From: Kimberly Burr <kimlarry2@comcast.net>
To: <LClyde@waterboards.ca.gov>
Date: 1/29/2009 4:03 PM
Subject: Fwd: COMMENTS Basin Plan LOW THREAT DISCHARGES.
Attachments: EPAnotInformed.rtf; Triclosan_Final.pdf; Drugs in Water.rtf; Rowan Hopper.rtf; Incid. Comments1-09.final.rtf

Begin forwarded message:

> From: Kimberly Burr <kimlarry2@comcast.net>
> Date: January 29, 2009 3:58:14 PM PST
> To: CKuhlman@waterboards.ca.gov
> Subject: COMMENTS Basin Plan LOW THREAT DISCHARGES.
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>
> January 29, 2009
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>
> Catherine Kuhlman: Executive Officer
>
> North Coast Regional Water Quality Control Board
>
> 5550 Skylane Blvd. Ste. A
>
> Santa Rosa, CA 95403
>
>
>
> Public Comment WATER QUALITY CONTROL PLAN FOR THE NORTH COAST
> REGION TO ESTABLISH EXCEPTION CRITERIA TO THE
>
> POINT SOURCE WASTE DISCHARGE PROHIBITIONS BY REVISING THE ACTION
> PLAN FOR STORM WATER DISCHARGES AND ADDING A NEW ACTION PLAN FOR LOW
> THREAT DISCHARGES.
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>
> Dear Ms. Kuhlman:
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>
> "All our water sources - rivers and reservoirs, springs and
> aquifers -
>

> may contain drugs flushed down our toilets and off factory farms
> somewhere up stream," said Food & Water Watch Executive Director
> Wenona Hauter. (See attached "Drugs in Water" articles)
>
>
>
>
>
> Disposal of treated wastewater whether it is through irrigation,
> direct discharge to rivers, or over spraying of land is disposal. As
> you know, wastewater is comprised of treated sewage and other highly
> polluted liquids, solids, and chemicals that find their way down
> toilets, sinks, and drains most of which then pass through treatment
> facilities. And the treatment train is imperfect.
>
>
>
> There must be no granting of exceptions to current regulations nor
> weakening, of definitions, requirements, or limits with respect to
> disposal of treated wastewater even if it is given a different
> name. To the extent that this Basin Plan amendment strengthens
> protection of water quality, beneficial uses and provides increased
> long-term environmental benefits, the amendment is proper. All
> state laws meant to enhance, improve, maintain, and protect high
> quality drinking water, beneficial uses, including but not limited
> to the California Environmental Quality Act, the California Toxics
> Rule, and all federal statutory schemes meant to eliminate water
> pollution, must be complied with. Backsliding, compromise of
> scientific standards and knowledge, and further degradation of
> surface and groundwater cannot be substituted for the expediency of
> the moment.
>
>
>
> Wastewater is clearly not safe potable water (see the attached
> studies) and it is the main way, and often times the only way, in
> which many pollutants enter the environment, the groundwater, and
> the surface waters. In a study of 19 water facilities, eleven
> pharmaceuticals were detected on a frequent basis. ...'several point
> to the potential for risk - especially for the fetus and those with
> severely compromised health." (Rowan Hopper January 2009,
> attached). The authors go on to suggest that the amount of
> pollution to which we subject our children, wildlife, and ourselves
> is a choice.
>
>
>
> It is not proper, based upon what evidence we do have, to place the
> environment and people at higher risk by relaxing protections of
> water quality and granting exceptions to discharge regulations.
> Choosing to not waive prohibitions on incidental run off of
> wastewater and choosing not to set what are merely arbitrary
> thresholds would be to impose more control and a return to common
> sense rather than common denial. There are other ways in which to
> manage wastewater the first of which is to begin to accept the
> notion of limits. Regulatory agencies must continue vigorous

> efforts to clean up the environment and our waterways rather than be
> pushed to find additional ways in which to negatively impact them.
> Impaired water bodies must not be subjected to further impacts, and
> clean water bodies must be protected.
>
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>
> The conditions in which fish and amphibians spend their entire lives
> are already harmful to them. To these, there is no longer such a
> thing as a low threat pollutant. The thresholds have been
> exceeded. Humans too are suffering the effects of pollution.
> Wastewater is a toxic brew and even treated wastewater poses
> substantial known and unknown risks to the environment, wildlife,
> and humans.
>
>
>
> Relaxation of rules governing runoff of polluted irrigation or over
> spray is not indicated at this time. On the contrary, the opposite
> is indicated. Stronger rules protective of water quality are
> indicated and more aggressive enforcement is warranted.
>
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>
> Thank you for careful consideration of the above, the attached, and
> the authorities referenced therein.
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>
> Sincerely,
>
> Kimberly Burr
>
> Kimberly Burr
>
> Attachments:Triclosan Final; EPA Not Informed; Drugs in Water; and
> Rowan Hopper
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EPA a failure on chemicals, audit finds
Assessment of toxic risks inadequate, says new chief

Milwaukee Journal Sentinel, Meg Kissinger
Published January 26, 2009

January 24, 2009: The Environmental Protection Agency's ability to assess toxic chemicals is as broken as the nation's financial markets and needs a total overhaul, a congressional audit has found.

The Government Accountability Office has released a report saying the EPA lacks even basic information to say whether chemicals pose substantial health risks to the public. It says actions are needed to streamline and increase the transparency of the EPA's registry of chemicals. And it calls for measures to enhance the agency's ability to obtain health and safety information from the chemical industry.

