New Stormwater Permit Requirements for Municipalities

City Management Association of Oklahoma

Stillwater, OK

January 22, 2014

Richard Smith, INCOG

Common Pollutants in Urban Stormwater

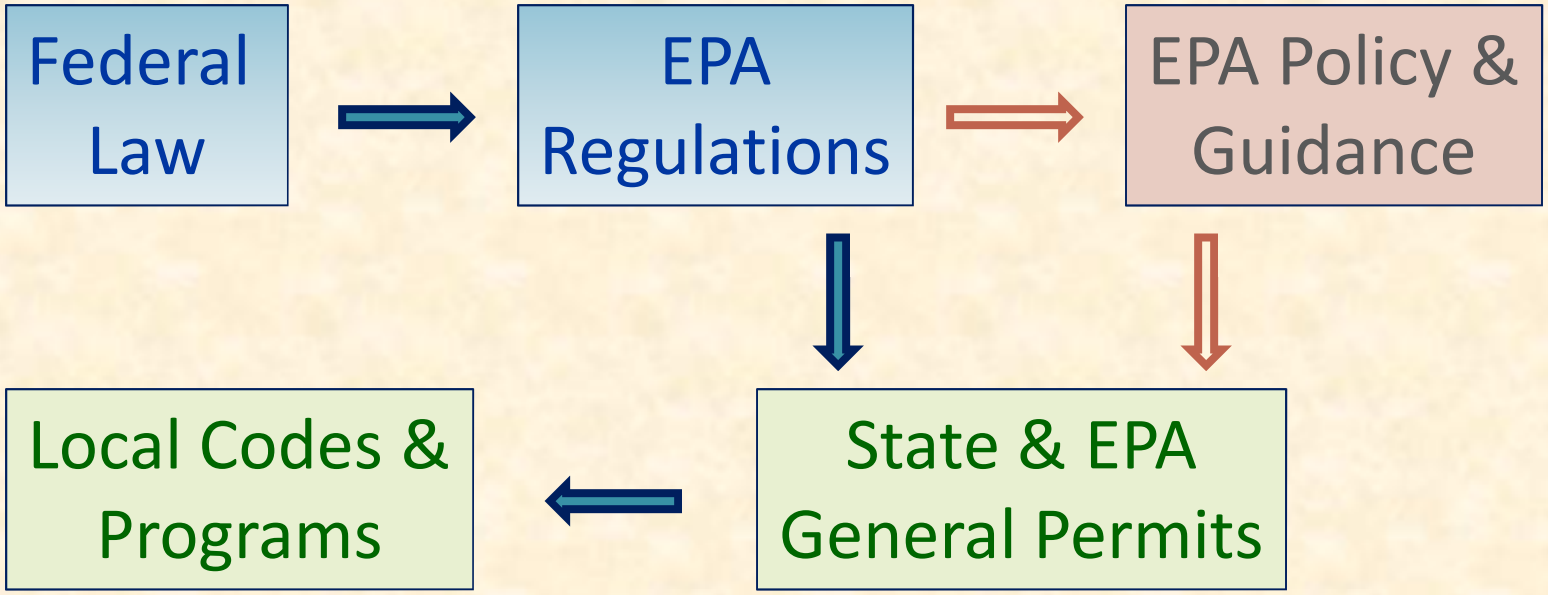
- Sediment
- Nutrients
- Oxygen-Demanding Substances
- Pathogens
- Trash

- Road Salts
- Oil and Grease
- Heavy Metals
- Heat
- Petroleum
- Pesticides
- Other organics

Phase I & II Stormwater Regulations

- EPA's **Phase I** rules finalized November 16, 1990.
- Covered 11 categories of "industrial activities" by SIC, plus cities ≥ 100,000 (Tulsa & OKC). Included:
  - *Construction (≥5 acres disturbance).*
  - *Landfills (that received industrial wastes).*
  - *Airports (with de-icing and maintenance).*
  - *POTWs (≥1 MGD).*
- **Phase II** rules finalized December 1999.
  - *Urbanized Area in cities and counties.*
  - *Construction 1-5 acres.*
  - *Others designated by ODEQ.*

Federal → State → Local Rules



"Trickle Down Theory"

