Out of Control – On Purpose: DOE's Dispersal of Radioactive Waste into Landfills and Consumer Products

Nuclear Information and Resource Service, May 2007

REFERENCES

Atomic Energy Commission

US Atomic Energy Commission, Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors." June 1974 [ML003740243], commonly called REG GUIDE 1.86

California Department of Health Services

California Department of Health Services, DECON-1, "State of California Guidelines for Decontamination of Facilities and Equipment prior to Release for Unrestricted Use." June 1977.

Department of Energy

DOE resources and reports

DOE/EM-0342, "Accelerating Cleanup: Paths to Closure," Draft, Office of Environmental Management, February 1998

DOE/EM-0362, "Accelerating Cleanup: Paths to Closure," Office of Environmental Management, June 1998

DOE/EM-0466, "From Cleanup to Stewardship, a Companion Report to Accelerating Cleanup: Paths to Closure," Office of Environmental Management, October, 1999

DOE/EM-0563, "A Report to Congress on Long-Term Stewardship," Office of Environmental Management, Office of Long-Term Stewardship, Vol. I-II; January 2001

"Closing the Circle on the Splitting of the Atom, The Environmental Legacy of Nuclear Weapons Production in the United States and What the Department of Energy is Doing About It, Office of Environmental Management, January 1995

Annual Site Environment Reports (ASERs) http://www.em.doe.gov/Pages/asers.aspx Site specific, not all years and sites available.

Pollution Prevention Tracking and Reporting System

DOE has a P2 or Pollution Prevention program which includes recycling of "clean" materials. As discussed throughout this report, the definition of clean can vary and can, in some cases, include materials contaminated with some DOE-generated radioactivity. A database entitled *Pollution Prevention Tracking and Reporting System* provides reports of materials recycled at each site, but does not indicate details of where on site the material originated or where they went. The data base can be seen and used at

https://www.eh.doe.gov/p2/data_entry/reports/ro_recycleRpt.aspx or https://www.hss.energy.gov/NuclearSafety/NSEP/p2/data_entry/reports/ro_recycleRpt.aspx

"Update on the Activities of the DOE Office of Environmental Guidance (EH-23) in Calendar Year 2003," DOE/EH-0384, U.S. Department of Energy, Office of Environment, Safety and Health, Office of Environment, Washington, DC 20585, 2004

Abraham Announces 2nd Major Nuclear Non-Proliferation Effort with Kazakhstan: Former Nuclear Weapons Facility to Produce Commercial Copper Beryllium; NNSA News: NA-02-13, contact Jeanne Lopatto, DOE, 202/586-4940, Lisa Cutler, NNSA, 202/586-7371, July 1, 2002.

Incomplete response to NIRS FOIA F2005-00782, dated September 7, 2006.

"Material Disposition Alternatives and Approaches Workshop, Presentations, National Center for Excellence for Metals Recycle," DOE Assets Utilization Program, Oak Ridge Operations, Knoxville, Tennessee, June 12-16, 2000.

"Authorized Release Overview: Obtaining DOE Authorized Release Limits for Property Containing Residual Radioactivity," power point presentation accessed 2/3/06 and 3/23/06 at http://www.bnl.gov/wmd/Linkable%20files/Power%20Point/Authorized%20Release%20Overview.ppt

DOE regulations

10 CFR 835 Department of Energy Occupational Radiation Protection, as amended on June 8, 2007, 72 Federal Register110: 31904/ Friday, June 8, 2007 / Rules and Regulations [Docket No. EH–RM–02–835] RIN 1901–AA95 Procedural Rules for DOE Nuclear Activities and Occupational Radiation Protection, Office of Health, Safety and Security, Department of Energy. (Changes summarized at http://hss.energy.gov/HealthSafety/WSHP/radiation/rule.html)

Draft 10 CFR 834, Radiation Protection of the Public and Environment, published in *Federal Register*, March 25, 1993 (Vol. 58, p.16268)

DOE internal orders

DOE ORDER 5400.5 2-8-90, Change 2: 1-7-93, Radiation Protection of the Public and Environment, U.S. Department of Energy Washington, D.C. January 7, 1993

DOE O 450.1, Environmental Protection Program. DOE, 2003.

DOE G 450.1-5, Implementation Guide for Integrating Pollution Prevention into Environmental Management Systems. DOE, 2005.

DOE ORDER 5820.2A Radioactive Waste Management, U.S. Department of Energy Washington, D.C. 9-26-88.

