

commentletters - Comment Letter - Proposed Water Recycling Draft Policy & Draft Staff Report & Certified Regulatory Program Environmental Analysis

From: "Michael Garabedian" <mikeg@gvn.net>
To: <commentletters@waterboards.ca.gov>
Date: 10/26/2007 11:55 AM
Subject: Comment Letter - Proposed Water Recycling Draft Policy & Draft Staff Report & Certified Regulatory Program Environmental Analysis

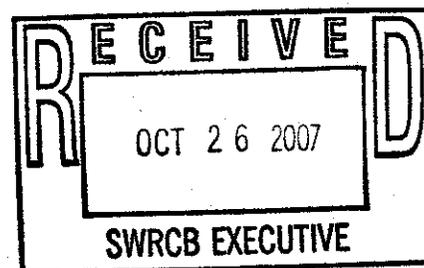
12/4/07 Bd. Mtg.
Water Recycling Policy
 Deadline: 10/26/07 Noon

To:

Jeanine Townsend, Acting Clerk to the Board Executive Office

State Water Resources Control Board

P.O. Box 100
 Sacramento, California 95812-5620



Friends of the North Fork, a California nonprofit corporation working to protect and preserve the North Fork American River, submits these comments on the Proposed Water Recycling Draft Policy ("Policy") & Draft Staff Report & Certified Regulatory Program Environmental Analysis ("Report & CRPEA" or "Report").

Inappropriate use and execution of Certified Regulatory Program analysis & an EIR is required

The development of this water quality policy that includes various policies and projects including but not limited to Recycled Water Irrigation Projects ("RWIP") and Groundwater Recharge Reuse Projects ("GRRP's"), and that directly and indirectly affects a variety of other policies and projects, e.g. the beneficial uses such as drinking water from rivers and streams subject to discharges from municipal wastewater systems, stormwater runoff, and so forth, requires an Environmental Impact Report. The Report & CPREA is also not suitable nor is it permissible for this program, and, even if it were, the environmental analysis is not adequate.

The State Board, not Regional Boards, should continue to manage development of water reuse policy

Given the growing knowledge about unregulated components of reused water, the State Board should not devolve any aspects of this policy to the Regional Boards.

A major and key issue at this time are the legal (e.g., pharmaceuticals, caffeine), and illegal (e.g. cocaine) chemical components in reused water

Given the growing understanding about currently unregulated components of recycled water, including many that are not removed by POTW operations, Board Resolutions 68-16 and 77-1 do not provide a minimally necessary foundation and background for the proposed policy.

The staff report on page 3 opines that "The main groundwater issue associated with the use of recycled water for irrigation is the accumulation of salt including nitrate in groundwater." This statement is at odds with the facts.

Environmental Checklist item "d" on page 18 of the Report concludes that the project would not "Otherwise substantially degrade water quality" because its impact would be less than significant with mitigation with an explanation that CDPH keeps and eye on drinking water (see proposed Policy 15). This is speculative in any event, and, now, outdated.

Policy 16 appears to deal with unregulated constituents, that is, those "not typically found in surface water or groundwater, because it is usually produced from sewage." No chemicals are named specifically or by any categorization. Policy 16 goes on to state that Regional Boards "may need to establish a limitation for a constituent for which CDPH has not established an MCL." This is an entirely inappropriate fractionization of the need to proceed in the face of both uncertainty and the growing knowledge base.

No current, if any, scientific consultation appears to have gone into development of the proposed Policy and Report & CREPA

Proposed Policies 17 and 18 are unsubstantiated and absent any scientific justification or reference to such. Policy 17 appears to be dismissive of the need for effluent limitations for "certain" but unnamed constituents. Policy 18 recognizes that reused water may seriously degrade groundwater basins by moving chemicals from the substrate into the water. This danger to aquifers has been referred to by one scientist as the creation of a chemical soup about which we know nothing. In ground and surface water unregulated constituents can interact with each other and with chemicals in the surface water or ground and create unforeseen chemicals and problems.

Friends refers the Board to one government scientist with whom and with whose work the Board does not yet appear to be familiar. Here are portions of his is C.V. from <http://www.epa.gov/nerlesd1/bios/daughton.htm>:

National Exposure Research Laboratory
Environmental Sciences

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- [Environmental Sciences](#)
- [Resume for Christian Daughton](#)

The EPA Web site will be available intermittently on Sunday, October 28, 2007 from 8:00 p.m. until midnight EDT. We apologize for any inconvenience.

Christian Gaei Daughton, Ph.D.

Contact Information:

Christian Gaei Daughton, Ph.D.
(702) 798-2207

Environmental Chemistry, Environmental Sciences, NERL/ORD

Employment & Academic Appointments

February 1997 - present. *Supervisory Physical Scientist*, Chief of the Environmental Chemistry Branch (ECB), Environmental Sciences Division, U.S. Environmental Protection Agency, Las Vegas, Nevada. Supervise and direct in-house research program in environmental and analytical chemistry. Associate Graduate Faculty, Environmental Studies Program, University of Nevada, Las Vegas.

