacity for managing the waste.

The amounts of waste we think will arise in the future mean that we need to change the way we manage it. The consultation on this strategy told us that people want to reduce the environmental impact of LLW management, which means closer alignment with the way other industry manages its wastes and moving away from relying on disposal. The strategy sets out how we will ensure the UK's continued capability and capacity through avoiding generating waste, reusing materials and recycling LLW based on robust information and transparent decision making processes. The LLW Repository, where the majority of UK LLW waste is disposed, is central to the strategy and it is important that we preserve the capacity at the site and use it wisely. All disposal capacity is a precious resource; it should be used sparingly and as a last resort".

4.1.5 Import and export of Low Level Waste

The LLW Policy 2007 also sets out Government policy on the import and export of LLW. Relevant sections are reproduced below (paragraph numbers are those used in the Policy Statement):

28. Transfer of radioactive waste across national boundaries is regulated under the Transfrontier Shipment of Radioactive Waste Regulations 1993 (currently under review). The regulations require prior notification and approval by the environmental regulators before any radioactive waste can be exported from, or imported to, the UK. In recognition that technologies for the recycling of certain materials within radioactive waste have advanced over recent years, and that Cm2919 was not written with largescale decommissioning in mind, Government policy on import and export of LLW has been modified as set out below and these modifications now amend, for LLW, the provisions of paragraphs 145 and 146 of Cm2919 (ref 3).

29. The export of LLW to other OECD (Organisation for Economic Co-operation and Development) and EU (European Union) countries may only be authorised or consented to by the competent UK authority in light of an assessment of all practicable options, and should not be permitted except:

- *for the recovery of re-useable materials; OR*
- *for treatment that will make its subsequent storage and disposal more manageable.*

In all cases where such processes would add materially to the wastes needing to be disposed of in the country of destination, the presumption should be that they will be returned to the UK, to a timescale agreed by regulators and competent authorities (as defined in the Transfrontier Shipment Regulations) in the UK and in the country of destination.

30. The import of LLW from other countries may only be authorised or consented to by the competent UK authority in light of an assessment of all practicable options, and if it complies with EU and UK legislation and any associated Government guidance provided to the competent UK authority, and should not be permitted except:

- *for the recovery of re-useable materials; OR*
- *for treatment that will make its subsequent storage and disposal more manageable.*

In all cases where such processes would add materially to the wastes needing to be disposed of in the UK, the presumption should be that they will be returned to the country of origin to a timescale agreed by regulators and competent authorities in the UK and in the country of origin.

To comply with the requirements of the *Transfrontier Shipment of Radioactive Waste and Spent Fuel Regulations 2008 (SI 2008/3087)* approval of shipments of radioactive waste from Dounreay to Sweden, Germany and USA would require a separate application for approval by the competent authorities in Sweden, Germany, USA and Scotland and any countries through which the waste is carried while in transit.

4.1.6 Scottish Higher Activity Waste Policy

The Scottish Government published its Policy for Higher Activity Radioactive Waste (HAW) in January 2011[21]. The Policy is for the long-term management of HAW in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste could be retrieved. All long-term waste management options will be subject to robust regulatory requirements.

It should be noted however that the Policy does not apply to radioactive waste which has already been dealt with under the policies of previous governments. This includes radioactive waste which is the subject of previous or existing contractual arrangements, including waste sent to facilities outside of Scotland, such as Sellafield.

The aim of the Policy is to ensure that all activities for the long-term management of the waste are made in a way that protect the health and interests of people and the integrity of the environment now and in the future. The policy provides a framework for managing HAW in Scotland which allows for the treatment, storage and near-surface disposal of radioactive waste.

When considering long term management options for HAW the Policy requires the Waste Hierarchy to be applied. The Hierarchy requires all waste producers to consider waste management with regard to prevention, minimisation, preparation for re-use, recycling and other recovery with disposal as the final option. The Policy also requires long-term management options to take account of the Proximity Principle.

With respect to the treatment of HAW the Policy allows consideration to be given to the transport of the waste from where it arises for treatment elsewhere in the UK or some countries overseas; for the recovery of reusable materials or treatment that will make the subsequent storage or disposal of the waste more manageable. However, in all cases where such processes would add materially to the waste needing to be disposed of in a country of destination, including in other parts of the UK, the presumption should be that waste will be returned to Scotland, to a timescale agreed by regulators and competent authorities in Scotland and in the country of destination.

[21] http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1/16293/higheractivitywastepolicy

Scottish Government recognised that the policy on its own was not sufficient to define the national requirements for radioactive waste management facilities in Scotland. Hence Scottish Government has now launched a programme of work to implement this policy working closely with a range of stakeholders including regulators and the NDA. SEPA understands that this programme of work will be looking at a range of management options and the need for suitable facilities located across Scotland. Scottish Government's HAW Policy Implementation project will be the main vehicle for defining the national need and identifying suitable locations for such waste management facilities.

4.1.7 Best Practicable Means (BPM) and Best Practicable Environmental Option (BPEO)

4.1.7.1 Best Practicable Means BPM

BPM is defined in Cm 2919 as:

> *'Within a particular waste management option, the BPM is that level of management and engineering control that minimises, as far as practicable, the release of radioactivity to the environment whilst taking account of a wider range of factors, including cost-effectiveness, technological status, operational safety, and social and environmental factors. In determining whether a particular aspect of the proposal represents the BPM, the Inspectorates will not require the applicant to incur expenditure, whether in money, time or trouble, which is disproportionate to the benefits likely to be derived'.*

SEPA has a duty to ensure that all exposures to ionising radiation are kept as low as reasonably achievable (ALARA), taking into account economic and social factors. SEPA has set out[22] how the concept of BPM is used to satisfy the ALARA principle. This is achieved by placing three key requirements into authorisations for the disposal of radioactive waste which require:

- The use of BPM to minimise the radioactivity of and volume of radioactive waste generated;
- The use of BPM to minimise the total radioactivity in radioactive waste that is discharged to the environment; and
- The use of BPM to minimise the radiological effects of any radioactive waste discharges on the environment and members of the public.

Additionally the concept of BPM is used to ensure that all operations carried out at the Authorised premises are conducted within this framework for instance in carrying out radiochemical analysis or taking measurements and samples or in the operation and maintenance of equipment.

The requirement to keep all radiation exposures as low as reasonably achievable, taking into account social and economic factors applies over and above the requirement to control doses to individuals in accordance with the specified dose limits. The qualification that economic and social factors should be taken into account in any assessment of what is reasonably achievable means that all practices which give rise to exposure to radiation must be examined carefully to see what might be done to reduce exposure, but that in deciding

[22] Satisfying the ALARA requirement and the role of Best Practicable Means. SEPA 2010.

whether any particular measures should be used a correct balance must be achieved between the benefit to be derived from those measures and their cost (not only in monetary terms). This does not mean that the decision on what level of protection should be achieved should be taken on the basis of readily quantifiable factors only. The international standards include the requirement to take social factors into account and this recognises the importance of considerations, which cannot be quantified in the process of establishing the appropriate level of protection. When applied to waste disposal, such considerations might include general policies for environmental protection as well as public perceptions of the importance of such matters. However, it is fundamental to the control procedure that measures should not be required which involve costs grossly disproportionate to any benefits likely to be achieved. This is recognised in SEPA's authorisation within the definition of how BPM is to be applied as well as the ongoing duty of the Authorisation Holder to use BPM at all times.

BPM is given the following meaning within SEPA's authorisation as follows:

> *(a) In determining whether particular means are the "best practicable" for the purposes of this Authorisation, the Authorisation Holder 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.*
>
> *Where reference is made to the use of "best practicable means" in this Authorisation, the terms "best", "practicable" and "means" have the following meaning:*
>
> *"Best" – means the most effective techniques for achieving a particular objective having due regard to technological advances (state of the art) and changes in scientific knowledge; and understanding.*
>
> *"Practicable" – indicates that the "means" under consideration should only be selected following an optimisation process that includes consideration of the technical viability including comparable processes, facilities or methods of operation which have recently been successfully tried out and takes into account social and economic costs and benefits.*
>
> *"Means" – includes technology, the way that installations / plant is designed, built, maintained, operated and decommissioned and wider management arrangements.*
>
> *(c) The social and economic costs and benefits that should be taken into account in the optimisation process used to decide what is practicable includes (where relevant);*
>
> - *economic costs*
> - *social benefits*
> - *radiological exposures to the public*
> - *occupational radiological exposures*
> - *radiological impact on the environment*
> - *conventional safety*
> - *consistency with the waste hierarchy*
> - *impact of the non-radioactive properties of radioactive waste*

- *the generation and associated impact of non-radioactive wastes, including climate change emissions*
- *the proximity principle*
- *applicable government policy*

4.1.7.2 Best Practicable Environmental Option (BPEO)

As stated above an option should only be selected as practicable if it has been selected through a proportional optimisation process. Optimisation includes optioneering and it will be necessary in most circumstances to undertake an appropriate optioneering study as part of this process.

There are a number of methodologies that could be used to undertake the optioneering component of the process, e.g. Best Practicable Environmental Options (BPEO) studies.

BPEO is defined in Cm 2919 as:

> '*A concept developed by the Royal Commission on Environmental Pollution, it implies that decisions on waste management have been based on an assessment of alternative options evaluated on the basis of factors such as the occupational; and environmental risks, the environmental impacts, the costs and the social implications'*

The Royal Commission on Environmental Pollution (RCEP) provided the following definition of BPEO in its Twelfth Report (RCEP, 1988):

> *"…the outcome of a systematic and consultative decision-making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long term as well as in the short term."*

As the BPEO concept has been developed in the UK, it has generally been applied to decisions where a strategic choice between different approaches to managing environmental impact is required. An element of stakeholder input to the process, coupled with transparency regarding data and assumptions, are also generally considered integral to the BPEO concept, which is particularly suited to exploring the impact of different perspectives on the eventual decision.