Lisa Jackson, the EPA's new administrator, promised to take the report under consideration.

"It is clear that we are not doing an adequate job of assessing and managing the risks of chemicals in consumer products, the workplace and the environment," Jackson said in a prepared statement Friday. "It is now time to revise and strengthen EPA's chemicals management and risk assessment programs."

The Journal Sentinel has chronicled the failure of the EPA to disclose information about toxic chemicals in its series, "Chemical Fallout," which began in 2007. Last month, the newspaper reported that the agency routinely allows companies to keep new information about their chemicals secret, including compounds that have been shown to cause cancer and respiratory problems.

Earlier in 2008, the Journal Sentinel revealed that the EPA's Voluntary Children's Chemical Evaluation Program, which relies on companies to provide information about the dangers of the chemicals they produce, is all but dead. And it disclosed that the agency's program to screen chemicals that damage the endocrine system had failed to screen a single chemical more than 10 years after the program was launched.

Health and environmental advocates pounced on the GAO's findings as proof that the EPA has been shirking its responsibilities for years.

"This just shows that the EPA is not any better able to protect Americans from risky chemicals than FEMA was to save New Orleans or the SEC was to cope with the financial collapse," said John Peterson Myers, a scientist and author who has been writing about chemical risks to human health for more than three decades.

For the EPA to be compared to the collapsed financial markets dramatically underscores the need for a complete overhaul of the regulation of toxic chemicals, said

Richard Wiles, executive director of Environmental Working Group, a health watchdog organization based in Washington, D.C.

"The EPA joins the hall of shame of failed government programs," Wiles said.

The EPA is at high risk for waste, fraud, abuse and mismanagement and needs a broad-based transformation, the auditors found.

"The EPA lacks adequate scientific information on the toxicity of many chemicals that may be found in the environment - as well as on tens of thousands of chemicals used commercially in the United States," the GAO report said. "EPA's inadequate progress in assessing toxic chemicals significantly limits the agency's ability to fulfill its mission of protecting human health and the environment."

The EPA's ability to protect public health and the environment depends on credible and timely assessments of the risks posed by toxic chemicals, the GAO found. Its Integrated Risk Information System, which contains assessments of more than 500 toxic chemicals, "is at serious risk of becoming obsolete because the EPA has been unable to keep its existing assessments current or to complete assessments of important chemicals of concern."

The EPA urgently needs to streamline and increase the transparency of this assessment process, the report says.

"Overall, the EPA has finished only nine assessments in the past three years," the report found. "At the end of 2007, most of the 70 ongoing assessments had been under way for more than five years."

The EPA needs additional authority to that provided in the Toxic Substances Control Act to obtain health and safety information from the chemical industry, the GAO auditors found.

"They need to shift more of the burden to chemical companies to demonstrate the safety of their products," the report found.

Strengthening the EPA is one of the GAO's three most urgent priorities for the Obama administration. The GAO also called for overhauling the nation's financial regulatory system, whose inattention helped trigger the global financial crisis, and improving the Food and Drug Administration's ability to protect the public from unsafe or ineffective drugs and other medical products.

The list is updated every two years and released at the start of each new Congress to help in setting oversight agendas. Recent Congresses and administrations have been particularly alert to GAO's High-Risk List and have used its findings to help tailor agency-specific solutions as well as broader initiatives across government.

SANTA CLARA BASIN
WMI
WATERSHED MANAGEMENT INITIATIVE

Environmental Emergence of Triclosan

White Paper prepared by the Emerging Contaminants Workgroup
of the Santa Clara Basin Watershed Management Initiative (SCBWMI)[1]

January 2006

Executive Summary

Antibacterial agents, such as triclosan, are common ingredients in many everyday household and personal care products. There is a growing concern about the emergence of these chemicals in the environment. The SCBWMI Emerging Contaminants Workgroup reviewed the state of knowledge regarding triclosan, the most common of these antibacterial agents. The Workgroup recommends the adoption of strategies to minimize the occurrence of antibacterial agents and their breakdown products in surface water. Proposed next steps, messages and audiences are presented in Section 5. Based on a comprehensive literature review, the SCBWMI Emerging Contaminants Workgroup draws the following conclusions:

- The American Medical Association has not endorsed the necessity or efficacy of triclosan and other antibacterial agents in personal care products (Section 1)
- Antibacterial agents and their degradation products are found in many tested U.S. surface waters, including San Francisco Bay (Section 2)
- One such agent, triclosan is acutely and chronically toxic to aquatic organisms (Section 3)
- Triclosan bioaccumulates in fish and human tissue (Section 3)
- Triclosan may degrade into other toxic compounds (Section 3)
- Triclosan may encourage antibiotic resistance in pathogenic bacteria. (Section 3).
- Physicians indicate that the best germ fighting measure continues to be the actual act of hand washing with regular soap, or for extra assurance, alcohol or peroxide-based hand sanitizers (Section 4)

Emerging Contaminants Workgroup
The Emerging Contaminants Workgroup was chartered at the request of the SCBWMI in 2001 to provide a forum to discuss issues related to endocrine disrupting compounds and recycled water. The workgroup has since broadened its scope to include all emerging contaminants of concern, not just those having endocrine disrupting effects. The workgroup is open to all interested parties. Participants include scientists, engineers, staff and managers from government and non-government organizations.

The purpose of the group is to collect and review information based on the best available science on emerging contaminants of concern in and around San Francisco Bay. The Workgroup has been successful in developing communication pieces for different audiences, including white papers for local government and non-governmental organizations' staff, and fact sheets for the general public.