June 1995-1996. *Supervisory Research Chemist*, appointed to Acting Chief, Analytical Sciences Branch (ASB) of the Characterization Research Division (CRD-Las Vegas), National Exposure Research Laboratory (NERL), ORD, U.S. Environmental Protection Agency. Second-line supervisor with 13 direct reports (including three supervisors). Total staff of 43 federals and 25 non-federals (including post-docs). Personal goal is to make a lasting impact on ORD environmental science by fostering new research areas, and to make a significant contribution to defining an organizational structure and mission for CRD's future. Manage the largest and most diverse Branch at NERL in terms of expertise, disciplines, and mission. The expertise of ASB's scientists (GS-13-15) ranges from analytical chemistry to human exposure to earth sciences. ABS's activities ranged from (i) research/development in new cost-effective monitoring technologies and research in human exposure, to (ii) support to Program offices (e.g., the national quality assurance program for the Office of Drinking Water in radiation monitoring), to (iii) support to the Regions (e.g., Technical Support Center), to (iv) oversight of national programs (e.g., SITE program in monitoring technologies).

1991-1995. *Supervisory Research Chemist*, Chief of the Methods Research Branch (and later Program Manager), Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Las Vegas, Nevada (predecessor to CRD-Las Vegas). Supervised and directed in-house and extramural research program (eight senior

chemists) for development of new Agency analytical methods for chemical pollutants (e.g., RCRA SW-846). Applications of HPLC/MS, GC/SFC/DDIR, CZE/MS, HRMS, SFE, ICP/MS.

1989-1991. *Technical Consultant*, environmental chemistry, microbiology, and toxicology.

- specializing in development of new analytical methods, environmental fate of toxicants, environmental monitoring plans, critical literature reviews, and bioremediation.

1987-1989. *Staff Scientist II*, Lawrence Berkeley Laboratory, University of California, Berkeley.

- *Deputy Leader/Research Director*: LBL Synfuels Program
- Directed development of computerized information system for energy-related organic pollutants; directed graduate student research on environmental fate/waste treatment of synfuel process streams.

1979-1986. *Assistant Research Toxicologist*, Sanitary Engineering and Environmental Health Research Laboratory, University of California, Berkeley.

- *Deputy Leader/Research Director*: Lawrence Berkeley Laboratory Oil Shale Waste Treatment & Environmental Fate Program; founded program and secured funding from DOE.
- directed/performed research on environmental fate and control technologies for oil shale retort water pollutants; directed graduate student research. Pioneered the use of solid-phase extraction for the determination of oil and grease (first new approach in decades and commercialized years later by 3M), and developed the first new approach in decades for determining organic carbon.

1978-1979. *NIH Postdoctoral Fellow in Environmental Toxicology*, laboratory of Prof. Martin Alexander, Department of Agronomy, Cornell University.

- research on bacterial degradation of pesticide breakdown products.
- developed methods of chemical analysis for organophosphorus compounds.

1978. *Visiting Scientist in Clinical Chemistry*, laboratory of Dr. Lloyd Snyder, Technicon Instruments Corporation, Tarrytown, New York.

- developed methods for high-performance liquid chromatography.

1976-1977. *Postdoctoral Associate in Microbiology*, laboratory of Prof. Martin Alexander, Department of Agronomy, Cornell University.

- research on bacterial metabolism of organophosphorus chemical warfare agents.
- pioneering research on identification of metabolites from enzymatic cleavage of the phosphonate C-P bond.

1972-1976. *NIH Predoctoral Trainee in Toxicology*, Department of Environmental Toxicology, University of California, Davis.

- pioneering research on bacterial metabolism and decontamination of hazardous pesticide wastes in continuous culture and in soil.

Education

University of California, Davis, Department of Environmental Toxicology.

- Ph.D. 1976, *Ecology*. Dissertation: "Parathion and Acclimated Bacteria: Interactions in the Chemostat and in Soil." Thesis Chairman: Prof. Dennis P.H. Hsieh.

University of California, San Diego, Revelle College. B.A. 1971, *Biology*.

Societies/Honors

U.S. EPA 2004 Bronze Medal for Commendable Service (Region 5 Emerging Pollutant Workshop Planning Group) [awarded 27 April 2004]

U.S. EPA 2000 *Scientific and Technological Achievement Award* (Level II) [selected by the U.S. EPA Science Advisory Board] for publication in *Environmental Health Perspectives*, 107(supp 6):907-938 (1999) (PDF) [41 pp, 788KB] [awarded 24 Jan. 2002].

U.S. EPA Office of Research and Development *Honor Award for Diversity Leadership* (April 2000).

Member: American Chemical Society; American Association for the Advancement of Science.

NIH pre-doctoral traineeship (1972-76) and post-doctoral (1978-79) fellowships in *Environmental Toxicology*.

PUBLICATIONS

Refereed and Archival Journals & Books

Ruhoy, IS and Daughton, CG. "Types and Quantities of Leftover Drugs Entering the Environment via Disposal to Sewage - Revealed by Coroner Records," *Sci. Total Environ.*, 2007, 388(1-3):136-147; doi 10.1016/j.scitotenv.2007.08.013. **(New!)**

Daughton, CG. "Pharmaceuticals as Environmental Pollutants: the Ramifications for Human Exposure," In *Encyclopedia of Public Health* **EXIT Disclaimer**, (Kris Heggenhougen, Editor-in-Chief), Elsevier; in press; publication targeted for 2008; see: <http://www1.elsevier.com/homepage/about/mrwd/pubh/> **EXIT Disclaimer** **(New!)**

Daughton, CG "Pharmaceuticals in the Environment: Sources and Their Management," Chapter 1, 1-58, *In Analysis, Fate and Removal of Pharmaceuticals in the Water Cycle* (M. Petrovic and D. Barcelo, Eds.), Wilson & Wilson's Comprehensive Analytical Chemistry series (D. Barcelo, Ed.), Volume 50, Elsevier Science; 2007, 564pp. **(New!)**

Daughton, CG "Emerging Chemicals as Pollutants in the Environment: a 21st Century Perspective (PDF)," [20 pp, 736KB] *Renewable Resources Journal.*, 2005, 23(4):6-23.

