

PUBLIC ACCESS MATERIALS

COMMITTEE TO ASSESS THE HEALTH IMPLICATIONS OF PERCHLORATE INGESTION

1. EPA External Review Draft of *Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization* (January 2002).
2. Perchlorate Toxicology Assessment References for 2002 EPA Internal Review Draft.
3. Compilation of Public Comments Received by EPA on its 2002 External Review Draft of *Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization*. (Available at <http://www.epa.gov/ncea/perchlorate/comments/>)
4. References Associated with Disposition of Comments on the 2002 EPA External Review Draft (*Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization*) and Recommendations for Revisions Document. (Available at <http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=72117>)
5. Disposition of Comments and Recommendations for Revisions to 2002 EPA External Review Draft of *Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization*. (Available at <http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=72117>)
6. Department of Defense Submission for the NAS Perchlorate Review. September 26, 2003.
7. Report on the Peer Review of EPA's 2002 External Review Draft (available at <http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=51762>).
8. Letter from the Center for Occupational/Environmental Risk Analysis & Management, College of Public Health, University of South Florida to NASA. Review of Proposed U.S. EPA DWEL for Perchlorate. December 10, 2003.
9. One-pager on FDA activities related to Perchlorate in Food.
10. Chang, S., C. Crothers, S. Lai, and S. Lamm. 2003. Pediatric neurobehavioral diseases in Nevada counties with respect to perchlorate in drinking water: An ecological inquiry.
11. S.H. Lamm. November 2003. Perchlorate exposure does not explain differences in neonatal thyroid function between Yuma and Flagstaff. Letters to the Editor. JOEM. Vol. 45, No. 11.

12. Strawson, J., Q. Zhao, and M. Dourson. Reference dose for perchlorate based on thyroid hormone change in pregnant women as the critical effect. (available at www.tera.org/perchlorate/welcome.htm)
13. Farland, W.H. and A.M. Jarabek. 2003. Perchlorate Risk Characterization: U.S. EPA Technical Perspectives. Slides of presentation made to committee on October 27, 2003, Washington, DC.
14. Authors: EPA External Review Draft and Response to Comments: *Perchlorate Environmental Contamination: Toxicological Review and Characterization*. Biographical information provided to committee on October 27, 2003.
15. Rogers, D. 2003. Presentation of Col. Daniel Rogers, USAF, to the National Academy of Science Committee to Assess the Health Implications of Perchlorate Ingestion. October 27, 2003, Washington, DC.
16. Mattie, D.R. 2003. Toxicity and Risk Assessment of Perchlorate from a DoD Perspective. Slides of presentation made to committee on October 27, 2003, Washington, DC.
17. Dominguez, O. 2003. NASA's Perspectives on Perchlorate. A Briefing to the National Academies of Sciences. Slides of presentation made to committee on October 27, 2003, Washington, DC.
18. Troxell, T. 2003. FDA Perspective on Perchlorate. Slides of presentation made to committee on October 27, 2003, Washington, DC.
19. Schneider, T.R. 2003. Remarks before the National Research Council Committee to Assess the Health Implications of Perchlorate Ingestion. A Congressional Perspective. Slides of presentation made to committee on October 27, 2003, Washington, DC.
20. Tolman, J. 2003. Perchlorate Risk Assessment. Slides of presentation made to committee on October 27, 2003, Washington, DC.
21. Borak, J. 2003. Slides of presentation made to committee on October 27, 2003, Washington, DC.
22. The Perchlorate Study Group. 2003. Summary of Expert Comments for the National Academy of Sciences (NAS) Committee to Assess the Health Implications of Perchlorate Ingestion. Material provided to committee on October 27, 2003.
23. Sass, J., G. Solomon, and E. Olson. 2003. Comments on behalf of the Natural Resources Defense Council, Health and Environment Program. Slides of presentation made to committee on October 27, 2003, Washington, DC.