DOE guidance documents and implementation guides to internal orders

Application of DOE 5400.5 requirements for release and control of property; November 17, 1995. Department of Energy Memo from Air, Water and Radiation Division: EH-412: Wallo

DOE-STD-XXXX-YR Proposed: Guide to Good Practice for Establishing Authorized limits for the release of waste and property contaminated with residual radioactivity

DOE-STD March 1997: Application of best available technology for radioactive effluent control

DOE-STD-ALARA 1 draft: Applying the ALARA process for radiation protection of the public and environmental compliance with 10 cfr part 834 and doe 5400.5 ALARA program requirements

DOE-STDE-ALARA 2 draft April 1997: Applying the ALARA process for radiation protection of the public and environmental compliance with 10 cfr part 834 and doe 5400.5 ALARA program requirements

DOE HDBK-XXXX-97 JUNE 1997: Draft handbook for controlling release for reuse or recycle of non-real property containing residual radioactive material

DOE XXXX: Draft, Environmental Implementation guide for radiological survey procedures, February 1997

ANL/EAD/TM-92: Protocol for development of authorized release limits for concrete at US department of energy sites

ANL/EAD/TM-94: Concrete release protocol case studies for decommissioning work at the Idaho national engineering and environmental laboratory

DOE G 435.1-1 IV Implementation Guide for use with DOE M 435.1-1,7-09-99, Chapter IV Low-Level Waste Requirements.

US DOE 1997 Draft Handbook for Controlling Release for Reuse or Recycle of Property Containing Residual Radioactive Materials, Office of Environmental Management, Germantown, MD, March 1997.

DOE G 441.1-XX-XX-02, Implementation Guide, Control and Release of Property with Residual Radioactive Material, for use with DOE 5400.5, *Radiation Protection of the Public and the Environment*, April 2002

DOE Memos and Directives

Memorandum 2001-001288, January 19, 2001, Managing the Release of Surplus and Scrap Materials.

Department of Energy press release: Secretarial Announcement Blocking Nickel Recycling at Oak Ridge and "prohibiting the release of all volumetrically contaminated metals" Jan. 12, 2000

Department of Energy press release: Secretarial Announcement of Suspension of Release of Materials (Metals) from DOE Facilities July 13, 2000

DOE Secretarial Memo on Release of Surplus and Scrap Materials July 13, 2000

6450-01-P: DOE Record of decision for the DOE's waste management program: Treatment and Disposal of Low-Level waste and mixed low-level waste; Amendment of the record of decision for the Nevada test site.

DOE memos: Secretarial moratorium memoranda 1999-July 2001

DOE recycle policy 2000 carbon steel

DOE use of recycling revenue for pollution prevention 1999

NRC/DOE MOU Concerning the Management of Sealed Sources

Environmental Protection Agency

EPA Background Information Document and Technical Support Documents, draft and final: Draft Technical Support Document (TSD) (3 volumes) July 1997
Draft Cost Benefit Analysis June 1997
Final TSD 3 volumes Sept 2001

Accessible (as of May 2007) at www.epa/radiation/cleanmetals:

Technical Support Document, *Potential Recycling of Scrap Metal from Nuclear Facilities* (*Part 1: Radiological Assessment of Exposed Individuals*), Volumes 1-3, Anigstein, R., W.C. Thurber, J.J. Mauro, S.F. Marschke and U.H. Behling, S. Cohen and Associates, prepared for US EPA Office of Radiation and Indoor Air, Deborah Kopsick, under contract 1-W-2603-LTNX; September 2001

Radiation Protection Standards for Scrap Metal: Preliminary Cost-Benefit Analysis prepared for Radiation Protection Division, Office of Radiation and Indoor Air, US EPA under contract numbers 68-D4-0102 and 0155, June 1997

Environmental Protection Agency and Department of Energy Reference documents compiled by EPA for DOE on radioactive release and clearance