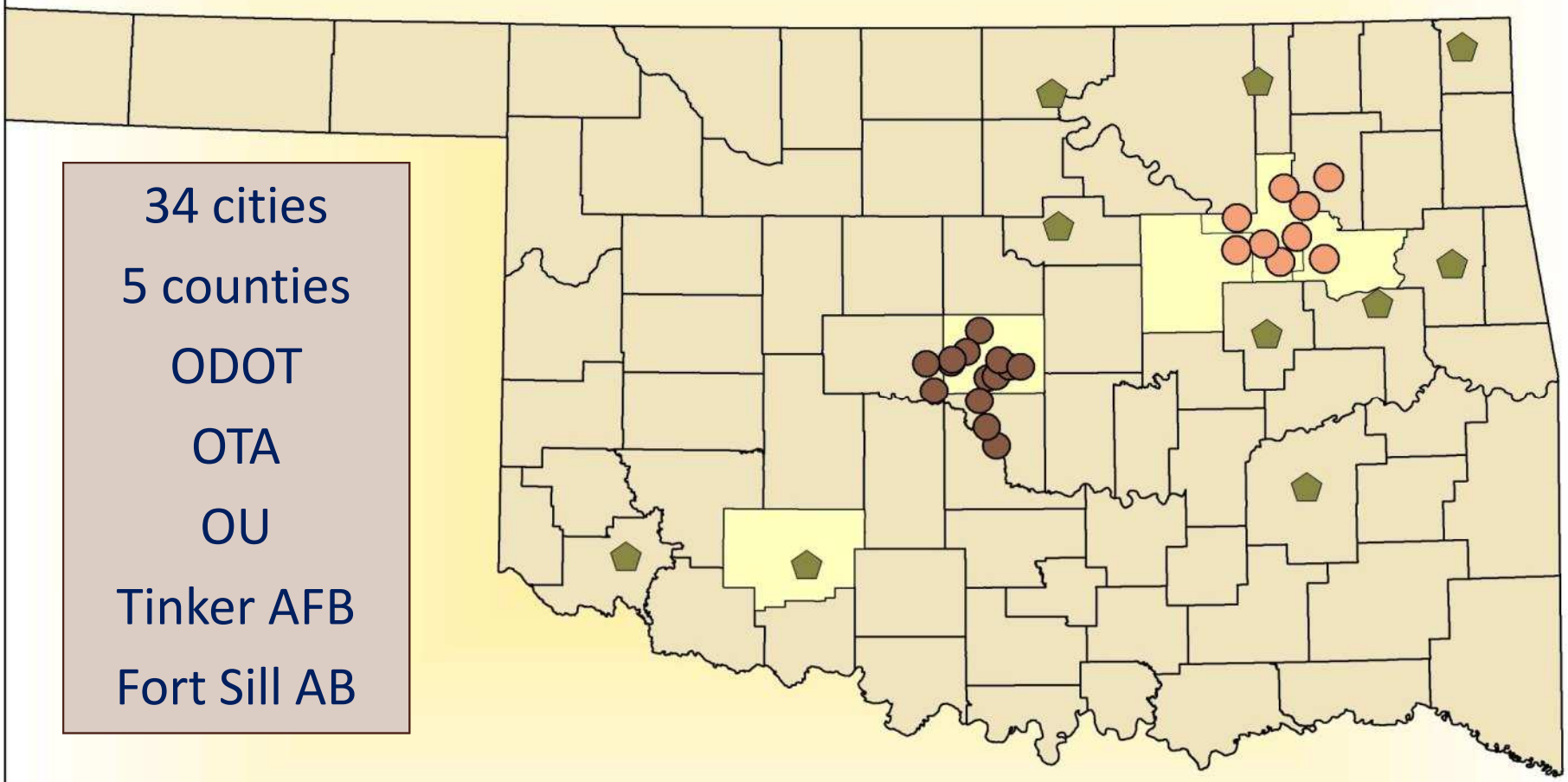
	Regulated Small MS4s		Regulated Small MS4s
1	Altus	27	Mustang
2	Arkoma *	28	Moore
3	Bartlesville	29	Muskogee
4	Bethany	30	Nichols Hills
5	Bixby	31	Nicoma Park
6	Broken Arrow	32	Noble
7	Catoosa	33	Norman
8	Choctaw	34	Oklahoma County
9	Claremore	35	Oklahoma Dept. of Transportation
10	Comanche County	36	Oklahoma Turnpike Authority
11	Coweta	37	Okmulgee
12	Creek County	38	Owasso
13	Del City	39	Ponca City
14	Edmond	40	Rogers County *
15	Fort Sill Army Base	41	Sand Springs
16	Glenpool *	42	Sapulpa
17	Guymon *	43	Spencer
18	Harrah *	44	Stillwater
19	Jenks	45	Tahlequah
20	Jones *	46	Tinker Air Force Base
21	Logan County *	47	The Village
22	Kiefer *	48	Tulsa County
23	Lawton	49	University of Oklahoma
24	McAlester	50	Wagoner County
25	Miami	51	Warr Acres
26	Midwest City	52	Yukon

Phase II Permittees Under 2005 and 2014 OKR04 Permit

Blue shaded with asterisks are potential new permittees proposed for coverage in 2014.

