

TOXIC TALES

Impact of Oregon's New Water Quality Standards

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<http://www.co.clackamas.or.us/wes/>

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Impact of Oregon's New Water Quality Standards



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Today's Discussion

- Background
- NPDES Permit Impacts
- Pretreatment Program Impact
 - *Local Limits*
 - *Source Reduction*
- Conclusions



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Background

- Water Quality Standards (WQS)
 - Reviewed every 3 years
 - EPA authority to review and approve
- Water Quality Standards (WQS)
 - ◆ Protection of Aquatic Life
 - Based on Acute and Chronic
 - Based on Fresh and Marine
 - ◆ Protection of Human Health
- Fish Consumption Rate (FCR)
 - Element of Human Health Protection (was 6.5 gr/day)
 - Oregon revised WQS based on FCR of 17.5 gr/day
 - Disapproved by EPA June 2010
 - Oregon rerevised WQS based on FCR of 175 gr/day

TABLE 20

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
CHLOROMETHYL ETHER (BIS)	N	Y					0.00000376ng**	0.00184ug**	
CHLOROPHENOL 2	Y	N	*4,380.	*2,000.					
CHLOROPHENOL 4	N	N			*29,700.				
CHLOROPHENOXY HERBICIDES (2,4,5-TP)	N	N					10.ug		
CHLOROPHENOXY HERBICIDES (2,4-D)	N	N					100.ug		
CHLORPYRIFOS	N	N	0.083	0.041	0.011	0.0056			
CHLORO-4 METHYL-3 PHENOL	N	N	*30.						
CHROMIUM (HEX)	Y	N	16.	11.	1,100	50.	50.ug		0.05mg
CHROMIUM (TRI)	N	N	1,700.+	210.+	*10,300		170.mg	3,433.mg	0.05mg
COPPER	Y	N	18.+	12.+	2.9	2.9			
CYANIDE	Y	N	22.	5.2	1.	1.	200.ug		
DDT	Y	Y	1.1	0.001	0.13	0.001	0.024ng**	0.024ng**	
DDT METABOLITE (DDE)	Y	Y	*1,050.		*14.				
DDT METABOLITE (TDE)	Y	Y	*0.06		*3.6				
DEMETON	Y	N		0.1		0.1			
DIBUTYLPHTHALATE	Y	N					35.mg	154.mg	
DICHLOROBENZENES	Y	N	*1,120.	*763.	*1,970.		400.ug	2.6mg	
DICHLOROBENZIDINE	Y	Y					0.01ug**	0.020ug**	
DICHLOROETHANE 1,2	Y	Y	*118,000.	*20,000.	*113,000.		0.94ug**	243.ug**	
DICHLOROETHYLENES	Y	Y	*11,600.		*224,000.		0.033ug**	1.85ug**	
DICHLOROPHENOL 2,4	N	N	*2,020.	*365.			3.09mg		
DICHLOROPROPANE	Y	N	*23,000.	*5,700.	*10,300.	*3,040.			
DICHLOROPROPENE	Y	N	*6,060.	*244.	*790.		87.ug	14.1mg	
DIELDRIN	Y	Y	2.5	0.0019	0.71	.0019	0.071ng**	0.076ng**	
DIETHYLPHTHALATE	Y	N					350.mg	1.8g	
DIMETHYL PHENOL 2,4	Y	N	*2,120.						
DIMETHYL PHTHALATE	Y	N					313.mg	2.9g	
DINITROTOLUENE 2,4	Y	Y					0.11ug**	9.1ug**	
DINITROTOLUENE	Y	N					70.ug	14.3mg	
DINITROTOLUENE	N	Y	*330.	*230.	*590.	*370.			
DINITRO-O-CRESOL 2,4	Y	N					13.4g	765.ug	
DIOXIN (2,3,7,8-TCDD)	Y	Y	*0.01	*38 pg/L			0.000013ng**	0.000014ng**	
DIPHENYLHYDRAZINE	Y	N					42.ng**	0.56ug**	

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How much fish do we need to eat ?

