


Future Permitting Issues

Wastewater Utility Council
May 16, 2007

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Presentation Overview

- Where do new issues come from?
- What are some of these issues?
- What can be done to prepare for them?

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Where do issues come from?



☞ Changes in water quality standards at the state or federal level



☞ New EPA initiatives



☞ Reinterpretation of regulations by the State or EPA



☞ Unforeseen circumstances (example Vulnerability Assessments)

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What are these future Issues?



☞ Ammonia Criteria



☞ Temperature Criteria



☞ Total Maximum Daily Loads (TMDLs) - 303(d) list



☞ SSO/CMOM

☞ Nutrient Criteria

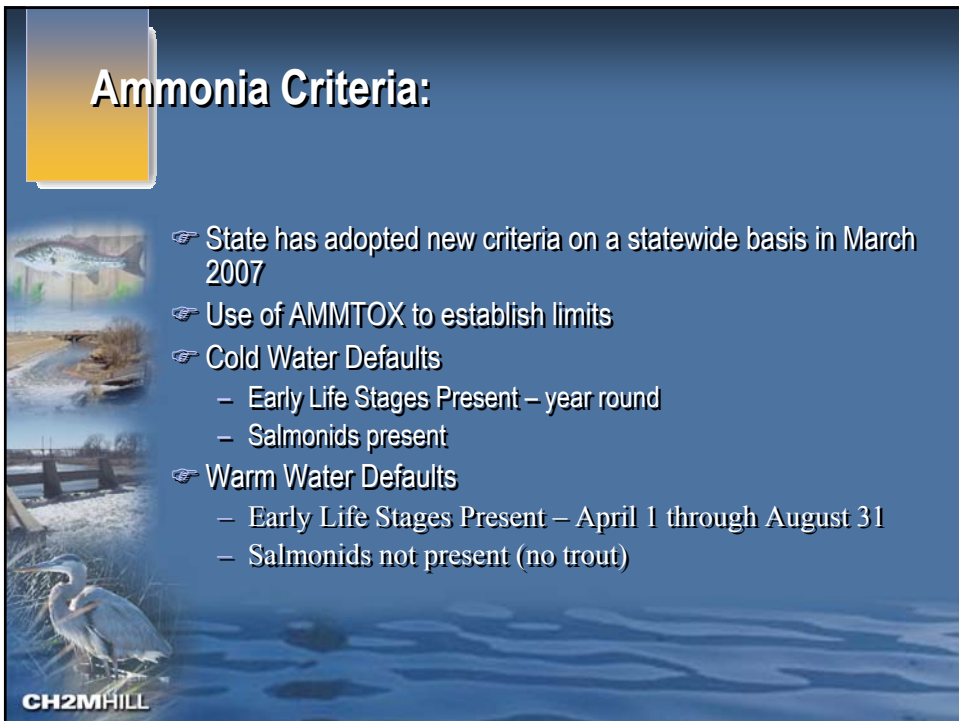
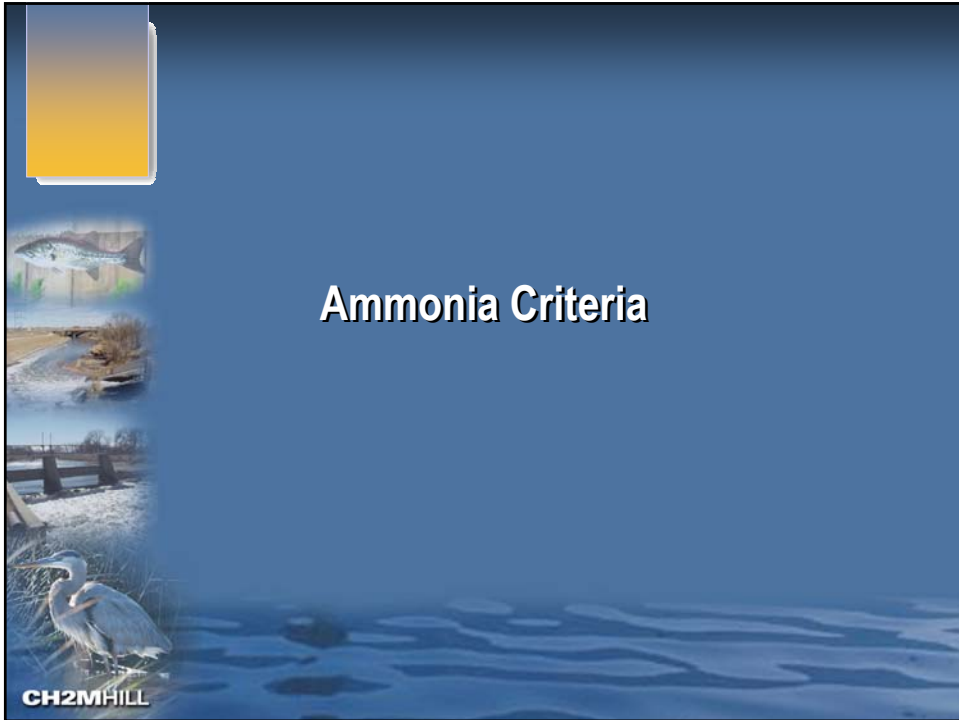
☞ Emerging contaminants