Audience and Purpose of White Papers
The white papers are not designed as outreach pieces for the general public. Rather, they are produced for regional and local government, as well as participating non-government organization staff, and are designed to provide a starting point for discussion on next steps. The papers provide an overview of research, current programs when applicable, and potential pollution prevention solutions.

[1] For more information, contact: Stephanie Hughes, RMC (shughes@rmcwater.com; 408-240-8174); Jessie Denver, City of San Jose (jessie.denver@sanjoseca.gov; 408-277-3534; or Karin Didriksen North, City of Palo Alto (karin.north@cityofpaloalto.org; 650-494-7629).

1. Introduction

Triclosan[2] is registered as an antibacterial agent, bactericide, disinfectant, and fungicide. Triclosan use began in the 1970s as an antibacterial agent in soaps. Uses of triclosan have risen dramatically in the past few years. It appears this may be more of a marketing strategy than a medical necessity. Triclosan is now found in the following products:

- Hand soap
- Dish-washing products
- Laundry detergents and softeners
- Plastics (e.g., toys, cutting boards)
- Toothpaste
- Deodorants and antiperspirants
- Cosmetics
- Hair conditioners
- Impregnated sponges
- Pesticides (as an inert ingredient[3])

Triclosan, as well as other antibacterial agents and their degradation byproducts, are now found throughout the environment, including surface waters, soil, fish tissue, and human breast milk.[4] Despite increasing data reflecting the presence of triclosan in surface water, in conducting research for the development of this White Paper, no data was found to support the necessity or efficacy of antibacterial agents in consumer products.

Furthermore, the American Medical Association (AMA) has concerns about the use of these chemicals and has:

- Encouraged the U.S. Food and Drug Administration to study the issue.
- Stated that they will monitor the progress of the current FDA evaluation of the safety and effectiveness of antimicrobial s for consum er use in over-the counter hand and body washes.
- Encouraged continued research on the use of common antimicrobials as ingredients in consumer products and their impact on the major public health problem of antimicrobial resistance.[5]

This White Paper details these issues and presents messages, identifies audiences, and suggests strategies to reduce unnecessary uses of antibacterial products.

2. Sources and Transport Pathways to Surface Water

According to the literature, triclosan has been detected in a variety of environmental media. In a 1999-2000 study by the U.S. Geological Survey, triclosan was found in 57 percent of the 139 U.S. waterways

[2] A related c ompound, triclocarban, is similarly used as an antibacterial agent. While not the focus of this white paper, due to limited available research, it is anticipated that it should be incorporated i nto public outreach messages regarding antibacterial agents.

[3] http://www.cdpr .ca.gov/cgi-bin/ epa/mkepa3.pl?ch ems=054901&activeonly=on

[4] Swiss researchers f ound three out of five samples of human breast milk contained measurable concentrations of triclosan, at concentration s up to 30 #g/kg lipid weight. Adolfsson-Erici, M. Patterson, J .Parkkonen, and J.Sturve. (2000) Triclosan, A Commonly Used Bactercide Found in Human Milk and in the Aquatic Environment, in *Abstracts of Dioxin, 2000, 20th International Symposium on Halogenated Environmental Organic Pollutants and POP's: Monterey, CA.*, Volume 48, page 83

[5] L. Tan, N.H. Nielsen, D.C. Young, Z. Trizna for the Council on Scientific Affairs. *Use of antimicrobial agents in consumer products. Arch Dermatol.* 2002; 138: 1082-1086

that were thought to be susceptible to agriculture or urban activities.[6] The San Francisco Estuary Institute has also detected triclosan and its metabolites in San Francisco Bay (Bay) surface waters.[7]

Triclosan has been found in both surface water and wastewater. Surface water sources may include wastewater treatment plant effluent, urban stormwater, rural stormwater, and agricultural runoff.

The transport of triclosan to wastewater treatment plants occurs when people:

- Wash hands with antibacterial soap
- Hand wash dishes with antibacterial soap
- Clean with antibacterial products
- Use antibacterial products in a dishwasher
- Bathe or shower with antibacterial soap or shampoo
- Brush teeth with toothpaste containing antibacterial products
- Wash clothes with antibacterial products
- Wash antibacterial cutting boards

When domestic wastewater is treated before discharge to surface waters, there is evidence that up to 95 percent of triclosan is removed via the wastewater treatment plant process.[8] This removal efficiency is dependent on treatment plant operations. Swiss researchers observed a 94 percent removal rate of triclosan at wastewater treatment operations that employed mechanical clarification, biological treatment or nitrification, flocculation and filtration. The researchers estimated that 79 percent of the triclosan was removed via biological degradation while 15 percent adsorbed to the sludge. The remaining 6 percent in the effluent resulted in a concentration of 42 ng/Liter.[9]

Unlike wastewater, most runoff that enters storm drains is untreated and directly flows into creeks, rivers and ultimately to the Bay. Triclosan may be transported into the stormwater system through commercial or residential washing of equipment outdoors with antibacterial soaps (e.g., washing a vehicle or restaurant mats with triclosan-contai ning products).