Once permitted, always permitted.

2003 Phase II Cities and Counties



34 cities

5 counties

ODOT

OTA

OU

Tinker AFB

Fort Sill AB

5-Year waivers were granted to several; reassess in 2014

Prepared by INCOG
June 2013

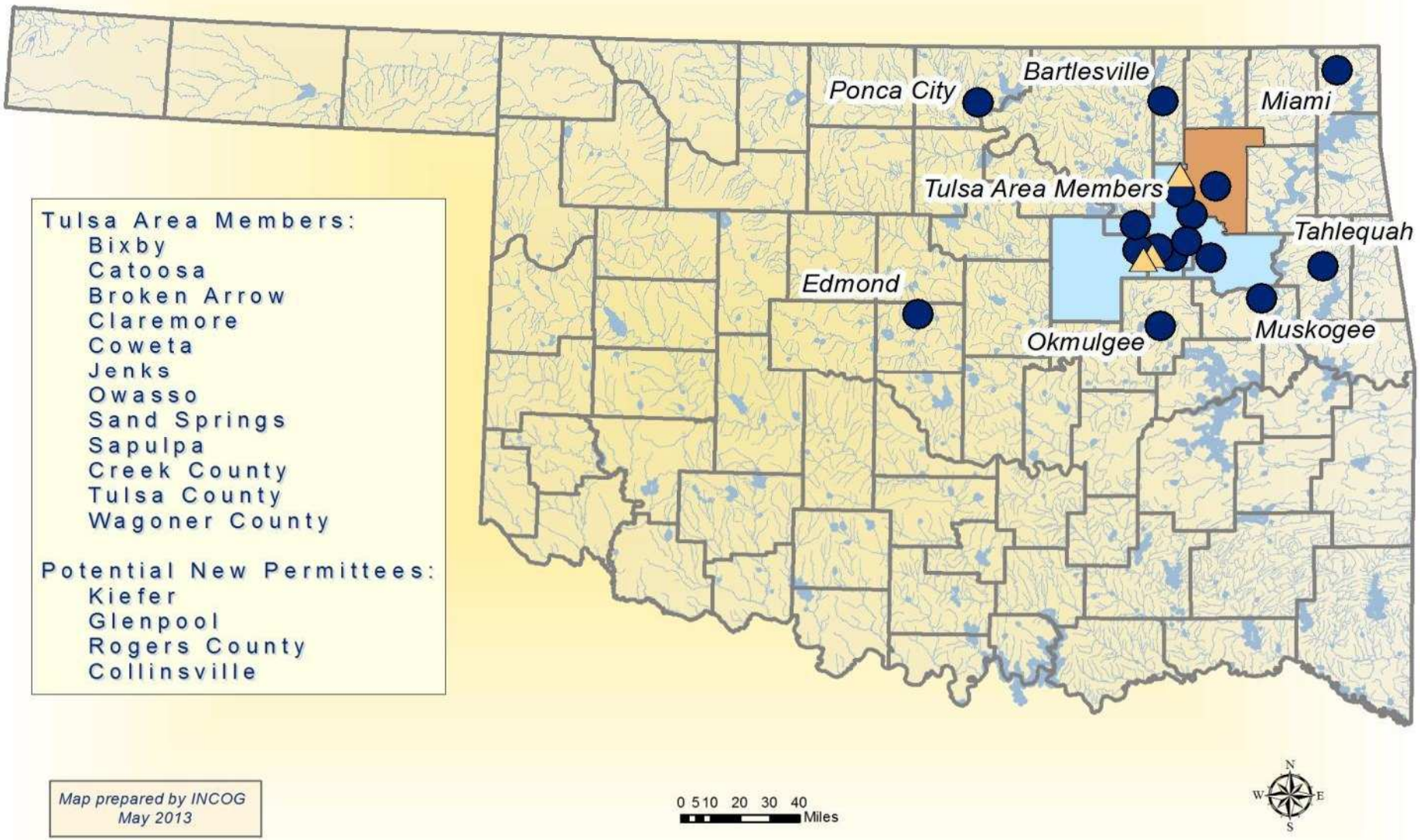
0 20 40 80 Miles

N W E S

Population of Phase II Cities in Oklahoma

Graph by Richard Smith, INCOG

Green Country Stormwater Alliance Members 2013-14



Tulsa Area Members:

