NRC FORM 7 (8-2007) 10 CFR 110

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR NRC EXPORT/IMPORT LICENSE, AMENDMENT, OR RENEWAL

(See Instructions on Page 5)

APPROVED BY OMB: NO. 3150-0027 EXPIRES: 06/30/2009

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PART A. FOR NRC USE ONLY	☑ PUBLIC OR ☐ NON-PUBLIC	DATE RECEIVED 9-22-09
LICENSE NUMBER XMAT411	DOCKET NUMBER 11005831	ADAMS ACCESSION NUMBER

PART B. TO BE COMPLETED FOR ALL LICENSES, AMENDMENTS, RENEWALS OR NOTIFICATIONS

(If more space is needed to complete any of the items, use Pages 3-4 first, and then attach additional sheets, if necessary.)

1. NAME AND ADDRESS OF APPLICANT/LICENSEE
Sigma-Aldrich Corporation and Subsidiaries
6000 N. Teutonia Avenue
Milwaukee, WI 53209

1a. NAME OF APPLICANT'S CONTACT: Susan Haertling

1b. APPLICANT'S REFERENCE NUMBER: Appl. Dtd. 9-18-09

1c. PHONE NUMBER: (314) 236-8735

1d. FAX NUMBER: (314) 286-8005

1e. E-MAIL ADDRESS: susan.haertling@sial.com

2. TYPE OF ACTION REQUESTED *(Check One)*

☑ EXPORT (Parts B, C, E) ☐ NOTIFICATION OF EXPORT OF INCIDENTAL RADIOACTIVE MATERIAL (PART C, E) ☐ IMPORT (Parts B, D, E) ☐ COMBINED EXPORT/IMPORT (Parts B, C, D, E) ☐ AMENDMENT/RENEWAL Existing License Number: XMAT0407

3. CONTRACT NUMBER(S)	4. FIRST SHIPMENT DATE	5. LAST SHIPMENT DATE	6. PROPOSED EXPIRATION DATE
None	12/01/2009	12/31/2014	12/31/2014

PART C. TO BE COMPLETED FOR EXPORT ONLY OR COMBINED LICENSES, AMENDMENTS, OR RENEWALS

(If more space is needed to complete any of the items, use Pages 3-4 first, and then attach additional sheets, if necessary.)

7. NAME(S) / ADDRESS(ES) OF SUPPLIERS AND/OR OTHER PARTIES TO THE EXPORT
Sigma-Aldrich Corporation
6000 North Teutonia Avenue
Milwaukee, WI 53209

8. NAME(S) / ADDRESS(ES) OF INTERMEDIATE FOREIGN CONSIGNEE(S)
None

9. NAME(S) / ADDRESS(ES) OF ULTIMATE FOREIGN CONSIGNEE(S)
Ontario Power Generation
100 University Avenue
Toronto, Ontario m5g 1x6
Canada

7a. FUNCTION(S) PERFORMED/SERVICE(S) PROVIDED: information on page 3

8a. INTERMEDIATE USE(S): none

9a. ULTIMATE END USE(S): information on page 3

10. DESCRIPTION OF RADIOACTIVE MATERIALS, SEALED SOURCES, NUCLEAR FACILITIES, EQUIPMENT, OR COMPONENTS; FOR NUCLEAR EQUIPMENT INCLUDE TOTAL DOLLAR VALUE OF EQUIPMENT FOR EXPORT	10a. MAX TOTAL VOLUME / ELEMENT WGT (KG), OR TOTAL ACTIVITY (TBq)	10b. MAX ENRICHMENT OR WGT %	10c. MAX ISOTOPE WGT (KG)
Heavy water in the form of deuterium oxide shipped as spent deuterium oxide (D2O concentration approximately 60% in water).	8,400 kg deuterium	N/A	N/A

Rec'd 9-22-09 RB

11. FOREIGN OBLIGATIONS (BY COUNTRY AND BY PERCENTAGE OF MAXIMUM TOTAL VOLUME)
Deuterium is of Canadian origin (100%) CA

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LICENSE NUMBER	DOCKET NUMBER	ADAMS ACCESSION NUMBER	
XMAT411	1100583		☑ PUBLIC OR ☐ NON-PUBLIC

PART D. TO BE COMPLETED FOR IMPORT ONLY, OR COMBINED LICENSES, AMENDMENTS, OR RENEWALS

(If more space is needed to complete any of the items, use Pages 3-4 first, and then attach additional sheets, if necessary.)