3. *Impacts to Aquatic Ecosystems*

3.1 Aquatic Toxicity and Bioaccumulation

While our current understanding of triclosan's environmental effects is limited, there is evidence that triclosan is acutely and chronically toxic to aquatic organisms.[10,11,12] Research has shown that the presence of triclosan may influence both the structure and the function of algal communities in stream

[6] Kolpin, Dana et al. (2002) Pharmaceuticals, hormones and other organic wastewater contaminants in U.S. Streams, 1999-2000: A National Reconnaissance, *Environmental Science and Technology* v. 36: 1202-1211.
[7] Oros, Daniel and David, Nicole (2002). Identification and Evaluation of Unidentified Organic Contaminants in the San Francisco Estuary, *San Francisco Estuary Regional Monitoring Program for Trace Substances*, SFEI Contribution 45.
[8] Samsøe-Petersen , L., M . Winther-Niels en, and T. Madsen, Danish EPA, "*Fate and Effects of Triclosan*," September 2003.
[9] H. Singer, S. Muller, C . Tixier and L. Pillonel, *Environ. Sci. Technol*. 2002, 36, 4998-5004
[10] Adolfsson-Erici , M.; Pettersson, M.; Parkkonen, J .; Sturve, J. *Organohalogen Compd.* 2000, 4 5, 83-86.
[11] Offhaus, K .; Klingl, H.; Scherb, K.; Wachs, B. 1978.
[12] Orvos, D. R.; V ersteeg, D . J.; Inauen, J.; Dapdevielle, M.; Rothenstein, A.; Cunningham, V. *Environ. Toxicol. Chem.* 2002, 21, 1338-1349.

ecosystems receiving treated wastewater effluent.[13] These changes could result in shifts in both the nutrient processing capacity and the natural food web structure of these streams.

In addition to aquatic toxicity, research suggests that triclosan bioaccumulates in fish tissue. According to a literature review by the Danish Environmental Protection Agency, triclosan bioaccumulates in fish, with bioaccumulation factors of 3,700 to 8,400.[14] This means that the concentrations found in fish are thousands of times higher than what is found in the water column.

Furthermore, at least one transformation product, methyl triclosan (see further discussion in Section 3.2), is relatively stable in the environment, making it also available for bioaccumulation.
Once methylated, the lipophilicity of triclosan increases, meaning that it will be more likely to bioaccumulate in fatty tissue and is not likely to photodegrade.[15] In a Swiss study, the lipid-based concentrations of methyl triclosan observed in fish were considerably higher than the concentrations in lake water, suggesting significant bioaccumulation of the compound. For aquatic organisms, the potential uptake mechanisms of lipophilic contaminants are direct uptake from water through exposed surfaces, mainly gills (bioconcentration), and uptake through the consumption of food (biomagnification).[16]

3.2 Environmental Transformation into Other Toxic Compounds

Once triclosan is released into the environment, the compound may undergo photodegradation or biodegradation. Several studies have shown that triclosan can be transformed into other potentially toxic compounds, including methyl triclosan, dioxins, chloroform, and other chlorinated compounds. Triclosan is likely being methylated in wastewater treatment plants, where there is a high density of microorganisms. Both triclosan and its transformation product, methyl triclosan, are found in wastewater treatment plants effluent and both have recently been detected in Swiss receiving waters.[17]

Degradation By-Products

Under certain circumstances, triclosan can rapidly photodegrade into dioxins and other chlorinated priority pollutants.

According to a University of Minnesota study, triclosan rapidly photodegrades by direct photolysis and both 2,8-dichlorodibenzo-*p*-dioxin (2,8-DCDD) and 2,4-dichlorophenol (2,4-DCP) are produced.[18]

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[13] B.A. Wilson, V.H Smith, F. de Noyelles Jr. C.K. Larive, *Effects of three pharmaceutical and personal care products on natural freshwater algal assemblages*, Environ.Sci. Technol. **2003**.
[14] L. Samsoe-Petersen, M. Winther-Nielsen, and T. Madsen, Danish EPA, "*Fate and Effects of Triclosan*," September 2003.
[15] Lindstrom, A.; Buerge, I. J.; Poiger, T.; Bergqvist, P.-A.; Muller, M.D.; Buser, H.-R. *Occurrence and Environmental Behavior of the Bactericide Triclosan and Its Methyl Derivative in Surface Waters and in Wastewater Environ. Sci. Technol*. 2002. 36, 2322-2329
[16] Balmer. M.; Poiger, T.; Droz. C.; Romanin. K.; Bergqvist, P.; Muller. M.; Buser. R.; *Occurance of methyl triclosan, a transformationproduct of the batericide Triclosan, in fish from various lakes in Switzerland. Environ. Sci. Technol*. 2004, 38, 390-395.
[17] Lindstrom, A.; Buerge, I. J.; Poiger, T.; Bergqvist, P.-A.; Muller, M.D.; Buser, H.-R. *Occurrence and Environmental Behavior of the Bactericide Triclosan and Its Methyl Derivative in Surface Waters and in Wastewater. Environ. Sci. Technol*. 2002. 36, 2322-2329.
[18] D.E. Latch, J.L. Packer, B.L. Stender, J. VanOverbeke, W.A. Arnold, K.McNeill. *Aqueous Photochemistry of Triclosan: Formation of 2,4-Dichlorophenol, 2,8-Dichlorodibenzo-p-Dioxin, and Oligomerization Products. Environ. Sci. Technol.* 2005. 24, 517-525.

2,8-DCDD is at least 150,000 times less toxic than the most harmful forms of dioxins, but repeated exposure to chlorine in water treatment facilities can chlorinate triclosan. Chlorinated triclosan is discharged from a wastewater treatment plant, and sunlight can convert it into more toxic dioxins.[19] Even low levels of dioxin congeners are of concern because dioxins readily accumulate in organisms and become more concentrated in tissues through biomagnification.