24. Sass, J., G. Solomon, and E. Olson. 2003. Comments on behalf of the Natural Resources Defense Council, Health and Environment Program, Washington, DC. Material provided to committee on October 27, 2003.
25. Gibbs, J.P. 2003. Comments on behalf of Kerr-McGee Chemical LLC. Material provided to committee on October 27, 2003.
26. Gibbs, J.P. October 2003. Perchlorate, Thiocyanate, and Nitrate. Inhibition of iodine uptake by the NIS and resulting thyroid effects: A side by side comparison of the scientific literature. Includes full text references. Material provided to committee on October 27, 2003.
27. Transcript of the First Meeting of the NAS Committee to Assess the Health Implications of Perchlorate Ingestion. *NOTE: This is an unedited verbatim transcript of the first meeting of the Committee to Assess the Health Implications of Perchlorate Ingestion and is not an official report of National Academy of Sciences, National Academy of Engineering, Institute of Medicine, or National Research Council (collectively "National Academies"). Opinions and statements included in the transcript are solely those of the individual persons or participants at the meeting, and are not necessarily adopted or endorsed or verified as accurate by the National Academies.*
28. Consultants in Veterinary Pathology. 2003. Hormone, Thyroid and Neurohistological Effects of Oral (Drinking Water) Exposure to Ammonium Perchlorate in Pregnant and Lactating Rats and in Fetuses and Nursing Pups Exposed to Ammonium Perchlorate During Gestation or *via* Maternal Milk. Morphometry Review Report, Task 1 – Review of Selective Morphometric Data from F1 Generation Day 22 Postpartum Rats, Including New Morphometric Data Obtained from Additional Step Sections. In-life Testing Facility – Argus Research Laboratories, Inc. Original Study Sponsor – Perchlorate Study Group. Sponsor of Additional Morphometric Evaluations – U.S. Environmental Protection Agency. February 3, 2003.
29. Environmental Study Group (ESG). Perchlorate Testing Program – First Test Results. Document dated October 13, 2003 forwarded by George Seaver, ESG.
30. Gibbs, J.P. 2003. Study of the Thyroid Status among Pregnant Women in Northern Chile. Document forwarded by Joan Strawson, Jay Zhao, and Michael Dourson on October 31, 2003.
31. Dourson, M. and C. Bittner. 2003. Includes (a) comments by Christopher Bittner, Utah Department of Quality, on the October 2003 Draft of the *Reference Dose for Perchlorate Based on Thyroid Hormone Change in Pregnant Women as the Critical Effect* and (b) e-mail exchange (questions and responses) between Michael Dourson, an author on the draft report, and Christopher Bittner.

32. Pedersen, I.B., N. Knudsen, T. Jørgensen, H. Perrild, L. Ovesen, and P. Laurberg. 2002. Large differences in incidences of overt hyper- and hypothyroidism associated with a small difference in iodine intake: A prospective comparative register-based population survey. *Journal of Clinical Endocrinology and Metabolism* 87(10): 4462-4469.
33. Wolf, D. 2000. Report of the peer review of the thyroid histopathology from rodents and rabbits exposed to ammonium perchlorate in the drinking water. U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Environmental Carcinogenesis Division. Memorandum dated May 5, 2000.
34. Wolf, D. 2001. Erratum to the report of the peer review of the thyroid histopathology from rodents and rabbits exposed to ammonium perchlorate in the drinking water. U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Environmental Carcinogenesis Division. Memorandum dated October 26, 2001
35. Slides of rat thyroid illustrating ammonium perchlorate induced hypertrophy, hyperplasia, and adenoma. Slides received from Douglas Wolf on November 24, 2003.
36. Kelsh, M.A., P.A. Buffler, J.J. Daaboul, G.W. Rutherford, E.C. Lau, J.C. Barnard, A.K. Exuzides, A.K. Madl, L.G. Palmer, and F.W. Lorey. 2003. Primary congenital hypothyroidism, newborn thyroid function, and environmental perchlorate exposure among residents of a southern California community. *Journal of Occupational and Environmental Medicine* 45(10): 1116-1127.
37. Lamm, S.H. 2003. Perchlorate Exposure does not explain differences in neonatal thyroid function between Yuma and Flagstaff. *Journal of Occupational and Environmental Medicine* 45(11): 1131-1132.
38. Chang, S., C. Crothers, S. Lai, and S. Lamm. 2003. Pediatric neurobehavioral diseases in Nevada counties with respect to perchlorate in drinking water: An ecological inquiry. *Birth Defects Research (Part A)* 67: 886-892.
39. Brechner, R.J., G.D. Parkhurst, W.O. Humble, M.B. Brown, and W.H. Herman. 2000. Ammonium perchlorate contamination of Colorado River drinking water is associated with abnormal thyroid function in newborns in Arizona. *Journal of Occupational and Environmental Medicine* 42(8): 777-782.
40. Siegel, L. 2003. Perchlorate in rocket fuel: A broader view. Comments received from Lenny Siegel, Executive Director, Center for Public Environmental Oversight, December 2003.