6.5 GR/DAY

=

0.22 OZ/DAY

=

1.4 CTM



17.5 GR/DAY

=

0.62 OZ/DAY

=

3.8 CTM



175 GR/DAY = 6.2 OZ/DAY = 37.6 CTM



CTM = Cans of Tuna per Month

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WQS Comparison - Human Health

Chemical	Water & Organism (ug/L)			Organism (ug/L)			Quantitation Limit (ug/L)
	6.5 gr/d	17.5 gr/d	175 gr/d	6.5 gr/d	17.5 gr/d	175 gr/d	
BHC Gamma (Lindane)	none	0.98	0.17	none	0.017	0.0017	0.01
Bis(2-ethylhexyl)phthalate	none	1.2	0.20	none	2.2	0.22	1
4,4'-DDD	none	3.1E-04	3.1E-05	none	3.1E-04	3.1E-05	0.01
4,4'-DDT	2.4E-05	2.2E-04	2.2E-05	2.4E-05	2.2E-05	2.4E-05	0.01
Pyrene	none	830	290	none	4,000	400	1
Vinyl Chloride	2	0.025	0.020	525	2.4	0.24	0.5

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Background

- Process took a number years
- Lots of meetings with lots of stakeholders
 - Develop list of affected compounds
 - Develop proposed standards
- More meetings with lots more stakeholders
 - Role of Agriculture, Forestry, Industry, Environmental Groups, and POTWs
 - Develop strategies for eventual compliance by NPDES permittees
- Approved by EPA October 17, 2011



It's a done deal! Time to move on!

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NPDES Permit Impacts

- Permit Renewal Every 5 Years
- What To Do !!!!!
 - Compliance strategies to consider

But before we go there

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NPDES Permit Impacts

- Permit Renewal

- How it is typically done

- Complete renewal application and submit
- State permit writer drafts permit
- Applicant review and public process
- Permit issued

- The new paradigm

- Take ownership of your analysis
- Take ownership of your RPA
- Be prepared before working through the permitting process
(Because once the limits are set, there is no backsliding)

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NPDES Permit Impacts

Take Ownership of Your Analysis!

- Conduct sampling carefully to minimize contamination
- Evaluate the results carefully. Look for:
 - False Positives
 - Outliers
 - Background
 - Quantitation Limits
 - Changes between sampling events
 - Conditions during sampling event

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NPDES Permit Impacts

Run Reasonable Potential Analysis

- Spreadsheet/process is a statistical evaluation
- If there is a RP to exceed a WQS, then Look for:
 - False Positives, Outliers, Quantitation Limits
 - Robustness of dataset
 - Background
 - Mixing Zone / Dilution Ratios

RPA Run Information		Please complete the following General Facility Information			
Facility Name:	Anytown STP	1. Do I have dilution value from a mixing zone study? (Y/N)	y	4. If answered "Y" to Question 1, then fill in dilution values from mixing zone study	
DEQ File Number:	enter file # here	2. Is the receiving waterbody fresh water? (Y/N)	y	Dilution @ RMZ under harmonic mean flow	25
Permit Writer Name:	Ima Permit	3. If answered "N" to Question 1, then fill in the following table		Dilution @ RMZ under 30Q5 flow	25
Outfall Number:	1	Eff. Flow Rate	MGD	*	
Date of RPA Run:	enter date here	Stream Flow: Harmonic Mean	CFS	*	
RPA Run Notes:		Stream Flow: 30Q5	CFS	*	
		% dilution at MZ	%	25%	
		Calculated dilution factors			
		Dilution @ Harmonic Mean Flow	na		
		Dilution @ 30Q5	na		
		5. Please enter statistical Confidence and Probability values (note: defaults already entered)			
		Confidence Level	%	95%	
		Probability Basis	%	95%	