Daughton, CG "Non-Regulated Water Contaminants: Emerging Research (PDF)," [22 pp, 222KB] *Environ. Impact Assess. Rev.*, 2004, 24(7-8):711-732 (in A. Steinemann and J. Tickner, eds.: "Environment and Health - New Answers, New Questions."

Daughton, C.G. "Groundwater Recharge and Chemical Contaminants: Challenges in Communicating the Connections and Collisions of Two Disparate Worlds (PDF)," [13 pp, 562KB] *Ground Water Monitoring & Remediation*, Spring 2004, 24(2):127-138.

Daughton, C.G. "PPCPs in the Environment: Future Research — Beginning with the End Always in Mind (PDF)," [29 pp, 237KB] In *Pharmaceuticals in the Environment*, Kümmerer, K. (Ed.), 2nd edition, Springer, 2004, chapter 33, pp. 463-495.

Daughton, C.G. "Pollution from the Combined Activities, Actions, and Behaviors of the Public: Pharmaceuticals and Personal Care Products," invited article for Diversified Perspectives, Northern California Regional Chapter of the Society of Environmental Toxicology and Chemistry, NorCal SETAC News 14(1):5-15, Feb 2003.
<http://www.epa.gov/nerlesd1/bios/daughton/seatac.pdf> [12 pp, 155KB]

Daughton, C.G. "Chemicals from Pharmaceuticals and Personal Care Products (PDF)," [7 pp, 1.3MB] in *Water: Science and Issues*, E. Julius Dasch (ed.), New York: Macmillan Reference USA, 2003, vol. 1, p 158-164.

Daughton CG. "Cradle-to-Cradle Stewardship of Drugs for Minimizing Their Environmental Disposition while Promoting Human Health. I. Rationale for and Avenues toward a Green Pharmacy (PDF)," [18 pp, 481KB] *Environ. Health Perspect.* 2003, 111:757-774.

Daughton CG. 2003. "Cradle-to-Cradle Stewardship of Drugs for Minimizing Their Environmental Disposition while Promoting Human Health. II. Drug Disposal, Waste Reduction, and Future Direction (PDF)," [11 pp, 150KB] *Environ. Health Perspect.* 2003, 111:775-785.

Daughton, C.G. "Environmental stewardship and drugs as pollutants (PDF)," [1 pg, 110KB] *Lancet* 2002, 360:1035-1036.

Daughton, C.G. "Literature Forensics? Door to What Was Known but Now Forgotten (PDF)," [6 pp, 110KB] *Environ. Forensics* 2001, 4(2): 277-282.

Also see follow-up commentary: **Daughton, C.G.** "Literature Forensics: Navigating Through Flotsam, Jetsam, and Lagan," *The Scientist* 2002, 16(4):12 (Feb. 18).

Daughton, C.G. "Emerging Pollutants, and Communicating the Science of Environmental Chemistry and Mass Spectrometry — Pharmaceuticals in the Environment (PDF)," [15 pp, 158KB] *J. Am. Soc. Mass. Spectrom.* 2001 12, 1-10.

Daughton, C.G.; Jones-Lepp, T. (eds.) Pharmaceuticals and Personal Care Products in the Environment: Scientific and Regulatory Issues, *Symposium Series 791*; American Chemical Society: Washington, D.C., 2001, 416 pp.
<http://www.oup-usa.org/isbn/0841237395.html> (0-8412-3739-5) 

Daughton, C.G.; Jones-Lepp, T. "Preface," in *Pharmaceuticals and Personal Care Products in the Environment: Scientific and Regulatory Issues*, Daughton, C.G. and Jones-Lepp, T. (eds.), *Symposium Series 791*; American Chemical Society: Washington, D.C., 2001.

Daughton, C.G. "Illicit Drugs in Municipal Sewage: Proposed New Non-Intrusive Tool to Heighten Public Awareness of Societal Use of Illicit/Abused Drugs and Their Potential for Ecological Consequences," in *Pharmaceuticals and Personal Care Products in the Environment: Scientific and Regulatory Issues*, Daughton, C.G. and Jones-Lepp, T. (eds.), *Symposium Series 791*; American Chemical Society: Washington, D.C., 2001, pp. 348-364.

Daughton, C.G. "Pharmaceuticals in the environment: Overarching issues and overview," in *Pharmaceuticals and Personal Care Products in the Environment: Scientific and Regulatory Issues*, Daughton, C.G. and Jones-Lepp, T. (eds.), *Symposium Series 791*; American Chemical Society: Washington, D.C., 2001, pp. 2-38.

Daughton, C.G.; Ternes, T.A. Pharmaceuticals and Personal Care Products in the Environment: Agents of Subtle Change? (PDF) [41 pp, 788KB] *Environ. Health Perspect.* 1999, 107(suppl 6), 907-938.

