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Our Reference: D/SEPA/5044N

RECEIVED SEPA
20 AUG 2012
EAST KILBRIDE

16 August 2012

Dear Miss Buchan

LOW LEVEL WASTE ENCAPSULATION FACILITY
PRELIMINARY INFORMATION ON RADIOACTIVE AERIAL DISCHARGES

During a meeting on Thursday 17 of May, 2012 regarding the Low Level Waste Encapsulation Plant it was agreed that the project should supply you with some early design information in order to enable the inclusion of the project within the consultation for the RSA Application which has been made by DSRL and is currently under consideration by SEPA.

The project is currently at an early stage of design and more comprehensive and accurate information will be presented to you later this year (September/October) as agreed. This letter is intended to provide early estimates of likely discharges and has employed a pessimistic approach.

Information relating to the design of the stack (height, location and operational parameters) will be subject to Air Dispersion Modelling.

This letter summarises the information provided to you by email on 9 August 2012 within report EP0011 ISO1.

Stack Name	LLW Encapsulation Facility (D2179)
Stack Location	299355, 967474
Stack Height	15m
Efflux Velocity	Minimum 15m/s

The estimated releases are presented in Table 1 attached. Estimates pessimistically assume single HEPA filtration of the off gas (DF = 1E-03)

I hope that this information meets your needs at this stage and I thank you for accommodating the LLW Encapsulation Facility within your considerations.

If you have any queries regarding the content of this letter please contact do not hesitate to contact Mr Doug McGeachin on 01847 802241 who will be pleased to assist.

Yours sincerely

A J Scullion
Director of Assurance

Encs Tables 1 and 2

Table 1 Normal Operational Emissions – summary

	Worst Case			Average		
	Per Container	Per Year	Lifetime	Per Container	Per Year	Lifetime
Total α (Bq)	6.8E-01	7.1E+02	4.7E+03	3.2E-03	3.3E+00	2.2E+01
Total βγ (Bq)	2.0E+00	2.1E+03	1.4E+04	9.1E-02	9.4E+01	6.2E+02
Assumptions:						
1040 containers per year						
6848 Total container (lifetime capacity of Phase 1-3 LLW Vaults)						

The releases per container are calculated in Table 2. The worst case is based upon the UK national LLW Limits. The average case is based upon the WAC Limits divided by the notional ultimate container capacity of the D3100 LLW Vaults (6848).

Table 2 Normal Operational Emissions – per Container Processed

Nuclide	D3100 LLW Vaults WAC Limit* (Bq)	Worst Case		Average Case	
		Container Activity (Bq)	Emission (Bq)	Container Activity (Bq)	Emission (Bq)
^{210}Po	4.23E+10	1.3E+09	1.3E-02	6.2E+06	6.2E-05
^{226}Ra	8.94E+10	2.8E+09	2.8E-02	1.3E+07	1.3E-04
^{227}Ac	5.43E+06	1.7E+05	1.7E-06	7.9E+02	7.9E-09
^{228}Th	2.59E+09	8.1E+07	8.1E-04	3.8E+05	3.8E-06
^{229}Th	1.20E+06	3.7E+04	3.7E-07	1.8E+02	1.8E-09
^{230}Th	2.37E+08	7.4E+06	7.4E-05	3.5E+04	3.5E-07
^{232}Th	9.29E+08	2.9E+07	2.9E-04	1.4E+05	1.4E-06
^{231}Pa	1.95E+07	6.1E+05	6.1E-06	2.8E+03	2.8E-08
^{232}U	9.86E+07	3.1E+06	3.1E-05	1.4E+04	1.4E-07
^{235}U	7.12E+07	2.2E+06	2.2E-05	1.0E+04	1.0E-07
^{234}U	2.66E+11	8.3E+09	8.3E-02	3.9E+07	3.9E-04
^{235}U	8.84E+09	2.8E+08	2.8E-03	1.3E+06	1.3E-05
^{236}U	2.27E+10	7.1E+08	7.1E-03	3.3E+06	3.3E-05
^{238}U	2.40E+09	7.5E+07	7.5E-04	3.5E+05	3.5E-06
^{237}Np	3.09E+07	9.6E+05	9.6E-06	4.5E+03	4.5E-08
^{238}Pu	9.84E+10	3.1E+09	3.1E-02	1.4E+07	1.4E-04
^{239}Pu	6.35E+11	2.0E+10	2.0E-01	9.3E+07	9.3E-04
^{240}Pu	2.56E+11	8.0E+09	8.0E-02	3.7E+07	3.7E-04
^{242}Pu	1.12E+08	3.5E+06	3.5E-05	1.6E+04	1.6E-07
^{241}Am	7.30E+11	2.3E+10	2.3E-01	1.1E+08	1.1E-03
^{242m}Am	3.25E+09	1.0E+08	1.0E-03	4.7E+05	4.7E-06
^{243}Am	6.38E+07	2.0E+06	2.0E-05	9.3E+03	9.3E-08
^{243}Cm	5.27E+08	1.6E+07	1.6E-04	7.7E+04	7.7E-07
^{245}Cm	1.91E+10	6.0E+08	6.0E-03	2.8E+06	2.8E-05
Total α	**2.18E+12**	**6.8E+10**	**6.8E-01**	**3.2E+08**	**3.2E-03**
^{3}H	1.09E+13	3.6E+10	3.6E-01	1.6E+09	1.6E-02
^{14}C	5.47E+10	1.8E+08	1.8E-03	8.0E+06	8.0E-05
^{60}Co	3.47E+11	1.1E+09	1.1E-02	5.1E+07	5.1E-04
^{63}Ni	5.46E+11	1.8E+09	1.8E-02	8.0E+07	8.0E-04
^{79}Se	5.40E+08	1.8E+06	1.8E-05	7.9E+04	7.9E-07
^{90}Sr	1.85E+13	6.1E+10	6.1E-01	2.7E+09	2.7E-02
^{93}Mo	3.57E+09	1.2E+07	1.2E-04	5.2E+05	5.2E-06
^{94}Nb	2.94E+09	9.6E+06	9.6E-05	4.3E+05	4.3E-06
^{99}Tc	9.90E+09	3.2E+07	3.2E-04	1.4E+06	1.4E-05
^{137}Cs	2.77E+13	9.1E+10	9.1E-01	4.0E+09	4.0E-02
^{151}Sm	9.34E+11	3.1E+09	3.1E-02	1.4E+08	1.4E-03
^{152}Eu	1.18E+12	3.9E+09	3.9E-02	1.7E+08	1.7E-03
^{210}Pb	4.32E+10	1.4E+08	1.4E-03	6.3E+06	6.3E-05
^{226}Ra	1.71E+09	5.6E+06	5.6E-05	2.5E+05	2.5E-06
^{241}Pu	1.95E+12	6.4E+09	6.4E-02	2.8E+08	2.8E-03
Total βγ	**6.22E+13**	**2.0E+11**	**2.0E+00**	**9.1E+09**	**9.1E-02**

**The WAC limits in the table are from the proposed limits in DSRL's NLLWF Waste Acceptance Criteria 2010 (NLLWF/3/REP/GAL/0429/IS/02). These limits have been lowered in the recent draft SEPA authorisation published for consultation. The limits in the table, used for calculations, are therefore conservative.*

Assumptions

RF	1.0E-08
DF	1000 (Single HEPA Filtration)
Number of Containers	6848