

Water Protection Program Update:

9th Annual Missouri Water & Wastewater
Conference

November 10, 2005



Missouri Department of Natural Resources
Division of Environmental Quality
Water Protection Program
Ed Galbraith, Director

Water Protection Program Issues

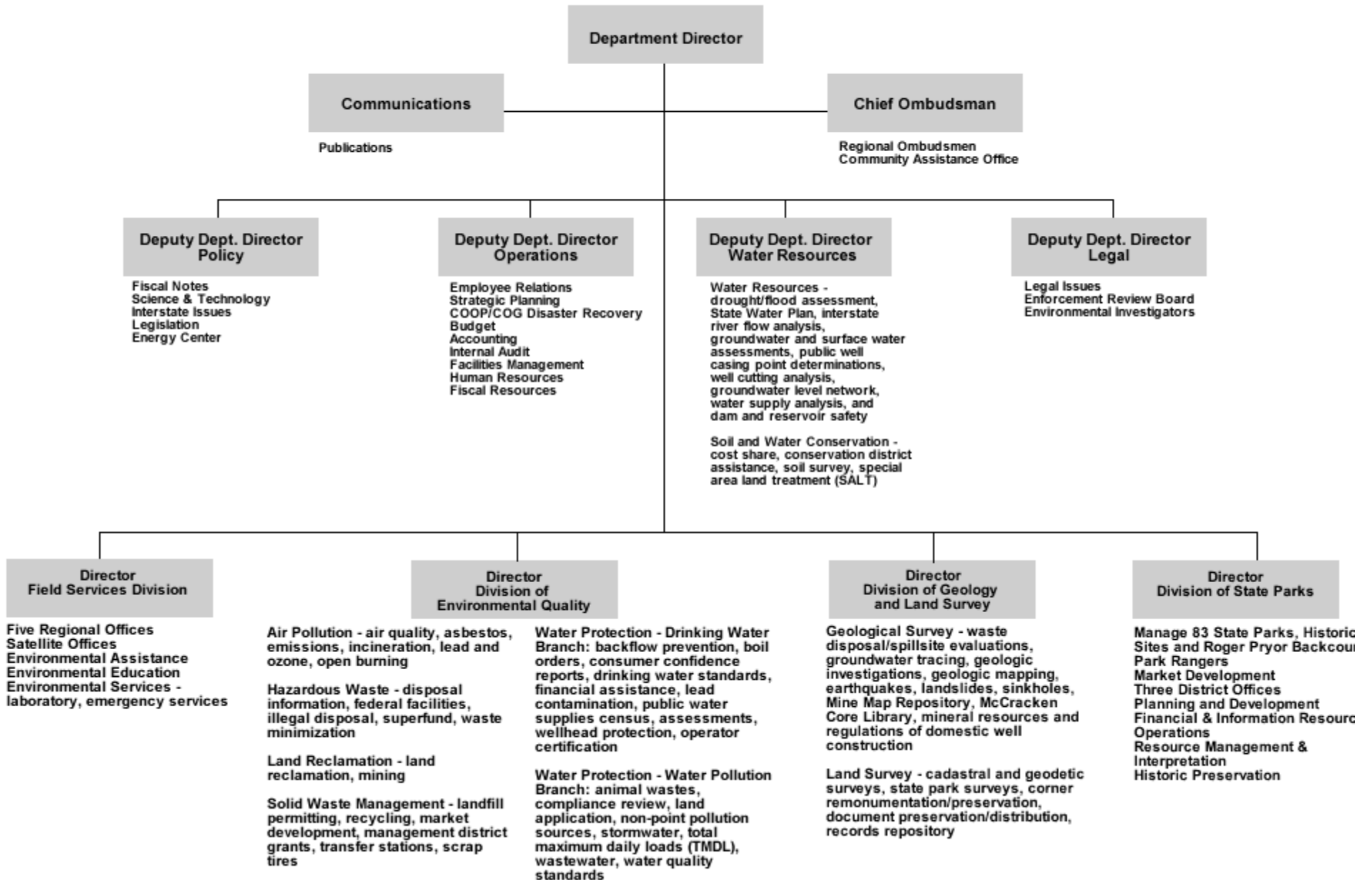


- Department reorganization.
- Results of recent water quality rule.
- Predictable, transparent, timely.
- Permitting wastewater treatment lagoons.
- Upcoming Clean Water Forum.
- Fees.



Missouri Department of Natural Resources

Organization Chart with Functions



Water Quality Standards Rulemaking History



- Dec. 31, 2005 - Revisions effective in state law.
- April 30, 2006 - EPA to approve or disapprove.

