



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

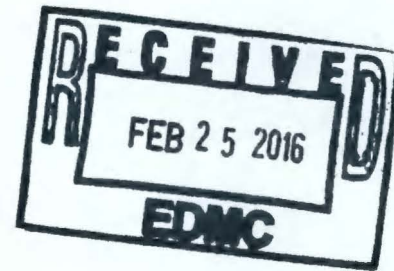
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16-AMRP-0110

FEB 23 2016

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Mr. D. A. Faulk, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
825 Jadwin Avenue, Suite 210
Richland, Washington 99352



Addressees:

ANNUAL LETTER REPORT FOR TRITIUM TREATMENT TECHNOLOGY
DEVELOPMENTS – MARCH 2016

This letter transmits the Annual Letter Report for Tritium Treatment Technology Developments for March 2016. This report is intended to provide an update on the development of treatment technologies pertinent to cleanup and management of tritiated wastewater and tritium contaminated groundwater at the Hanford Site.

Tri-Party Agreement M-026-07D requires submittal of a formal evaluation of the development status of tritium technology every five years. The next formal evaluation is due March 31, 2019. This letter constitutes completion of the Tri-Party Agreement commitment to submit an annual letter report in years that a formal evaluation is not required. The attached table summarizes the technologies discussed in past reports, indicates treatment maturity, and defines treatment applicability.

Tritium treatment reports developed to date conclude that tritium treatment technologies are not viable for the large volumes of Hanford wastewater and groundwater with relatively low concentrations (less than $1.0E-05$ Ci/L). The attached summarizes technologies, indicates technology maturity, and defines technology applicability.

Addressees
16-AMRP-0110

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FEB 23 2016

If you have any questions, please contact me or your staff may contact Mike Cline, of my staff on (509) 376-6070.

Sincerely,



Ray J. Corey, Assistant Manager
for the River and Plateau

AMRP:MSC

Attachment

cc w/attach:

G. Bohnee, NPT
J. V. Borghese, CHPRC
R. Buck, Wanapum
R. H. Engelmann, CHPRC
D. Goswami, Ecology
D. L. Halgren, CHPRC
S. Hudson, HAB
R. Jim, YN
N. M. Menard, Ecology
S. L. Nichols, Ecology
C. P. Noonan, MSA
K. Niles, ODOE
R. E. Piippo, MSA
J. B. Price, Ecology
D. Rowland, YN
R. Skeen, CTUIR
M. J. Turner, MSA

Administrative Record
Environmental Portal

TABLE
Summary of Tritium Removal and Mitigation Technologies

Technology	Year Report Prepared						
	1994	1995	1997	1999	2001	2004	2009/ 2014
Distillation	D, h		D, h	D, h	D, h	D, h	D, h
Gaseous diffusion	D, h						
Laser isotope separation	T, h	T, h	T, h				
Electrolysis	D, h	D, h	D, h				
Combined electrolysis and catalytic exchange (CECE)	D, h	D, h T, l	D, h T, l	D, h T, l	D, h T, l	D, h T, l	D, h T, l
Combined electrolysis catalytic exchange with vapor phase catalytic exchange					D, h		
Membrane separation process	T, l	T, l	T, l				
Cryogenic distillation	D, h	D, h	D, h	D, h	D, h		
Bithermal catalytic exchange		D, h T, l		D, h T, l	D, h T, l	D, h T, l	D, h T, l
Isotopic exchange, air sparge		T, l					
Finely divided nickel catalyst		O					
Separation by Metanetix Inc.		O					
Substituted naphthalene		O					
Crown Ether Complexes		O					
Girdler-sulfide Process			D, h	D, h	D, h	D, h	D, h
Palladium Membrane Reactor							D, h
GE Integrated Systems							D, h
Liquid phase catalytic exchange with solid oxide electrolyte			D, h	D, h T, l	D, h T, l		
Liquid phase catalytic exchange with high-temperature steam electrolysis (Hot Elly)			D, h				
Sulfur resin ion exchange			O				
Metal hydride exchange			T, h				
Soil column discharge	D, l, h		D, l, h	D, l, h	D, l, h	D, l, h	D, l, h
Barrier formation			O	D, l, h	D, l, h	D, l, h	D, l, h
Air sparging			T, l				
Dual-temperature liquid-phase catalytic exchange				D, h			
Tritium resin separation process				T, l	T, l	T, l	T, l
Kinetic-isotope effect for concentrating tritium				T, l	T, l		
Pumping and recharging				D, l	D, l	D, l	D, l
Phytoremediation					D, l	D, l	D, l
Evaporation						D, l	D, l
Graphene oxide (GOx) laminar membrane separation							T, l

Maturity:

D = Demonstrated or developed technology that has been successfully applied in the field

T = Testing or theoretical stage of development

O = Observation indicates a potential process needing funding to continue

Applicability:

l = Technology is applicable to larger wastewater volumes having lower levels of tritium (less than 1.0E-05 Ci/L)

h = Technology is applicable to smaller wastewater volumes having higher levels of tritium (greater than 1.0E-05 Ci/L)