☞ E. Coli

☞ Selenium

☞ Others

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Ammonia Criteria:



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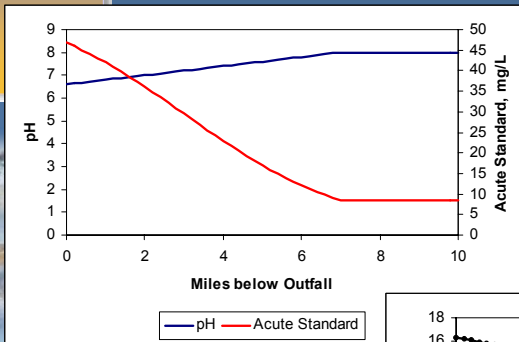
Early Life Stages

- Evaluate what species are present, below the discharge.
- Determine when early life stages are present.
- Propose changes if appropriate.

Evaluate ammonia limits to determine if any additional time will be necessary.

- Run AMMTOX based on current CAM data including any new data.
- Determine if additional time will be needed to meet limits.
- If necessary request a temporary modification.

Pattern of Toxicity, Simple Scenario

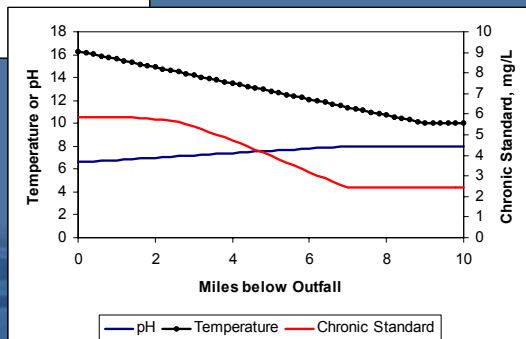


Initial

- pH: 6.6
- Temp: 16.3

Final

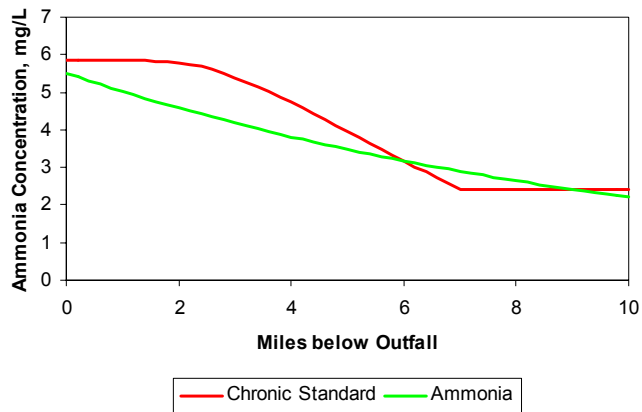
- pH: 8.0
- Temp: 10



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Pattern of Toxicity, Complex Scenario

- Simple Scenario pH, temperature
- Initial ammonia = 5.5
- Loss = 3/d
- V = 2 fps



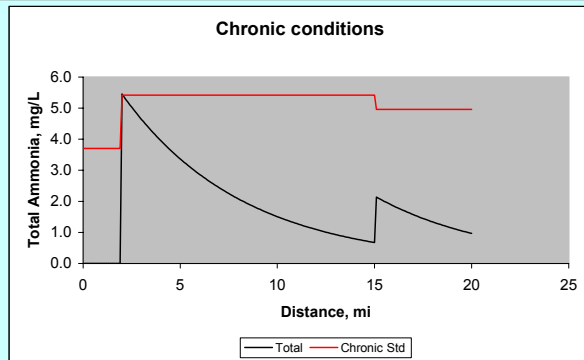
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Organization of AMMTOX