- Bixby
- Catoosa
- Broken Arrow
- Claremore
- Coweta
- Jenks
- Owasso
- Sand Springs
- Sapulpa
- Creek County
- Tulsa County
- Wagoner County

Potential New Permittees:

- Kiefer
- Glenpool
- Rogers County
- Collinsville

Map prepared by INCOG
May 2013

Municipal Stormwater Programs

- Phase II permittees must abide by OKR04.
- Requires a written document: "Stormwater Management Program" (SWMP).
- Implement a suite of Best Management Practices (BMPs).
- File Annual Reports.
- ODEQ audits every 5 years. EPA may also audit.
- OPDES permit failure means fines and prison.
- Many program changes are taking place…

Six Minimum Control Measures

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention and Good Housekeeping

Public Education and Participation

Booths at local festivals and events

Stormdrain marking

Volunteer stream monitoring

Brochures, newsletters

Give-away items with logos

Adopt a watershed

Adopt a stream

Clean-ups

Household Pollutant Collections

Scouts, Camp Fire, etc.

Local school clubs & classes

Future TV, Radio, Print ?

KJRH 2 More Local News
teamtulsa.com

Oklahoma's NewsChannel 8
COVERAGE YOU CAN COUNT ON

News Talk 740 KRMG
Tulsa's Local News & Weather Source

Tulsa World Online
An information Service of Tulsa World

Spirit of Oklahoma 6 KOTV

Dry Weather Field Screen and Construction Site Inspections

Visual observations

Chemical test kits

Interviews

Private property

Lab samples

Source-Tracking Inspections

Technical resources and skills will be needed for performing inspections

Crew Experience

Field Safety

Enforcement

Annual Report to Permitting Authority

- Status of compliance with permit conditions.
- Assessment of BMP effectiveness.
- Progress of achieving the Measurable Goals.
- Information analyzed and monitoring data.
- Summary of future planned activities.
- Proposed changes in SWMP and BMPs.
- Description / schedule of additional BMPs.
- Notify PA that another entity is being used to implement part of the SWMP, if any.

OKR04 Penalties for Non-Compliance

PENALTY TYPE	PROVISION	AMOUNT	PERIOD	PROVISION	MAX.	PRISON
Civil	Not to exceed	$10,000	Per day	For each violation	--	--
Admin	Not to exceed	$10,000	Per Day	Per violation	$125,000	--
Criminal Action	Not less than	$2,500	Per day	Of violation	$2 million	30 year
Permit Fraud	Not more than	$20,000	Per day	Of violation	$20,000	4 years

Latest OKR04 Timeline

This timeline may change.

April 2014: Draft OKR04 is finalized.

April 2014: ODEQ letters to permittees: 90 days to submit NOIs. New permittees have 180 days.