Daughton, C.G.; Ternes, T.A. "Erratum: Pharmaceuticals and personal care products in the environment: Agents of subtle change?" (PDF) [41 pp, 788KB] (*Environ. Health Perspect.* 1999, 107(suppl. 6), 907-938), *Environ. Health Perspect.*, 2000 108(suppl. 3), 598.

Web Sites

Pharmaceuticals and Personal Care Products (PPCPs) as Environmental Pollutants: Pollution from Personal Actions, Activities, and Behaviors; conceived, designed, and established by C.G. Daughton (beginning in April 2000): <http://www.epa.gov/nerlesd1/chemistry/pharma/index.htm>; site retired and migrated to <http://www.epa.gov/ppcp> (2007).

Posters

Daughton, C.G. "Origins and Fate of PPCPs in the Environment (PDF)," [1 pg, 328KB] U.S. EPA, NERL, Las Vegas February 2001 (revised January 2004; March 2006).

Daughton, C.G. "Pharmaceuticals and Personal Care Products (PPCPs) as Environmental Pollutants (PDF)," [1 pg, 1194KB] prepared for the U.S. EPA 2003 Science Forum, Washington, DC.

Daughton, C.G. "Biological Systems and Stressors: 'Toxicant Totality Tolerance Trajectory' - 4T's (PDF)," [2 pp, 256KB] U.S. EPA, NERL, Las Vegas (October 2002).

Daughton, C.G. "Pharmaceuticals and Personal Care Products (PPCPs) as Ubiquitous Pollutants from Personal Use and Activities (PDF)," [1 pg, 4MB] U.S. EPA, NERL, Las Vegas (May 2002).

Daughton, C.G. "Pharmaceuticals & Personal Care Products (PPCPs) in the Environment: Agents of Subtle Change? (PDF)," [1 pg, 6 MB] U.S. EPA, NERL, Las Vegas (January 2001).

Reports

Daughton, C.G. "Emerging Pollutants' - Questions, Challenges, and the Future," guest editorial, NORMAN Newsletter, Network of Reference Laboratories for Monitoring of Emerging Environmental Pollutants, EU, issue 1, June 2006; available: http://www.norman-network.net/newsletters/newsletter_norman_1.pdf **[EXIT Disclaimer]**

Daughton, C.G. "Non-Regulated Contaminants: Emerging Issues (PDF)," [41 pp, 1.9MB] invited speaker, National Academies, Institute of Medicine, Roundtable on Environmental Health Sciences, Research, and Medicine (EHSRT), Workshop #5: From Source Water to Drinking Water: Emerging Challenges for Public Health, 16 October 2003, Washington, DC: <http://www.iom.edu/event.asp?id=14623> **[EXIT Disclaimer]**
Note: The proceedings from this workshop were summarized in an IOM book: "From Source Water to Drinking Water: Workshop Summary," 2004; available: <http://books.nap.edu/catalog/11142.html> **[EXIT Disclaimer]** (see pages 39-42, section "Non-regulated Contaminants": <http://books.nap.edu/books/0309093066/html/35.html#pagetop>) **[EXIT Disclaimer]**

Daughton, C.G. "Environmental Stewardship of Pharmaceuticals: The Green Pharmacy." In: The Proceedings of the National Ground Water Association (NGWA), 3rd International Conference on Pharmaceuticals and Endocrine Disrupting Chemicals in Water, Minneapolis, MN; 19-21 March 2003, p. 5-14.

Daughton, C.G. "A Key to Ensuring Success for EPA: Enhancing the Exchange of Knowledge & Information," 43-slide presentation on "knowledge management" prepared June 2002 (updated July and 29 August 2002).

Daughton, C.G. "[Commentary on Illicit Drugs in the Environment: A Tool for Public Education - Societal Drug Abuse and Its Aiding of Terrorism](http://www.epa.gov/nerlesd1/bios/daughton/book-post.htm)," 23 October 2001.
<http://www.epa.gov/nerlesd1/bios/daughton/book-post.htm>)

(note: this commentary further elaborates and extends upon the ideas first presented in the book chapter "Illicit Drugs in Municipal Sewage: Proposed New Non-Intrusive Tool to Heighten Public Awareness of Societal Use of Illicit/Abused Drugs and Their Potential for Ecological Consequences," C.G. Daughton, in *Pharmaceuticals and Personal Care Products in the Environment: Scientific and Regulatory Issues*, Daughton, C.G. and Jones-Lepp, T. (eds.), Symposium Series 791; American Chemical Society: Washington, D.C., 2001, pp. 348-364 (Chapter 20).

Jones-Lepp, T.L.; Alvarez, D.A.; Petty, J.D.; Osemwengie, L.I.; **Daughton, C.G.** "Analytical Chemistry for Mapping Trends of Pharmaceutical and Personal Care Product Pollution from Personal Use: Some Current Research and Future Needs," 2001.
 (Presented at 10th Annual Symposium on Handling of Environmental and Biological Samples, Wiesbaden, Germany), NERL-LV 01-058, 10 September 2001.