<u>Fil</u>	e <u>Date</u>	Subject
A	1999	Evaluation of Guidelines for Exposure to TENORM, NAS NRC-preliminary
		conclusions
В	1-21-99	RESRAD Recycle Computer Model Argonne National Labs
C	1998	Radiation Protection 89 European Commission Directorate, Recommends
_		Guidelines for recycling metal from dismantling nuclear installations
D	12-98	NUREG 1640 NRC 2 Volumes SAIC Assessments of clearing equipment and materials from nuclear facilities
Е	6-98	Final Draft Report on Recycling Scrap Metals from Nuclear Facilities
_	0 7 0	Sensitive Industries (Cohen and Assoc for EPA)
F	6-98	Draft Report comparing EPA TSD doses to IAEA doses (Cohen &Assoc)
G	5-98	Compares Health Impacts of Recycling vs. Disposal of Radioactive Metal
		(Cohen and Assoc for EPA)
Η	5-98	Direct Disposal in RCRA Permitted Landfill (Cohen and Assoc for EPA)
I	4-98	Draft Report – doses from personal devices such as hip replacement joints,
		braces and baby strollers
J	3-98	ALARA effect reducing collective impacts of recycling
K	9-97	collective low dose scenarios (SC&A)
L	9-97	Uncertainty analysis of dilution using unique geographic analysis (SC&A)
M	9-97	Models 17 RMEI steel scenarios w/ 40 radionuclides, ltg scenario, PRA
N	9-97	Assesses doses and risks from non-ferrous metals (Al, Cu, Ni, Stainless
		Steel, silver and gold (SC&A)
O	9-97	Doses for Alternative "Low Dose" Scenarios
P	7-97	Dose + Risk for Reuse Scenarios, estimates doses from RG 1.86 <10 mr/y
Q	3-97	Descriptions of dilution of scrap metal from n facilities, exposure
		scenarios, leaching of rads from slags, doses and risks to MEIs by
_	2.05	scenario, uncertainties in recycling evaluations
R	3-97	Characterizes metal industries and inventories in US, aluminum, copper scrap,
		radionuclides for impact assessments, distribution during melting of Carbon
C	2.07	steel, distribution of contaminants
S	3-97 3-97	Technical document
T		Vulnerable Industries Analysis of No. Action, Sefectorese Buriel, Bestrieted Bestrele
U	8-96	Analysis of No Action, Safestorage, Burial, Restricted Recycle,
V	8-95	Restricted Recycling cost benefits of recycling
W	8-95	Assumptions for cost benefit anlyses done in V
X	8-95	Technical support for cost benefits
Y	1987-89	Comments of NRC Advisory Committee on Nuclear Wastes and Advisory
1	1701-07	Committee on Reactor Safety on previously proposed BRC policy
		Committee on reactor barety on previously proposed bive poney

Health Physics Society and American National Standards Institute

American National Standards Institute, ANSI/HPS N13.12-1999, "Surface and Volume Radioactivity Standards for Clearance." published by the Health Physics Society, August 31, 1999.

International Atomic Energy Agency, and other international resources

European Council (EC) Directive 96/29/Euratom of 13 May 1996.

EC Directive 96/29/Euratom Critique at http://www.llrc.org/regulation/subtopic/brifsept.htm

INTERNATIONAL ATOMIC ENERGY AGENCY Exemption of Radiation Sources and Practices from Regulatory Control. IAEA TEC DOC 401, 1987

INTERNATIONAL ATOMIC ENERGY AGENCY, Principles for the Exemption of Radiation Sources and Practices from Regulatory Control, Safety Series No. 89, IAEA, Vienna, 1988

INTERNATIONAL ATOMIC ENERGY AGENCY, Application of Exemption Principles to the Recycle and Reuse of Materials from Nuclear Facilities. IAEA Safety Series No 111P1. 1, Vienna, 1992

INTERNATIONAL ATOMIC ENERGY AGENCY publication, *Application of Exemption Principles to the Recycle and Reuse of Materials from Nuclear Facilities*, (Safety Series No. 111-P-1.1, ISBN 92-0-104992-7), 1992

INTERNATIONAL ATOMIC ENERGY AGENCY, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (jointly sponsored by FAO, IAEA, ILO, OECD/NEA, PAHO and WHO), Safety Series No. 115, IAEA, Vienna, 1996

INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Material, 1996 Edition, Safety Standards Series No. ST-1, IAEA, Vienna, 1996

INTERNATIONAL ATOMIC ENERGY AGENCY, Clearance Levels for Radionuclides in Solid Materials, Application of Exemption Principles, Interim report for comment, IAEA-TECDOC-855, Vienna, 1996

Proceedings of a Specialists' Meeting on Application of the concepts of Exclusion, *Exemption and Clearance: Implications for the Management of Radioactive Materials*. IAEA, Vienna, May 6-9, 1997

INTERNATIONAL ATOMIC ENERGY AGENCY, Clearance of Materials Resulting from the Use of Radionuclides in Medicine, Industry and Research, IAEA-TECDOC- 1000, Vienna, 1998

MARSSIM, MARSAME (DOD, DOE, EPA, NRC)

NUREG-1575 Revision 1, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, Aug. 2000 [ML003761476]

Nuclear Regulatory Commission NUREG-1575, Environmental Protection Agency EPA 402-R97-016. *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, December 1997.