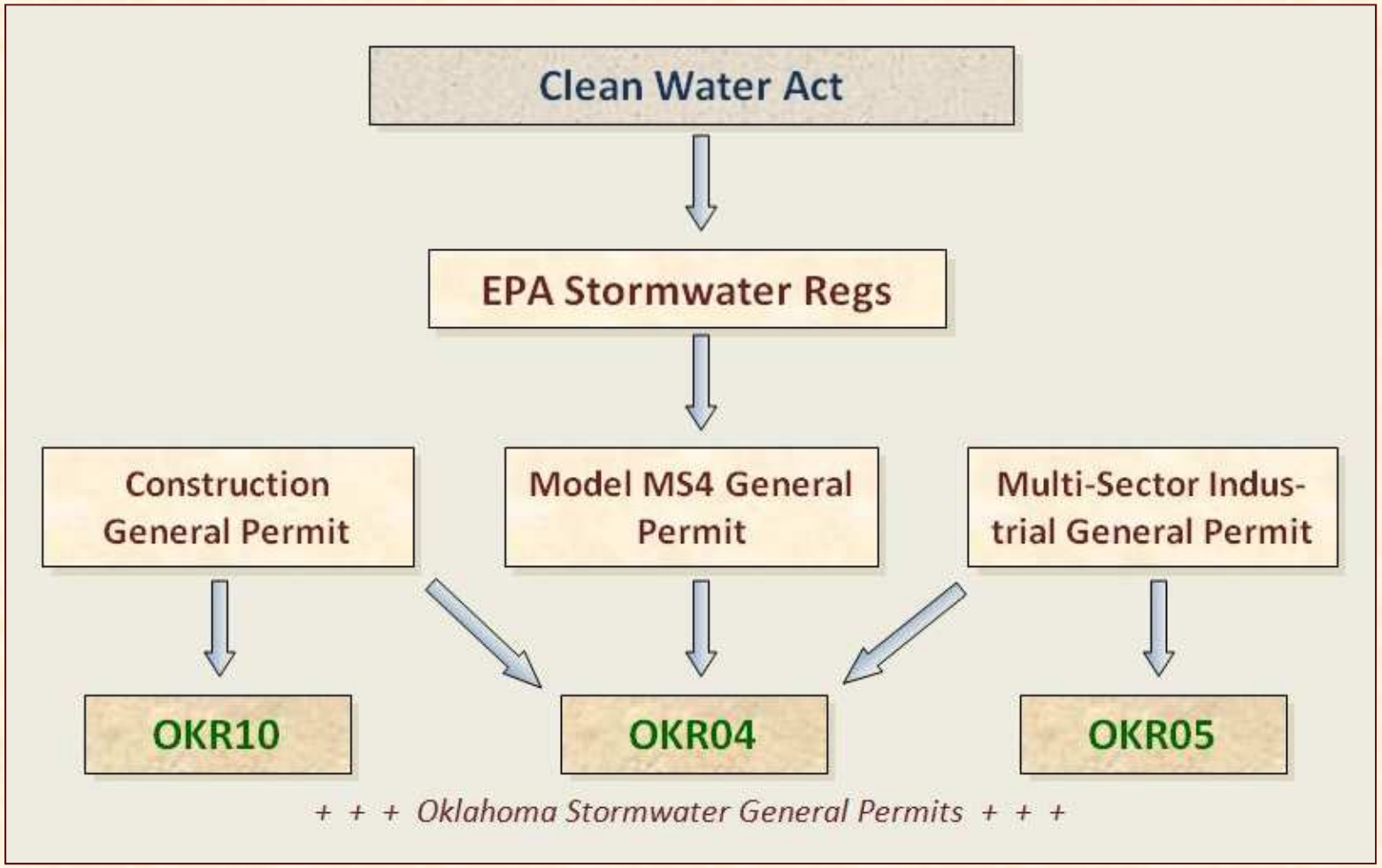
July 2014: NOIs sent to ODEQ by existing permittees.

August 2014: ODEQ starts issuing Discharge Authorizations to existing permittees.

October 2014: NOIs sent to ODEQ by new permittees.

November 2014: ODEQ starts issuing Discharge Authorizations to new permittees.

Oklahoma's Three General Permits



Stormwater General Permits and More

- OKR04 – Phase II for Small MS4s.
- OKR05 – MSGP for Phase I industrial activities.
- OKR10 – Construction activities ≥1 acre.
- Tulsa and Oklahoma City have Individual Permits.
- Each permit is renewed (revised) every 5 years.
- All 5-year permit renewals must be approved by EPA + public comment period.
- EPA's Construction Effluent Limitation Guidelines (ELGs).
- ODEQ is "Permitting Authority" for all State permits.

Future Stormwater Rules and Permits

New EPA Rulemaking:

- Draft ~~6/10/2013~~ (??) & final 12/10/2014 (??).
- Will address NRC criticisms and EPA's new strategy.
- Will focus on LID and flow containment.

Revised Oklahoma General Permits:

- ✔ **OKR05** (industrial activities) finalized 9/5/11.
- ✔ **OKR10** (construction activities) finalized 9/13/12.
-  **OKR04** (Phase II MS4s) finalized in early 2014 ?

Factors Affecting Who Will Be Permitted

- Increased populations of many small cities (more >10,000).
- Increased 303(d) listings (impairment).
- EPA pressing PAs to evaluate non-UA cities for possible permitting.
- Large cities that become >100,000 will remain “Phase II”.
- Future EPA rules will blur distinction between P1 and P2.
- Watershed-based city boundaries into a single permit mechanism ?

Effectiveness Monitoring in the Future?

EPA is considering requiring sampling for several purposes:

- Demonstrate BMP effectiveness.
- Compliance with TMDL implementation plans.
- Demonstrate attainment of WQS.
- Document overall program effectiveness.