The key characteristics of BPEO assessments identified and advocated by RCEP are generally regarded as definitive, and include the following:

- The process is essentially strategic – it is geared towards identifying a preferred overall strategy from the perspective of the environment as a whole, as opposed to detailed optimisation of the selected scheme;
- A structured and systematic process is used to identify and compare strategic options. The presumption is that a BPEO assessment will generally be an open and transparent process, documented to make explicit the reasoning, data and assumptions;
- Alternatives should be evaluated in terms of their projected implications for environmental quality. Consideration also needs to be given to questions of practicability (including financial costs and/or benefits, as well as wider social and

economic considerations), as well as the overall strategic objectives, in order to reflect the wider context in which the decision is being taken;

- The process should involve consideration of environmental effects in both the short term and the long term, requiring consideration to be given to the relative importance of different indicators of environmental performance (e.g. short-lived versus persistent pollutants);
- Effects on the environment are not necessarily restricted to direct emissions of pollutants to land, air and water from the process (or activity) itself; life cycle considerations (such as energy demand) may also have a part to play in the decision process.

There is an accent on consultation as an integral part of the assessment process – an informed assessment of alternatives necessarily involves taking into account the values and perspectives of a range of stakeholders.

DSRL's application is supported by BPEO studies. These are given in papers 12, 13A and 13B.

4.1.8 Conservation

The Conservation (Natural Habitats & Conservation) Regulations 1994 (Habitats Regulations) implement Council Directive 92/34/EC on the conservation of natural habitats and wild flora and fauna (the Habitats Directive), and pick up and strengthen the requirements of Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). The Directive aims to establish a network of the most important sites for wildlife and maintain them at favourable conservation status. The network consists of Special Protection areas (SPAs) for birds and Special Areas of Conservation (SACs) for other species and habitats. The Habitats Regulations require SEPA to be satisfied that the integrity of designated European sites (SACs and SPAs) will not be adversely affected by relevant permissions issued by SEPA.

In addition, the Nature Conservation (Scotland) Act 2004 sets out a series of measures which are designed to conserve biodiversity and to protect and enhance the biological and geological natural heritage of Scotland. In doing so, the Act provides the principal legislative components of a new, integrated, system for nature conservation within Scotland. The Act also locates the conservation of biodiversity and of Scotland's natural environment within a wider British, European and global context. In relation to biodiversity in particular, it requires public bodies and office-holders to consider the effect of their actions at a local, regional, national and international level. Measures relating to the protection of species and habitats also recognise the importance of the wider international context.

As a public body under Section 1 of the 2004 Act, SEPA is required to further the conservation of biodiversity when exercising its regulatory functions. As part of the consultation process, SEPA will identify any significant biodiversity interests that might be affected, and will take these into account in its decision-making. The 2004 Act also introduced tighter controls for the protection of Sites of Special Scientific Interest (SSSIs). These include stronger requirements for SEPA and other regulatory bodies to protect SSSIs through the implementation of regulatory regimes.

To fulfil the requirements of the Directive, SEPA has adopted the ERICA assessment tool. The key outputs of ERICA are dose rates and risk quotients. The risk quotient is the ratio of the predicted environmental dose rate and the benchmark dose rate assumed to be environmentally "safe". The default benchmark in ERICA is a screening dose rate for incremental exposure of 10 µGy h^{-1}. This value is considered to be sufficiently cautious that if

it is not exceeded there would not be a deleterious affect on designated sites from the discharge.

SEPA has undertaken a dose assessment to non-human species for disposals to air and water from the Dounreay nuclear licensed site at the authorised limits requested for in the application. The dose rates to non-human species as a result of the exposure to the gaseous and liquid discharges were all predicted to be less than the screening dose of 10 μGy h^{-1}. Therefore the exposure of non-human species to the discharges is considered to be of negligible concern. The summary report of the dose assessment to non-human species is given in Paper 5.

4.1.9 Article 37

As a Member State of the European Union, UK activities involving radioactive substances are governed by legislation set down under the Euratom Treaty (Council Directive 80/836/EURATOM).

Article 37 of the Euratom treaty states:

> *"Each Member State shall provide the European Commission with such general data relating to any plan for the disposal of radioactive waste in whatever form as will make it possible to determine whether the implementation of such a plan is liable to result in the radioactive contamination of the water, soil or airspace of another Member State."*

It is not for SEPA to decide when submissions are required; it is for the Scottish Government, for facilities in Scotland. SEPA does however provide technical advice to Government and co-ordinates submissions in Scotland on behalf of the Scottish Executive. Thus SEPA's role in the preparation of an Article 37 submission is as an intermediary between the facility operator and the Scottish Government, and includes advising the facility operator on the contents of the submission, reviewing all draft submissions and advising the Scottish Government that the submission is complete.

An Article 37 submission which was based on the Dounreay Site Restoration Plan (DSRP) was submitted to the European Commission in 2004 and an Opinion was given in April 2005. It concluded that:
"the Commission is of the opinion that the implementation of the plan for the disposal of radioactive waste in whatever form arising from the Dounreay Site Restoration Plan (DSRP) in Scotland in the United Kingdom, both in normal operation and in the event of an accident of the type and magnitude considered in the General Data, is not liable to result in radioactive contamination, significant from the point of view of health, of the water, soil or airspace of another Member State.

However, the Commission notes that fourteen new installations will be constructed to address specific waste management requirements in the course of implementation of the DSRP and that for these installations incomplete data was presented to the Commission. The Commission confirms the necessity to obtain further detailed and comprehensive information, as soon as available, for these installations in order to be able to check if the current radiological impact assessments in normal and accidental conditions are still valid. The Commission further notes that for unplanned releases of radioactive effluents, the General Data include a categorisation procedure for the facilities based on hazard potential and corresponding radiological consequences, and that only those facilities with the identified potential to cause a significant threat to members of the public (off-site dose

exceeding 5 mSv) are examined in detail. While for a complex nuclear site there is merit in introducing a categorisation of the facilities as regards the accident scenarios, the Commission is not satisfied that as a matter simplification the General Data submitted did not include information on estimated amounts and physico-chemical forms of the radionuclides present in each of the facilities on the site nor on the quantities assumed to be released in the event of the accident considered for each of those facilities."

DSRL has produced an update to the 2004 DSRP Article 37 submission. The purpose of this update was twofold, (i) to address the information gaps in the 2004 Submission and (ii) to inform the Commission of the various changes that have occurred in the intervening period. DSRL has submitted the update to Scottish Government, for forwarding onto the European Commission.

Within Scottish Government's response to SEPA's statutory consultation on the application, Scottish Government raised the issue of the Article 37 submission: "*Whilst I see no reason at this stage for the Scottish Government to intervene with the application, I would be grateful if you could advise me how this application is being considered in the context of the ongoing update. Specifically I would like SEPA's view on what, if any, impact this has upon the site Article 37 update. Conversely does SEPA consider the application for authorisation is within the scope of the update to the 2004 submission?"*

SEPA note that the update to the 2004 DSRP Article 37 submission includes details of the current on site facilities and the discharge limits requested within the authorisation application. The update of the site submission includes dose assessments based on the current authorised discharge limits and the discharge limits requested in the application. SEPA is of the opinion that the application for authorisation is within the scope of the update to the site submission.

SEPA note that as the application includes increased discharge limits, SEPA cannot issue a new authorisation until 6 months after the Article 37 update information has been submitted to the European Commission.

4.1.10 UK Strategy for Radioactive Waste Discharges (OSPAR)

At the 1998 Ministerial meeting of the Oslo and Paris (OSPAR) Commission, contracting parties to the 1992 Convention for the Protection of the Marine Environment of the North East Atlantic agreed an OSPAR strategy for radioactive substances. The strategy was endorsed in a Ministerial Declaration, signed by the UK and other OSPAR contracting parties.

The aims of the strategy are:

- *progressive and substantial reduction of radioactive discharges and discharge limits to achieve strategy targets for identified sectors;*
- *progressive reduction of human exposure to ionising radiation arising from radioactive discharges, as a consequence of reductions in discharges, such that a representative member of a critical group of the general public will be exposed to an estimated mean dose of no more than 20 microsieverts a year from liquid radioactive discharges to the marine environment made from 2020 onwards;*
- *progressive reduction of concentrations of radionuclides in the marine environment resulting from radioactive discharges, such that by 2020 they add close to zero to historic levels.*

Following public consultation in June 2000, the Government produced the UK strategy for radioactive discharges 2001-2020[23] in July 2002 (and this was updated in 2009). The strategy describes how the Government and the devolved administrations will implement the OSPAR strategy with regard to Radioactive Substances. Statutory guidance on OSPAR was issued to SEPA by the Scottish Government[24] in 2008. The guidance is "high level" in nature requiring SEPA to take account of OSPAR and the UK discharge Strategy for radioactive substances when issuing authorisations.

The Statutory Guidance states:
"The Scottish Government considers that decommissioning of nuclear sites is an inherently justified activity. Thus, provided that discharges are minimised by the normal regulatory approach of using BPM, and the processes that they derive from are considered to be best practicable environmental option (BPEO) or equivalent, then in principle we do not think that decommissioning, when set against historic operational discharges, need compromise OSPAR commitments."

And for Dounreay:
"*Within the OSPAR Strategy, the Dounreay site falls within the research sector. That is because it was the UK test-bed for the development of fast-reactor technology and demonstration of the associated fuel cycle. The Government's announcement in 2001 that there would be no further reprocessing at Dounreay has greatly reduced the discharge profile for that site. Nevertheless, the process of decommissioning itself will result in fluctuations in that discharge profile. Because of the importance of Dounreay within the research sector however, it is unlikely that reductions elsewhere within the UK, for that sector can offset any increase in discharges from the Dounreay site. Consequently, SEPA may be faced with variability in discharges from the Dounreay site that appear to contradict the OSPAR commitment for progressive and substantial reductions of discharges. The Scottish Executive considers that such variability need not contradict OSPAR commitments when set against historic arisings from the site and the requirement to decommission that site, provided that SEPA considers that those discharges comply with its own regulatory requirement to use BPM and BPEO*."

4.1.11 Human Rights

The Scotland Act 1998 and the Human Rights Act 98 (HRA98) incorporate the provisions of the European Convention of Human Rights ("the ECHR") into Scots law. Under the HRA98, SEPA must consider whether its decisions in respect of an authorisation under RSA93 will result in any potential or actual breach of a Convention right. If SEPA does identify such a breach it must then consider whether it has the discretion to act otherwise, as its primary obligation must be to fulfil its statutory duty. Where SEPA does have discretion and the Convention right at issue is not absolute, it must then consider whether its decision is justified.