Research also indicates triclosan reacts with free chlorine to produce a number of breakdown products, including 2,4 dichlorophenol (2,4-DCP). The formation of 2,4-DCP is of a concern because it's an U.S. EPA priority pollutant, and is considered toxic to fish and other water dwelling organisms.[20, 21] 2,4-DCP is used in the manufacture of certain pesticides, antiseptics, and disinfectants. It is a degradation intermediate of the pesticide 2,4-D and various other pesticides. In addition, in the presence of sunlight, the 2,4-DCP further breaks down and may produce more highly chlorinated dioxins than 2,8-DCDD that may be far more toxic.[22]

Recent research from the Virginia Polytechnic Institute and State University also shows that triclosan in household dishwashing soaps reacts with chlorinated water to produce significant quantities of chloroform, a probable human carcinogen.[23]

3.3 Bacterial Resistance to Antibiotics

Triclosan may encourage the development of antibiotic resistance in pathogenic bacteria. Scientists worldwide are concerned that the overuse and misuse of antibiotics and antimicrobials may lead to an increased resistance among bacteria.

An article published by the American Medical Association indicates the level of concern in the medical community:[24]

> *"Despite their recent proliferation in consumer products, the use of antibacterial agents such as triclosan in consumer products has not been studied extensively. No data exist to support their efficacy when used in such products or any need for them, but increasing data now suggest growing acquired resistance to these commonly used antimicrobial agents."*
>
> *"The use of common antimicrobials for which acquired resistance has been demonstrated in bacteria as ingredients in consumer products should be discontinued, unless data emerge to conclusively show that such resistance has no impact on public health and that such products are effective at preventing infection."*

Unlike bleach and soap that destroy and dislodge bacteria microbes, triclosan works by interfering with a specific bacterial enzyme. Non-specific antiseptics, such as alcohol, merely break open the cell and, therefore, are not the type of chemical which bacteria could develop resistance. On the other hand, triclosans mode of action is different from alcohols and peroxide. Triclosan is fat-soluble and easily

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[19] K. McNeil, Quote, "Sunlight Converts Common Antibacterial to Dioxin", Ascribe Newswire, April 14, 2003
[20] D.E. Latch, J. Packer, B. Stender, J. Van Overbeke, W. Arnold, and K. McNeill, *Aqueous Photochemistry of Triclosan: formation of 2,4-Dichlorophenol, 2,8-Dichlorodibenzo-p-Dioxin, and Oligomerization Products, Environ. Toxicol. Chem*, Vol. 24, No. 3, pp. 517-525, 2005.
[21] EPA, Office of Water. Water Quality Standards Database Ambient Water Quality Criteria for 2,4-dichlorophenol. EPA 440/5-80-042, October 1980.
[22] K. McNeill, http://pubs.acs.org/subscribe/journals/esthag-w/2005/apr/science/kb_chlorine.html
[22] K.L. Rule, V.R. Ebbett, P.J. Vikesland. *Formation of Chloroform and Chlorinated Organics by Free-Chlorine - Mediated Oxidation of Triclosan. Environ. Sci. Technol*. 2005. 39, 3176 - 3185.
[24] http://www.ama-assn.org/ama/pub/article/2036-2913.html

penetrates the bacterial cell wall. And once inside the cell it attacks an enzyme that is used to produce fatty acids that are vital to cell function.[25,26] This type of mode-of-action could ultimately lead to the development of antibiotic resistance. Through continual use of triclosan, non-resistant bacterial strains would be killed, leaving only the bacteria whose enzyme system has evolved to resist the presence of triclosan. Some microbiologists fear that the comme rcial and personal overuse of triclosan could reduce effectiveness of currently useful antibiotics. For instance, an antibiotic used to treat tuberculosis targets the same enzyme system.[27]

4. Alternatives to Antibacterial Agents Are Readily Available

According to the Centers for Disease Control and Prevention (CDC), vigorous hand washing in warm water with plain soap for at least 10 seconds is sufficient to fight germs in most cases, even for healthcare workers.[28] For extra assurance, use of an alcohol- or peroxide-base d hand sanitizer product is a good option.

> *"The use of these products have never been shown to be superior, to my knowledge, to regular soap and water" says Dr. Tamar Barlan, director of the Center for Science in the Public Interest's project on antibiotic resistance.*[29]

As a result of data developed in Europe on triclosan, several major United Kingdom supermarkets banned the sale of consumer products containing the antibacterial agent in late 2003.[30]

Regarding the use of cutting boards, the following quote from the Mayo Clinic web site indicates that cutting boards impregnated with triclosan are ineffectual:

> *"There's no evidence that cutting boards containing triclosan, an antibacterial agent, prevent the spread of food-borne infections. These boards also may give a false sense of security and cause you to relax other efforts to keep the board clean. In addition, triclosan- treated boards don't kill germs. Antibacterial compounds only slow reproduction of microorganism s. Germs will die, but slowly enough to still contaminate other food or hands that come into contact with the board"*[31]

For alternatives to triclosan-containing cutting boards, the Center for Food Safety and Applied Nutrition recommends that households use a two cutting board system. Use one board for cutting foods that will be cooked (e.g., raw meats, poultry, fish, vegetables) and one for ready-to-eat foods (e.g., breads, fresh fruits).

When selecting products such as hand soap, toothpaste, and deodorants, read the label. If the product states "antibacterial" locate the active ingredients list to see if the product contains triclosan or other anti-bacterial agents. Consumers may opt to purchase products that either are not labeled "antibacterial" or contain alcohol or hydrogen peroxide as the antibacterial agent.