Final Order of Rulemaking

- Bacteria Criteria

Category	<i>E. coli</i> Criterion*	Illness Rate
WBC	A	8/1000
	B	14/1000
SCR	1134	9 times WBC-A

* #/100 mL expressed as a geometric mean.

Final Order of Rulemaking

- **WBC Use Designations After Rulemaking.**

Designated Use	Segments		Acres/Miles	
	Total	Percentage	Total	Percentage
All lakes (Table G)	455		293,257.80 ac.	
WBCR lakes	455	100.00%	293,257.80 ac.	100.00%
Other lakes	0	0.00%	0.00 ac.	0.00%
All streams (Table H)	3761		22,231.20 mi.	
WBCR streams	3619	96.22%	21,310.80 mi.	95.86%
Other streams	142	3.78%	920.40 mi.	4.14%
All in Tables G & H	4216			
WBCR waters	4074	96.63%		
Waters not WBCR	142	3.37%		

Final Order of Rulemaking

- Compliance Schedule.
 - Up to five (5) years upon the issuance, first renewal, or first significant modification of each permit on or after December 31, 2005.
 - Compliance must be no later than December 31, 2013.
 - Compliance means:
 - Disinfection to meet bacteria standards;
 - Water quality study to show no bacterial exceedance;
or
 - Use attainability analysis where the use has been removed.

Final Order of Rulemaking



- Fiscal Impact.
 - Disinfection costs:
 - Capital = \$234 million.
 - Maintenance = \$49.5 million.

Final Order of Rulemaking



- Other changes:
 - Ammonia limits.
 - Metals limits.
 - Site-specific criteria.

Predictability, Transparency, and Timeliness



- Consistent Operating Permits
- Water quality review sheets.
- Permit manual.
- Backlog.
- Wastewater treatment lagoons.



Missouri Department of Natural Resources
 Water Protection Program
 Water Pollution Control Branch
 NPDES Permits & Engineering Section

Water Quality Review Sheet

Determination of Effluent Limits

FACILITY INFORMATION

FACILITY NAME:	KC, Todd Creek WWTP	NPDES #:	MO-0024961
----------------	---------------------	----------	------------

FACILITY TYPE/DESCRIPTION:	3.4 MGD contact stabilization/extended aeration facility, sludge is land applied or hauled to the KC, Blue River STP (MO-0024911)
----------------------------	---

ECOREGION:	Western Corn Belt Plains	8-DIGIT HUC:	10240012	COUNTY:	Platte
------------	--------------------------	--------------	----------	---------	--------

Central Irregular Plains Interior River Valleys and Hills Ozark Highlands
 Mississippi Alluvial & Loess Plains Western Corn Belt Plains

LEGAL DESCRIPTION:	NW NE Sec. 1, T52N, R34W	LATITUDE/LONGITUDE:	+3921125/-09439524
--------------------	--------------------------	---------------------	--------------------

WATER QUALITY HISTORY:	Infrequent violations of effluent limitations for CBOD ₅ and ammonia as nitrogen. Available instream water quality data is dated (1990-1991), however, most recent stream survey (1997) indicates no visible impact.
------------------------	---

OUTFALL CHARACTERISTICS

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	WATERBODY	WBID
001	5.3	Advanced	Todd Creek	0316

Full Screen

Close Full Screen

RECEIVING WATERBODY INFORMATION

WATERBODY	CLASS	7Q10 (CFS)	1Q10 (CFS)	30Q10 (CFS)	*DESIGNATED USES
Todd Creek	C	0.0	0.0	0.0	LWW, AQL

* Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health - Fish Consumption (AQL), Irrigation (IRR), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Industrial (IND)

DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations were calculated using water quality criteria or model results and the dilution equation below:

$$C = \frac{(C_s * Q_s) + (C_e * Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow (cfs)

C_e = effluent concentration

Q_e = effluent flow (cfs)

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable acute water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Outfall #001 – Main Facility Outfall

- **Biochemical Oxygen Demand (BOD₅)** weekly average of 45 mg/L, monthly average of 30 mg/L [10 CSR 20-7.015(8)(B)1.].
- **Total Suspended Solids (TSS)** weekly average of 45 mg/L, monthly average of 30 mg/L [10 CSR 20-7.015(8)(B)1.].
- **pH** pH shall be maintained in the range from six to nine (6 – 9) standard units [10 CSR 20-7.015 (8)(B)2.]