4.1.12 Proximity Principle

The proximity principle has been set out by SEPA in relation to non-radioactive wastes in its publication of a National Waste Strategy for Scotland:

[23] UK Strategy for radioactive discharges 2001-2020, Department for Environment, Food and Rural Affairs, DEFRA Publications.
[24] Environment Act 1995. The UK Strategy for radioactive discharges, Statutory Guidance, February 2008. The Scottish Government.

"The proximity principle requires that wastes are managed as close as possible to their point of arising and places a greater degree of responsibility on communities to deal with the wastes they produce."

It has also been set out in relation to planning regulation in the form of National Planning Policy Guidelines:

"The Proximity Principle concerns the establishment of an adequate network of treatment and disposal installations to handle waste arisings as close as possible to the point of production. This encourages communities to take responsibility for locally produced household, commercial and industrial wastes."

SEPA in its publication went on further to explain that:

"The application of the principle will vary according to the waste concerned, the volume of arisings, its potential environmental impact and the techniques applied to its management."

In respect of radioactive waste, Government policy is that radioactive wastes should not be unnecessarily created, such wastes that are created should be safely and appropriately managed and treated, and that waste should be safely disposed of at appropriate times and in appropriate ways.

The LLW Policy 2007 and the HAW Policy 2011 both discuss the proximity principle with respect to managing radioactive waste. Although there is a desire expressed in these policy documents to avoid excessive transportation of waste it is important to balance this with all the other relevant factors on a case by case basis.

4.1.13 Transport

SEPA's remit in determining applications made under RSA93 does not extend to regulating the transport of radioactive material or waste. SEPA is aware that radioactive waste is routinely transported by road, rail and sea and is subject to regulation by the Office of Nuclear Regulation (ONR) an agency organisation of the Health and Safety Executive.

4.1.14 Nuclear Safety

The storage and accumulation of radioactive waste on a Nuclear Licensed Site is a nuclear safety issue. Issues[25] relating to nuclear safety at Dounreay are a matter for the Office of Nuclear Regulation and agency organisation of the Health and Safety Executive.

4.2 SEPA's Principles for Regulation

In order to encompass the changes currently driven by the EU, UK and Scottish policy and legislation, to reflect community expectations and to progress the requirements of SEPA's Management Statement, SEPA has developed a set of principles which are expected to be reflected in both the application determination process and the authorisation itself.

The over-arching principle is that of Sustainable Development which is enshrined in SEPA's Main Aim (see Section 2) and has been described as:

[25] But not any disposal of radioactive waste from the storage and accumulation of radioactive waste.

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Within this umbrella principle of Sustainable Development are contained five higher-level principles and five lower-level, or process, principles. The higher-level principles are:

1. Integrated Environmental Protection;
2. Efficiency and Effectiveness;
3. Polluter Pays;
4. Sound Science and Information; and
5. Precautionary Principle.

Together with the higher-level principles, the process principles are designed to produce outcomes in licensing, enforcement and routine matters that are both reasonable and achievable. These lower-level principles are:

1. Environmental Protection and Improvement;
2. Proportionality;
3. Fairness, Consistency and Legal Correctness;
4. Transparency and Accountability; and
5. Awareness Raising and Good Practice.

SEPA has incorporated all of the above principles into its procedures for determination of applications under RSA93.

5 RADIOLOGICAL PROTECTION PRINCIPLES

When considering any application to dispose of radioactive waste, SEPA is guided by the radiological protection principles recommended by the International Commission on Radiological Protection in ICRP 60[26] and given effect within the European Community by the 13 May 1996 Council Directive 96/29/Euratom. In May 2000 the Scottish Executive issued a Direction, the Radioactive Substances (Basic Safety Standards) (Scotland) Direction 2000, to SEPA specifying the duty of the Agency to observe the requirements of the Directive.

For radioactive substances, the system of protection is based on three principles; (i) justification of a practice, (ii) optimisation of protection, and (iii) the application of individual dose and risk limits.

5.1 Justification

In accordance with EC Directive 80/836 (EURATOM 1980), Article 13 requires Member States to ensure that the exposure of a population as a whole from each activity is minimised taking into account the principle of justification set out in Article 6(a) as amended by Directive 84/467 (EURATOM 1984):

> *"the various types of activities resulting in an exposure to ionising radiation shall have been justified in advance by the advantages which they produce".*

Directive 96/29/EURATOM of 9/EURATO

5.2 Optimisation

The principle of optimisation of dose or risk is derived in Council Directive 96/29/EURATOM from the recommendations of the ICRP and has been enshrined in European Directives, (EC Directive 80/836, 84/467 and 96/29/Euratom). ICRP 60 states the principle as:

> *"In relation to any particular source within a practice, the magnitude of individual doses, the number of people exposed, and the likelihood of incurring exposures where these are not certain to be received should be kept as low as reasonably achievable, economic and social factors being taken into account."*

The requirement to keep all radiation exposures as low as reasonably achievable, taking into account social and economic factors applies over and above the requirement to control doses to individuals in accordance with the specified dose limits. The qualification that economic and social factors should be taken into account in any assessment of what is reasonably achievable means that all practices that give rise to exposure to radiation must be examined carefully to see what might be done to reduce exposure, but that in deciding whether any particular measures should be used a correct balance must be achieved between the benefit to be derived from those measures and their cost (not only in monetary terms). This does not mean that the decision on what level of protection should be achieved should be taken on the basis of readily quantifiable factors only. The international standards include the requirement to take social factors into account and this recognises the importance of considerations which cannot be quantified in the process of establishing the appropriate level of protection. When applied to waste disposal, such considerations might include general policies for environmental protection as well as public perceptions of the importance of such matters. However, it is fundamental to the control procedure that measures should not be required which involve costs grossly disproportionate to any benefit likely to be achieved.

5.3 Dose and Risk Limits

Exposure to ionising radiation can cause cancer and hereditary defects. The higher the radiation dose, the greater the likelihood or risk that a cancer or hereditary defect will develop. But, apart from very high levels of radiation dose, there is no certainty that an individual exposed to radiation will suffer a health effect. The dose/risk relationships have been determined by studies on various groups that have been exposed to radiation, predominantly survivors of the atomic bombs in Japan and certain medical patients.

There is little evidence that very low doses of radiation can cause harm. However, the approach taken in radiation protection errs on the side of caution by assuming that there is no dose so low that it cannot potentially cause harm and there is no absolutely safe threshold of radiation dose below which the risk may approach zero. In the present state of knowledge it is appropriate to assume an increasing risk with increasing dose. This approach is accepted by the ICRP and by national bodies like the Health Protection Agency in the UK

The Radioactive Substances (Basic Safety Standards) (Scotland) Direction 2000 requires SEPA when discharging its functions in relation to the disposal of radioactive waste under RSA 93 to ensure that the dose limits for members of the public set out in Article 13 of Council Directive 96/29/EURATOM are not exceeded. The dose limit is set at 1 millisievert in a year (excluding medical irradiation) which is estimated to equate to a risk of death from fatal cancer of 1 in 20,000. The Direction to SEPA also requires that the contribution to public dose arising from the authorised radioactive discharges of any one new nuclear installation should be constrained to a maximum of 0.3 millisievert in a year which equates to

a risk of approximately 1 in 66,000. In addition where a number of nuclear facilities are adjacent, possibly owned by different organisations, an overall site constraint of 0.5 millisievert (a risk of 1 in 40,000) will be applied. Additionally SEPA is required to ensure that reasonable steps are taken such that the contribution to the exposure of the population as a whole from practices is kept as low as reasonably achievable, economic and social factors being taken into account.

A prospective dose assessment was carried out by the Food Standards Agency. It is given in paper 4.

The predicted doses to the critical group are given in the table below.

Contribution to critical group dose for comparison with dose limits.

Pathway	Annual Dose, microSieverts per year
Food Exposure Critical group prospective	8.7
Inhalation Critical group prospective	0.8
External Exposure Critical group (High Rate Exposure over Sand) prospective	198
Maximum Total Dose prospective	208
Marine Critical group retrospective[28]	6
Terrestrial Critical group retrospective	28
Total individual dose from all sources retrospective	47
MOD Vulcan NRTE disposals prospective	2.2

The prospective dose to the critical group of 208 microSieverts is below the single source dose constraint of 300 microSieverts.

The indicative effects of disposals from the Dounreay site can be estimated from the results of SEPA's environmental monitoring programme. The latest results are for the year 2010 and published in the Radioactivity in Food and the Environment series of reports (RIFE-16). Combining the total prospective doses (210 microSieverts) and the total retrospective individual dose from all sources (47 microSieverts) indicates that the dose to the most exposed adults is below the overall site dose constraint of 500 microSieverts. The overall site dose constraint is the maximum dose that may result from the discharges from all sources at a single location. In the case of Dounreay, the overall site dose constraint would include discharges from the neighbouring Vulcan NRTE site.

Habit surveys have not indicated that the effects of liquid and gaseous disposals are wholly additive. However if they are considered together the combined dose is 34 microSieverts. The radiological assessment of the impact of discharges at the proposed annual limits indicate that when the effects of historic disposals and direct irradiation are taken into account the total annual dose to the representative critical group is about 0.257 milliSieverts (257 microSieverts). This is below the 1 milliSievert public dose limit.