NUREG-1575, Supp. 1 EPA 402-R-06-002 DOE/EH-707 Multi-Agency Radiation Survey & Assessment of Materials & Equipment Manual (MARSAME), Draft Report for Comment, Dec. 2006

DOD, DOE, NRC, EPA Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME) [Docket No. EPA-HQ-OAR-2006-0957] 72 Federal Register 9:1708, January 16, 2007

National Academy of Sciences

The Disposition Dilemma: Controlling the Release of Solid Materials from Nuclear Regulatory Commission-Licensed Facilities, Committee on Alternatives for Controlling the Release of Solid Materials from US NRC-Licensed Facilities, Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences, National Research Council, National Academy of Sciences, National Academy Press, Washington, D.C., 2002.

Improving the Regulation and Management of Low-Activity Radioactive Wastes, Committee on Improving Practices for Regulating and Managing Low-Activity Radioactive Waste, Nuclear and Radiation Studies Board, Division on Earth and Life Studies, National Research Council of the National Academies of Science, National Academies Press, Washington, D.C. 2006

Nuclear Regulatory Commission

NUREG-0518, Draft Environmental Statement concerning proposed rulemaking exemptions from licensing requirements for smelted alloys containing residual technetium-99 and low-enriched uranium. Office of Standards Development, October 1980

NUREG-1507, Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions, Draft Report for Comment, Office of Nuclear Regulatory Research, August 1995

NUREG-1727, "NMSS Decommissioning Standard Review Plan," September 2000

NUREG 1640, Volumes 1 & 2, Radiological Assessments for Clearance of Equipment and Materials From Nuclear Facilities, June 2003

NUREG-1640 V2 Radiological Assessments for Clearance of Materials from Nuclear Facilities: Appendices A through E, Oct. 2004, [ML04309].

NUREG-1640 V3 Radiological Assessments for Clearance of Materials From Nuclear Facilities: Appendices F and G, June 2003, [ML032250706].

NUREG-1640 V4 Radiological Assessments for Clearance of Materials from Nuclear Facilities: Appendices H through O, May 2004, [ML041550973].

NRC Staff Requirements - SECY-98-028 – Regulatory Options for Setting Standards on Clearance of Materials and Equipment Having Residual Radioactivity, June 30, 1998.

NRC Staff Requirements Memo SRM -SECY-02-0133-Control of Solid Materials: Options and Recommendations for Proceeding, October 2002.

NUREG-1717 Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials. June 2001.

NUREG/CR-6682 Summary and Categorization of Public Comments on the Control of Solid Materials, September 2000 [ML00375].

NUREG-1736 Draft for Comment Consolidated Guidance About Materials Licenses: Consolidated Guidance: Standards for Protection Against Radiation in 10 CFR Part 20, Sept. 2000, [ML003766447].

NUREG-1761 Draft for Comment Radiological Surveys for Controlling Release of Solid Materials July 2002, [ML022320121].

NRC-04-01-049: SC&A Contract; Inventory of Materials with very low levels of radioactivity potentially clearable from various types of facilities

NUREG/CR-5849, ORAU-92/C57 Manual for Conducting Radiological Surveys in Support of License Termination, Draft Report for Comment, J.D. Berger, Oak Ridge Associated Universities, prepared for US NRC Division of Regulatory Applications, Office of Nuclear Regulatory Research, June 1992

NUREG/CR-5512, Residual Radioactive Contamination from Decommissioning, Technical Basis for Translating Contamination Levels to Annual Total Effective Dose Equivalent, Final Report, Office of Nuclear Regulatory Research, October 1992

NRC Response to FOIA 2005-0293 regarding 10 CFR 20.2002 requests, May 11, 2006

Radiation Studies

Morgan, Karl Z., "Cancer and low level ionizing radiation" *The Bulletin of the Atomic Scientists*. September 1978.

Bertell, Rosalie, *No Immediate Danger? Prognosis for a Radioactive Earth.* Women's Educational Press, Toronto, Ontario. 1985: 45. isbn 0-88961-092-4

Caufield, Catherine. *Multiple Exposures: Chronicles of the Radiation Age*. Harper and Row, New York. 1989: 48. isbn 0-06-015900-6.