- Recurrence model
 - Defines set point conditions, integral to mapping downstream trajectory of toxicity
- Reach Model
 - Predicts downstream pattern of stream standard based on expected spatial patterns in pH and temperature
 - Predicts downstream changes in total ammonia based on first order kinetics
 - Employs graphical approach for setting permit limits

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Output on Control page



Enter Source	Offset Here	CHRONIC TOTAL AMMONIA, mg/L											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
WWTP A	1	12.5	11.5	10.5	9.5	8.5	7.5	7.5	7.5	8.5	9.5	10.5	11.5
WWTP B	2	12.5	11.5	10.5	9.5	8.5	7.5	7.5	7.5	8.5	9.5	10.5	11.5
not in use													
not in use													

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Design of Basic Sampling Program

What

- Stream: pH, temperature, date, time, ammonia (u/s)
- Effluent: pH, temperature

When

- Stream: biweekly or monthly
- Effluent: individual, not DMR summary

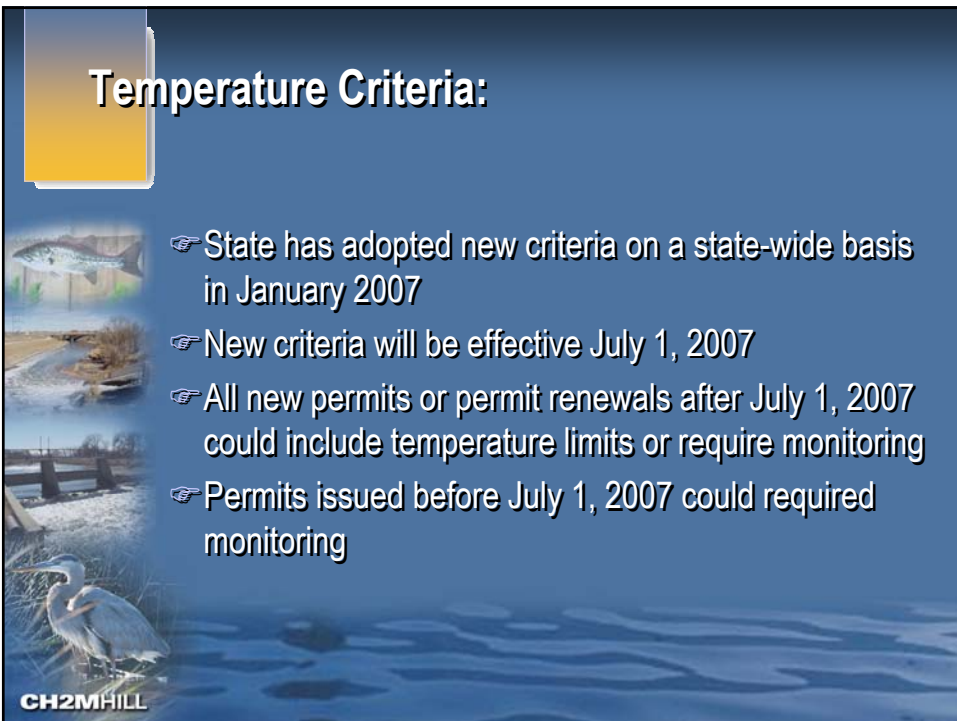
Where

- Upstream
- Downstream (equilibrium conditions)

Supplemental

- Ammonia loss rate
- Diel variation in pH and temperature
- Seepage
- Velocity

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Temperature Criteria: Cold Water



Rivers and streams

- June – Sep
 - Chronic = 17.0 °C
 - Acute = 21.2 °C
- Oct – May
 - Chronic = 9.0 °C
 - Acute = 13.0 °C

NS rivers and streams (no cutthroat or brook trout)

- Apr – Oct
 - Chronic = 18.2 °C
 - Acute = 23.8 °C
- Nov – Mar
 - Chronic = 9.0 °C
 - Acute = 13.0 °C