(0)(D)4.]

- **Total Ammonia Nitrogen.** Total Ammonia Nitrogen – Early Life Stages Present criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3, draft rule in the Missouri Register – May 2, 2005, Vol. 30, No. 9, Page 847]. Background ammonia as nitrogen for receiving stream = 0.01 mg/L

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

$$C_e = ((Q_e + Q_s)C - (Q_s * C_s))/Q_e$$

example review sheet, new ammonia

Page 3 of 1

Summer

Chronic WLA: $C_e = 1.5 \text{ mg/L}$

$LTA_c = 1.5 \text{ mg/L} (0.527) = \mathbf{0.8 \text{ mg/L}}$

[CV = 0.6, 99th Percentile]

MDL = $0.8 \text{ mg/L} * 3.11 = 2.5 \text{ mg/L}$

[CV = 0.6, 99th Percentile]

AML = $0.8 \text{ mg/L} * 1.55 = 1.2 \text{ mg/L}$

[CV = 0.6, 95th Percentile, n = 4]

Winter

Chronic WLA: $C_e = 3.1$

Lagoons

Chapter 7—Water Quality

10 CSR 20-7



3. Industrial, agricultural and other non-domestic contaminant sources, point sources or wastewater treatment facilities which are not included under subparagraph (6)(A)2.B, shall not be allowed to discharge. Agrichemical facilities shall be designed and constructed so that all bulk liquid pesticide nonmobile storage containers and all bulk liquid fertilizer nonmobile storage containers are located within a secondary containment facility. Dry bulk pesticides and dry bulk fertilizers shall be stored in a building so that they are protected from the weather. The floors of the buildings shall be constructed of an approved design and material(s). At an agrichemical facility, all transferring, loading, unloading, mixing and repackaging of bulk agrichemicals shall be conducted in an operational area. All precipitation collected in the operational containment area or secondary containment area as well as process generated wastewater shall be stored and disposed of in a no-discharge manner.

4. Monitoring requirements.

A. The department will develop a wastewater and sludge sampling program based on design flow that will require, at a minimum, one (1) wastewater sample per year for each twenty-five thousand (25,000) gpd of effluent, or fraction thereof, except that—

(I) Point sources that discharge less than five thousand (5,000) gpd may only be required to submit an annual report;

(II) Point sources that discharge more than one point three (1.3) mgd will be required at a minimum to collect fifty-two (52) wastewater samples per year; and

(III) Sludge sampling will be established in the permit.

B. Sampling frequency shall be spread evenly throughout the discharge year. This means that a point source with a continuous discharge shall take samples on a regular schedule, while point sources with seasonal discharges shall collect samples during the season of discharge.

C. Sample types shall be as follows:

(I) Samples collected from lagoons may be grab samples;

sampling types to fulfill the site specific informational needs of the department.

(B) Limits for Outstanding State Resource Waters as per Water Quality Standards.

1. Discharges shall not cause the current water quality in the streams to be lowered.

2. Discharges will be permitted as long as the requirements of paragraph (6)(B)1. are met and the limitations in section (8) are not exceeded.

(7) Effluent Limitations for Subsurface Waters.

(A) No person shall release any water into aquifers, store or dispose of water in a way which causes or permits it to enter aquifers either directly or indirectly unless it meets the appropriate groundwater protection criteria set in 10 CSR 20-7.031, Table A at a point ten feet (10') under the release point except as provided in subsections (7)(E) and (F). The permit writer shall review the complete application and other data to determine which parameter to include in the permit.

(B) No wastewater shall be introduced into sinkholes, caves, fissures or other openings in the ground which do or are reasonably certain to drain into aquifers except as provided in section (4) of this rule.

(C) All abandoned wells and test holes shall be properly plugged or sealed to prevent pollution of subsurface waters, as per the requirements of the Division of Geology and Land Survey.

(D) Where any wastewater treatment facility or any water contaminant source or point source incorporates the use of land treatment systems which allows or can reasonably be expected to allow wastewater effluents to reach the aquifer. Compliance with subsection (7)(A) shall be determined by a site specific monitoring plan.

(E) The effluent limitations specified in subsection (7)(A) shall not apply to facilities designed and constructed to meet department design criteria provided these designs have been reviewed and approved by the Department of Natural Resources. The Department of Natural Resources has the right to require monitoring, reporting, public notice and other information.

allowed to resample for purposes of verification of the excess. At their discretion, persons may demonstrate, at the direction of the Department of Natural Resources, that the impact on the water quality in the aquifer is negligible on the beneficial uses. The demonstration shall consider, at a minimum, the following factors:

1. Site geology;
2. Site geohydrology;
3. Existing and potential water uses;
4. Existing surface water and groundwater quality;
5. Characteristics of wastes or wastewater contained in facilities; and
6. Other items as may be required by the Department of Natural Resources to assess the proposal.