[28] RIFE 16, 2010

6. RADIOACTIVITY AND RADIATION UNITS AND QUANTITIES

Radioactivity may be defined as the process of disintegration or transformation of unstable atoms which leads to the emission of ionising radiations. The unit used to express the quantity of radioactivity present is the becquerel. One becquerel (Bq) is equal to the disintegration or transformation of one atom every second. One becquerel is a small quantity of radioactivity and it is normal to deal in large multiples such as those listed below.

kilobecquerel (kBq) .....one thousand (10^3) becquerels

megabecquerel (MBq).....one million (10^6) becquerels

gigabecquerel (GBq).....one billion (10^9) becquerels

terabecquerel (TBq) .....one thousand billion (10^{12}) becquerels

The basic unit of radiation dose is the gray (Gy). This is a unit of absorbed dose and is a measure of the amount of energy deposited in a material, such as tissue, by radiation passing through it. When passing through tissue some radiations deposit their energy in a more biologically harmful way than others. In order to take account of this effect a unit of dose equivalent known as the sievert (Sv) is used. The sievert is related to the gray by a simple weighting factor for each type of radiation. One sievert is a large unit of radiation dose. Radiation doses to members of the public are usually measured in small fractions of a sievert such as those listed below.

millisievert (mSv) .....one thousandth (10-3) of a sievert

microsieverts (µSv) .....one millionth (10-6) of a sievert

SEPA
Scottish Environment Protection Agency

DINGWALL
07 APR 2010
RECEIVED

Radioactive Substances Act 1993 (as amended)

APPLICATION FORM

For

Authorisation to accumulate and dispose of radioactive waste

PLEASE SEND TO THE REGISTRY DEPARTMENT AT THE APPROPRIATE AREA OFFICE:

Aberdeen Office
Greyhope House
Greyhope Road
Aberdeen
AB11 9RD
Tel: 01224 248338
Fax: 01224 248591

East Kilbride Office
5 Redwood Crescent
Peel Park
East Kilbride
G74 5PP
Tel: 01355 574200
Fax: 01355 574688

Dingwall Office
Fodderty Way
Dingwall Business Park
Dingwall
IV15 9XB
Tel: 01349 862021
Fax: 01349 863987

Perth Office
Strathearn House
Broxden Business Park
Lamberkine Drive
Perth
PH1 1RX
Tel: 01738 627989
Fax: 01738 630997

Edinburgh Office
Clearwater House
Heriot Watt Research Park
Avenue North
Riccarton
Edinburgh
EH14 4AP
Tel: 0131 4497296
Fax: 0131 4497277

The Data Protection Act 1998
"The Scottish Environment Protection Agency is responsible for maintaining and improving the environment and regulating environmental emissions. It has a duty to discharge its functions to protect and enhance the environment and to promote conservation and recreation.
The information provided will be processed by the Scottish Environment Protection Agency to deal with your application, to monitor compliance with the licence/permit/registration conditions, to process renewals, 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 affairs
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, Local Authorities, Emergency Services, Scottish Executive) 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.

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

THE SCOTTISH ENVIRONMENT PROTECTION AGENCY
APPLICATION FOR AUTHORISATION TO DISPOSE OF AND TO ACCUMULATE RADIOACTIVE WASTE UNDER SECTIONS 13 AND 14 OF THE RADIOACTIVE SUBSTANCES ACT 1993 (as amended)

Please complete this form clearly in black ink. Further information may be submitted on additional sheets that should be clearly marked with the name and address of the applicant. Applications that are incorrect or incomplete may be deemed not to be Duly Made.

---

1 APPLICANT DETAILS

1a Please State the company registered address

Name: Dounreay Site Restoration Limited
Address: Building D2003, Dounreay, Thurso, Caithness.

Post Code: KW14 7TZ Telephone No: 01847 802121

1b Please state the registered company number (if applicable)

SC307493

1c If there are existing certificates of registration or authorisation at the address on or from which radioactive waste will be accumulated or disposed provide details below

Registration Certificate number/s: None
Authorisation Certificate number/s: RSA/N/50010/99, RSA/N/50011/99, RSA/N/50012/99

Please give details of why a new authorisation is being sought.

A new authorisation is required to bring the scope of the DSRL authorisation in line with the undertakings of decommissioning the Dounreay site.

1d Please state when you would like the authorisation to come into effect

When determined

---

2 CONTACT DETAILS

2a Please provide details about the person that we may contact about the application

Name:	Mr A Scullion	
Address:	Dounreay Site Restoration Ltd, Bld D2003, Dounreay, Thurso Caithness	
Post Code:	KW14 7TZ	Tel No: 01847 806810
Email:	alan.scullion@dounreay.com	
Position /Designation:	Director of Assurance	

---

3 National Security

3a Please inform us about any National Security claim

Is there any information that you believe should be kept from the public register on the grounds of national security?

No

---

4 DETAILS OF PREMISES TO WHICH THE APPLICATION RELATES

4a Please provide details of the premises to be authorised

Name:	Dounreay
Address:	Dounreay, Thurso, Caithness
Postcode:	KW14 7TZ
Telephone No:	01847 802121
Fax:	01847 802697

4b Please provide details of the location of the premises

Please enclose a map detailing the location of the above premises and delineate the site boundary by marking this clearly in red on each copy. The map scale must be sufficient to allow the location to be identified and a clear distinction to be made between the premises for which authorisation is being sought and surrounding premises.

See Appendix 1

Please give the grid reference of the main entrance to the premises

NC 9960 6705

4c Please provide a detailed site plan

Please enclose 3 copies of a plan showing the extent of the premises for which authorisation is being sought by marking this clearly in red on each copy.

In circumstances where the premises comprise a building that is occupied by more than one organisation, a site that contains several buildings or where only part of a building or premises is used, then the plan must clearly delineate the boundary or boundaries for which authorisation is being sought.

See Appendix 2

4d Please provide a description of the premises to be authorised

Please provide a sufficiently detailed written description of the premises to support the plan provided. Together the plan and description must clearly allow identification of the locations on the authorised premises where radioactive waste will be accumulated and disposed.

See Appendix 2 and 3

The Dounreay site is located on the coastline in the county of Caithness in the north of Scotland. It is situated approximately 3 km from the village of Reay to the west and 14km from the town of Thurso to the east. The Dounreay nuclear licensed site covers approximately 55 hectares of land and is shown on the Dounreay Site Location map (Appendix 1), along with other adjacent land owned by the NDA.

Approximately 630 people live in a 5 km radius from Dounreay. These are predominantly in the village of Reay but also in sparsely scattered farmhouses closer to the site.

The surrounding area is largely moorland although agriculture is predominant on the coastal strip. Both the arable and grazing land surrounding Dounreay are relatively flat and treeless.

The site is located close to a number of environmentally sensitive areas. There are Sites of Special Scientific Interest (SSSIs) in the region, as well as sites proposed for protection as Special Areas of Conservation (SACs) under the Habitats Directive, or Special Protection Areas (SPAs) under the Wild Birds Directive. The Highland Council has proposed that 61 hectares of the west part of Sandside Bay should be designated as an "Area of Great Landscape Value".

The land owned by the NDA is not of significant conservation interest. However, there is an interesting area of maritime heath just outside of the NDA's boundary adjacent to the coast, although this does not have SSSI status. There are five archaeological sites around Dounreay, two of which are scheduled ancient monuments (both burial mounds). Dounreay Castle, which dates from the late 16th century, is located just outside the nuclear licensed site boundary.

4e Please state the local government area in which the premises are situated

Highland

4f Please give details of offshore installations operating in the Scottish area

Not Applicable

4g Please give the operational contact who will have the responsibility for the day to day overall supervision of the accumulation and disposal of the radioactive waste

Name:	Mr A Anderson
Address:	DSRL, Bldg D1300, Dounreay, Thurso, Caithness
Postcode:	KW14 7TZ
Telephone No:	01847 803071
Email:	alex.anderson@dounreay.com
Position/Designation:	Major Project Unit Manager Site Decommissioning Waste & Characterisation Unit

---

5 DETAILS OF THE UNDERTAKING FOR WHICH THE PREMISES ARE USED

5a Please provide details of the undertaking carried on by the applicant at the premises specified at question 4a or 4f above

Decommissioning of the Nuclear Licensed site at Dounreay
More specifically:

1 The decommissioning of the premises;
2 The storage of nuclear material and radioactive material on the premises;
3 Nuclear material recovery/conditioning operations on the premises;
4 The handling and treatment of waste transferred to the Authorisation Holder from the Vulcan Naval Reactor Test Establishment[1];
5 The treatment of nuclear material for storage, transfer for permanent safe storage or for disposal;
6 The treatment of radioactive wastes to place them in an accepted form for storage, disposal and/or transfer;
7 The receipt, treatment, storage and disposal of NDA liability nuclear materials and radioactive wastes, from the Fast Breeder Reactor programme, returned from EU Member states;
8 Analytical services in support of the above by destructive and non-destructive analysis and to characterise the environmental effects of the above; and
9 Land remediation and restoration to achieve the Interim and Final End Points.

[1] The Vulcan Naval Reactor Test Establishment, a Ministry of Defence site, transfers liquid and solid wastes to Dounreay for disposal, treatment and storage under letters of agreement with both SEPA and DRSL.

5b Please say how the radioactive wastes are produced

SOLIDS

The processes involved in the 'Undertakings at Dounreay' are generally identified as either:
wastes for disposal from or on the premises at Dounreay; or
material resulting, after treatment, in the arising of wastes to be disposed from or on the premises at Dounreay.

Solid low level waste[2] arisings from the operations detailed under 'Undertakings at Dounreay' typically consisting of general plant wastes (including paper, polythene, redundant plant equipment, plastics, and other consumables) which have been contaminated due to contact with radioactive material. These wastes exist on the Dounreay site in storage pending disposal and will further arise from the decommissioning of the site and activities/processes necessary in the management of the wastes and fuels identified in the undertakings.

Internal building materials removed as a part of the demolition of a building. This type of waste arises where decontamination of the surfaces is not practicable or the contamination cannot be removed due to its being absorbed into the material.

Soils found to be radioactive after excavation, are categorised as radioactive waste requiring disposal to a facility authorised to accept such waste for permanent deposit.

Aerosol (HEPA) and liquid filters (e.g. ion exchange resins and fabric candle filters) used to remove particulate from the gases and liquors, at source or immediately, prior to discharge to the environment.

Solids (sludges) settling out from suspension in liquids (e.g. pond water, effluents).

The cementation of the liquid raffinates[3] and ADU Floc held in storage tanks.

The cementation of Thorium Nitrate, including material returned under Government agreement from Peru.

Plutonium contaminated material (PCM) exists on the site in a storage facility and will further arise from the undertakings. PCM takes the form of soft wastes contaminated with plutonium to levels unacceptable for LLW disposal but for which recovery has no current economic justification. This waste will not be placed in final disposal without further treatment either at Dounreay or Sellafield.

The destruction of 514 drums of sodium metal from Forschungszentrum Karlsruhe GmbH.