Determine Monitoring Reqs.			Identify Pollutants of Concern					In-stream Conc.		Determine Reasonable Potential			
Pollutant Parameter	Carcinogen Status	Evaluation required?	# of Samples	Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. at RMZ	WQ Criteria		Is there Reasonable Potential to Exceed? (Y/N)	
										Water + Fish	Fish		
Pollutant Type	(Y/N)	(Y/N)		µg/l	default=0.6	µg/l	(Y/N)	µg/l	µg/l	µg/l	µg/l	Water + Fish	Fish
Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD													
Ammonia (as N)	Evaluation occurs on Ammonia (NH3) spreadsheet page												
Chlorine (total residual, TRC)	Evaluation occurs on Chlorine (-Cl) spreadsheet page												
Dissolved oxygen	Evaluation occurs on Dissolved Oxygen (DO) spreadsheet page												
Nitrates-Nitrite	N	Yes	2	nd	0.60	--	Non-Det.	*	--	10000	na	--	--
Kjeldahl nitrogen													
Oil and Grease	Compare to Effluent limits in permits or Federal Effluent Limit Guidelines												
Total dissolved solids	Compare to Effluent limits in permits or Federal Effluent Limit Guidelines												
Table 2 Effluent Parameters for Selected POTWs													
Hardness (Total as CaCO3)	Must be collect for metals criteria calculation. Submit data to the fields at the top of the spreadsheet												
Table 2: Metals (total recoverable), cyanide and tototal phenols													
Antimony	N	Yes	2	0.39	0.60	1.48	No	*	--	5.1	64	--	--
Arsenic (Inorganic)	Y	Yes	2	6.75	0.60	25.61	Yes	4.50	5.3445	2.1	2.1	YES	YES
Copper	N	Yes	2	1.90	0.60	7.21	No	*	--	1300	na	--	--
Methyl Mercury	N	*	If evaluation is required, contact HQ for technical assistance and follow guidance							na	040 mg/kg	na	--
Nickel	N	Yes	2	2.10	0.60	7.97	No	*	--	140	170	--	--
Selenium	N	Yes	2	nd	0.60	--	Non-Det.	*	--	120	420	--	--
Thallium	N	Yes	2	nd	0.60	--	Non-Det.	*	--	0.043	0.047	--	--
Zinc	N	Yes	2	30.00	0.60	113.84	No	*	--	2100	2600	--	--
Cyanide (Total)	N	Yes	2	nd	0.60	--	Non-Det.	*	--	130	130	--	--
Table 2: Volatile organic compounds													
acrolein	N	Yes	2	nd	0.60	--	Non-Det.	*	--	0.88	0.93	--	--
acrylonitrile	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.018	0.025	--	--
benzene	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.44	1.4	--	--
bromoform	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	3.3	14	--	--
carbon tetrachloride	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.10	0.16	--	--
chlorobenzene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	74	160	--	--
chlorodibromomethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.31	1.3	--	--
chloroform	N	Yes	2	nd	0.60	--	Non-Det.	*	--	260	1100	--	--
dichlorobromomethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.42	1.7	--	--
1,2-dichloroethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.35	3.7	--	--
1,2-trans-dichloroethylene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	120	1000	--	--

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NPDES Permit Impacts

If After all That

Compliance Strategy Considerations

1. *Intake Credit*
2. *Site Specific Background Allowance*
3. *Compliance Schedules*
4. *Site Specific Criteria*
5. *Variance*
6. *Use Attainability Analysis*
7. **Source Control**

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Industrial Pretreatment Program Impact

Local Limits Based on Pass-Through

$$\text{Maximum Allowable Headworks Loading (MAHL}_{wq}) = \frac{8.34 * [C_{wq} (Q_{str} + Q_{potw}) - (C_{str} * Q_{str})]}{1 - R_{potw}}$$

$$\text{Maximum Allowable Industrial Loading (MAIL}_{wq}) = \text{MAHL} (1 - SF) - (L_{unc} + HW + GA)$$

$$\text{Local Limits (C}_{lim}) = \frac{\text{MAIL}}{Q_{ind} * 8.34}$$

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Industrial Pretreatment Program Impact