Gofman, John and Egan O'Connor, *Radiation-Induced Cancer from Low-Dose Exposure: An Independent Analysis*. Committee for Nuclear Responsibility, Inc.1990:18-16, 18-18. Isbn 0-932682-89-8.

Garloch, Karen. "Repeated low radiation doses hike leukemia risk, UNC study finds." *The Charlotte Observer*. Wednesday, March 20, 1991

Kneale, G.W. and Alice Stewart, "Reanalysis of Hanford Data: 1944-1986 Deaths." *American Journal of Industrial Medicine*. 23:371-389, 1993

Little, M.P. and C.R. Muirhead, "Curvilinearity in the Dose-Response Curve for Cancer in Japanese Atomic Bomb Survivors." *Environmental Health Perspectives*. 105 (6): 1505, 1997

Wright, Eric, "Chromosomal instability in the descendants of unirradiated surviving cells after alpha particle irradiation." *Proc. Natl. Acad. Sci. USA*.95: 5730, 1998

Epidemiology:

Stewart, A.M., et al. "Radiation Exposures of Hanford Workers Dying from Cancer and Other Causes." *Health Physics*. Nov. 1977

Stewart, A.M, et al. "Delayed Effects of A-bomb radiation: a review of recent mortality rates and risk estimates for five-year survivors." *Journal Epidemiology and Community Health*. 36(2):80-6, 1982

Morgenstern, H., et al. "Epidemiologic Study to Determine Possible Adverse Effects to Rocketdyne/Atomic International Workers from Exposure to Ionizing Radiation" Report by the UCLA School of Public Health, September 1997

Wing, S., et al. "Mortality Among Workers at Oak Ridge National Laboratory." *JAMA*, 26 (11):1397, 1991

Cell studies:

Lorimore, S. A., Wright, E et. al. "Chromosomal Instability in the descendants of unirradiated surviving cells after alpha particle irradiation." *Proc. Natl. Acad. Sci. USA*. 95: 5730-5733, 1998

Other:

European Committee on Radiation Risk--Comité Européen sur le Risque de l'Irradiation, 2003 Recommendations of the ECRR: The Health Effects of Ionising Radiation Exposure at Low Doses and Low Dose Rates for Radiation Protection Purposes: Regulators' Edition Edited by Chris Busby with Rosalie Bertell, Inge Schmitz-Feuerhake, Molly Scott Cato and Alexei Yablokov, published on behalf of ECRR by Green Audit, Brussels, 2003. ISBN: 1 897761 24 4

Kadhim, M. A., Wright E. et al. "Transmission of chromosomal instability after plutonium alpha particle irradiation." *Nature*. 355:738, 1992

Southwest Research and Information Center, "Uranium Legacy." *The Workbook*, v8, no6. Albuquerque, NM, 1983

Morris, M. and R. Knorr, *The Southeastern Massachusetts Health Study 1978-1986-Report of the Massachusetts Department of Public Health*. October 1990. See also: Clapp R. Cobb S. et al. "Leukemia Near Massachusetts Nuclear Power Plant." Letter in *Lancet*. December 5, 1987

Wing, S. and D. Richardson et al. "A Reevaluation of Cancer Incidence Near the Three Mile Island Nuclear Power Plant: The Collision of Evidence and Assumptions." *Environmental Health Perspectives*, v 105, no 1. National Institutes of Health. Bethesda, Maryland, Jan. 1997

Hatch, M. et al. "Background Gamma Radiation and Childhood Cancers Within Ten Miles of a US Nuclear Power Plant." *International Journal of Epidemiology*, v 19, no 3. 1990.

Hudson, R.L. "Child Cancers Found to Rise Near Chernobyl." The Wall Street Journal. September 3, 1992. The article quoted was published in *Nature* on the same day and was researched by the World Health Organization.

Rupert, J. "Illness Tied to Disaster Still on Rise." The Washington Post. June 24, 1995. The reporter was quoting Britain's Imperial Cancer Research Fund, The Ukrainian Health Ministry and the United Nations, 1995.

Wing S. Shy C. et al. "Mortality Among Workers at Oak Ridge National Laboratory: Evidence of Radiation Effects in Follow-up Through 1984." *JAMA*, v 265 no 11, March 20, 1991

Mancuso, T.F., A. Stewart and G. Kneale "Radiation Exposures of Hanford Workers Dying From Cancer and Other Causes." *Health Physics*, v 33. Pergamon Press, Great Britain, November 1977.