---

[2] Low Level Waste (LLW) – a waste having an activity content greater than 0.4 Gigabecquerels per tonne alpha and beta/gamma activity and not greater than 4 Gigabecquerels per tonne alpha or 12 Gigabecquerels per tonne beta/gamma activity.
[3] The aqueous by-product of reprocessing containing a high proportion of dissolved fission products

The treatment of unirradiated and irradiated nuclear material to place the material into a form suitable for further processing or storage will result in solid radioactive waste arisings. The nuclear material, the treatment of which will produce the aforementioned radioactive wastes, includes:

- DFR breeder material
- PFR irradiated oxide fuel
- PFR irradiated carbide fuel
- Un-irradiated PFR type oxide fuel subassemblies
- Un-irradiated PFR type carbide fuel subassemblies
- Un-irradiated oxide fuel residues
- Un-irradiated carbide fuel residues
- Irradiated Test Reactor fuel comprising highly enriched uranium used in the production of medical isotopes and physics experiments (HELIOS target and uranium hydroxide)
- Un-irradiated high enriched uranium and thorium (includes treated HELIOS material)
- Plutonium laden liquor
- Plutonium in ZEBRA plates
- Natural and depleted uranium materials
- Irradiated thorium
- Unirradiated thorium
- Irradiated miscellaneous fuels including fuels that are the property of other countries.

LIQUIDS

Liquid radioactive wastes will be produced from activities of the undertakings and disposed to the North Atlantic Ocean via the sea disposal pipeline including:

- Salt solutions from the destruction of alkali metal coolants;
- Aqueous solutions from the cleaning/decontamination of components from PFR and DFR;
- Aqueous solutions from the cleaning of shielded flasks used for intra-site movements.

The control of water in seepage to the ILW storage shaft results in radioactive aqueous effluent being pumped to the Low Level Liquid Effluent Treatment Plant (LLLETP) for final disposal.

Ground water flow through the Low Level Waste pits is collected and transferred to the LLLETP for final disposal.

Analytical methods result in the transfer of radioactive liquid effluents being transferred to the LLLETP for final disposal.

Pond waters used for the storage of radioactive material will be transferred to the LLLETP for final disposal.

Ground water in seepage to boreholes, on the licensed site, will be transferred, where appropriate, to the LLLETP for final disposal.

The treatment of unirradiated and irradiated nuclear material to place the material into a form suitable for further processing or storage will result in liquid radioactive waste arisings.

Waste aqueous effluents received from the adjacent Ministry of Defence Establishment.

Liquid wastes exist or will arise that are not suitable for disposal to the marine environment.

The Dounreay site currently holds a variety of radioactively contaminated waste solvents, accumulated as a result of irradiated fuel reprocessing operations and oils from electrical transformers, gearboxes and other lubrication purposes. The waste solvent is mainly composed of Tributyl Phosphate in Odourless Kerosene (TBP/OK) and this contains most of the radioactivity. The waste oils include transformer oils, which contain very small quantities of radioactivity, and lubricating oils.

Other liquid radioactive waste (e.g. zinc bromide, counting scintillants, organics), that are not suitable for disposal to the North Atlantic Ocean, exist on the Dounreay site in storage and will further arise during the undertakings.

GASEOUS (including gases dusts and mists)

Gaseous radioactive waste, comprising of radioactive gases, dusts and mists, will be produced from the undertakings and disposed to the atmosphere via dedicated stacks (chimneys) constructed for the purpose.

Dusts and mists released during the processes used to treat the wastes and/or fuels enter the gaseous streams by elevation into the ventilation airflow.

Radioactive gases, principally tritium and krypton 85, are released during the processes used to treat the wastes and/or fuels to put them into the passive states required for long term storage or disposal, including:

- ✓ Destruction of alkali metal coolants;
- ✓ Destruction of 514 drums of sodium metal from Forschungszentrum Karlsruhe GmbH;
- ✓ Transfer and cementation of raffinates;
- ✓ Cleaning/decontamination of components from PFR and DFR.

The treatment of unirradiated and irradiated nuclear material to place the material into a form suitable for further processing, transportation to another licensed site or storage will result in gaseous radioactive waste arisings. (see previous listing) The release of krypton 85 from unirradiated fuel pins, as they are de-pelletted for treatment or transfer elsewhere for treatment, is included here.

Radioactivity may potentially arise, at very low levels, as a result of re-suspension of activity from contaminated ground, the release of volatile species from the low level solid waste disposal pits, re-suspension from external tanks and the non-forced ventilation of buildings and offices where radioactive contamination has the potential to be present (fugitive discharge). Application is made for these to be recognised and monitored by the environmental monitoring programme carried out by DSRL.

5c Do any of the processes result in the accumulation or disposal of alpha emitting radionuclides?

Yes

5d Describe the process and the modifications considered for reducing the quantities of radioactive waste likely to arise.

DSRL has a Waste & Characterisation Unit that regularly reviews waste minimisation, waste strategy and waste characterisation with the aim to ensure that all wastes are routed through the most appropriate route.

Integrated Waste Strategy

In support of the delivery of NDA strategy, all NDA sites are required to produce and implement an optimised Integrated Waste Strategy (IWS). This is provided though a formal specification and a companion document.

The overall objective of the IWS is to demonstrate how Dounreay will assess and manage all wastes, both radioactive and non-radioactive (including those in solid, liquid or gaseous form) arising from the site's past, present and future operations. The IWS may also include any other waste transferred from other non-NDA sites for management of disposal.

The IWS demonstrates how all waste related activities on the site are integrated and includes a demonstration that the waste can be appropriately managed in accordance with BPEO and BPM, at the time and rate at which it will arise. It is submitted to the NDA as part of the Lifetime Plan review process and will enable Dounreay to demonstrate to its regulators and stakeholders that it is complying with legislation and standards.

DSRL, as Nuclear Site Licensee, is responsible for managing all decommissioning and waste management works on the Site, utilising both DSRL personnel and suitably qualified and experienced specialist contracting companies. The DSRL management team will, throughout the decommissioning works, act in liaison with the regulators.

Sustainable Development

DSRL's plans for waste management are in line with Government policy on sustainable development as expressed in Cm 2919 (as amended). In particular, the plans do not foreclose any options for the storage, treatment and final disposal of ILW waste until decision is made on the UK strategy for radioactive waste management. However, in accord with RWMD Letters of Compliance ILW liquid wastes are being converted into a solid form, by cementation, as a part of the requirement to reduce the radioactive hazards on the site. The plans also accord with the agreements given as part of Agenda 21 of the Rio Conference (Cm 2822) and the statutory guidance to SEPA by the Scottish Government under Section 31 of the Environment Act 1995.

The objective of restoring the Dounreay site, as defined in the LTP, is to make it available for unrestricted alternative use or to achieve a permanently safe condition that requires minimal institutional care. In this respect, DSRL is striving to ensure that a burden is not placed on future generations by the nuclear liabilities on the site, both in terms of safety and financially. The decommissioning of facilities and the safe processing of wastes, is achieving a "progressive reduction of the hazard" on the site in line with Government policy and the objectives of the NDA. As described in the section below, particular attention is being given to the minimisation of wastes and discharges to the environment. This is being ensured by undertaking a BPEO study to underpin the management of decommissioning wastes.

Waste Minimisation

Waste minimisation is an integral part of a comprehensive waste management and safety culture that aims to reduce the environmental impact of the wastes generated at Dounreay.

The waste minimisation strategy involves a comprehensive approach which considers all the different parts of a process. These parts include process selection, the choice of plant design and equipment, plant operation and decommissioning practices. The minimisation strategy is influenced by the whole spectrum of activities, including source reduction, operational practices involving recycling and reuse, and administrative controls of waste management optimisation. The strategy requires an integrated approach considering the relationship between all the types of waste produced by a process.

The Waste Hierarchy[4]

The waste hierarchy aims to encourage the management of waste materials in order to reduce the amount of waste materials produced, and to recover maximum value from the wastes that are produced. It is not applied as a strict hierarchy as many complex factors influence the optimal management for any given waste material. However, as a guide, it encourages the prevention of waste, followed by the reuse and refurbishment of goods, then value recovery through recycling and composting.

The next option is energy recovery, an important level in the hierarchy as many materials have significant embedded energy that can be recovered. Waste prevention, reuse, recycling and recovery are collectively defined by the Organisation for Economic Co-operation and Development (OECD) as waste minimisation. Finally, waste disposal should only be used when no option further up the hierarchy is possible.

[4] Taken from the SEPA website
http://www.sepa.org.uk/waste/moving_towards_zero_waste/waste_hierarchy.aspx

The Waste Hierarchy

This concept invokes a key component of waste minimisation by requiring generators to develop ideas on prevention before looking to the reuse, recycling and disposal options. The Waste Hierarchy reinforces that minimising waste needs to be addressed at the early stages of a process to prevent effectively the generation of waste.

5e Do you intend to receive and dispose of radioactive waste from other premises? (give details)

Yes.

The neighbouring site operated by the Ministry of Defence (Vulcan) transfers low level liquid wastes to the low level liquid effluent treatment plant (LLLETP) for disposal and transfers solid radioactive waste to DSRL for treatment, storage and disposal.

6 GASEOUS WASTE – DISPOSAL OF GASEOUS RADIOACTIVE WASTE

6a Do you intend to dispose of radioactive waste in the form of gas, mist or dust

Yes.

6b For each discharge point please give a full description of the waste and identify or describe the discharge point.

