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- 7 FEB 2011

Dounreay Site Restoration Ltd

**Dounreay Site Restoration Ltd**

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DINGWALL
- 7 FEB 2011
RECEIVED

The Registrar
SEPA
North Region HQ
Graesser House
Fodderty Way
DINGWALL
IV15 9XB

**For the attention of Mr H Fearn**

Our Reference: D/SEPA/4734N

3 February 2011

Dear Sir

**RADIOACTIVE SUBSTANCES ACT 1993 (AS AMENDED) SECTION 13 APPLICATION FOR THE DISPOSAL OF RADIOACTIVE WASTES FROM THE PREMISES AT DOUNREAY, CAITHNESS AMENDMENT TO PARAGRAPHS 6B and 6E**

In operating the Sodium Inventory Destruction (SID) facility in the Sodium Tank Farm at the Prototype Fast Reactor (PFR) it has become apparent that there is no guarantee, based on the provenance of history and radiological survey, that a load is entirely free of alpha and beta/gamma contamination.

To acknowledge the possibility of alpha and beta/gamma contamination DSRL wishes to amend the table in paragraph 6b to include alpha and beta particulate in the gaseous discharge. The table entry for the PFR NaTkFm/SID should be amended to read

| Discharge Point | Height (m) (from ground level) | Efflux Velocity (m/s) | Radionuclides | Estimated maximum discharge (Bq/yr) | |
|---|---|---|---|---|---|
| PFR NaTkFm/SID | 6 | 0.10 | Alpha and beta particulate, tritium gas | Alpha<br>Beta<br>$^{3}H$ | 1.00E+02<br>5.00E+02<br>8.13E+09 |

The discharge values for the alpha and beta/gamma discharge is based on a calculated minimum detectable activity (MDA) multiplied by the ratio of duct flow ($m^3$/hr) to sample flow (l/min) multiplied by 52 (assuming SID operates each week of the year),

Alpha (MDA (0.0094)) * (nominal duct flow / nominal sample flow (55 / 37)) * 52 = 12 Bq/12 months

Beta/gamma (MDA (0.038)) * (nominal duct flow / nominal sample flow (55 / 37)) * 52 = 49 Bq/12 months

The 12 month values have then been multiplied by 10 and rounded up/down to the nearest hundred.

To maintain consistency within the application the table in paragraph 6e is amended for the Sodium Tank Farm to read

| Facility | Sampling Frequency | Frequency | Analysis required |
|---|---|---|---|
| Sodium Tank Farm | Weekly when operational | As required | 1) Beta<br>2) Alpha<br>3) Tritium |

It is recognised by DSRL that before any intentional discharge of alpha and beta/gamma activity that sampling arrangements must be put in place. In addition the Sodium Tank Farm stack dispersion may have to be remodelled to assure that the particulate dispersion is adequate for protection of humans and the environment.

This letter is primarily to request the inclusion of alpha and beta/gamma discharge from the Sodium Tank Farm stack within the application. The letter does not discount the possibility of carrying out the necessary works to include this discharge under the extant Certificate of Authorisation, RSA/N/V02/50010/99.

If you have any queries on the content of this letter please contact John Disbury on telephone 01847 806056 who will be pleased to assist.

Yours faithfully

P J Thompson

for **A J Scullion** PETER THOMPSON
**Director of Assurance**

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Dounreay Site Restoration Ltd

RECEIVED SEPA
11 MAY 2011
EAST KILBRIDE

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Miss L Buchan
SEPA
5 Redwood Crescent
Peel Park
EAST KILBRIDE
G74 5PP

Our Reference: D/SEPA/4815N

06 May 2011

**By email and post**

Dear Miss Buchan

**APPLICATION FOR A DISPOSAL AUTHORISATION UNDER RSA '93**
**INCLUSION OF TEMPORARY VENTILATION OUTLETS**

As you are aware the list of authorised gaseous discharge outlets in Table 4.1 of DSRL's current gaseous Authorisation RSA/N/50010/99, as varied, includes 'any ventilation outlet on any temporary containment enclosure used for decommissioning work outwith the curtilage of any building.'

Whilst Section 10.3.3 of the support document[1] which accompanied DSRL's application for a new RSA Authorisation makes reference to the ongoing need for temporary ventilation outlets, this is not stated in the application form.

Hence, further to your telephone conversation with Dr Niall Watson on 5 May 2011 I am writing to confirm that DSRL has an ongoing need for temporary ventilation outlets – to facilitate decommissioning operations – and thereby requests that this requirement is explicitly included in the Authorisation application.

If you have any queries on the content of this letter please contact Dr Niall Watson on 01847 806197 who will be pleased to assist.

Yours sincerely

**A J Scullion**
**Director of Assurance**

[1] Information in Support of an Application for Authorisation for the Disposal of Liquid, Gaseous and Solid Radioactive Wastes from Dounreay, March 2010.