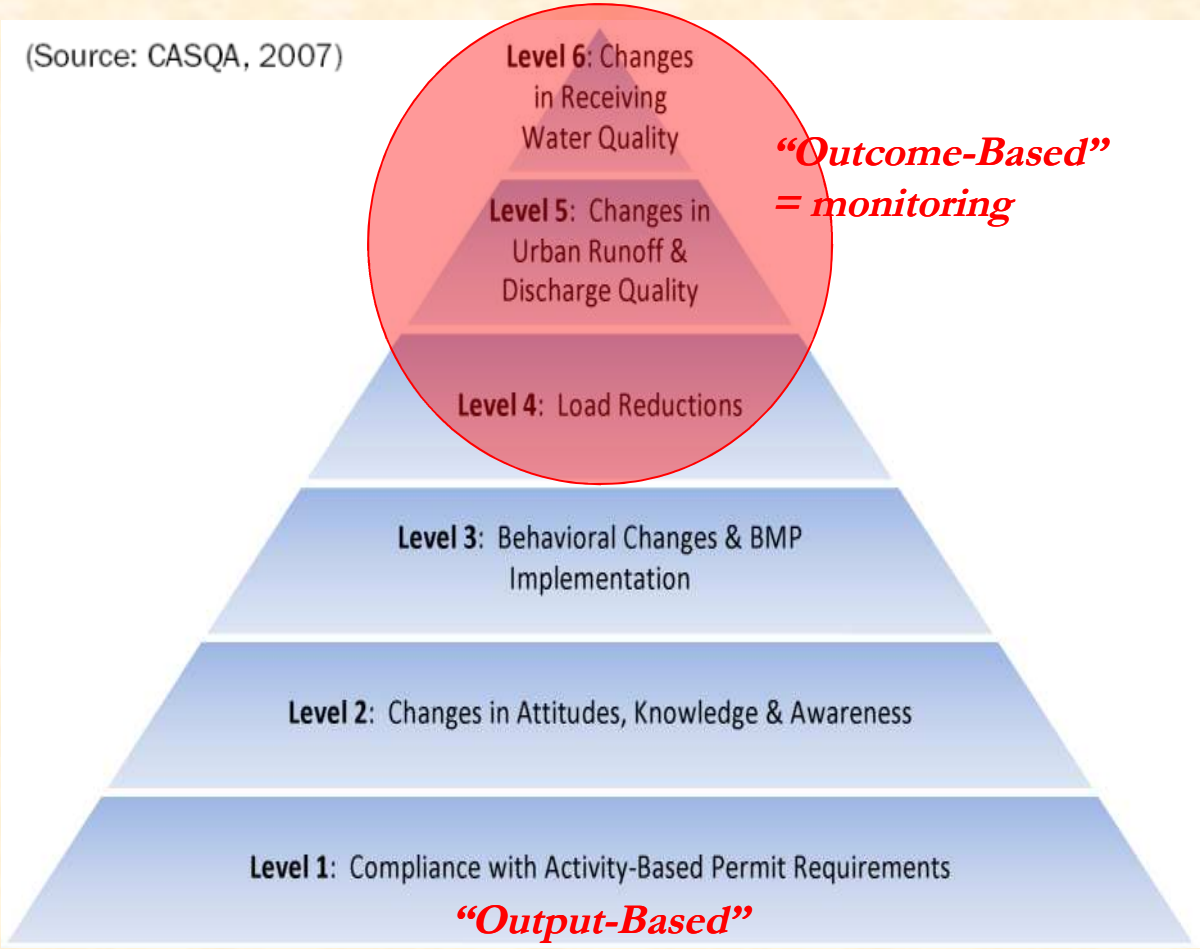


Image by Richard Smith, INCOG

What Is 303(d) Impairment ?

A stream or lake can be listed for any combination of parameters:

Dissolved oxygen, nutrients

Toxics (metals, organics, pesticides, "unknown")

Sediment, suspended solids, turbidity

Pathogens (bacteria)