Lakes and Reservoirs

- Apr – Dec
 - Chronic = 17.0 °C
 - Acute = 21.2 °C
- Jan – Mar
 - Chronic = 9.0 °C
 - Acute = 13.0 °C

Lakes and Reservoirs ≥100 ac

- Apr – Dec
 - Chronic = 18.2 °C
 - Acute = 23.8 °C
- Jan – Mar
 - Chronic = 9.0 °C
 - Acute = 13.0 °C

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Temperature Criteria: Warm Water



Rivers and streams (Mar – Nov)

- General
 - Chronic = 28.7 °C
 - Acute = 31.3 °C
- Common shiner, Johnny darter, orangethroat darter
 - Chronic = 24.2 °C
 - Acute = 29.0 °C
- Razorback sucker
 - Chronic = 27.7 °C
 - Acute = 31.3 °C
- Other sensitive species
 - Chronic = 27.5 °C
 - Acute = 28.6 °C

Rivers and streams (Dec – Feb)

- General
 - Chronic = 14.3 °C
 - Acute = 15.2 °C
- Common shiner, Johnny darter, orangethroat darter
 - Chronic = 12.1 °C
 - Acute = 14.5 °C
- Razorback sucker
 - Chronic = 13.9 °C
 - Acute = 15.2 °C
- Other sensitive species
 - Chronic = 13.7 °C
 - Acute = 14.3 °C

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Temperature Criteria: Warm Water



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☞ Lakes and Reservoirs

- Apr – Dec
 - Chronic = 26.5 °C
 - Acute = 29.3 °C
- Jan – Mar
 - Chronic = 13.3 °C
 - Acute = 14.6 °C

Temperature Criteria:



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☞ Narrative criteria


- normal pattern of diel and seasonal fluctuations
- spatial diversity with no abrupt changes
- no increases of a magnitude, rate, and duration to cause harm to resident aquatic life

☞ Monitoring

- Upstream and effluent
- Cognizant of the time of day
- Impacts due to diversions


☞ Site specific Monitoring

- Fish species present
- Seasons



TMDLs – 303(d) List

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TMDLs - What is the 303(d) list?

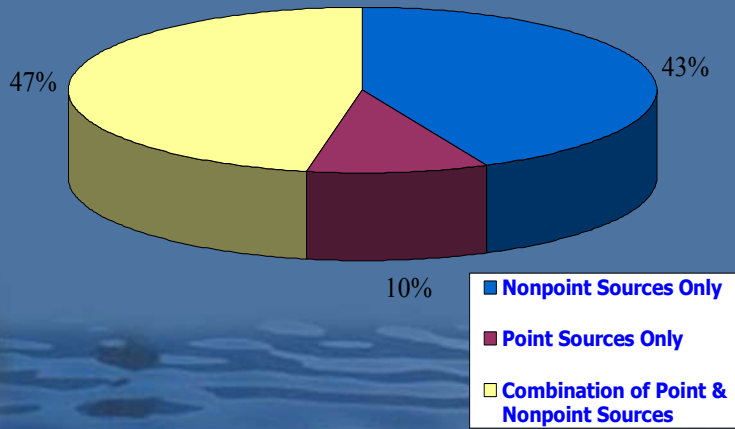
- ☞ “303(d)” refers to a section of the Clean Water Act
- ☞ List of stream segments not meeting water quality standards or threatened
- ☞ Developed every two years, most recent finalized April 2006
- ☞ TMDLs required for all segments listed