Daughton, C.G. "[Pollution from Personal Actions, Activities, and Behaviors: Pharmaceuticals and Personal Care Products in the Environment \(Multidimensional Science Issues Relevant to Regulatory Considerations\)](http://www.law.tulane.edu) (PDF)," [13 pp, 1.1MB] *Environment 2001: Water, Energy and the Law*, session on "Pharmaceutical Discharges and Drinking Water" (<http://www.law.tulane.edu>), **EXIT Disclaimer** organized by The Tulane Institute for Environmental Law and Policy (<http://www.law.tulane.edu>), **EXIT Disclaimer** 9 March 2001, New Orleans, Louisiana, 13 pages.

Professional Presentations

Daughton C.G. "PPCPs in the Environment: an Overview of the Science," keynote presentation for the 2007 AWRA (American Water Resources Association) Summer Specialty Conference on Emerging Contaminants in the Environment, 25-27 June 2007, Vail, CO; <http://www.awra.org/meetings/Vail2007/index.html> **EXIT Disclaimer**

Daughton C.G. "PPCPs in the Environment: an Overview of the Science," invited presentation for conference on Pharmaceuticals and Personal Care Products in the Environment, California Department of Toxic Substances Control, Sacramento, California, 22 May 2007.

Daughton C.G. "PPCPs in the Environment: an Overview of the Science," invited presentation for symposium on "Emerging (Unregulated) Contaminants," AWWA CA/NV Section, Spring 2007 Conference, Las Vegas, Nevada, 18 April 2007.

Daughton C.G. "PPCPs as Environmental Contaminants: an Overview of the Science," invited presentation for Gulf Coast Society of Toxicology Conference "Emerging Environmental Contaminants," Baylor University, Waco, Texas, 27-28 October 2006.

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: Overview of Significance in Water Recycling," invited presentation for "PPCPs and Water Reuse/Recycling," organized by the LA chapter of the Physicians for Social Responsibility (www.psrla.org) **EXIT Disclaimer**, 28 September 2006, Metropolitan Water District, Los Angeles, CA.

Daughton, C.G. "Pharmaceuticals in the Environment: Overview of Sources, Concerns, and Solutions," invited keynote presentation for Pharmaceuticals in the Environment, webinar series organized by the EPA National Regional Science Council's PPCPs (Pharmaceuticals and Personal Care Products) Cross-Regional Team, 26 September 2006.

Daughton, C.G. "PPCPs: Overview of Sources, Environmental Impacts, and Solutions," invited opening talk for plenary session on Emerging Contaminants, Annual Conference of the National Estuary Program, 20 September 2006, San Francisco, CA [National Estuary Program: <http://www.epa.gov/owow/estuaries/>] **EXIT Disclaimer**

Daughton, C.G. "PPCPs: Overview of Sources, Environmental Impacts, and Solutions," invited presentation for: Pacific Southwest Organics Residual Symposium, sponsored by the U.S. EPA and WEF, Sacramento, CA, 14 July 2006.

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: Overview of Significance, Concerns, and Solutions," invited presentation for: "Challenge Transdisciplinary Environmental Research," sponsored by MOMUS (Modelling Nature-Society Systems: <http://www.momus-network.de/englishf.htm>) [EXIT Disclaimer] [J.W. Goethe-University Frankfurt/Main and the Institute for Social-Ecological Research, ISOE: <http://www.isoe.de/english/index.htm>] [EXIT Disclaimer], Frankfurt, Germany, 20 June 2006.

Daughton, C.G. "Pharmaceuticals in the Environment: a Perspective from the U.S.," invited presentation for: CleanMed Europe: The International Healthcare Congress on Sustainable Products and Practices, Stockholm, Sweden, 29-31 May 2006; session on "Pharmaceuticals and the Environment," http://www.cleanmed.org/europe/2006/docs/list_of_speakers.pdf (PDF) [7 pp, 39KB] [EXIT Disclaimer]

Daughton, C.G. "Pharmaceuticals as Environmental Contaminants: An Overview of the Science," invited presentation for: End User Drug Disposal Conference, organized by the Drug Enforcement Administration, Seattle Field Division, Portland District Office, Portland, OR, 25-26 April 2006.

Daughton, C.G. "Pharmaceuticals & Personal Care Products as Environmental Pollutants from Everyday Activities," invited presentation for: Environmental & Water Resources Engineering Seminar Series: 'Emerging Contaminants', Department of Civil & Environmental Engineering, University of California, Davis, 10 April 2006.

Daughton, C.G. "Pharmaceuticals and Personal Care Products (PPCPs) as Environmental Pollutants: Pollution from Consumption and Use," invited presentation for Renewable Natural Resources Foundation Congress on Assessing and Mitigating Environmental Impacts of Emerging Contaminants, Washington, DC, 1-2 December 2005; <http://www.rnrf.org/2005cong/> [EXIT Disclaimer]

Daughton, C.G. "Introduction to Pharmaceuticals and Personal Care Products (PPCPs)," invited presentation at Non-Regulated Pollutants Workshop: Brominated Flame Retardants (BFRs) and Pharmaceuticals & Personal Care Products (PPCPs), U.S. EPA Region 2 Pollutants of Emerging Concern Panel Series, New York, NY, 26 October 2005.

Daughton, C.G. "Overview of Science Involved with Pharmaceuticals," keynote address, U.S. EPA Workshop: Pharmaceuticals in the Environment, Office of Research and Development, National Exposure Research Laboratory, Las Vegas, NV, 23-25 August 2005.