41. Montgomery, E. Letter from Errol L. Montgomery (Errol L. Montgomery & Associates, Inc.) to Ellen K. Mantus, National Academy of Sciences dated December 4, 2003. Regarding information cited in Crump et al. (2000).
42. Gibbs, J., S. Lamm, and O. Soldin. Comments on EPA's analysis of the occupational studies in the 2002 Draft and Park 2001. Comments submitted to National Research Council on December 9, 2003.
43. Gibbs, J. and K. Crump. Analysis of the September 23, 2003 memorandum from Allan H. Marcus to Annie M. Jarabek entitled "Review of Original Statistical Methods and Alternate Analyses for Ecological Epidemiological Study of Crump et al. (2000)". Comments submitted on behalf of the Perchlorate Study Group to National Research Council on December 9, 2003.
44. Crump, K. Benchmark Analysis for the Perchlorate Inhibition of Thyroidal Radioiodine Uptake. Document submitted on behalf of the Perchlorate Study Group to National Research Council on December 9, 2003.
45. Compilation of Public Comments Received by the U.S. EPA But Not Addressed in the 2003 Disposition. Comments submitted to National Research Council from Perchlorate Study Group on December 9, 2003.
46. Greer, M.A., G. Goodman, R.C. Pleus, and S.E. Greer. 2002. Health effects assessment for environmental perchlorate contamination: The dose response for inhibition of thyroidal radioiodine uptake in humans. *Environmental Health Perspectives* 110(9): 927-937.
47. Correction to Greer et al. (2002) published in *Environmental Health Perspectives* 110(10): A564.
48. Gibbs, J. and J. Borak. Potential confounding of rodent studies due to interaction between soy diet and iodine intake. Comments submitted to National Research Council on behalf of the Perchlorate Study Group on December 9, 2003.
49. Wickman, R. E-mail received from Richard Wickman (NASA) on November 24, 2003, providing correction to the transcript of public session for the Committee to Assess the Health Implications of Perchlorate Ingestion held October 27, 2003.
50. Pearce, E. E-mail received from Elizabeth Pearce on December 5, 2003, providing unpublished data from iodine studies in healthy women and in pregnant women from the Boston Medical Center Obstetric Clinic.
51. Pearce, E. E-mail received from Elizabeth Pearce on December 10, 2003, providing additional information on the iodine levels in pregnant women from the Boston Medical Center Obstetric Clinic.

52. Clewell, R.A., E.A. Merrill, L. Narayanan, J.M. Gearhart, and P.J. Robinson. Evidence for competitive inhibition of iodide uptake by perchlorate and translocation of perchlorate into the thyroid. Pre-print, December 2003.
53. Dourson, M. E-mail received from Michael Dourson (TERA) on December 12, 2003, providing a slide of poster presented at the Society for Risk Analysis showing that a PBPK model can be developed for different life stages in humans and can be used to predict doses for inhibition of iodine uptake in the fetus.
54. Schwartz, H. 2003. The Role of Thyroid Hormone in Mammalian Brain Development and the Argus Studies. Slides of presentation made to committee on December 12, 2003, in Irvine, CA.
55. Clewell, R. 2003. Assessing Risks from ClO_4^- Exposure Based in Inhibition of Iodide Uptake – A PBPK Approach. Slides of presentation made to committee on December 12, 2003, in Irvine, CA.
56. Wolf, D. 2003. Peer Review and Pathology Assessment of Perchlorate-Induced Lesions. Slides of presentation made to committee on December 12, 2003, in Irvine, CA.
57. Juraska, J. 2003. Changes in Brain Morphology and Their Significance. Slides of presentation made to committee on December 12, 2003, in Irvine, CA.
58. De Rosa, C. 2003. Technical Perspectives on Perchlorates. Slides of presentation made to committee on December 12, 2003, in Irvine, CA.
59. Wahlsten, D. 2003. Perchlorate Effect on Rat Corpus Callosum: Fact or Artifact? Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
60. Sanderson, S. 2003. The Perchlorate State-of-the-Science Symposium. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
61. Elberger, A.J. 2003. Omaha Perchlorate Meeting – Module A. Analysis and Interpretation of Neurodevelopmental Rat Brain Morphometry Studies. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
62. Donnelly, K.C. 2003. Module C – Adequacy and Relevance of Human Data. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
63. Lewis, S.C. 2003. Summary Report from UNMC Symposium Module D: Assessment/Differentiation of *Adverse*, *Adaptive*, and *Pre-adaptive* Effects. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.

64. Hagemann, M. 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
65. Ting, D. 2003. Human Health Risk Assessment of Perchlorate. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
66. (a) Buffler, P. 2003. Perchlorate Exposure and Effects on Newborns: An Analysis of California Newborn Screening Data. Slides of presentation made to committee on December 13, 2003, in Irvine, CA. (b) Buffler, P. 2003. Perchlorate Exposure and Effects on Newborns: An Analysis of California Newborn Screening Data. Revisions to slides of presentation made to committee on December 13, 2003, in Irvine, CA.
67. Borak, J. 2003. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
68. Pleus, R. 2003. The Dose Response for Perchlorate Inhibition of Thyroidal Radioiodine Uptake in Human Volunteers. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
69. Crump, K. 2003. Comments to NRC Committee to Assess the Health Implications of Perchlorate Ingestion. Slides of presentation made to committee on December 13, 2003, in Irvine, CA.
70. Garman, R.H., A.S. Fix, B.S. Jortner, K.F. Jensen, J.F. Hardisty, L. Claudio, and S. Ferenc. 2001. Methods to identify and characterize developmental neurotoxicity for human health risk assessment. II: Neuropathology. *Environmental Health Perspectives* 109(1): 93-100.
71. Rodier, P.M. and W.J. Gramann. 1979. Morphologic effects of interference with cell proliferation in the early fetal period. *Neurobehavioral Toxicology* 1: 129-135.
72. Hooth, M.J., A.B. DeAngelo, M.H. George, E.T. Gaillard, G.S. Travlos, G.A. Boorman, and D.C. Wolf. 2001. Subchronic sodium chlorate exposure in drinking water results in a concentration-dependent increase in rat thyroid follicular cell hyperplasia. *Toxicologic Pathology* 29(2): 250-259.
73. EPL (Experimental Pathology Laboratories). Appendix A: PWG consensus diagnoses for individual animals reviewed in each group. *From: Mann, P.C. 2000. The Effects of Ammonium Perchlorate on Thyroids: Pathology Working Group Report. May 4, 2000.*
74. 2003 Water Quality Report (with data from calendar year 2002). Irvine Ranch Water District. PWS ID#: CA3010092.