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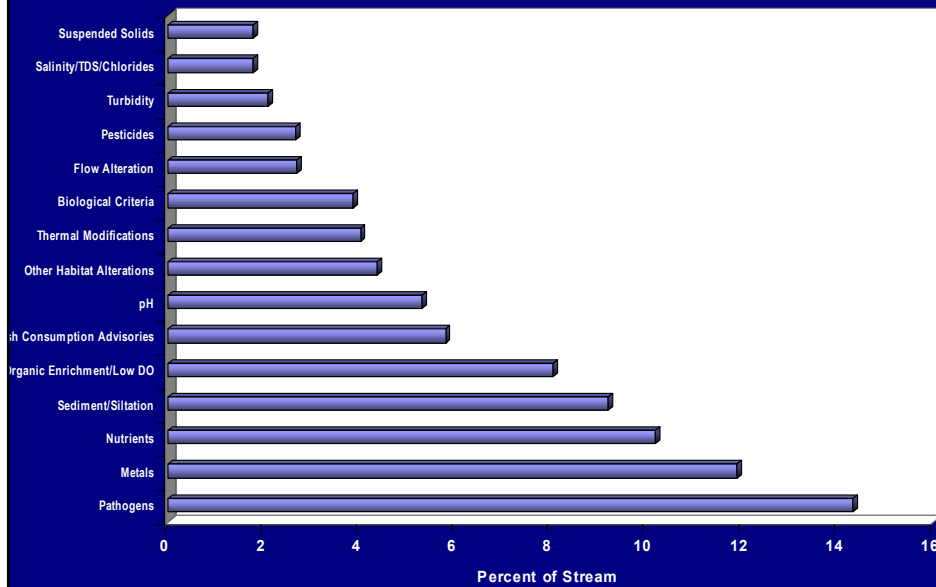
Sources of Impairment by Source Category



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Source of Impairment on a Nationwide Basis



TMDL Development

☞ TMDL = WLAs + LAs + MOS

- WLA (wasteload allocation) is for point sources
- LA (load allocation) is for NPSs
- MOS is margin of safety

☞ Can require reduction in point and nonpoint sources; the key issue is the allocation between point sources and nonpoint sources

☞ TMDL language dictates what and how the limit is applied in permit

☞ New dischargers may be required to meet standards directly, redo the TMDL at their expense, or trade for loading.

☞ Be involved!

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Sanitary Sewer Overflows (SSOs) and CMOM

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SSOs - Goal of the SSO Program is to *eliminate* SSOs



☞ > 40,000 SSOs per year
(excludes basement backups)

☞ SSOs occur when flow exceeds system conveyance capacity



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What is prohibited?

- ☞ Discharge of untreated, raw sewage
- If it reaches waters of the U.S., violates CWA
 - If not, it must be reported (*new requirement*)

☞ Exceptions to prohibition are provided for unavoidable SSOs:

- Caused by severe natural conditions or "other factors"

☞ ***Burden of proof falls on the permittee***



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EPA Consistently Has Said They Will Publish An SSO Rule

- ☞ Preamble revisions
- ☞ October 2002 EPA said would submit to OMB ~4th Quarter 2003
- ☞ February 2003 said would wait until after CSO/SSO Report to Congress; due December 2003
- ☞ EPA will wait until after blending policy to release SSO Rule



Major themes of the SSO Rule

- 
- ☞ Add Expanded Standard Permit Conditions
 - Capacity, Management, Operations & Maintenance (CMOM) program
 - Prohibits SSOs... but provides consistent framework for raising a defense
 - Reporting, public notification, and recordkeeping
 - ☞ Expanded NPDES Permit Coverage
 - Framework for regulating municipal satellite collection systems

What is CMOM?

Capacity Management and Operation and Maintenance (CMOM)

A tool for ensuring quality wastewater collection services to customers

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CMOM performance potentials

☞ Capacity

- Adequacy defined
- Budgeted CIP

☞ Management

- Asset management
 - New sewer controls
 - Facility planning
- Documented
- Budgeted

☞ Operation

- Documented
- Reviewed
- Budgeted O&M

☞ Maintenance

- Documented
- Preventative valued
- Budgeted O&M

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Collection System – CMOM & SSOs



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- ☞ Regulatory status uncertain.
 - More likely with the adoption of the new Peak Weather Flow Policy
- ☞ EPA/State requiring programs on a case-by-case basis
- ☞ State is ramping up their program
 - Looking for trends in spills over the last 3 years
 - Basement backups that are caused by problems in main line are SSOs
- ☞ No plans for permitting satellite collection systems

Collection System – CMOM & SSOs



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- ☞ Likely state process
 - Require facilities to do an evaluation of their system per EPA CMOM Guidance
 - CDPHE does a CMOM inspection
 - Three types of outcomes:
 - Inspection show that the facilities knows what it is doing, no further action
 - Resolved cause of SSOs, but program needs additional work
 - Enforcement Action