Daughton, C.G. "PPCPs, Water Reuse, and the Perception of Risk," invited presentation, 124th Annual Conference and Exposition (ACE: "The World's Water Event"), American Water Works Association (AWWA), 15 June 2005, Moscone Center, San Francisco, California: <http://www.awwa.org/ace2005> [EXIT Disclaimer]

Daughton, C.G. "Origins and Ramifications of Pharmaceuticals & Personal Care Products as Environmental Contaminants," NEWMOA workshop for environmental and public health officials in Massachusetts, Northeast Waste Management Officials' Association (NEWMOA), 14 June 2005, Boston, MA.

Daughton, C.G. "Origins and Ramifications of Pharmaceuticals & Personal Care Products as Environmental Contaminants," invited presentation (remote) for EPA's OPPT Emerging Chemicals Workgroup, Washington, DC, 20 April 2005.

Daughton, C.G. "Origins and Ramifications of Pharmaceuticals & Personal Care Products as Environmental Contaminants," invited presentation for 11th Annual Pacific Northwest Pretreatment Conference, Water Resources Education Center, Vancouver, Washington, 8 September 2004.

Daughton, C.G. "Pharmaceuticals in the Environment: Overview of Significance, Concerns, and Solutions," invited keynote at First Integral Virtual Symposium sponsored by the American Chemical Society [ACS] Division of Environmental Chemistry and the U.S. EPA, at the ACS 228th National Meeting in Philadelphia, PA, 25-26 August 2004;

Daughton, C.G.; T.L. Jones-Lepp; L.H. Keith; M.J.M. Wells (co-organizers and chairs) "Environmental Chemistry of Pharmaceuticals and Personal Care Products (PPCPs)," (First Integral Virtual Symposium sponsored by the American Chemical Society [ACS] Division of Environmental Chemistry and the U.S. EPA), at the ACS 228th National Meeting in Philadelphia, PA, 25-26 August 2004.

Daughton, C.G. "Origins and Ramifications of Pharmaceuticals & Personal Care Products as Environmental Contaminants," invited presentation for 11th Annual Pacific Northwest Pretreatment Conference, Water Resources Education Center, Vancouver, Washington, 8 September 2004.

Daughton, C.G. "Pharmaceuticals & Personal Care Products as Environmental Contaminants," invited presentation for Office of Science and Technology Policy (OSTP), National Science and Technology Council's subcommittee Emerging Environmental Health Threats, Washington, DC, 28 June 2004.

Daughton C.G. "Origins and Ramifications of Pharmaceuticals & Personal Care Products in the Environment," invited presentation for the WaterReuse Foundation's 2004 Annual Water Reuse Research Conference "Shaping the Future of Water Reuse Through Research," 17 May 2004, Las Vegas, Nevada.

Daughton C.G. "Pharmaceuticals and Personal Care Products (PPCPs) as Environmental Pollutants: Pollution from Personal Actions," invited presentation for the EPA's ORD Science Council Meeting, Environmental Sciences Division, National Exposure Research Laboratory, Las Vegas, Nevada, 14 April 2004.

Daughton C.G. "Pharmaceuticals as Ubiquitous Pollutants: Significance, Concerns, Solutions," invited presentation for California-Nevada Section of American Water Works Association, Spring Conference, Water Quality Division, University Forum, Las Vegas, NV, 16 April 2004.

Daughton C.G. "Pharmaceuticals and Personal Care Products (PPCPs) as Environmental Pollutants: Pollution from Personal Actions," invited presentation for the U.S. EPA Regional Science Liaison/Hazardous Substances Technical Liaison Meeting, 26 February 2004, NERL-Las Vegas.

Daughton C.G. "Ubiquitous Pollution from Health and Cosmetic Care: Significance, Concern, Solutions, Stewardship," invited presentation for California Bay-Delta Authority Science Program Workshop

(<http://science.calwater.ca.gov/>; **EXIT Disclaimer**)

<http://www.science.calwater.ca.gov/pdf/ContaminantStressorsSuppMat.pdf> [2 pp, 35KB]), **EXIT Disclaimer** "Contaminant Stressors in the Bay-Delta Watershed," 4 February 2004.

Daughton C.G. "Environmental Stewardship of Pharmaceuticals: The Green Pharmacy," invited presentation for Sixth National Environmental Public Health Conference, Centers for Disease Control, Session "Chemicals in commonly used products," Atlanta, GA, 3-5 December 2003 (<http://www.cdc.gov/nceh/conference>) **EXIT Disclaimer**

Daughton, C.G. "Pharmaceuticals as Ubiquitous Pollutants: Significance, Concern, Solutions, Stewardship," invited speaker, eHormone 2003, Fifth International Symposium, sponsored by Center for Bioenvironmental Research, Tulane & Xavier universities, New Orleans. October 16-18. <http://e.hormone.tulane.edu>. **EXIT Disclaimer**

Daughton, C.G. "Non-Regulated Contaminants: Emerging Issues (PDF)," [41 pp, 1.9MB] invited speaker, National Academies, Institute of Medicine, Roundtable on Environmental Health Sciences, Research, and Medicine (EHSRT), Workshop #5: From Source Water to Drinking Water: Emerging Challenges for Public Health, 16 October 2003, Washington, DC: <http://www.iom.edu/event.asp?id=14623>. **EXIT Disclaimer**

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: Introduction and Overview," invited presentation to U.S. EPA Emerging Pollutants Workshop, U.S. EPA Region 5 Office, Chicago, IL, 11-14 August 2003.