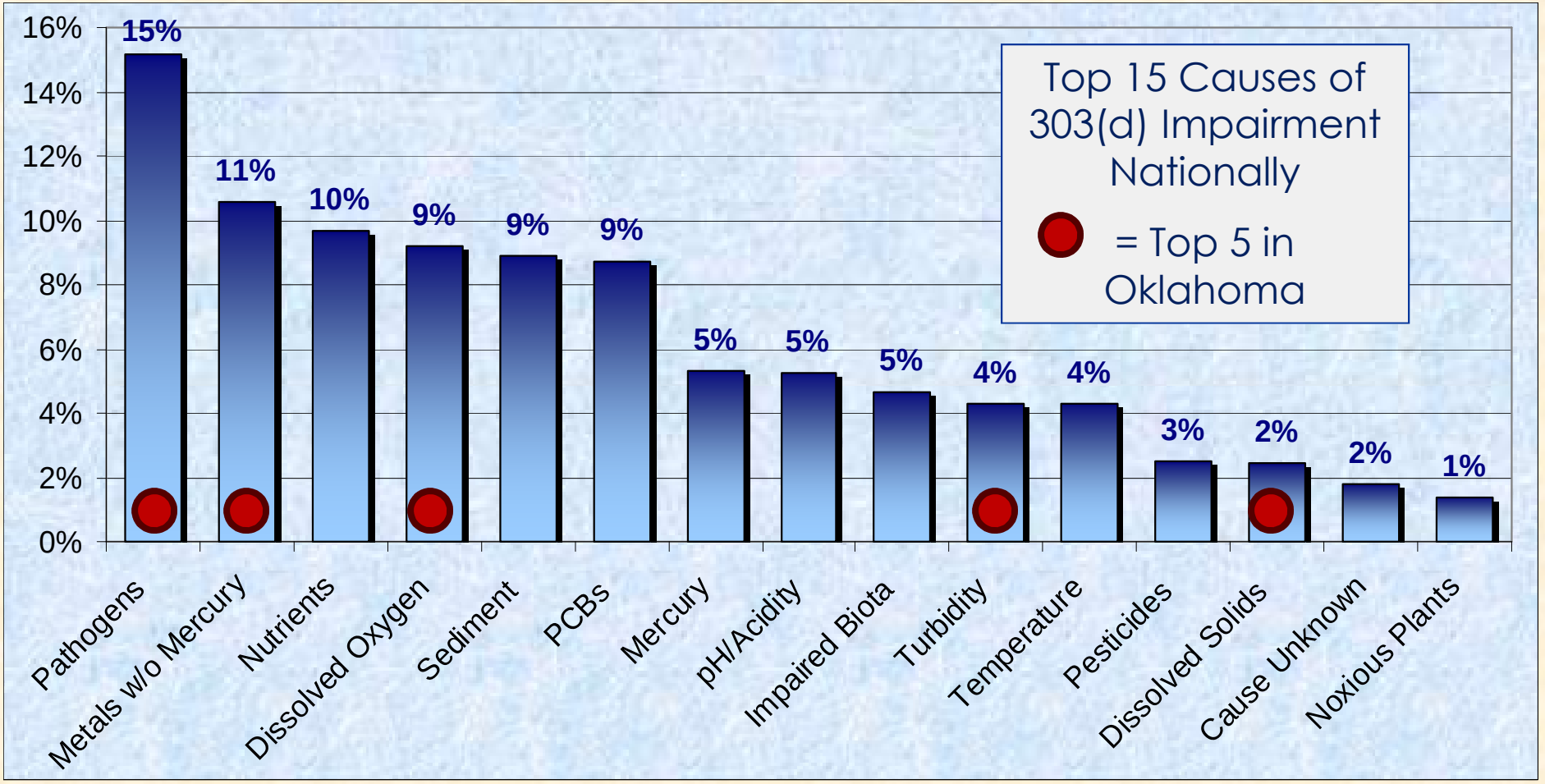
Biological (fish, macroinvertebrates)