Nutrient Criteria



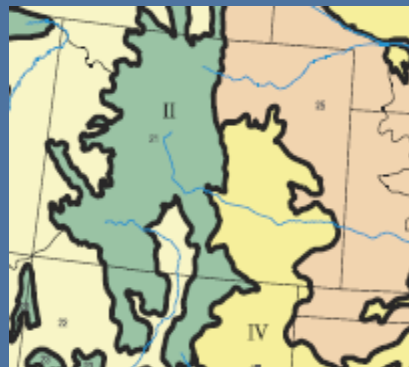
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EPA Proposed Criteria in 2001



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- ☛ Ecoregion 2
 - Phosphorus = 0.010 mg/L
 - Nitrogen = 0.38 mg/L
- ☛ Ecoregion 4
 - Phosphorus = 0.023 mg/L
 - Nitrogen = 0.56 mg/L
- ☛ Ecoregion 5
 - Phosphorus = 0.067 mg/L
 - Nitrogen = 0.88 mg/L



Nutrients:



- ☞ Division has been working toward developing criteria.
- ☞ Criteria to be proposed in 2010.
- ☞ Current intent is to work on lakes first.
- ☞ Dr Bill Lewis performed study of montane lakes and rivers.
- ☞ Result of study
 - Lakes: Total Phosphorus = 0.01 mg/L Total Nitrogen = 0.35 mg/L
 - Rivers: Total Phosphorus = 0.10 mg/L, Total Nitrogen = 0.7 mg/L
- ☞ Suggested Actions
 - Monitoring for nutrients
 - Provide input into State proposals
 - Anticipate site specific studies

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Emerging Contaminants



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Emerging Contaminants Are Making News



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☞ Media reports

- "Household supplies appear in water: Drugs, disinfectants worry state panel" – Arizona Republic, 7/2004
- "Mutant fish prompt concern: Study focuses on sewage plants" - Denver Post, 10/2004
- "Abnormal Fish Found Closer to Washington: Waste Suspected in Egg-Bearing Males" – Washington Post, 12/2004
- "Cause of freakish fish not pinpointed" – Omaha World Herald, 2/2006

☞ One of EPA Water's top priorities

- ☞ Division is hoping for research to determine appropriate standards

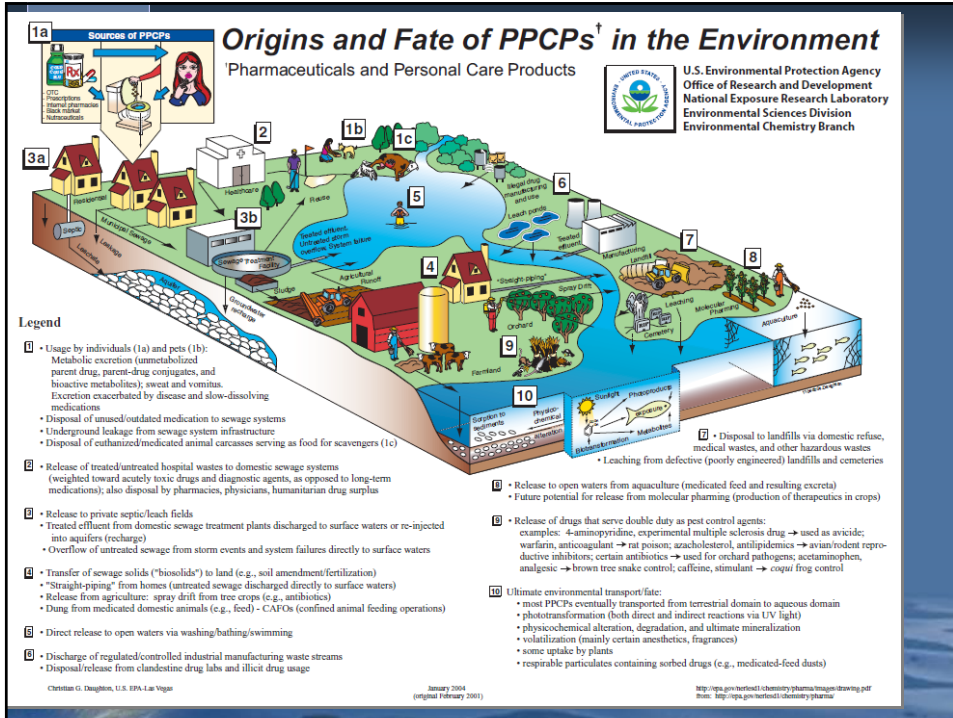
Emerging Contaminants: EDCs vs. PPCPs



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☞ Definitions

- EDC – Endocrine Disrupting Chemicals
- PPCP – Pharmaceutical and Personal Care Products
- ECs – Emerging Contaminates. Consist of both EDCs and PPCPs
- ☞ PPCPs and EDCs are not synonymous—they overlap
- ☞ Only a small subset of PPCPs are known/suspected of being direct-acting EDCs (e.g., synthetic steroids); toxicological concerns usually differ.
- ☞ EDCs are comprised of members from many different chemical classes