Daughton, C.G. "PPCPs as Ubiquitous Pollutants from Health and Cosmetic Care: Significance, Concern, Solutions, Stewardship," invited presentation for U.S. EPA OPPTS-ORD Seminar Series, Washington, DC, 16 July 2003 (two separate seminars).

Daughton, C.G. "Pharmaceuticals and Person Personal Care Products (PPCPs) as Environmental Pollutants (PDF)," [1 pg, 1.6MB] invited poster presentation for U.S. EPA Science Forum, 5-6 May 2003, Washington, DC.

Daughton, C.G. "Environmental Stewardship of Pharmaceuticals: The Green Pharmacy (PDF)," [57 pp, 2.3MB] presentation at the National Ground Water Association (NGWA), 3rd International Conference on Pharmaceuticals and Endocrine Disrupting Chemicals in Water, Minneapolis, MN; 19-21 March 2003.

Daughton, C.G. "Antimicrobials in the Environment: Less-Recognized Issues and Needs (PDF)," [52 pp, 1.9MB] panelist presentation for National Academy of Sciences, Institute of Medicine (IOM) Roundtable on Environmental Health Sciences, Research, and Medicine — Roundtable #9: Human Health Effects of Using Antimicrobial Agents in Agriculture, 9 December 2002, Washington, DC.

Daughton, C.G. "Preventing Social Chaos Caused by Surreptitious (or Overt Threat of) Water Sabotage: Universal Early-Warning Non-Target Monitoring for All Chemical Agents, Including Delayed-Onset Toxicants," US. EPA/ORD Water Security Partners' Meeting, 20-21 November 2002, Cincinnati, OH.

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: Ubiety, Ubiquity, Significance, Solutions, and Stewardship," invited presentation for Oregon State University's Fall Water Resources Seminar Series, Corvallis, OR (presentation via video link from NERL-Las Vegas), 30 October 2002.

Daughton, C.G. "Environmental Aspects of Pharmaceuticals and Personal Care Products (PPCPs)," invited presentation for Environmental Science and Health Graduate Program, University of Nevada, Reno, NV, 16 October 2002.

Daughton, C.G. "Environmental Aspects of Pharmaceuticals and Personal Care Products (PPCPs)," invited presentation for 2002 CA-NV-AWWA Annual Fall Conference, Reno, NV, 14-17 October 2002. [<http://ca-nv-awwa.org> **EXIT Disclaimer**]

Daughton, C.G. Invited panelist for session on "Pharm Pollution" at the Society of Environmental Journalists (SEJ) Twelfth Annual Conference, Baltimore, Maryland, 9-13 October 2002. [<http://www.sej.org/confer/index1.htm> **EXIT Disclaimer**]

Daughton, C.G. "Personal-Practices Pollutants: Ubiety, Ubiquity, Significance, Solutions, Stewardship," keynote presentation for RTC-SRA/SETAC Fall Workshop: Emerging Contaminants in the Aquatic Environment: Risk and Regulatory Perspectives, NC State University, Raleigh, North Carolina, 3-4 October 2002. [<http://www.rtc-sra.org> **EXIT Disclaimer**]

Daughton, C.G. "Ubiquitous Pollutants from Cumulative Personal Practices - Stewardship of the Water Cycle," invited presentation for Groundwater Resources Association (GRA) 11th Annual Meeting & Conference, Newport Beach, CA, 18-19 September 2002. [http://gsa.confex.com/gsa/2001AM/finalprogram/abstract_21224.htm **EXIT Disclaimer**]

Daughton, C.G. "Pharmaceutical and Personal Care Products as Ubiquitous Pollutants from Personal Use and Activities," invited presentation for Society of Environmental Toxicology and Chemistry, Southern California Regional Chapter (<http://www.socalsetac.org/> **EXIT Disclaimer**), University of California, Riverside, CA, 13 July 2002.

Daughton, C.G. "Pharmaceutical and Personal Care Products as Ubiquitous Pollutants from Personal Use and Activities," invited presentation for U.S. EPA Region 9 Partners in Science Conference, San Francisco, CA, 22 May 2002.

Daughton, C.G. "Pharmaceutical and Personal Care Products as Ubiquitous Pollutants from Personal Use and Activities," poster presentation for the EPA Science Forum 2002: Meeting the Challenges, 1-2 May 2002, Washington, DC; poster #27, Safe Water session, 2 May.

Daughton, C.G. "Pharmaceutical and Personal Care Products as Environmental Pollutants," invited lecture for the University of Connecticut Spring 2002 Colloquium Series *Emerging Environmental Concerns* (Environmental Engineering Program), Storrs, CT, 25 March 2002.

Daughton, C.G. "Pharmaceutical and Personal Care Products as Environmental Pollutants," invited talk for a meeting of the U.S. Fish and Wildlife Service (Regional Environmental Contaminants Conference), Henderson, NV, 14 March 2002.

Daughton, C.G. "Pharmaceutical and Personal Care Products as Environmental Pollutants," invited talk for a meeting of the US Geological Survey (Nevada District), Las Vegas, NV, 26 February 2002.

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: An Overview (Pollution from Personal Actions, Activities, and Behaviors)," invited talk for the Association of Engineering Geologists (AEG: Southwest Section), Las Vegas, NV, 12 February 2002.