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[25] McMurray, L . M., O ethinger, M, Levy, S . B., " *Triclosan targets lipid synthesis*", *Nature* (1998) 394, 531-32.
[26] Levy, C . W., R oujeinikovai, A., Sedelnikova, S., Baker, P . J., Stuitje, A. R., S labas, A . R., R ice, D., & Rafferty, J. B., "*Molecular Basis of Triclosan Activity*", *Nature (1999)*, 398, 383-384.
[27] http://www.scie ncenews.org/2000 0527/fob4.asp
[28] http://www.nurs eweek.com/f eatures/98-10/so ap.html
[29] http://www.envi ronmentalobservatory.org/News/news.c fm?News_ID=1973
[30] Edwards, R ob. "Supermarkets to ban toxic detergen ts", Sunday Herald. h ttp://ww1.sundayherald.com/3778 2
[31] http://www.mayo clinic.com/invok e.cfm?objectid=D 542B4F4-649E-401 4-B0444D9488F33C 12

5. *Next Steps*

The SCBWMI Emerging Contaminants Workgroup proposes to initiate a unified regional approach to reduce the use of triclosan in the Bay Area. Below are the suggested next steps.

1. Present this information to other regional and state agencies, including but not limited to:
   - !" Santa Clara County Medical Association
   - !" Bay Area Pollution Prevention Group and their member POTWs
   - !" BACWA/BASMAA Media Relations Group
   - !" Tri-TAC
2. Present this information to local environmenta l and health groups and request their support via public outreach campaigns and information to their members. Examples include:
   - !" Clean Water Action
   - !" Silicon Valley Toxics Coalition
   - !" Sierra Club
   - !" Communities for a Better Environment
   - !" Surfriders
   - !" Baykeeper
3. Coordinate with these agencies and groups to develop a public factsheet as well as concise messages that resonate with the public and specific audiences. Possible messages include:
   - !" Antibacterial products are found in San Francisco Bay.
   - !" The use of antibacterial products may provide a false sense of security and lead to inadequate hand-washing practices.
   - !" Alternatives include washing hands with soap and water and using alcohol or peroxide based hand gel sanitizing agents for extra assurance.
   - !" Minimize use of antibacterial cleaning and personal care products.
   - !" Avoid antibacterial cutting boards. Use two cutting boards, one for foods to be cooked, and one for ready-to-eat foods (colored boards are available to facilitate instant recognition).
4. Continue to follow scientific literature for additional information regarding environmental fate of antibacterial agents and their by-products.
5. Consider developing State legislation to limit the use of antibacterial agents in consumer products. Concurrently, review opportunities to develop more generic legislation that would address a broader range emerging watershed contaminants.
6. Review opportunities to include messages from other water quality outreach efforts to specific audiences. Such audiences might include:
   - !" Primary purchasing agents in house holds and commercial institutions
   - !" Purchasing departments of public institutions
   - !" Health care and veterinary professionals
   - !" Parents and teachers
   - !" Manufacturers and distributors

6. Glossary

ACUTE TOXICITY - adverse health effects from a single dose or exposure to a toxic chemical or other toxic substance

ANTIBACTERIAL - a product that kills or inhibits the growth of bacteria, generally in foods, inanimate surfaces, or hands; EPA considers that "antibacterial" should only apply to prod ucts designed to control human pathogenic microorganisms

ANTIBIOTIC - a class of natural and synthetic compounds that are capable of inhibiting the growth of or destroying bacteria and other microorganisms

ANTIMICROBIAL AGENT- chemicals used to kill or inhibit the growth of microorganism s whether bacteria, viruses, or fungi. EPA considers that "antimicrobial" should be associated with the protection of articles (e.g., tents)

ANTISEPTIC - a product generally used on skin to prevent infection and decay by inhibiting the growth of microorganism s

BIOACCUMULATE - an increase in the concentration of a chemical in specific organs or tissues at a level higher than would normally be expected

BIOCONCENTRATION - the accumulation of a chemical in tissues of a fish or other organism to levels greater than that in the surrounding environment

BIOMAGNIFICATION - a progressive build up of persistent substances by successive trophic levels, meaning that it relates to the concentration ratio in a tissue of a predator organism as compared to that in its prey

BREAK-DOWN DEGRADATION/BY-P RODUCTS- substances or chemicals left behind after the original substance undergoes some process, such as digestion or photodegradat ion

CHRONIC TOXICITY- adverse health effects from repeated doses of a toxic chemical or other toxic substance over a relatively prolonged period of time, generally greater than one year

INERT INGREDIENTS - compounds that are stable and unreactive under specified conditions

LIPIDS- any of a group of organic compounds that generally contain fatty acids and are water insoluble

METABOLITES - a substance that takes part in the process of metabolism, which involves the breakdown of complex organic constituents of the body with the liberation of energy for use in bodily functioning

METHYLATION - modification of a molecule by the addition of a methyl group

PHOTODEGRADATION - the process of decaying or breaking down a substance using sunlight or other radiant energy

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Senators rip EPA over lack of knowledge on drugs in water
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By MARTHA MENDOZA - April 28, 2008

WASHINGTON (AP) -- The Environmental Protection Agency was lambasted during a Senate hearing Tuesday for allowing the American public to learn that traces of pharmaceuticals are in much of the nation's drinking water from an Associated Press investigative series, not the federal government.

Sen. Barbara Boxer, D-Calif., who chairs the Senate Committee on Environment and Public Works, angrily chided Benjamin H. Grumbles, EPA assistant administrator for water, for the agency's failure to require testing for drugs and for public disclosure of test results.