How could the state/EPA be pushed to regulate ECs?

- ☞ Third party law suit
- ☞ General Public demands action
- ☞ Downstream water provider concerns
- ☞ Politics
- ☞ Regulator out to "save the environment"
- ☞ Desire to "do something"

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Implementation of existing criteria could present challenges to dischargers



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- ☞ Colorado Wastewater Utility Council initiated a study on organics and wastewater treatment plants.
- ☞ Out growth of the water quality standards hearing on organics.
- ☞ Study Elements
 - Data gathered from several WWTPs detected several organics
 - Determine levels in possible sources to the stream based on existing data
 - Evaluate what addition data will be necessary.
- ☞ Focused on ethylhexyl phthalate (Bis-2)– an endocrine disrupter. All WWTPs had some level.

Wastewater Discharge Concentrations of Bis 2



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Parameter	No of Detects	No of Samples	Ave of Detectable Results	Max of Detectable Results	Min of Detectable Results
Metro District	3	31	15.7	21	11
Colorado Springs	3	22	23.8	57	1.5
Centennial WSD	3	7	1.02	1.5	0.65

- ☞ Centennial has no industrial users
- ☞ Possible Limits
 - MCL = 6 ug/L
 - Cancer Risk = 3 ug/L
 - Water + Fish = 1.2 ug/L
 - Fish Ingestion = 2.2 ug/L

Conclusions of WWUC Study



- ☞ There are detectable levels of endocrine disrupting compounds in wastewater, stormwater and industrial discharges.
- ☞ Insufficient data available in Colorado on water quality levels in the stream.
- ☞ Suggestion is for additional study including data collection.
- ☞ Wastewater Treatment
 - Construction = \$0.40 to \$20/gpd (recent article in WE&T)

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Miscellaneous Other Issues



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E. Coli :



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- ☞ New permits will have E. Coli limits, not fecal coliform
- ☞ Division is in the process of development of first TMDL for bacteria
- ☞ Current thought is to assign 126 org/100ml on discharges directly
 - Includes dry weather discharges from stormwater pipes
 - WWTP permits
- ☞ Should track implementation if your segment is listed

Selenium



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- ☞ Sources - shales, coal deposits, naturally occurring
- ☞ Often related to irrigation
- ☞ State will need to address standard as part of TMDL development.
- ☞ Treatment
 - Tertiary treatment - physical or biological
- ☞ EPA proposed new standard in December 2004. Tissue based value of 7.9 ug/kg. Final criteria is 2 years off.
 - USFWS wants 2 ug/L
- ☞ Water concentration based on bioaccumulative factors.
- ☞ Work is being done in gathering data throughout the state.

Other Challenges

Metals

☞ Copper

- Common problem for WWTPs
- New criteria proposed no yet final

☞ Cadmium

- 2001 EPA criteria significantly more stringent than current

☞ Zinc

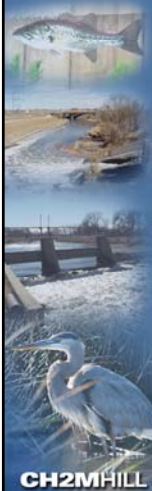
- New criteria can result in less stringent limits

☞ Mercury

- Monitoring method results in tighter numbers
- WWTPs have detected low levels

☞ Several alternatives available to address metals

- Translator
- Water Effect Ratio



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Other Challenges

☞ Reasonable Potential Analysis

- New policy is currently more scientifically based
- Likely will need to be tweaked after experience is gained

☞ Aquatic Life Use Classification

- Development of biological criteria
- Would be in addition to current numeric values
- Could result in need for permittee to do aquatic studies on a regular basis



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Questions?