Radioactive Gaseous Discharge Points: Identification, Height, Efflux Velocity, Effluent Type and Estimated Maximum Discharge*

Discharge Point	Height (m) (from ground	Efflux Velocity	Radionuclides	Estimated maximum discharge (Bq/yr)	
D1213	55	8.26	Alpha and beta particulate, tritium gas, iodine gas	Alpha Beta ^{3}H ^{129}I	3.24E+06 7.28E+08 ~~5.13E+11~~ 1.00E+09
D2164 (New D1213 ~~replacement~~ North)	31	>15	Alpha and beta particulate, tritium gas, iodine gas	Alpha Beta ^{3}H ^{129}I	-
D2170 (New D1213 ~~replacement~~ South)	31	>15	Alpha and beta particulate, tritium gas	Alpha Beta ^{3}H	-
PFR	40	3.02	Alpha and beta particulate, tritium gas, krypton gas	Alpha Beta ^{3}H ^{85}Kr	3.86E+08 ~~1.2E+12~~ 5.69E+14
~~PFR (New~~ location)	40	15	Alpha and beta particulate, tritium gas, krypton gas	Alpha Beta ^{3}H ^{85}Kr	~~3.86E+08~~ 1.2E+12 5.69E+14
IFBS	18	6.73	~~Alpha and beta particulate, krypton gas~~	~~Alpha~~ Beta ~~^{85}Kr~~	~~4.00E+03~~ 6.00E+04 ~~5.69E+14~~
~~PFR AML~~	~~40~~	~~4.97~~	Alpha and beta particulate, tritium gas	Alpha ~~Beta~~ ^{3}H	6.00E+04 ~~5.00E+05~~ 1.00E+09
PFR SSC	32	0.00	Not currently in use		
~~PFR NaTkFm/SID~~	6	0.10	Tritium gas		8.13E+09
DFR Pond	51	16.28	Alpha and beta particulate, tritium gas, krypton gas	Alpha Beta ^{3}H ^{85}Kr	1.52E+05 3.41E+08 1.36E+12 3.00E+12
~~DFR Sphere~~	~~51~~	~~19.65~~			
DFR ESB	51	21.75			
DFR NDP	51	19.34			
DFR C4	51	29.86			

D3000	17	16.45	Alpha and beta particulate, tritium gas	Alpha Beta ^{3}H	5.00E+03 2.00E+04 1.00E+10
D1200	18	6.60	Alpha and beta particulate	Alpha Beta	5.00E+04 1.00E+05
D1226	20	6.40	Alpha and beta particulate	Alpha Beta	2.00E+04 2.00E+05
D2670	21	14.17	Alpha and beta particulate, krypton gas	Alpha Beta ^{85}Kr	5.8E+04 3.60E+05 4.00E+12
DN141	17.5	12.98	Alpha and beta particulate	Alpha Beta	5.00E+03 1.00E+04
D2900	18	12.08	Alpha and beta particulate, tritium gas	Alpha Beta	4.00E+04 1.00E+05 1.00E+10
D9867	17	12.29	Alpha and beta particulate	Alpha Beta	5.00E+03 1.00E+04
D8570	13	6.50	Alpha and beta particulate	Alpha Beta	5.00E+03 1.00E+04
DNO60	13.5	0.00	Not currently in use	Alpha Beta	
D2167	8	11.17	Alpha and beta particulate	Alpha Beta	5.00E+03 1.00E+04
D1211	18	TBC	Alpha and beta particulate	Alpha Beta	TBC
D1115 Pipe	6	0.00	Alpha and beta particulate, tritium gas. Intermittent purge flow only	Alpha Beta	10 10

***For detail on facility and stack discharge estimates please refer to supporting document No 8 (Ref RSA Application (09) Estimate)**

6c List the radionuclides you intend to discharge

Radionuclide	Maximum discharge in a single day (Bq)	Maximum discharge in a year (Bq)
Alpha	2.00E+04	7.28E+06
Beta (excl ^{3}H and ^{85}Kr)	8.06E+06	2.94E+09
Tritium	2.14E+11	7.82E+13
Krypton 85	1.58E+12	5.76E+14
Iodine 129	2.74E+06	1.00E+09

Maximum number of days in a year gaseous waste will be discharged:

365(6)

6d For each of the radionuclides listed above, what will be the concentrations in the waste disposed of?

Radionuclide	Concentration in waste disposed of (m^3)
Alpha	Various across all discharge points
Beta	Various across all discharge points
Tritium	Various across all discharge points
Krypton-85	Various across all discharge points
Iodine-129	Of the order of 0.27 Bq/m^3

6e How do you intend to measure or estimate the activity of the discharge? Please explain

Frequency of Gaseous Sampling and Analysis Required

Facility	Sampling Frequency	Frequency	Analysis required
PFR	Weekly	Weekly	1) Beta 2) Alpha
PFR	Weekly	Weekly	1) Tritium
DFR	Weekly	Weekly	1) Beta 2) Alpha 3) Tritium
DFR	As required	As required	1) Krypton-85
D1213	Weekly	Weekly	1) Iodine-129 2) Tritium
D1213	Daily	Monthly Bulk	1) Beta 2) Alpha
D1200	Weekly	Weekly	1) Beta 2) Alpha
D1226	Weekly	Weekly	1) Beta 2) Alpha
D2670	Weekly	Weekly	1) Beta 2) Alpha
D2900	Weekly	Weekly	1) Beta 2) Alpha
D9867	Weekly	Weekly	1) Beta
D8570	Weekly	Weekly	1) Beta 2) Alpha
D9833	Weekly	Weekly	1) Beta 2) Alpha
Sodium Tank Farm	Weekly when operational	As required	1) Tritium
D1115	As required	As required	1) Beta 2) Alpha
D3000	Weekly	Weekly	1) Beta 2) Alpha 3) Tritium
Sodium Analysis	Weekly	Weekly	1) Beta 2) Alpha

Laboratory			3) Tritium
Secondary Sodium Circuits	Weekly when operational	As required	1) Tritium
DN141	Weekly	Weekly	1) Beta 2) Alpha
D2167	Weekly	Weekly	1) Beta 2) Alpha

Calculation of Activity Discharged - Gaseous

The activity of tritium and tritiated water vapour discharged is estimated by multiplying the activity measured in the samples taken by the ratio of the discharge flow rates to the sampling flow rates.

The activity of total alpha particulate, total beta particulate and other radionuclides discharged is estimated by multiplying the activity in the samples taken by the ratio of the discharge flow rates to the sampling flow rates.

The activity of iodine-129 discharged is estimated by multiplying the activity in the samples taken by the ratio of the discharge flow rates to the sampling flow rates.

The activity of krypton-85 discharged is estimated on the basis of the calculated krypton-85 content of the fuel. The calculation makes use of the known and recorded history of the fuel and the FISPIN model.

The activity of krypton-85 discharged from DFR reactor cover gas the activity of the krypton-85 is estimated in accordance with the procedure set out in the Dounreay Environment Committee paper DEC(06)P85.

The total alpha particulate and total beta particulate activities discharged from D1115 will be taken directly from the sample taken.

ANALYTICAL METHODS – Gaseous Discharges

The generic methods, noted by a key letter will be in accordance with the appropriate procedures listed.

Description		Generic Method
1.	**Stack gaseous discharge analysis**	
1.1	Total alpha (excluding ^{242}Cm and ^{244}Cm)	B
1.2	Total beta (excluding ^{3}H and ^{85}Kr)	A
1.3	Tritium	C
1.4	Iodine-129	D
1.5	Krypton-85	E

Generic Method Key

A. Solid source counting.
B. Liquid scintillation counting.
C. Chemical separation followed by Liquid scintillation counting.

D. Sample preparation followed by high resolution Gamma spectrometry.
E. Calculation.

6f Please attach your radiological assessment of the proposed discharges to this form

Dose assessment included ref. RSA Application (09) Doses

The nearest building to which the public has unfettered access is the dwelling at Buidoo approximately 735 metres from the D1226 stack, the nearest discharge stack.

The dose model PC CREAM 97 has a limitation that only allows up to 5 stack locations and 5 receptor points to be modelled in any one assessment. The model has used the DFR stack as the reference stack and the nearest habitations are:

- Residence adjacent to the visitor centre 1200m (E)
- Cottages to the south of the A836 near Vulcan entrance 1074m (SE)
- Residence to the south of the A836 identified as Isauld 1938m (SSW)
- Isauld House 1832m (SW)
- Goat Farm at Shebster 4100m (S)

The adjacent buildings are residences to which there is general public access. The other adjacent buildings are those that comprise the Ministry of Defence site Vulcan.

The ventilation system incorporates systems designed to minimise the discharge of activity. These systems are chosen relative to the process that gives rise to the activity release and the type of activity. The systems used are High Efficiency Particulate Arrestor (HEPA) filters, wet scrubbers, dry scrubbers and cyclones.

The discharge points are identified in the plan shown at Appendix 3 of this application.

The efflux velocities are shown in the table at question 6b above.

---

7 LIQUID WASTE – ACCUMULATION AND DISPOSAL OF LIQUID RADIOACTIVE WASTE

7a Do you intend to accumulate or dispose of radioactive aqueous waste, including organic combustible waste?

Yes

7b What is the chemical and physical nature of the waste you intend to accumulate or dispose of?

The liquid radioactive wastes to be disposed from the premises to the North Atlantic Ocean will be:

- Chloride solutions;
- Nitrate solutions; and
- Aqueous solutions contaminated with soluble radionuclides, radionuclides held up in colloidal suspension and radionuclides held as suspended solids of dimensions less than 60μm in any dimension.

These aqueous liquids, at any time are potentially a mix of the above mentioned forms, may be treated by addition of acid or alkali, when required, to ensure the hydrogen ion concentration of the effluent at time of discharge to the marine environment is between pH5 and pH9.

Other aqueous and organic liquids in the forms of oils, solvents, zinc bromide solution and scintillant gels are accumulated pending disposal to TRADEBE High Temperature Incinerator at Fawley, Southampton (Supporting Document 5).

7c Why do you intend to accumulate aqueous waste?

Aqueous wastes are accumulated until sufficient volume is collected (~500 m^3) for disposal to the North Atlantic Ocean within a tidal window of 2 hours before and ½ hour after high tide. (High tide is as determined for Scrabster, Caithness, Highland).

Other aqueous wastes will be unsuitable for direct disposal to the environment and these are accumulated until the identified disposal route is authorised

7d How do you intend to accumulate aqueous waste?

The aqueous wastes are collected in the Sea Discharge Tanks of the Low Level Liquid Effluent Treatment Plant.

Other liquids are held in suitable containers within stores where appropriate environmental protection measures are installed e.g. Bunds.

7e How long do you intend to accumulate aqueous waste for?

Aqueous wastes are accumulated for up to 5 days.

Other liquids will be stored until such time as the identified disposal routes are authorised.

7f How much radioactive waste do you intend to accumulate?

Radionuclide	Maximum activity (Bq)	Maximum Volume at any one time (m^3)
Alpha	6.0E+07	1100
Beta	5.0E+10	1100
Strontium 90	5.0E+09	1100
Caesium 137	2.5E+10	1100
Sodium 22	2.5E+08	1100
Tritium	2E+12	1100
Americium 241	3E+05	1100

7g Where will you dispose of the aqueous waste?

1. The North Atlantic Ocean at grid reference NC 981 676.

2. Where it has been identified that there is continuous groundwater flow with an activity concentration of less than 5 Bq/l Alpha and less than 100 Bq/l beta that these are authorised for discharge from the Dounreay site via the most appropriate drain outfall. The outfalls for which authorisation is requested are Outfalls 2, 3 and 4 and each will require suitable modification and modelling prior to any radioactive aqueous liquor discharge.