A. All demonstrations shall be reviewed by the department if the demonstrations show that the impact on groundwater quality will not result in an unreasonable risk to the public, alternate effluent limitation(s) will be proposed by the Department of Natural Resources and presented to the Clean Water Commission for approval. The Clean Water Commission has the right to require monitoring, reporting, public notice and other information as deemed appropriate in the approval of the alternate limitation for one (1) or more parameters from (7)(A). The Clean Water Commission may hold a public hearing to secure public comment prior to final action on an alternate limitation.

B. No alternate limitations will be granted which would impair beneficial uses of the aquifer or threaten human health or the environment.

C. Alternate limitations may be revoked by the department should any monitoring indicate an adverse effect on a beneficial water use or violations of the alternate limitation.

(8) Effluent Limitations for All Waters, Except Those in Paragraphs (1)(A)1.-6.

(A) The following limitations represent the maximum amount of pollutants which may be discharged from any point source, water contaminant source or wastewater treatment facility.

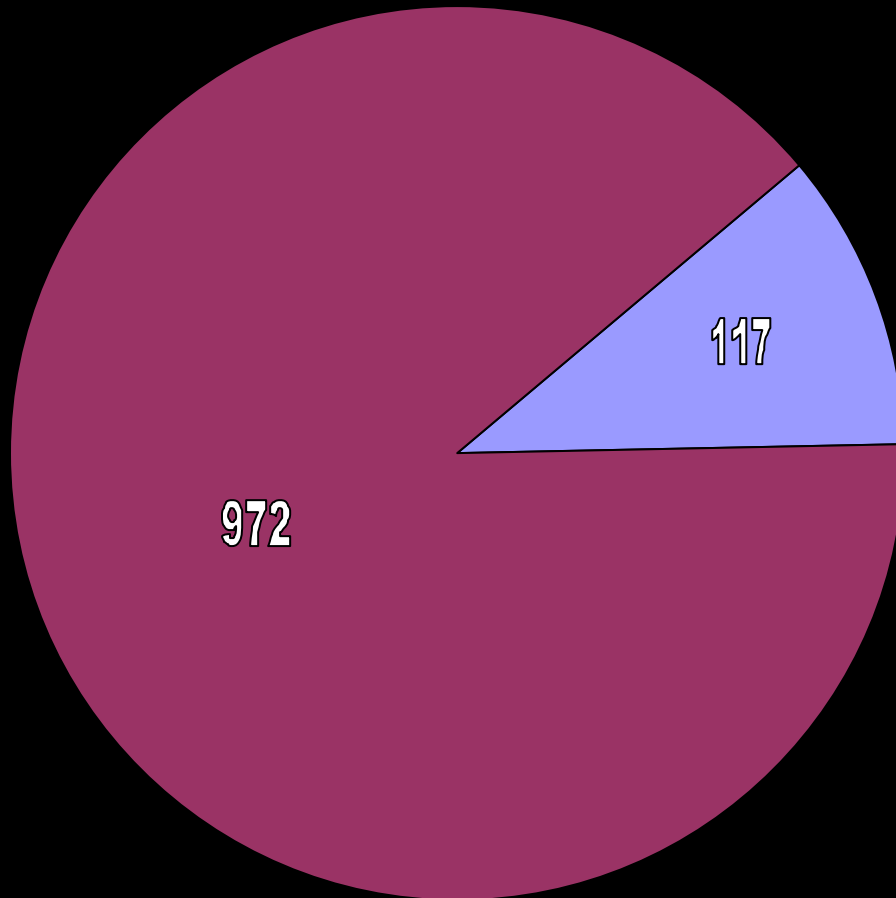
(B) Discharges from wastewater treatment

Lagoons

<u>Facility</u>	<u>Design</u>	<u>Actual</u>	<u>Stream</u>	<u>Pollutant</u>	<u>Compliance</u>
• Stover NW	.073		Gabriel Creek/C	BOD,NFR	In compliance
• Lake Lotawana	.287	.1	W. Fk. Sni-a-Bar/P	BOD,VSS	Occasional exceed
• Owensville	.410	.288	Red Oak Creek/C	VSS	In compliance
• California N	.821	.571	E. Brush Creek/U to C	N,P,BOD,NFR	Occasional exceed
• Lake Forest Estates	.032	.072	Big Bottom Creek/C	BOD,VSS	In compliance
• Oak Grove N	.2	.2	Horseshoe Creek/UtoC	BOD,NH3N	Not in compliance,