"When a story like this breaks, why is it necessary for Sen. (Frank) Lautenberg to call a hearing on this? Why aren't you working on this night and day?" Boxer asked. "The Associated Press did your work -- and they're telling us what's in the water."

Boxer set the critical tone in her opening remarks, when she praised the AP and the U.S. Geological Survey, which has conducted extensive testing, for informing the nation that "our water supplies can contain a mixture of pharmaceuticals. Notice I didn't thank the EPA."

Responding to the aggressive questioning in a packed hearing room, Grumbles insisted the agency is not downplaying the issue.

"We're very concerned. It does send a big red flag. We're taking this very seriously," Grumbles testified. He said the EPA was "drastically expanding the scope" of its monitoring of testing of drinking water across the nation.

"Your concern is not comforting. I can tell you that," said Lautenberg, D-N.J., who chairs the Subcommittee on Transportation Safety, Infrastructure Security and Water Quality. "Action is what we are trying to get."

The subcommittee convened the hearing in response to a series last month by the AP National Investigative Team that detailed test results showing the presence of minute concentrations of drugs in drinking water in 24 major metropolitan areas that serve 41 million Americans.

The AP's five-month inquiry found that while water is screened for drugs by some

suppliers, they usually don't tell customers they have found medication in it, including antibiotics, anti-convulsants, mood stabilizers and sex hormones. The stories also detailed the growing concerns among scientists that this pollution is already adversely affecting wildlife, and may threaten human health.

Some of the witnesses cautioned against sinking a lot of money and resources into regulating pharmaceuticals in drinking water before the health risks are better understood. In addition, they pointed out there may be more pressing concerns about other contaminants.

After Grumbles maintained that federal scientists were studying the issue of drugs in water long before the AP series, Sen. Amy Klobuchar, D-Minn., asked him why most people hadn't heard about the contamination.

"You've been doing all of this, but it really surprised a lot of us. It really shouldn't take a newspaper article to get the story out," she said. "My concern here is you talk a lot about potential (inclusion of drugs on regulated contaminant lists) and things we can do. I'm concerned there hasn't been enough action."

Grumbles was grilled on why water providers are not required to test for pharmaceuticals, on why the EPA's budget for testing of endocrine disruptors in waterways has been slashed 35 percent and why the agency has not disclosed all of its test results. Repeatedly, senators said they were not satisfied with his responses.

In a letter to the subcommittee earlier this month, Grumbles said it would be unreasonable and expensive to require such testing, given the uncertain risk to humans.

In remarks prepared for his testimony, he seemed somewhat less reluctant.

"Some have argued that it does not make sense to monitor for pharmaceuticals in water if there is limited information about the health effects at the concentrations that could be detected," his prepared remarks read. "We disagree. Information about occurrence and health effects is complementary and should be developed in tandem."

However, in his actual testimony, Grumbles declined to commit to such testing by water providers. "I think that they should disclose information that is useful to the public." Wondering if that meant raw data, he said, "I don't know."

Boxer answered back, "I'm talking about test results."

Outside the hearing room, Grumbles said utilities should test their waters for pharmaceuticals if they have the financial and technical resources.

Boxer also called on Grumbles to immediately release records sought this year by the AP in a Freedom of Information Act request from a White House task force that is

supposed to be devising a federal plan to research pharmaceuticals in the environment.

Earlier this week, the AP reported that the White House Office of Science and Technology Policy group has missed its December deadline to produce a national research strategy. In releasing about 70 pages of documents, a White House lawyer told the AP another "10 inches worth" were being withheld.

"The White House is keeping its task force secret," said Boxer, who urged the Bush administration to "immediately release all of the records."

She pressed Grumbles to produce the material within 10 days. He made no such commitment.

After the hearing, Lautenberg said the EPA response was inadequate. "To me, it represents a sleight of hand that we are familiar with here."

In other testimony, the senators were joined in their call for more research by Robert M. Hirsch, the USGS's associate director for water.

"Whether or not there are adverse human health effects from cumulative lifetime exposures to the low concentrations of complex mixtures of pharmaceuticals found in the environment remains a research priority, particularly the effects on sensitive subpopulations such as children, women of child-bearing years, the elderly and people with suppressed immune systems," Hirsch said.

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Pharmaceuticals Again Found in U.S. Drinking Water
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in Groundwater and Waste Discharge
. 0 CommentsEdit
WASHINGTON, DC, March 10, 2008 (ENS)

Drugs taken for pain, infection, high cholesterol, asthma, epilepsy, mental illness and heart problems contaminate drinking water supplies of at least 41 million Americans, according to a report by the Associated Press National Investigation Team released today. These findings confirm a 2002 report by the U.S. Geological Survey that was the first nationwide study of pharmaceutical pollution in the nation's rivers and streams.

Drug residues contaminate drinking water supplies when people take pills. While their bodies absorb some of the medication, the rest is flushed down the toilet.

Drinking water treatment plants are not designed to remove these pharmaceutical residues, and the AP team uncovered data showing these same chemicals in treated tap water and water supplies in 24 major metropolitan areas.

All of the pharmaceuticals reported in drinking water supplies are unregulated in treated tap water. Although the concentrations of drugs found by the AP research were miniscule, measured in parts per billion, any level is legal and the U.S. Environmental Protection Agency, EPA, does not require water utilities to test for these substances.

Tap water can contain drugs and other contaminants. (Photo by Greg Riegler

Previous research has shown that exposure to levels even lower than reported in this survey can cause harm to aquatic species. Effects on humans, if any, have not been determined.