75. Perchlorate Study Group. Comments to the Committee to Assess the Health Implications of Perchlorate Ingestion [BEST-K-03-05-A]. Regarding EPA's analysis and disposition of the human studies and public comments made to EPA regarding the human studies. On behalf of the Perchlorate Study Group, December 11, 2003, Irvine, CA.
76. Torres, R. Letter received from Raymond Torres, Tribal Chairman, The Torres Martinez Desert Cahuilla Indians dated December 5, 2003. Regarding perchlorate contamination in drinking water wells on the Torres Martinez Indian Reservation.
77. Croft, T. 2003. Overview of Las Vegas Valley Perchlorate Remedial Efforts. Information provided by Todd Croft (Nevada Division of Environmental Protection) to committee on December 13, 2003, in Irvine, CA.
78. Praglin, G.A. 2003. Fax received from Gary A. Praglin (Engstrom, Lipscomb, and Lack) on December 12, 2003. Kerr-McGee bulletin on ammonium perchlorate.
79. Wolf, D. 2003. E-mail received from Doug Wolf (EPA) on December 15, 2003, in response to questions raised at the public meeting of the Committee to Assess the Health Implications of Perchlorate on December 12, 2003, in Irvine, CA.
80. Wahlsten, D. 2003. Letter received from Douglas Wahlsten (University of Alberta) dated December 15, 2003, regarding brain morphometry and the perchlorate review at UC Irvine.
81. Wahlsten, D., F. Colbourne, and R. Pleus. 2003. A robust, efficient and flexible method for staining myelinated axons in blocks of brain tissue. *Journal of Neuroscience Methods* 123: 207-214.
82. Bishop, K.M. and D. Wahlsten. 1999. Sex and species differences in mouse and rat forebrain commissures depend on the method of adjusting for brain size. *Brain Research* 815: 358-366.
83. Gibbs, J.P. 2003. Letter received from John P. Gibbs (Kerr-McGee) dated December 16, 2003 that includes responses from Dr. Tellez regarding issues of confounding in the Crump et al. (2000) study raised in Park (2001) and Marcus 2003a memos.
84. Koller, L. 2003. E-mail received from Loren Koller on December 18, 2003, that provides responses to EPA's comments for rejecting the recommendations of the 2002 Peer Review Study Panel on the immunotoxicology of perchlorate.
85. (a) Transcript of the Second Meeting of the NAS Committee to Assess the Health Implications of Perchlorate Ingestion (December 12, 2003). *NOTE: This is an*

unedited verbatim transcript of the second meeting of the Committee to Assess the Health Implications of Perchlorate Ingestion and is not an official report of National Academy of Sciences, National Academy of Engineering, Institute of Medicine, or National Research Council (collectively "National Academies"). Opinions and statements included in the transcript are solely those of the individual persons or participants at the meeting, and are not necessarily adopted or endorsed or verified as accurate by the National Academies.

(b) Transcript of the Second Meeting of the NAS Committee to Assess the Health Implications of Perchlorate Ingestion. (December 13, 2003). *NOTE: This is an unedited verbatim transcript of the second meeting of the Committee to Assess the Health Implications of Perchlorate Ingestion and is not an official report of National Academy of Sciences, National Academy of Engineering, Institute of Medicine, or National Research Council (collectively "National Academies"). Opinions and statements included in the transcript are solely those of the individual persons or participants at the meeting, and are not necessarily adopted or endorsed or verified as accurate by the National Academies.*