Surveys of Receiving Streams
Lagoons with flows less than 300,000

Lagoons

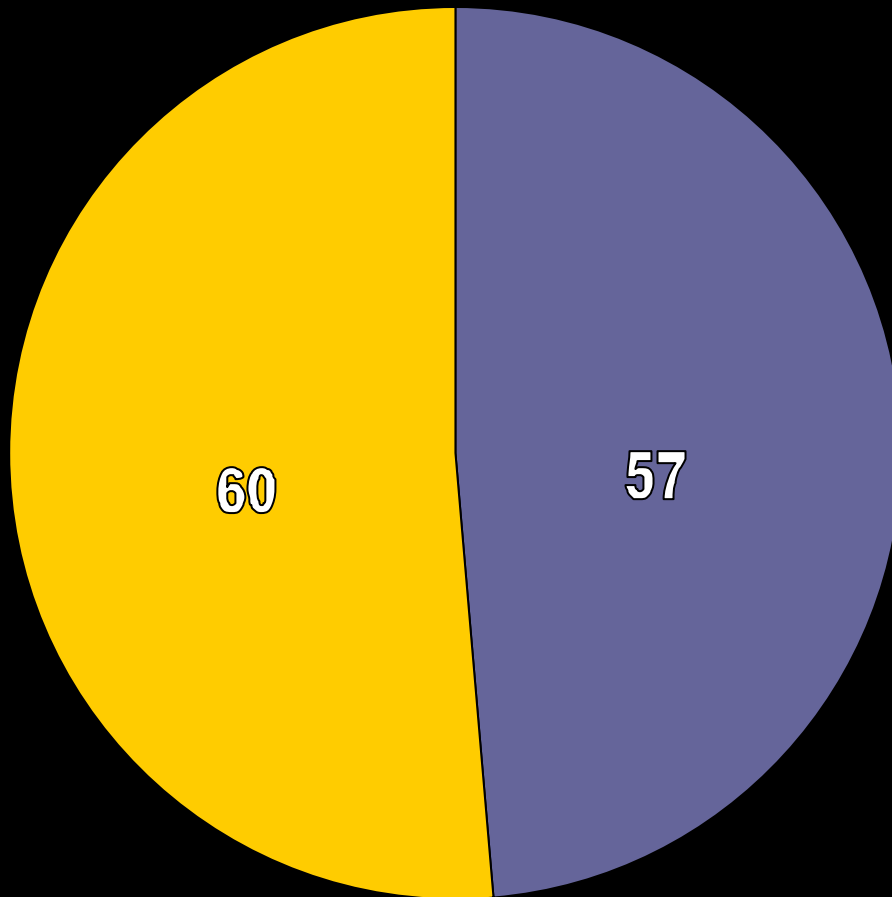


- Stream examined in the last 10 years
- Stream not examined in the last 10 years

Lagoons

Number of observed receiving streams with general criteria violations

Lagoons with flows less than 300,000



- Violation of WQS, General Criteria
- Not currently violating WQS, General Criteria

Next Clean Water Forum

- Draft Agenda:
- **2006 Water Legislative Agenda**
- **WPP Regulatory Agenda for 2006-2007**
- **Permit Improvement**
- **Nonpoint Source Efforts**
- **Missouri's Water Quality Monitoring Effort**

Rulemaking Issues

- Effluent limits and water quality reviews.
- Lagoons less than 22,500 gpd discharge.
- Risk based corrective action.
- 401 Water Quality Certification.
- Impaired waters list [303(d)].
- Pesticides.
- Combined Sewer Overflows (CSOs).

Rulemaking Issues

- Water Quality Standards
 - Nutrient Criteria for Lakes.
 - Unclassified waters.
 - Wetlands.
 - Antidegradation Implementation Procedure.
- Drinking Water Design Guide

Future Rulemaking Information

- Upcoming & ongoing events can be found at:

<http://www.dnr.mo.gov/wpscd/wpcp/rules/wpp-rule-dev.htm>

Fees



Water Protection Program Update:

9th Annual Missouri Water & Wastewater Conf
November 10, 2005



Missouri Department of Natural Resources
Division of Environmental Quality
Water Protection Program
Ed Galbraith, Director