The USGS survey revealed a list of compounds including the painkillers acetaminophen and ibuprofen, prescription medicines for cardiac disorders and hypertension, and female sex hormones used in birth control pills and hormone replacement therapy. The AP study surfaced as a campaign to get consumers to use tap water instead of bottled water is being waged across the country by the nonprofit group Food & Water Watch.

"All our water sources - rivers and reservoirs, springs and aquifers - may contain drugs flushed down our toilets and off factory farms somewhere up stream," said Food & Water Watch Executive Director Wenona Hauter. "But scaring people away from their taps into the bottled water isle at the grocery store will cost them thousands of dollars a year without making them any safer."

"Nearly 40 percent of bottled water is simply repackaged tap water. What's more, there's no government agency testing bottled water contamination from known hazards such as bacteria, synthetic contaminants, or heavy metals," Hauter said.

"While the Associated Press did not test bottled water, earlier testers have found dangerous substances such as arsenic and bromate, both known carcinogens. And bottled water comes with its own list of unknown hazards from chemicals leached into the water from the plastic bottles. Hauter maintains, "Tap water is still the best choice for most Americans."

The AP research extends knowledge detailed in a survey of contaminants in tap water conducted by the nonprofit Environmental Working Group published in December 2005.

Tap water in 42 states is contaminated with more than 140 unregulated chemicals that lack safety standards, the Environmental Working Group found during a 30 month investigation of water suppliers' tests of the treated tap water.

"Environmental Working Group's studies show that tap water across the U.S. is contaminated and now we know that millions of Americans are also drinking low level

mixtures of pharmaceuticals with every glass of water," said Jane Houlihan, Environmental Working Group vice president for research.

"The health effect of this cocktail of chemicals and drugs hasn't been studied but we are concerned about the effects on infants and others who are vulnerable, Houlihan said.

Environmental Working Group analysis shows that of the top 200 drugs in the United States, 13 percent list serious side effects at levels less than 100 parts per billion, ppb, in human blood, with some causing potential health risks in the parts-per-trillion range.

A national tap water atlas published online by the Environmental Working Group shows tap water testing results from 40,000 communities around the country. View the atlas at: http://www.ewg.org/sites/tapwater/ The drug residues in tap water join hundreds of other synthetic chemicals Americans are exposed to daily, as contaminants in food, water, and air, or in common consumer products.

The environmental groups are asking the U.S. Environmental Protection Agency to take swift action to set standards for pollutants in tap water that will protect the health of Americans nationwide, including children and others most vulnerable to health risks from these exposures.

Top 11 Compounds in US Drinking Water
Published by admin on January 20, 2009

Rowan Hooper, New Scientist - 1/12/09

A comprehensive survey of the drinking water for more than 28 million Americans has detected the widespread but low-level presence of pharmaceuticals and hormonally active chemicals.

Little was known about people's exposure to such compounds from drinking water, so Shane Snyder and colleagues at the Southern Nevada Water Authority in Las Vegas screened tap water from 19 US water utilities for 51 different compounds. The surveys were carried out between 2006 and 2007.

The 11 most frequently detected compounds - all found at extremely low concentrations - were:

- Atenolol, a beta-blocker used to treat cardiovascular disease
- Atrazine, an organic herbicide banned in the European Union, but still used in the US, which has been implicated in the decline of fish stocks and in changes in animal behaviour
- Carbamazepine, a mood-stabilising drug used to treat bipolar disorder, amongst other things
- Estrone, an oestrogen hormone secreted by the ovaries and blamed for causing gender-bending changes in fish
- Gemfibrozil, an anti-cholesterol drug
- Meprobamate, a tranquiliser widely used in psychiatric treatment
- Naproxen, a painkiller and anti-inflammatory linked to increases in asthma incidence
- Phenytoin, an anticonvulsant that has been used to treat epilepsy
- Sulfamethoxazole, an antibiotic used against the Streptococcus bacteria, which is responsible for tonsillitis and other diseases
- TCEP, a reducing agent used in molecular biology
- Trimethoprim, another antibiotic

The concentrations of pharmaceuticals in drinking water were millions of times lower than in a medical dose, and Snyder emphasizes that they pose no public health threat. He cautions, though, that "if a person has a unique health condition, or is concerned about particular contaminants in public water systems, I strongly recommend they consult their physician".

Christian Daughton of the EPA's National Exposure Research Laboratory says that neither this nor other recent water assessments give cause for health concern. "But several point to the potential for risk - especially for the fetus and those with severely compromised health."

Daughton says the contamination surveys help people realize how they are intimately and inseparably connected with their environment. "The occurrence of pharmaceuticals in the environment also serves to make us acutely aware of the chemical sea that surrounds us," he says.

Modern life While the US government regulates the levels of pathogens in US drinking water, there are no rules for pharmaceuticals and other compounds, apart from one: the herbicide atrazine. The atrazine levels measured by Snyder and colleagues were well within federal limits.

Snyder says water utilities could make drinking water purer. But the costs of "extreme purification" - far beyond what is needed for safety alone - are huge in terms of increased energy usage and carbon footprint. Ultra-pure water might not even be safe, adds Snyder.

The widespread occurrence of pharmaceuticals and endocrine disruptors reflects improved detection techniques, rather than greater pollution, says Snyder. Contamination is a fact of modern life, he adds.

"As we continue to populate and aggregate, our wastes will certainly accumulate where we live," he says. "We as a species have decided to live a modern life, with pharmaceuticals, plastics, transportation - therefore we must accept that there will be a certain degree of contamination."

« New Evidence that River Pollution could be causing Male Fertility Problems