86. Dourson, M. 2004. E-mail received from Michael Dourson on January 2, 2004 regarding information discussed at the Perchlorate State of the Science Meeting.
87. EPA. 2004. Information received from EPA on programs, model specifications, and data for the Bayesian analysis of the motor activity data – (a) WinBugs (Bayesian software) program, (b) output from the Bayesian software, (c) model parameters or specifications, (d) S-Plus software program for reading data into the Bayesian program, and (e) motor activity data.
88. University of California. 2004. Three Scientific Peer Reviews of the Office of Environmental Health Hazard Assessment's December 2002 Draft Public Health Goal (PHG) Document on Perchlorate in California Drinking Water. January 2004.
89. Bishop, K.M. and D. Wahlsten. 1997. Sex differences in the human corpus callosum: Myth or reality? *Neuroscience and Biobehavioral Reviews* 21(5): 581-601.
90. Wahlsten, D. and B. Bulman-Fleming. 1994. Retarded growth of the medial septum: A major gene effect in acallosal mice. *Developmental Brain Research* 77: 203-214.
91. Rockette, H.E. and V.C. Arena. 1983. Mortality patterns of workers in the Niagra plant. Niagra Falls, NY: Occidental Chemical Corporation; microfiche no. OTS0537001.
92. Argus Research Laboratories, Inc. 2004. Micrograph images of thyroid sections of selected animals from the two-generation study conducted by Argus – Argus (1999).

93. (a) Cavaliere, E. 2004. Letter received from Ercole Cavaliere to Richard Johnston dated January 30, 2004 regarding transmission of the report of the Perchlorate State of the Science Symposium held September 29-October 1, 2003 in Omaha, NE. (b) Perchlorate State of the Science Symposium 2003: Report of the Planning Committee and Reports of the Expert Review Panels.
94. Dourson, M. E-mail received from Michael Dourson, TERA, on February 6, 2004. Attachment -- *Reference Dose for Perchlorate Based on Thyroid Hormone Change in Pregnant Women as the Critical Effect*. Available at <http://www.tera.org/perchlorate/welcome.htm>.
95. Wolf, D. E-mail received from Douglas Wolf, EPA, on February 19, 2004, regarding thyroid tumors in animals. Attachment – Slides of thyroid adenoma from Argus multi-generational study.
96. Jarabek, A. E-mail received from Annie Jarabek, EPA, on February 20, 2004, regarding thyroid tumors in animals.
97. Ladd, L. Numerous e-mails received from Larry Ladd, perchlorate awareness activist. (a) E-mail received on February 6, 2004, (b) E-mail received on February 6, 2004, (c) E-mail received on February 22, 2004, (d) E-mail received on February 23, 2004, (e) E-mail received on February 24, 2004.
98. Lamm, S. E-mail received from Steven Lamm, Consultants in Epidemiology and Occupational Health, on February 18, 2004, regarding EPA interpretation of Lawrence et al. data.
99. Dourson, M. E-mail received from Michael Dourson, TERA, on March 17, 2004. Attachment -- Update of Study of Pregnant Women in Three Cities in Northern Chile with Varying Levels of Environmental Perchlorate Exposure.
100. Dourson, M. E-mail received from Michael Dourson, TERA, on March 18, 2004. Attachment -- SOT poster presentation of the use of human and animal PBPK models in risk assessment for perchlorate.
101. Pearce, E. E-mail received from Elizabeth Pearce, on March 19, 2004, regarding unpublished data on urine and breast milk iodine levels in a small sample of Boston-area lactating women.
102. Jennings, A. Materials submitted by Allen Jennings, USDA. (a) Survey of lettuce for potential perchlorate accumulation. (b) Lettuce results from Dr. Sanchez. (c) Perchlorate Residues on Agricultural Produce Irrigated by Water from the Colorado River.
103. Perchlorate Study Group. March 17, 2004. Comments to the Committee to

Assess the Health Implications of Perchlorate Ingestion, regarding status of new research projects.

104. Buffler, P.A., M.A. Kelsh, E.C. Lau, C.H. Edinboro, and J.C. Barnard. 2004. Epidemiologic Studies of Primary Congenital Hypothyroidism and Newborn Thyroid Function Among California Residents. Final Report, April 14, 2004.
105. ICF Consulting. April 2004. Evaluation of EPA's Responses to Comments on "Perchlorate Environmental Contamination: Toxicological Review and Risk Characterization, External Review Draft (January 16, 2002)." Draft. Prepared for National Aeronautics and Space Administration (NASA).
106. ICF Consulting. April 2004. Recommendation for an Oral Intake Reference Dose (RfD) for Perchlorate. Revised Draft. Prepared for National Aeronautics and Space Administration (NASA).
107. Schwartz, J. E-mail received from Jackie Schwartz on April 9, 2004, regarding the exposure assessment used in her master's thesis.
108. West, C. R. May 19, 2004. Letter regarding Massachusetts Department of Environmental Protection's draft, *Perchlorate, Toxicological Profile and Health Assessment* (May 2004). Attachment -- Massachusetts Department of Environmental Protection's draft, *Perchlorate, Toxicological Profile and Health Assessment* (May 2004).
109. Clark, K. E-mail received from Krista Clark, Association of California Water Agencies, on May 21, 2004, regarding a critical review of the perchlorate exposure results presented in "Gestational Exposure to Perchlorate is Associated with Measures of Decreased Thyroid Function in a Population of California Neonates" by Jackie Schwartz, 2001. Attachment -- Perchlorate Survey of Coastal Southern California: A Critical Review of the Perchlorate Exposure Results presented in "Gestational Exposure to Perchlorate is Associated with Measures of Decreased Thyroid Function in a Population of California Neonates" by Jackie Schwartz, 2001.
110. Lamm, S. Materials submitted by Steve Lamm, CEOH. (a) The Neonate and Perchlorate Exposure. A Literature Review Relevant to Environmental Perchlorate Exposures and the Full-Term and Premature Newborn (5/21/04). (b) The Neonate and Perchlorate Exposure. A Literature Review Relevant to Environmental Perchlorate Exposures and the Full-Term and Premature Newborn (updated 5/24/04).
111. Braverman, L. E-mail received from Lewis Braverman, Boston Medical Center, on May 21, 2004, regarding abstracts to be submitted to the American Thyroid Association. (a) Abstract: Braverman et al. The Effect of Perchlorate, Thiocyanate, and Nitrate on Thyroid Function in Long-Term Workers Exposed to