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RECEIVED SEPA
22 AUG 2011
EAST KILBRIDE

Miss L Buchan
SEPA
5 Redwood Crescent
Peel Park
EAST KILBRIDE
G74 5PP

Our Reference: D/SEPA/4870R

18 August 2011

Dear Miss Buchan

**RADIOACTIVE SUBSTANCES ACT 1993 (AS AMENDED) ("The Act")**
**DECOUPLE WASTE SODIUM FROM SITE WIDE APPLICATION**

Recently SEPA and DSRL have discussed the need or otherwise to decouple the request for the possible off-site treatment of waste sodium (including the KnK sodium) from the extant RSA authorisation application for the Dounreay site premises. Following discussions between Linda Buchan (SEPA) and Mike Brown, Karl Shuler, John Smith and Doug Graham (DSRL) on 30th June 2011, it was decided to decouple the waste sodium from the site wide application. DSRL took an action to formally record this agreement, and to present an amended table (originally sent to SEPA on 3rd June 2010 Ref. D/SEPA/4561N) of the "Waste to be disposed off Premises" in order to record the remaining items to be included in the site wide RSA authorisation application.

The amended table listing the "Waste to be disposed off Premises" is attached. It should be noted that the changes are restricted to the last row of the original table. The data of the wastes to be sent to the Tradebe incinerator at Fawley has been altered to remove the waste sodium component. This has led to the removal of 51$m^3$ solids, and a reduction in the anticipated annual radioactivity in the waste to be disposed off-site from 600 GBq tritium to 100 GBq tritium for the waste solvents, oils, zinc bromide and scintillants. (The beta/gamma and alpha activities are unchanged as this activity was not associated with waste sodium).

Until DSRL has made a case that the off-site treatment of the waste sodium is the BPM option, then the reference strategy of treatment at Dounreay would still apply as covered by the extant RSA authorisation. On this basis, and because the data on the ion exchange resin being sent back to Germany was included in the recent statutory consultation on the site wide RSA authorisation application, this row has been left in the table, so that the new RSA authorisation would also cover the reference strategy.

DSRL also believes that the changes to the amended table of the "Waste to be disposed off Premises" are regarded as minor in nature and will not lead to a requirement to repeat the statutory consultation on the site wide RSA authorisation application. SEPA has indicated a similar understanding.

On the basis that DSRL, by means of this letter, has now informed SEPA that a separate application will be prepared to cover the waste sodium (depending on the outcome of an DSRL BPM study), we believe that SEPA will be able to continue the progression of the site wide RSA authorisation application process. I trust that the information provided in this letter will allow SEPA to do this.

Finally, on a separate note, in disposing of waste off site, DSRL would like to take advantage of government policy enabling the use of off-site waste treatment opportunities in the supply chain, for Low Level Waste, where they have appropriate authorisations in place to receive our wastes. Whilst the attached table specifies off-site waste treatment operators, DSRL would like our new site wide RSA authorisation to capture the use of any appropriately authorised supplier.

If you have any queries regarding the contents of this letter and the accompanying table, please do not hesitate to contact either Mr Mike Brown on extension 2800, or Dr Doug Graham on extension 6030, who will be pleased to assist.

Yours sincerely

p/A J Scullion Peter Thom PSO

**A J Scullion**
**Director of Assurance**

Enc

## WASTE TO BE DISPOSED OFF PREMISES (MODIFIED AUGUST 2011)

| Name and Address to Who Waste is to be Disposed | Description of Waste | Principal Radionuclides or Group of Radionuclides | Anticipated Annual Activity in Waste to be Disposed, Beta/Gamma GBq | Anticipated Annual Activity in Waste to be Disposed, Alpha GBq | Anticipated Specific Activity in Waste to be Disposed | Anticipated Annual Volume of Waste to be Disposed – $m^3$ |
|---|---|---|---|---|---|---|
| Studsvik Nuclear AB S SE-611 82 Nyköping Sweden or; Metals Recycling Facility Studsvik UK Ltd 1 Joseph Noble Road Lillyhall Workington, Cumbria CA14 4JX | Steel, Cast Iron, Aluminium, Copper, Lead, Brass, Cables | Fingerprints are to be predominately beta/gamma and/or low toxicity alpha | 2070 | 690 | Activity not exceeding; (i) All alpha-emitting radionuclides 4 GBq/Tonne (ii) All other radionuclides not including (i) above 12 GBq/Tonne. Unless lower limits are required per the specific facility WAC | 20 |
| Low Level Waste Repository Holmrook Cumbria CA19 1XH | Steel, Cast Iron, Aluminium, Copper, Lead, Brass, Cables, Mercury | Fingerprints are to be predominately beta/gamma and/or low toxicity alpha | 828 | 276 | Activity not exceeding; (i) All alpha-emitting radionuclides 4 GBq/Tonne (ii) All other radionuclides not including (i) above 12 GBq/Tonne. Unless lower limits are required per the specific facility WAC | 8 |
| CARLA Melting Plant Siempelkamp Nukleartechnik GmbH Siempelkampstr 45 – 47803 Krefeld-Germany | Steel, Cast Iron, Aluminium, Copper, Lead, Brass, Cables | Fingerprints are to be predominately beta/gamma and/or low toxicity alpha | 414 | 138 | Activity not exceeding; (i) All alpha-emitting radionuclides 4 GBq/Tonne (ii) All other radionuclides not including (i) above 12 GBq/Tonne. Unless lower limits are required per the | 4 |