Roman, E. et al. "Case-control Study of Leukemia and Non-Hodgkin's Lymphoma Among Children Aged 0-4 years Living in West Berkshire and North Hampshire Health Districts." *BMJ* 1993 #306, 1993

Sorahan, T. and P.J. Roberts, "Childhood Cancer and Paternal Exposure to Ionizing Radiation: Preliminary Findings From the Oxford Survey of Childhood Cancers." *American Journal of Industrial Medicine*, v 23: 343-354, 1993

Kendall, G.M. et al. "Mortality and Occupational Exposure to Radiation: First Analysis of the National Registry for Radiation Workers." *BMJ* v 304: 220-5, 1992

Viel, J.F. and D. Pobel, "Incidence of Leukaemia in Young People Around the La Hague Nuclear Waste Reprocessing Plant: A Sensitivity Analysis." *Statistics in Medicine*, v 14: 2459-2472, 1995

Gardner et al. "Results of Case-control Study of Leukemia and Lymphoma Among Young People Near Sellafield Nuclear Plant in West Cumbria." *BMJ* v 300, February 17, 1990

Heasman et al. "Childhood Leukemia in Northern Scotland." Lancet, v 1:266, 1986

Morgenstern, H. and J. Froines, "Epidemiologic Study to Determine Possible Adverse Effects to Rocketdyne/Atomics International Workers from Exposure to Ionizing Radiation." State of California Health and Welfare Agency, June 1997

Johnson, C.J. "Cancer Incidence in an Area of Radioactive Fallout Downwind From the Nevada Test Site." JAMA, v 251 n 2: 231-6, January 13, 1984

Ortmeyer P., Makhijani A. "Let Them Drink Milk." *The Bulletin of the Atomic Scientists*, Nov/Dec. 1997

Bishop, J.E. "Study Links Breast Cancer Treatment to Higher Risk of the Disease in Lungs." *The Wall Street Journal*, May 14, 1993: B6.

Kneale, G.W. and A.M. Stewart, "Childhood Cancers in the UK and their Relation to Background Radiation" *Radiation and Health*, 1987

Nuclear Information and Resource Service radiation fact sheets at www.nirs.org/radiation

RESRAD (DOE and NRC)

RESRAD Family of Codes available online at http://web.ead.anl.gov/resrad/home2/ Environmental Assessment Division Argonne National Laboratory operated by the University of Chicago, under Contract W-31-109-Eng-38, for the United States Department of Energy.

RESRAD 5.0, 6.3 RESRAD-BUILD 3.3 RESRAD-BIOTA 1.21 RESRAD-RECYCLE 3.10 RESRAD Benchmarking Against Six Radiation Exposure Pathway Models, ANL/EAD/TM-24, Faillace, E.R., Cheng, J. J., Yu, C. Environmental Assessment Division, Argonne National Laboratory, 9700 south Cass Avenue, Argonne, Illinois, October 1994

Validation of dose Calculation Programmes for Recycling, Menon, Shankar, Brun-Yaba, Christine, Yu, Charley, Cheng, Jing-Jy, Bjerler, Jan, Williams, Alexander, Statens Stralskyddsinstitut, Swedish Radiation Protection Authority, SSI Rapport (SSI report). 2002-3

ANL/EAD-TM-50, Evaluation of Radioactive Scrap Metal Recycling, Environmental Assessment Division Argonne National Laboratory USDOE Office of Environmental Restoration, Argonne's Decision and Information Sciences Division and Reactor Engineering Division, Argonne, Illinois. Dec. 1995

ANL/EAD/LD-2, "Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD, Version 5.0, Working Draft for Comment, Argonne National Laboratory, Sept. 1993

NUREG/CR-6676 Probabilistic Dose Analysis Using Parameter Distributions Developed For RESRAD and RESRAD-BUILD Codes, July 2000 [ML003741920]

NUREG/CR-6697 Development of Probabilistic RESRAD 6.0 and RESRAD-BUILD 3.0 Computer Codes, Dec. 2000 [ML010090284]

Tennessee Department of Environmental Conservation

Tennessee State Regulations for Protection Against Radiation, TDEC Chapter SRPAR 12-2-10 Licensing and Registration.

TDEC Department of Environment and Conservation, Solid Waste Permit Status at Radiological Facilities, Memorandum of Agreement, 2006.

TDEC White Paper, Evaluation and Acceptance of Licensee Requests for the Disposal of Materials with Extremely Low Levels of Contamination in Class D Landfills, September 2006.

Research at, interviews and correspondence with Tennessee Department of Environment and Conservation Divisions of DOE Oversight, Radiological Health and Solid Waste.