- Perchlorate. (b) Abstract: Braverman et al. The Effect of Low Dose Perchlorate for Six Months on Thyroid Function in Normal Volunteers.
112. Dourson, M. E-mail received from Michael Dourson, TERA, on May 24, 2004, regarding update on Chilean study of perchlorate exposure. (a) Study of Pregnant Women in Three Cities in Northern Chile With Varying Levels of Environmental Perchlorate Exposure, (b) Figures: Urine iodide in a sample of 100 pregnant women living in Boston and 171 pregnant women living in Northern Chile; Maternal Free T4; Maternal TSH, (c) Study of the Thyroid Status among Pregnant Women in Northern Chile.
 113. Ting, D. 2004. California Human Health Risk Assessment on Perchlorate. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 114. Klaassen, C.D. 2004. Presentation to the Committee to Assess the Health Implications of Perchlorate Ingestion. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 115. Dominguez, O. 2004. Introduction of ICF Consulting to NRC Committee to Assess the Health Implications of Perchlorate Ingestion. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 116. Mendez, W. 2004. Perchlorate Toxicological Review. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 117. Gibbs, J. 2004. Presentation to the Committee to Assess the Health Implications of Perchlorate Ingestion. Slides (and discussion) of presentation made to committee on May 24, 2004, in Woods Hole, MA. Abstract of Tellez et al., Chronic Environmental Exposure to Perchlorate in Drinking Water and Thyroid Function During Pregnancy and the Neonatal Period.
 118. Borak, J. 2004. Presentation to the Committee to Assess the Health Implications of Perchlorate Ingestion. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 119. Farland, W. 2004. Perchlorate: Clarification of US EPA Technical Perspectives. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 120. Lamm, S. H. 2004. The Neonate and Perchlorate. Slides of presentation made to committee on May 24, 2004, in Woods Hole, MA.
 121. Engel, A., M. B. Kruse, and S. H. Lamm. Thyroxine Levels and Incremental Exposures to Goitrogens—Cigarette Smoking and Cruciferous Vegetable Consumption in the US.

122. Lamm, S. E-mail received from Steve Lamm, CEOH, on May 25, 2004, regarding neonatal thyroid status and neurodevelopment. Attachments – (a) Chang, S., C. Crothers, S. Lai, and S.H. Lamm. 2003. Pediatric Neurobehavioral Diseases in Nevada Counties with Respect to Perchlorate in Drinking Water: An Ecological Inquiry. *Birth Defects Research (Part A)* 67:886-892, (b) Soldin, O.P., A.K.N. Nandedkar, K.M. Japal, M. Stein, S. Mosee, P. Magrab, S. Lai, and S.H. Lamm. 2002. Newborn thyroxine levels and childhood ADHD. *Clin. Biochem.* 35(2):131-136, (c) Soldin, O.P., S. Lai, S.H. Lamm, and S. Mosee. 2003. Lack of a Relation between Human Neonatal Thyroxine and Pediatric Neurobehavioral Disorders. *Thyroid* 13(2):193-198.
123. Lamm, S. E-mail received from Steve Lamm, CEOH, on May 26, 2004, regarding a review of the literature on neurocognitive deficits and mild iodine deficiency. Attachments – (a) Degree of Iodine Deficiency and Neurocognitive Performance: A Review of the Literature. (b) Table 2: Studies with no supplemented groups categorized in terms of units of UIE ($\mu\text{g I/L}$, $\mu\text{g I/g Cr}$, $\mu\text{g I/day}$) and iodine status). Arrows indicate change in UIE over time (due to supplementation or national iodization programs).
124. Lamm, S. E-mail received from Steve Lamm, CEOH, on June 15, 2004, regarding error in sections relevant to the neonatal/premature infant glomerular filtration rate.
125. Borak, J. E-mail received from Jonathan Borak, Yale University, on June 15, 2004, regarding error in the sections relevant to the neonatal/premature infant glomerular filtration rate in May 24, 2004 presentation to the NRC committee.
126. Carlin, W.H., Hoffman, B.J., Mallmann, T.K., Peschman, T.J. Development of a Highly Selective Ion Exchange Resin for Removal of Perchlorate from Groundwater. Submitted June 17, 2004.
127. Transcript of the Fourth Meeting of the NAS Committee to Assess the Health Implications of Perchlorate Ingestion (May 24, 2004). *NOTE: This is an unedited verbatim transcript of the fourth meeting of the Committee to Assess the Health Implications of Perchlorate Ingestion and is not an official report of National Academy of Sciences, National Academy of Engineering, Institute of Medicine, or National Research Council (collectively "National Academies"). Opinions and statements included in the transcript are solely those of the individual persons or participants at the meeting, and are not necessarily adopted or endorsed or verified as accurate by the National Academies.*
128. Letter received from Dr. John Gibbs, Kerr-McGee Corporation, to Dr. Richard Johnston, on July 13, 2004. Attachments: (a) Comments to the Committee to Assess the Health Implications of Perchlorate Ingestion [BEST-K-03-05-A] Regarding Human Studies of the Effect of Thiocyanate on Thyroid Function are Relevant to Perchlorate Risk Assessment – A Short Communication. Submitted