| Name and Address to Who Waste is to be Disposed | Description of Waste | Principal Radionuclides or Group of Radionuclides | Anticipated Annual Activity in Waste to be Disposed, Beta/Gamma GBq | Anticipated Annual Activity in Waste to be Disposed, Alpha GBq | Anticipated Specific Activity in Waste to be Disposed | Anticipated Annual Volume of Waste to be Disposed – $m^3$ |
|---|---|---|---|---|---|---|
| | | | | | specific facility WAC | |
| EnergySolutions, LLC Bear Creek Operations<br>1560 Bear Creek Road<br>Oak Ridge<br>TN 37830 | Steel, Cast Iron, Aluminium, Copper, Lead, Brass, Cables | Fingerprints are to be predominately beta/gamma and/or low toxicity alpha | 414 | 138 | Activity not exceeding; (i) All alpha-emitting radionuclides 4 GBq/Tonne<br>(ii) All other radionuclides not including (i) above 12 GBq/Tonne. Unless lower limits are required per the specific facility WAC | 4 |
| AEA Technology plc or Forschungszentrum Karlsrhue GmbH | Ion Exchange Resin | Cs-137 | 500 | - | - | - |
| Customer Services<br>Tradebe Fawley<br>Charleston Road<br>Hardley, Hythe<br>Southampton<br>Postcode: SO45 3NX<br>Tel: 023 8088 3000<br>Email: sales@tradebe-fawley.co.uk | Solvents<br>Oils<br>Zinc Bromide<br>Scintillants | Tritium and other beta emitting nuclides and alpha emitting nuclides | $^3H$ – 100<br>Beta – 12 | Alpha – 4 | - | 50$m^3$ liquids |

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Dounreay Site Restoration Ltd

RECEIVED SEPA
04 OCT 2011
EAST KILBRIDE

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Our Reference: D/SEPA/4900R

30 September 2011

**By email and post**

Dear Miss Buchan

**APPLICATION FOR A DISPOSAL AUTHORISATION UNDER RSA '93**
**INCLUSION OF NEW LABORATORY STACK**

Further to recent discussions between yourself and Dr. Niall Watson, DSRL is now in a position to provide the information on the new laboratory (D2176) stack to allow its inclusion in the RSA Authorisation application. As operations that currently occur within the D1200, D1226 and the Alkali Metals Laboratory (AML) will transfer to the new laboratory the estimated maximum discharges for the new laboratory are the total of the maximum discharges for these three facilities, as set out in the RSA Application (09) Estimates document. Hence, DSRL requests that the table in paragraph 6b of the Authorisation application be amended to include the information listed below.

| Discharge Point | Height (m) (from ground level) | Efflux Velocity (m/s) | Radionuclides | Estimated maximum discharge (Bq/yr) | |
|---|---|---|---|---|---|
| D2176 Stack (location 298677 E, 966920 N) | 12.5 | 15 | Alpha and beta particulate, tritium gas | Alpha<br>Beta<br>$^{3}$H | 1.30E+05<br>8.00E+05<br>1.00E+09 |

To allow for uncertainties in deriving the discharge estimates, factors were applied in the RSA Application (09) Estimates document to arrive at proposed discharge limits. It is requested that these factors are applied to the maximum discharge estimates for the new laboratory, which would result in proposed limits of 2.40E+05 (alpha), 1.30E+06 (beta) and 1.50E+09 (tritium).

Once the transfer of operations to the new laboratory is complete discharges will continue to be made from the D1200, D1226 and AML stacks while decommissioning of those facilities is undertaken. Hence, the existing discharge estimates and proposed limits for these three facilities as set out in the RSA Application (09) Estimates document should still apply.

I understand that you will be on-site next week to have an initial discussion on the discharge estimates in the RSA Authorisation application.

If you have any queries regarding the content of this letter please do not hesitate to contact Dr Niall Watson 01847 806197, who will be pleased to assist.

Yours sincerely

**A J Scullion**
**Director of Assurance**