3. Waste samples for characterisation and/or analysis will be sent to appropriate analytical laboratories that hold all necessary authorisations and consents relating to the handling, analysis and disposal of radioactive wastes.

4. Disposal to TRADEBE High Temperature Incinerator at Fawley, Southampton (Supporting Document 5).

DISPOSAL TO A PUBLIC SEWER, WATER COURSE OR BODY

7h What is the name and 8 figure National Grid Reference of the sewerage treatment to which your premises discharges liquid radioactive waste?

Not applicable

7i What is the approximate daily total volume of water which you intend to discharge from the premises into the sewer?

The discharge volumes are estimated at:
230 m^3

7j What is the maximum monthly total of each radionuclide you intend to discharge?

Radionuclide	Maximum total activity in any single month (Bq)	Concentrations in the waste disposed (Bq/m^3)
Alpha	6.0E+08	1.0E+05
Beta	5.0E+11	8.7E+07
Strontium 90	5.0E+10	8.7E+06
Caesium 137	2.5E+11	4.3E+07
Sodium 22	2.5E+09	4.3E+05
Tritium	2E+13	3.5E+09
Americium 241	3E+06	2.0E+03

Detailed estimates from facilities are shown in Supporting Document 8 (Ref RSA Application (09) Estimate).

7k Will the waste include any substances liable to render it unacceptable for disposal to the drainage system serving the premises?

Yes, aqueous wastes containing zinc bromide are unsuitable for discharge.

7l How do you intend to measure or estimate the activity of the discharge? Pleae explain.

Calculation of Activity Discharged - Liquid

DSRL shall ascertain or estimate activity by suitable analytical techniques conducted in accordance with a Quality Assurance Plan to the standard required by ISO 9001. DSRL propose to use the analytical methods described and in accordance with the following:

- The activity of the effluent discharged will be estimated by multiplying the activity concentration in the samples prepared by the volume of effluent discharged.
- Gross alpha shall be measured by sample preparation and Liquid scintillation counting and reported in units of Becquerels.
- Gross beta (excluding tritium) shall be measured by sample preparation and solid source counting and reported in units of Becquerels.
- Gross gamma shall be measured by sample preparation and liquid source counting and reported in units of gammas per second.

ANALYTICAL PROCEDURES – Liquid Discharges

The activities of radionuclides or groups of radionuclides will be assessed in accordance with the analytical procedures listed below.

Radionuclide	Generic Method
Gross alpha	B
Gross beta (excluding 3H)	A
Tritium	B
Gross gamma	F
90-Strontium	C
137-Caesium	E
22- Sodium	E

Generic Method Key

A. Solid source counting
B. Liquid scintillation counting
C Chemical separation followed by Cherenkov counting
D. Chemical separation followed by high resolution Alpha spectrometry
E. Sample preparation followed by high resolution Gamma spectrometry
F. Liquid source counting

7m Please attach your radiological assessment of the proposed discharge to this form

Dose assessment included ref. RSA Application (09) Doses.

7n What is the name of the watercourse or body of water that your sewage treatment works discharges into and your SEPA consent to discharge reference (i.e. – WPC/x/xxxx)?

There are 6 surface water, trade effluent, sewage outfalls on the Dounreay site discharging to the North Atlantic Ocean.

CAR Licence numbers

CAR/L/1002038	Outfall 1 & 1S	10/04/06
CAR/L/1002037	Outfall 2 & 2S	10/04/06
CAR/L/1002036	Outfall 3 & 3S	29/06/09
CAR/L/1002035	Outfall 4	10/04/06
CAR/L/1002034	Outfall 5	10/04/06
CAR/L/1003977	Outfall 6	10/05/06

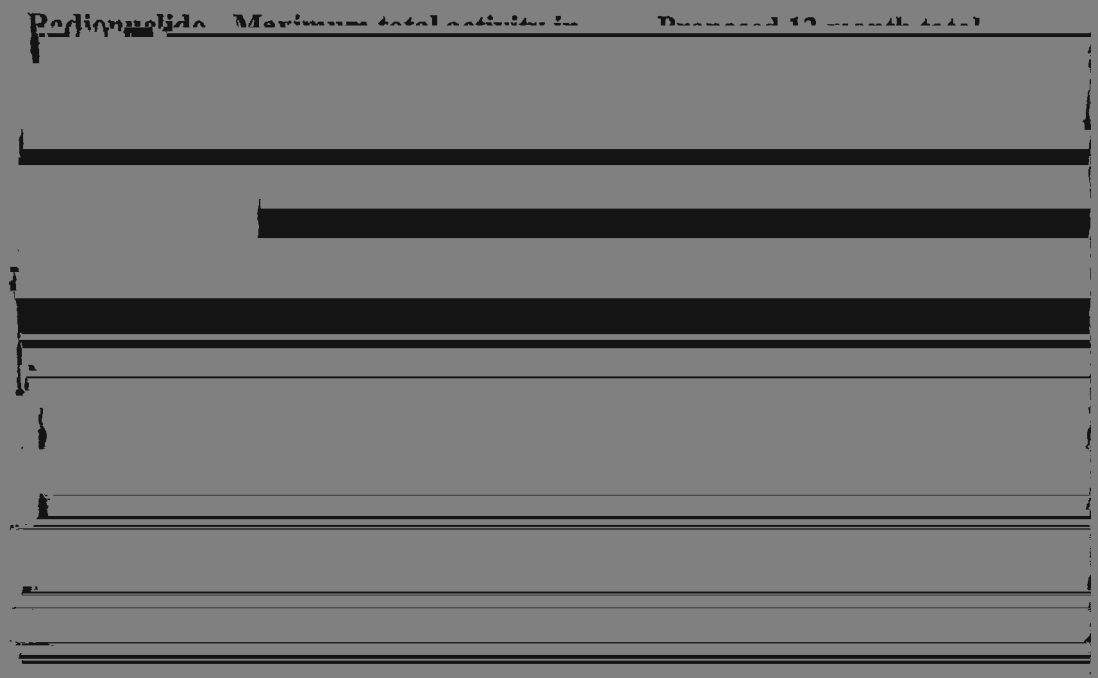
7o What is the approximate daily total volume of water which you intend to discharge from the premises?

Of the order of 480 m^3 in each batch from LLLETP.
Of the order of 200 m^3 from the sources discharging via the extant inactive outfalls.

7p How do you intend to treat your liquid waste to minimise the radioactivity being disposed of?

Aqueous wastes are subjected to abatement at source, including pH adjustment, ion exchange, particulate filtration and settlement, prior to discharge and final filtration during discharge.

7q What is the maximum monthly total of each radionuclide you intend to discharge?



	any single month (Bq)	activity
Alpha	6.0E+08	3.67E+09

Solids arising from the Outfalls will be assessed and the waste management options decided prior to any radioactive aqueous liquid discharges.

7s How do you plan to assess the activity of any sludge or solids which are left after treatment before final disposal?

Sludge activity will be determined through radiochemical analysis. Solids activity will generally be though NDA processes.

7t Please attach your radiological assessment of the proposed discharge to this form.

Dose assessment included ref. RSA Application (09) Doses.

---

8 SOLID WASTE – ACCUMULATION AND DISPOSAL OF SOLID WASTE

8a Do you intend to accumulate solid waste

Yes.

Radioactive wastes in both solid and liquid forms are accumulated on the Dounreay site. The Dounreay site is licensed under the Nuclear Installations Act 1965 (as amended) by the Health and Safety Executive Nuclear Installations Inspectorate. The accumulation of waste is regulated under Site Licence Sc 17 Licence Conditions 32 – Accumulation of Radioactive Waste, 33 – Disposal of Radioactive Waste and 34 – Leakage and Escape of Radioactive Material and Radioactive Waste.

The aqueous radioactive liquid waste disposal is via pipes, extending 600 m from the site licence boundary, ending in up-risers to the seabed surface. The original cast iron pipes and mild steel up-risers are no longer used and there is a long term intent for disposal. Whilst the disposal options are investigated the near term intent is to store the pipes in situ in the subsurface tunnel in which they are laid. Storage will commence when the pipes and risers are isolated from the marine environment and thus rendered unusable. This storage is an accumulation as defined in the Radioactive Substances Act 1993 due to the pipes existing beyond the licensed site boundary.

8b How much radioactive waste do you intend to store?

Approximately 1731 tonnes of steel

Radionuclide	Maximum activity (Bq)	Maximum time of accumulation
Alpha	1.0E+12	15 years
Beta	1.0E+13	15 years

8c How will you record and label this solid waste

The waste will be stored in situ until the disposal option is identified. Labelling and recording is not required.

8d How will you store the accumulated waste until it is disposed of?

The lines will be isolated by capping at both ends and will be left in the confines of the access tunnel.

8e Do you intend to dispose of solid waste?

Yes

8f How do you intend to dispose of solid waste?

Transfer of wastes to:

- Low Level Waste Repository to be built at Dounreay;
- Transfer of Intermediate Level Wastes encapsulated in concrete to the waste owners, under existing contracts, in countries outwith the boundaries of the United Kingdom;
- Transfer of tritiated alkali metals to licensed companies for disposal by incineration;
- Transfer of contaminated metals for processing and reuse;

9 DISPOSAL OF SOLID WASTE WITH ORDINARY REFUSE CONTAINING NO OTHER RADIOACTIVE WASTE

Not Applicable

10 TRANSFER TO THE OPERATOR OF THE NUCLEAR PREMISES AT DRIGG OR SELLAFIELD SITES

Not Applicable

11 INCINERATION ON THE PREMISES

Not Applicable

12 TRANSFER TO A CONTRACTOR (OTHER THAN THE OPERATOR OF THE NUCLEAR SITE AT DRIGG OR SELLAFIELD)

12a Give details of the radioactive waste you intend to transfer to your contractor

Radionuclide	Physical form of radionuclide	Maximum annual activity (Bq)
Alpha		4.00E+09
Beta		12.00E+09
Tritium	Elemental and organic	6.00E+11

Maximum volume of solids in any one year (m^3)	51
Maximum volume of combustible/liquid in any one year (m^3)	50

12b1 What is the registered company name of the contractor?

Studsvik UK Limited

12c1 What are the contact details and address of the contractor's site which will receive the waste?