- on behalf of the Perchlorate Study Group. July 13, 2004. (b) Tonacchera, M. et al. Relative Potencies and Additivity of Perchlorate, Thiocyanate, Nitrate and Iodide on the Inhibition of Radioactive Iodide Uptake by the Human Sodium Iodide Symporter. Copy of manuscript accepted for publication.
129. Borak, J. E-mail received from Jonathan Borak, Yale University, on July 20, 2004. Memorandum regarding error in May 24, 2004 presentation to the NRC committee.
 130. Guth, D. Letter from Dan Guth, The Boeing Company, to Richard Johnston on July 23, 2004. Attachments – (a) Guth, D. July 23, 2004. Critical Review of the US EPA Interpretation of Thyroid Hormone Effects and Mode of Action of Perchlorate. (b) Goodman, G., Intertox. July 22, 2004. The Effect of Iodine Deficiency on Thyroid Hormones and TSH in Rats: A Mini-Review.
 131. Jacobs, M. E-mail from Micki Jacobs regarding effects of dermal contact and inhalation of shower fumes. Received July 25, 2004.
 132. York, R. Digital images from Dr. Raymond York, Argus Laboratories, of the perchlorate-treated rat that had sections of two levels of the thyroid gland. Received July 6, 2004.
 133. Lamm, S. E-mail from Steven Lamm, CEOH, to Ellen Mantus, NAS, regarding revised submission to the NAS panel. Received July 26, 2004. (a) Letter from Dr. Steven Lamm to Dr. Ellen Mantus, dated July 26, 2004, regarding error in the perchlorate pharmacokinetic modeling that was submitted to NAS panel on May 24, 2004. (b) A Literature Review Relevant to Environmental Perchlorate Exposures and the Full-Term and Premature Newborn. July 26, 2004.
 134. Gibbs, J. E-mail from John Gibbs, Kerr-McGee Corporation, to Ellen Mantus, NAS, regarding latest draft of RAIU study in perchlorate workers. Received July 26, 2004. (a) Letter from Dr. John Gibbs to Dr. Richard Johnston, regarding current draft of The Effect of Perchlorate, Thiocyanate, and Nitrate on Thyroid Function in Long-Term Workers Exposed to Perchlorate. (b) Braverman et al. 2004. The Effect of Perchlorate, Thiocyanate, and Nitrate on Thyroid Function in Long-Term Workers Exposed to Perchlorate. July 25, 2004.
 135. Bruce, G. E-mail from Gretchen M. Bruce, Intertox, Inc., on July 27, 2004, to Ellen Mantus, NAS, regarding submission of manuscript entitled “Concerns Regarding U.S. EPA’s Assessment of Thyroid Follicular Cell Adenomas Identified in the Rat 2-Generation Reproduction Study of Perchlorate.” (a) Intertox, Inc. July 23, 2004. Concerns Regarding U.S. EPA’s Assessment of Thyroid Follicular Cell Adenomas Identified in the Rat 2-Generation Reproduction Study of Perchlorate. Prepared for Perchlorate Study Group.
 136. Hays, S.M. July 27, 2004. Predictions of the Pharmacokinetics of Perchlorate in

Full-Term and Premature Neonates. Intertox, Inc. Seattle, WA. Prepared on behalf of the Perchlorate Study Group.