Daughton, C.G. "Pharmaceuticals and Personal Care Products in Wastewater," invited talk for the Las Vegas Chapter of the Air & Waste Management Association, Las Vegas, NV, 9 January 2002.

Daughton, C.G. "Pharmaceuticals and Personal Care Products (PPCPs) as Environmental Pollutants: Overview and Research Needs," keynote presentation for USGS Eastern Region Workshop on Emerging Issues in Water Quality, Orlando, Florida, 28 November 2001 (<http://owqrl.er.usgs.gov/contaminants>).

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: An Overview (Pollution from Personal Actions, Activities, and Behaviors)," invited keynote presentation for International Society of Exposure Analysis (ISEA) 2001 Conference — "Exposure Analysis: An Integral Part of Disease Prevention," 4-8 November 2001, Charleston, South Carolina (<http://www2.edserv.musc.edu/isea/schedule/schedule.html>).

Daughton, C.G. "Pharmaceuticals and Personal Care Products in the Environment: Pollution from Personal Actions, Activities, and Behaviors," invited talk prepared for The Geological Society of America Annual Meeting (Pardee Keynote Symposium: "The Emerging Discipline of Medical Geology") 5-8 November 2001, Boston, Massachusetts (<http://gsa.confex.com/gsa/2001AM/key/index.html>). **EXIT Disclaimer**

Daughton, C.G. (note authorship change) "Pharmaceuticals and Personal Care Products in the Environment: An Overview - Pollution from Personal Actions, Activities, and Behaviors," invited paper presented at Earth System Processes - Global Meeting, 24-28 June 2001, Edinburgh, Scotland, Geologic Society of America, Session No. T16: "Integrated Approaches to Water Quality Issues" [abstract available at: http://gsa.confex.com/gsa/2001ESP/finalprogram/session_197.htm] **EXIT Disclaimer**

Daughton, C.G. "'Emerging' Pollutants, Mass Spectrometry, and Communicating Science: Pharmaceuticals in the Environment," keynote presentation at the 49th ASMS Conference on Mass Spectrometry and Allied Topics, American Society for Mass Spectrometry, Chicago, Illinois, 27-31 May 2001.

Daughton, C.G. "Pollution from Personal Actions, Activities, and Behaviors: Pharmaceuticals and Personal Care Products in the Environment," *Pharmaceuticals in the Environment*. [organized and chaired by Dr. Thomas Ternes]

The 10th Symposium on Handling of Environmental and Biological Samples in Chromatography, 1-4 April 2001, Mainz/Wiesbaden, Germany (<http://www.dplanet.ch/users/iaeac/> )

Daughton, C.G. "Pollution from Personal Actions, Activities, and Behaviors: Pharmaceuticals and Personal Care Products in the Environment (Multidimensional Science Issues Relevant to Regulatory Considerations)," *Environment 2001: Water, Energy and the Law*, session on "Pharmaceutical Discharges and Drinking Water," organized by The Tulane Institute for Environmental Law and Policy, 9 March 2001, New Orleans, Louisiana.

Daughton, C.G. "PPCPs in the Environment: Overview," University of Maryland, Chem 729 *Pharmaceuticals in the Environment* (full-semester Environmental Science course) [organized by Prof. Philip Kearney; co-organized by C.G. Daughton], 5 February 2001.

Daughton, C.G. "Communication of Our Science: Perspectives on Interacting with Journalists and the Public," U.S. EPA National Exposure Research Laboratory Annual Planning Meeting, Las Vegas, NV; 1 February 2001.

Daughton, C.G. "Pollution from Personal Actions, Activities, and Behaviors: Pharmaceuticals and Personal Care Products in the Environment," American College of Toxicology (ACT), overview for "Drugs in the Environment" at the *ACT's 21st Annual Meeting* (San Diego), 14 November 2000.

Daughton, C.G. "Pharmaceuticals in the Environment — An Overview," presented at the "Emerging Issues Conference," sponsored by the National Ground Water Association, USGS Toxic Substances Hydrology Program, US EPA National Risk Management Laboratory, and Wessex Institute of Technology, UK; Minneapolis, MN, 7-8 June 2000.

Daughton, C.G. "Pharmaceuticals in the Environment — Overarching Issues and Concerns," paper #29, presented at the *219th National Meeting of the American Chemical Society*, session on Pharmaceuticals in the Environment, San Francisco, CA, 27 March 2000 (published in "Issues in the Analysis of Environmental Endocrine Disruptors," Preprints of Extended Abstracts, Vol 40(1), pp. 96-98, 2000).

Daughton, C.G.; Ternes, T. (organizers/chairs) Special Symposium on "Pharmaceuticals in the Environment," held at the *219th National Meeting of the American Chemical Society*, San Francisco, CA, 27 March 2000 (published in "Issues in the Analysis of Environmental Endocrine Disruptors," Preprints of Extended Abstracts, Vol 40(1).

Absence from the proposed plan of a process and plan for the Board to develop policy and regulation of the unregulated constituents of reused water

It seems a spectacular absence from the Policy that it contains no analysis of the problem and proposal about how the Board and Regional Boards will proceed to develop policy on the subject of the unregulated constituents of reused water. While there is much support expressed to the Board for the Policy, it seems inadequate and not credible support if it contains no comment on this issue.

Michael Garabedian, president

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