Name: Kevin Wilkinson
Address: Studsvik UK Limited
Unit 14, Princes Park, 4th Avenue
Team Valley Trading Estate, Gateshead
Tyne and Wear
Postcode: NE11 0NF
Telephone No: +44 (0) 191 482 1744
E:mail: kevin.wilkinson@studsvik.co.uk
Position/Designation: Vice President - Waste Management

12d1 In which local authority area is the contractor's premises?

Tyne and Wear

12b2 What is the registered company name of the contractor?

TRADEBE

12c2 What are the contact details and address of the contractor's site which will receive the waste?

Name: Customer Services Tradebe Fawley
Address: Charleston Road, Hardley, Hythe, Southampton
Postcode: SO45 3NX
Telephone No: 023 8088 3000
E:mail: sales@tradebe-fawley.co.uk
Position/Designation:

12d2 In which local authority area is the contractor's premises?

Hampshire

12e Please describe contingency arrangements if your planned transfer routes become unavailable.

Another contractor will be identified and a variation to authorisation applied for.
Interim safe storage will be arranged.
If another contractor cannot be found then the disposal options will be reassessed.

13 SUPPORTING DOCUMENTS AND ATTACHMENTS

13a Please list any supporting documents or additional pages supplied.

1	APPENDIX 1 – Site Location
2	APPENDIX 2 – Extent of the Premises at Dounreay
3	APPENDIX 3 – Dounreay Gaseous and Liquid Discharge Points
4	WAC/MM/UK, Studsvik Metal Treatment – Customer Owned Waste Service, Rev D, 2009
5	TRADEBE, Code of Practice – Conditions of Acceptance of Radioactive Waste (Issue 4)
6	RSA Authorisation (09) INFO, Information in Support of an Application for Authorisation for the Disposal of Liquid, Gaseous and Solid Radioactive Wastes from Dounreay
7	RSA Application (09) DOSE, An Assessment of the Radiological Impacts of Proposed Atmospheric and Liquid Radioactive Waste Disposals from Dounreay
8	RSA Application (09) Estimate, Estimated Releases of Radioactivity to the Environment: Justification and the Uncertainty Related to the Estimates
9	RSA Application (09) Glossary, Glossary of Terms Used in the Documents Applying for an Authorisation to Dispose of Radioactive Wastes on or from the Premises at Dounreay
10	DEC(09)P196 – The 2008 DSRL Site Waste BPEO
11	DSRP WASTES BPEO – June 2003
12	DEC(09)P175 – A Review of National and International Best Practice on Waste Minimisation
13	WSU/Strategy/P033(08) – Dounreay 'Interim' Integrated Waste Strategy

14 COMMERCIAL IN CONFIDENCE

14a Absence of relevant processes or trade secrets

I accept that the information contained in the application form will form part of the publicly available information held by the Scottish Environment Protection Agency and relevant public registers.

SIGNED:  DATE: 31-3-10

AUTHORISED ON BEHALF OF: DSRL
(Company, corporate body, firm etc).

---

15 DECLARATION

I/we hereby apply for authorisation under section 13 & 14 in respect of the premises referred to in Section 4 and in respect of the accumulation and disposal of radioactive material of the description and quantities referred to above.
I/we declare that to the best of my/our knowledge the above particulars are true and accept that the information contained in the application form will form part of the publicly available information held by the Scottish Environment Protection Agency and relevant public registers.

SIGNED:  PRINT NAME: ANTHONY WRATTEN

POSITION & DESIGNATION: DEPUTY MANAGING DIRECTOR DATE: 31/03/10

AUTHORISED ON BEHALF OF:
(Company, corporate body, firm etc). DOUNREAY SITE RESTORATION LTD

16 DATA PROTECTION

I have read the data protection notice and understand the implications of the Data Protection Act 1998. (Also all persons mentioned in the form should sign the data protection part).

Signed A Anderson

Signed

Signed

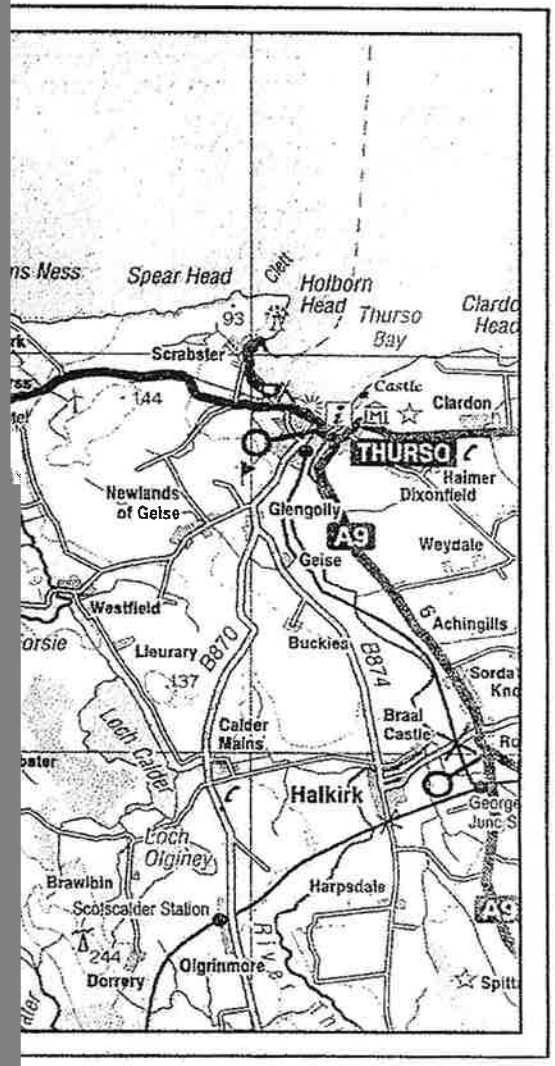
APPENDIX 1 – Site Location

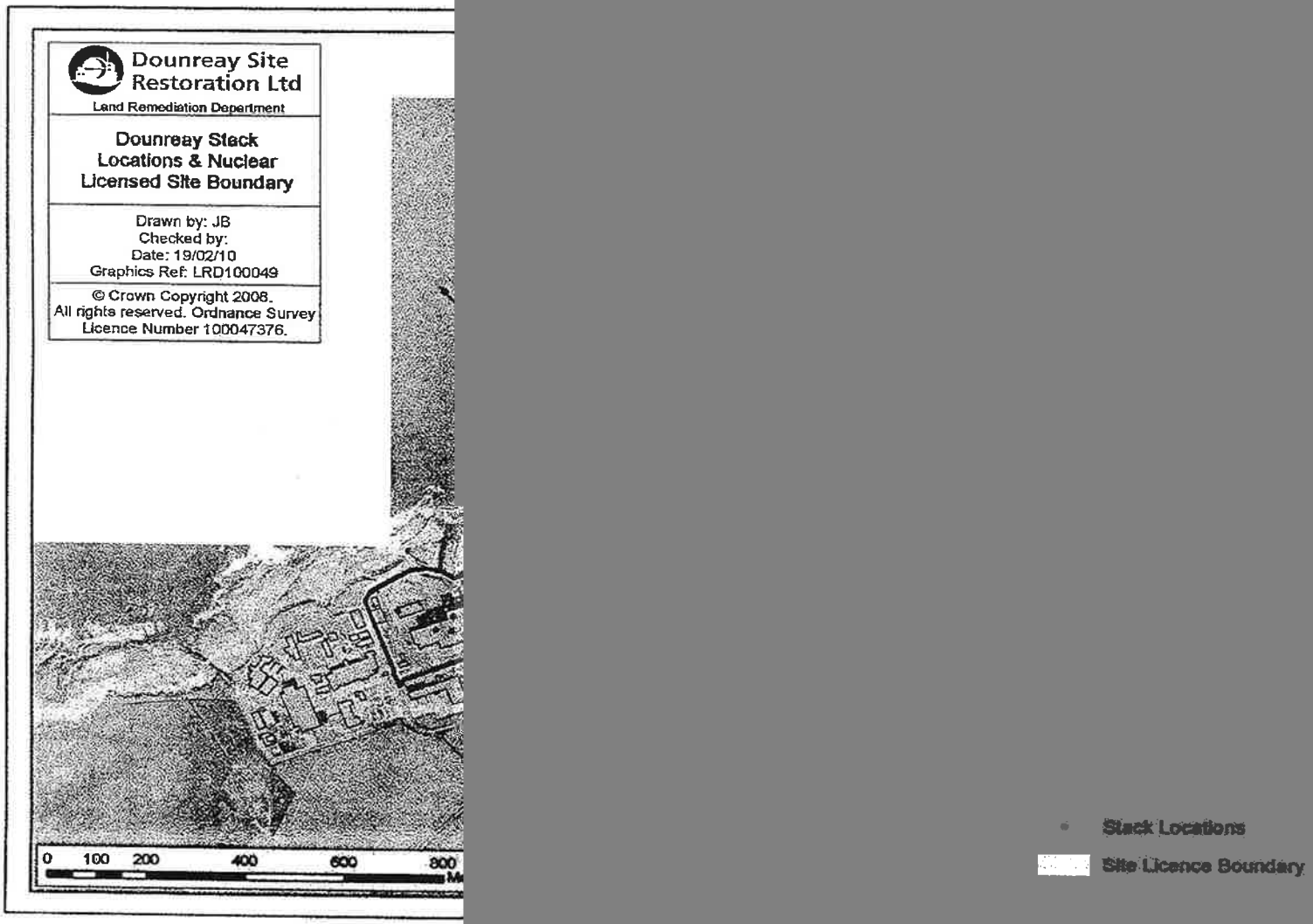
Dounreay Location

Drawn by: JB
Checked by:
Date: 19/02/10
Graphics Ref: LRD100050

Shurrery

0 1.25 2.5




Dounreay Site Restoration Ltd
Land Remediation Department
Dounreay Stack Locations & Nuclear Licensed Site Boundary
Drawn by: JB
Checked by:
Date: 19/02/10
Graphics Ref: LRD100049
© Crown Copyright 2008. All rights reserved. Ordnance Survey Licence Number 100047376.
0 100 200 400 600 800
Stack Locations
Site Licence Boundary

Dounreay Site Restoration Ltd
Land Remediation Department

Dounreay Stack Locations

Drawn by: JB
Checked by:
Date: 19/02/10
Graphics Ref: LRD100048