137. Clewell, R, E.A. Merrill, and J.M. Gearhart. Development of PBPK Models for Iodide and Perchlorate Distribution in Human Gestation and Lactation. AFRL/HEPB, Wright-Patterson Air Force Base, OH.
138. Alcorn, J. and P.J. McNamara. 2002. Ontogeny of Hepatic and Renal Systemic Clearance Pathways in Infants, Part II. Clin. Pharmacokinet. 41(13): 1077-1094.
139. Crump, K. Table 2: BMD Estimates and Corresponding BMDL for Perchlorate. Received June 11, 2004.
140. Crump, K. and G. Goodman. January 24, 2003. Benchmark Analysis for the Perchlorate Inhibition of Thyroidal Radioiodine Uptake Utilizing a Model for the Observed Dependence of Uptake and Inhibition on Iodine Excretion. Submitted on June 22, 2004.
141. Guth, D. E-mail received from Dan Guth, The Boeing Company, to Ellen Mantus on August 2, 2004. Attachment -- Goodman, G. Revised July 27, 2004. The Effect of Iodine Deficiency on Thyroid Hormones and TSH in Rats: A Mini-Review. Intertox, Inc. Seattle, WA.
142. Bruce, G. E-mail received from Gretchen Bruce, Intertox, Inc. to Ellen Mantus on August 2, 2004. Attachment -- Neurobehavioral Effects of Anti-Thyroid Agents in Rats: A Review of the Historical Literature and Comparison to the Results of the Perchlorate Studies. July 27, 2004. Intertox, Inc. Seattle, WA. Prepared on behalf of the Perchlorate Study Group.
143. Gibbs, J. Received August 9, 2004. (a) Letter from Dr. John Gibbs to Dr. Richard Johnston, regarding updated analysis from study of pregnant women in northern Chile. (b) Gibbs, J. 2004. Laboratory Methods and QC Analysis: August 2004 Update. (c) Gibbs, J. 2004. Chronic environmental exposure to perchlorate through drinking water and thyroid function during pregnancy and the neonatal period. August 8, 2004 Update.
144. Wickman, R. E-mail received from Richard Wickman, NASA, regarding final NASA-sponsored perchlorate report by ICF Consulting. Attachment -- ICF Consulting. July 2004. Recommendation for an Oral Intake Reference Dose (RfD) for Perchlorate. Prepared for NASA Environmental Management Division. July 2004.
145. Guth, D. E-mail received from Dan Guth, The Boeing Company, regarding analysis of the thyroid hormone and TSH changes observed in the rat studies used in the EPA risk assessment. (a) Goodman, G. August 31, 2004. The Iodine-Dependence of Perchlorate Effects on Thyroid Hormones in Rats: Review and

- Modeling Analysis. Intertox, Inc. Seattle, WA. (b) Goodman, G. August 31, 2004. The Iodine-Dependence of Perchlorate Effects on Thyroid Hormones in Rats: Review and Modeling Analysis. Appendix: Review of the Dose-Response for Perchlorate Effects on Thyroid Hormones and TSH in Rats Given High, Adequate, or Marginal Dietary Iodine. Intertox, Inc. Seattle, WA.
146. Guth, D. E-mail received from Dan Guth, The Boeing Company, regarding poster presented at the 2004 Society of Toxicology meeting regarding perchlorate exposure in iodine deficient rats. Attachment – P.C. Das, J. M. Hedge, D.C. Wolf, and K.M. Crofton. Marginal Iodine Deficiency Exacerbates Perchlorate Thyroid Toxicity.
147. Girard, Michael. E-mail received from Michael Girard, Perchlorate Study Group, regarding Request for Reconsideration (RFR) regarding Request for Correction (RFC) 13679. Attachment – Letter from Perchlorate Study Group to Information Quality Guidelines Staff, U.S. EPA, regarding Request for Correction (RFC) 13679. August 24, 2004.
148. Braverman, L.E. Letter from Lewis E. Braverman, MD, Boston Medical Center, to Richard Johnston, MD, regarding manuscript on occupational study among workers with long term perchlorate exposure. September 10, 2004. Attachments -- (a) Letter from Lewis E. Braverman, MD, to John P. Bilezikian, The Journal of Endocrinology and Metabolism, regarding Manuscript: The Effect of Perchlorate, Thiocyanate, and Nitrate on Thyroid Function in Workers Exposed to Perchlorate Long-Term. Braverman, LE, He X, Pino S, Cross M, Magnani B, Lamm SH, Kruse MB, Engel A, Crump KS, Gibbs JP. September 10, 2004. (b) The Effect of Perchlorate, Thiocyanate, and Nitrate on Thyroid Function in Workers Exposed to Perchlorate Long-Term. Braverman, LE, He X, Pino S, Cross M, Magnani B, Lamm SH, Kruse MB, Engel A, Crump KS, Gibbs JP.
149. Fisher, J. E-mail from Jeffrey Fisher, The University of Georgia, to Richard Corley, regarding dietary iodide PBPK modeling paper. Attachment – Fisher, J.W., Campbell, J.L., and Guth, D. A Human Dietary Iodide PBPK Model to Evaluate the Effects of Perchlorate on Thyroidal Iodide Content. This paper is being submitted by the authors(s) for publication.
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