Local Limits Based on Pass-Through

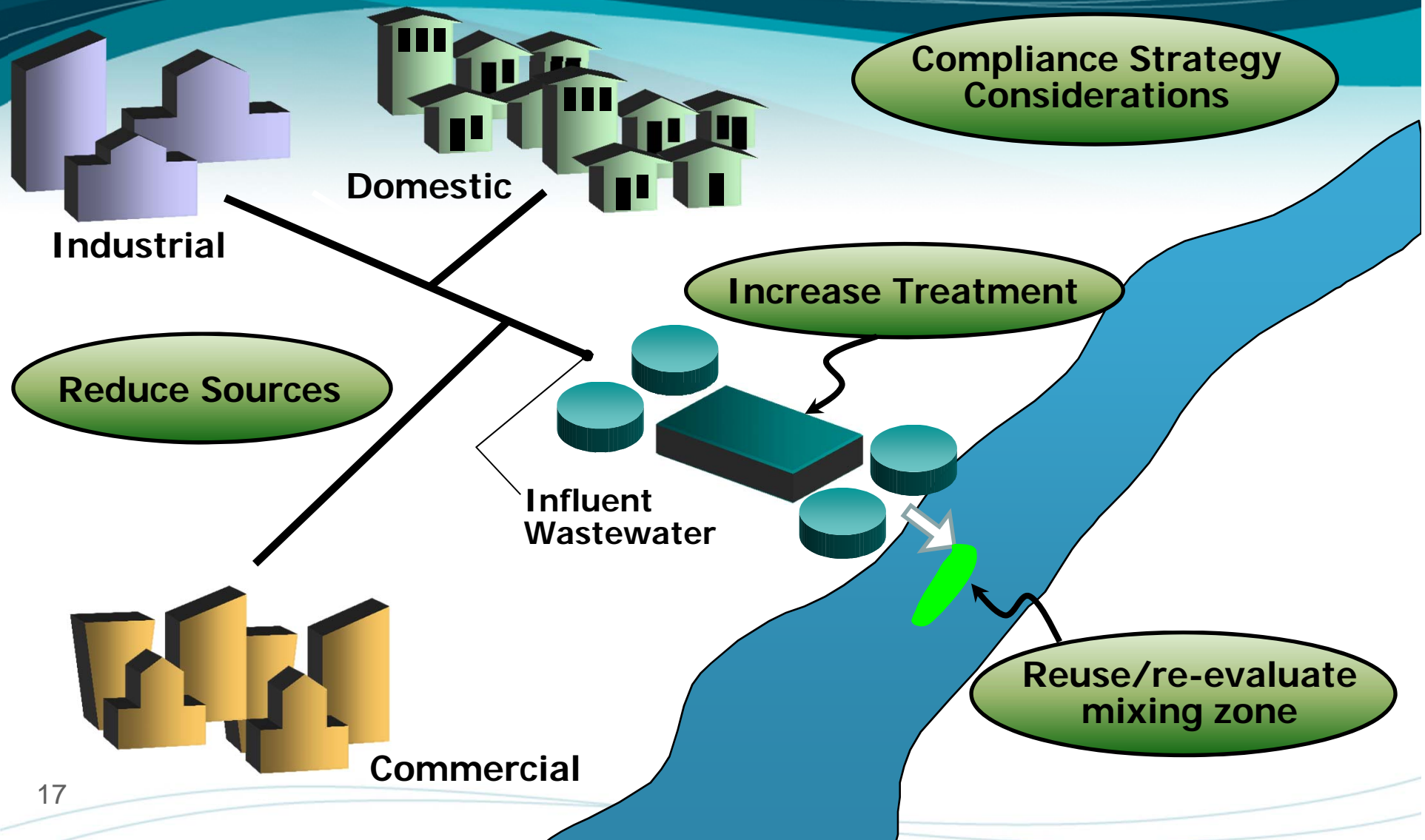
$$\text{Maximum Allowable Headworks Loading (MAHL}_{wq}) = \frac{8.34 * 0.001_{\text{mg/L}} * 9 \text{ MGD}}{1 - 0.1} = 0.083 \text{ lbs}$$

$$\begin{aligned} \text{Maximum Allowable Industrial Loading (MAIL}_{wq}) &= 0.083 \text{ lbs} * (1 - 0.1) - (8.34 * 0.001_{\text{mg/L}} * 8.5 \text{ MGD}) \\ &= 0.004 \text{ lbs} \end{aligned}$$

$$\text{Local Limits (C}_{lim}) = \frac{0.004 \text{ lbs}}{0.5 \text{ MGD} * 8.34} = 0.001 \text{ mg/L}$$

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Industrial Pretreatment Program Impact

Source Control - Different Strategies

Take Back Programs

- Pharmaceuticals
- Pesticides
- Mercury



Labeling

- Design For The Environment
- Eco-Certification
- Eco-Biz



Recycling

- Electronics
- Paint



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Conclusions

- » *Make every effort to be involved – from beginning to end*
- » *Whatever the outcome, it's going to cost a lot of \$\$\$*
- » *Be extremely proactive during the permitting process*

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References

<http://www.deq.state.or.us/wq/standards/toxics.htm>