12. NAME(S) / ADDRESS(ES) OF FOREIGN SUPPLIERS AND/OR OTHER PARTIES TO IMPORT	13. NAME(S) / ADDRESS(ES) OF INTERMEDIATE CONSIGNEE(S)	14. NAME(S) / ADDRESS(ES) OF ULTIMATE CONSIGNEE(S)
N/A	N/A	N/A

12a. NRC EXPORT LICENSE NUMBER(S) *(If applicable)*	13a. LICENSE NUMBER(S) / EXPIRATION DATE(S)	14a. LICENSE NUMBER(S) / EXPIRATION DATE(S)
N/A	N/A	N/A
	13b. INTERMEDIATE USE(S)	14b. ULTIMATE END USE(S)
	N/A	N/A

15. DESCRIPTION OF RADIOACTIVE MATERIALS, SEALED SOURCES, NUCLEAR FACILITIES	15a. MAX TOTAL VOLUME / ELEMENT WGT (KG), OR TOTAL ACTIVITY (TBq)	15b. MAX ENRICHMENT OR WGT %	15c. MAX ISOTOPE WGT (KG)
N/A	N/A	N/A	N/A

Rec'd 9-22-09 RB

16. FOREIGN OBLIGATIONS (BY COUNTRY AND BY PERCENTAGE OF MAXIMUM TOTAL VOLUME)
N/A

PART E. TO BE COMPLETED FOR ALL LICENSES, AMENDMENTS, OR RENEWALS

17. ADDITIONAL INFORMATION PROVIDED ON PAGES 3, 4, AND/OR ON SEPARATE SHEETS?	☑ YES ☐ NO	17a. COPIES OF RECIPIENTS' AUTHORIZATIONS PROVIDED?	☐ YES ☑ NO

18. CERTIFICATION: I, the applicant's authorized official, hereby certify that this application is prepared in conformity with Title10, Code of Federal Regulations, and that all information provided is correct to th e best of my knowledge.

18a. PRINT NAME AND TITLE OF AUTHORIZED OFFICIAL	18b. SIGNATURE -- AUTHORIZED OFFICIAL	18c. DATE
Susan Haertling, Director of Trade and Product Compliance, Sigma-Aldrich	S M Haertling	9/18/2009

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LICENSE NUMBER	DOCKET NUMBER	ADAMS ACCESSION NUMBER	
XMAT411	11005831		☑ PUBLIC OR ☐ NON-PUBLIC

ADDITIONAL INFORMATION *(Reference applicable block numbers from page 1 and/or page 2 for each entry)*

7a) FUNCTION(S) PERFORMED/SERVICE(S) PROVIDED

Sigma-Aldrich and its subsidiaries produce deuterium labeled reagents for various applications. Our manufacturing processes may use deuterium oxide as a solvent resulting in the creation of spent heavy water mingled with reaction residues. Ontario Power Generation performs the service of removing the residual contaminants from the spent deuterium oxide/water mixture.

9a) ULTIMATE END USE(S)

Heavy water in the form of spent deuterium oxide (70,000 kg of spent deuterium oxide as an approximate 60% solution in water) is sent from Sigma-Aldrich to the ultimate consignee (Ontario Power Generation) for purification/upgrading from a 60% solution (in water) to 98% pure deuterium oxide for future return to the United States.

70,000 kg spent deuterium in a 60% water solution = 42,000 kg D2O
Deuterium concentration of 42,000 kg D2O = 8,400 kg

Rec'd 9-22-09 RB