pH

Oil & grease

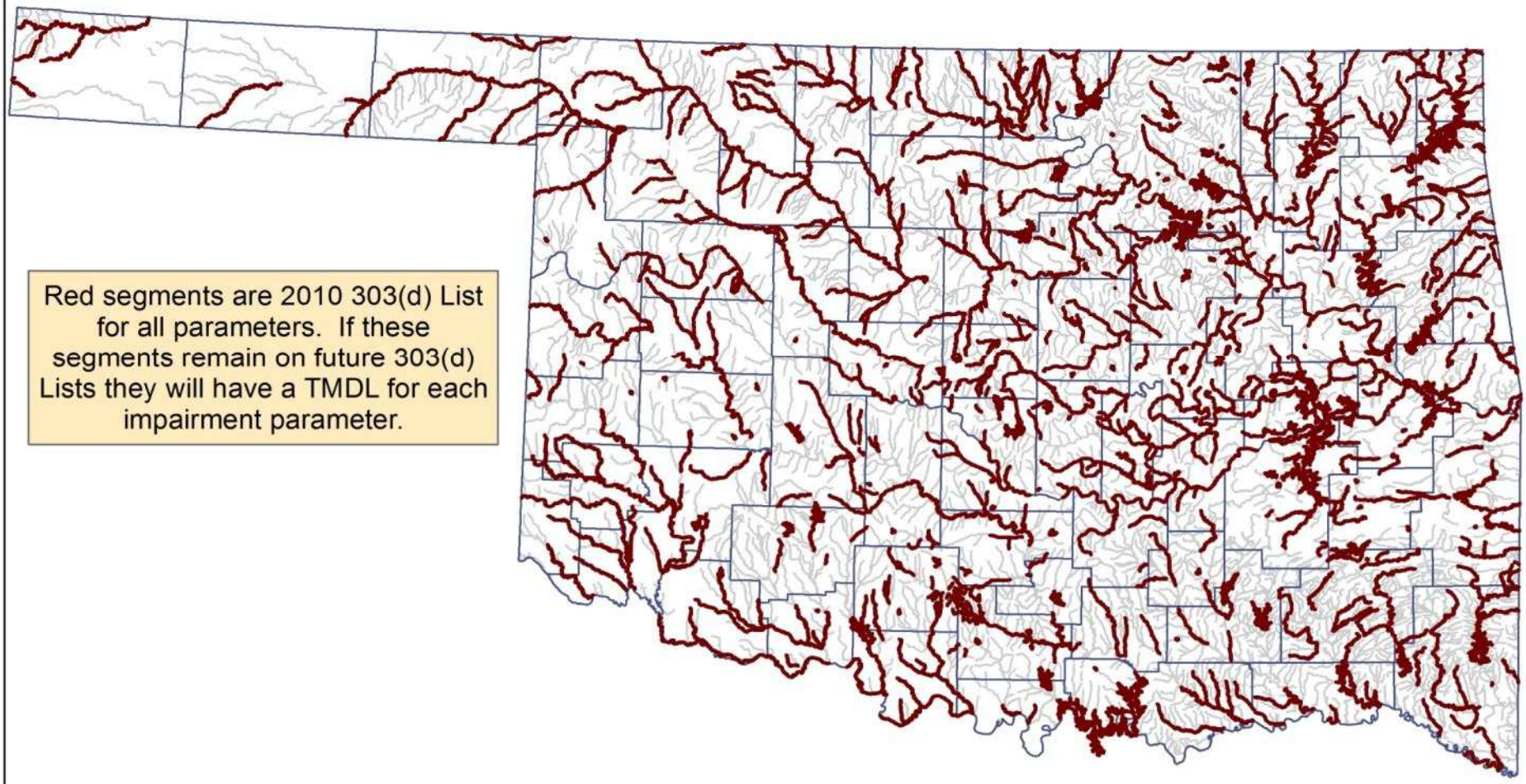
Chloride, sulfate, TDS

National 303(d) Statistics



Created from data on EPA website: http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T

2010 303d Listings for the State of Oklahoma



Red segments are 2010 303(d) List for all parameters. If these segments remain on future 303(d) Lists they will have a TMDL for each impairment parameter.

Legend

2010_OK_303d_waterbodies

Map Prepared by INCOG
January 2014

N
W E
S

TMDLs & WLA_MS4 Calculations

TMDL = Σ WLA + Σ LA + MOS + Σ WLA_MS4

Amount of Pollution A Waterbody Can Receive Without Violating Water Quality Standards

Point Sources = Wasteload Allocations

Nonpoint Sources & Natural Background = Load Allocations

Photos by Richard Smith, INCOG

TMDL Appendix F for Stormwater

"Compliance with the following provisions will constitute compliance with the requirements of this TMDL".

1. *Develop A Bacteria Reduction Plan*
2. *Develop Or Participate In A Bacteria Monitoring Program*
3. *Annual Reporting*

Some TMDLs do not have Stormwater Permit requirements (e.g., Turbidity TMDLs)

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EPA 2002 Memorandum

From EPA Memorandum, November 22, 2002, "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

"EPA expects that most [water quality-based effluent limits] … will be in the form of BMPs, and that numeric limits will be used only in rare instances."

"EPA's policy recognizes that …storm water discharges are … not easily characterized, only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction storm water discharges."

EPA 2010 Memorandum

- "Since 2002, States and EPA have obtained considerable experience in developing TMDLs and WLAs …. The technical capacity to monitor stormwater and its impacts …has increased."
- Where discharges have the reasonable potential to cause water quality problems, permits should contain numeric effluent limitations.
- Measurable Goals should be enforceable provisions.
- PAs should consider BMP numeric benchmarks and monitoring for estimating BMP effectiveness.

This memo was pulled for further consideration.

What's Driving the New EPA ?

Historically:

- 1990 & 1999 – Phase I & II regulations.
- EPA guidance, memorandums, etc.
- General Permits for each State.

Now:

- Construction ELG's = rulemaking.
- Lawsuits = court mandates.
- Continued urban pollution & 303(d) problems.
- Fear of more TMDL lawsuits.
- New types of TMDLs that address urban NPS.
- National Research Council's assessment report.
- Political climate in Washington.

Multi-Pollutant TMDLs? Reduce Flow!

New EPA strategy: Reducing flow reduces all pollutant loads.

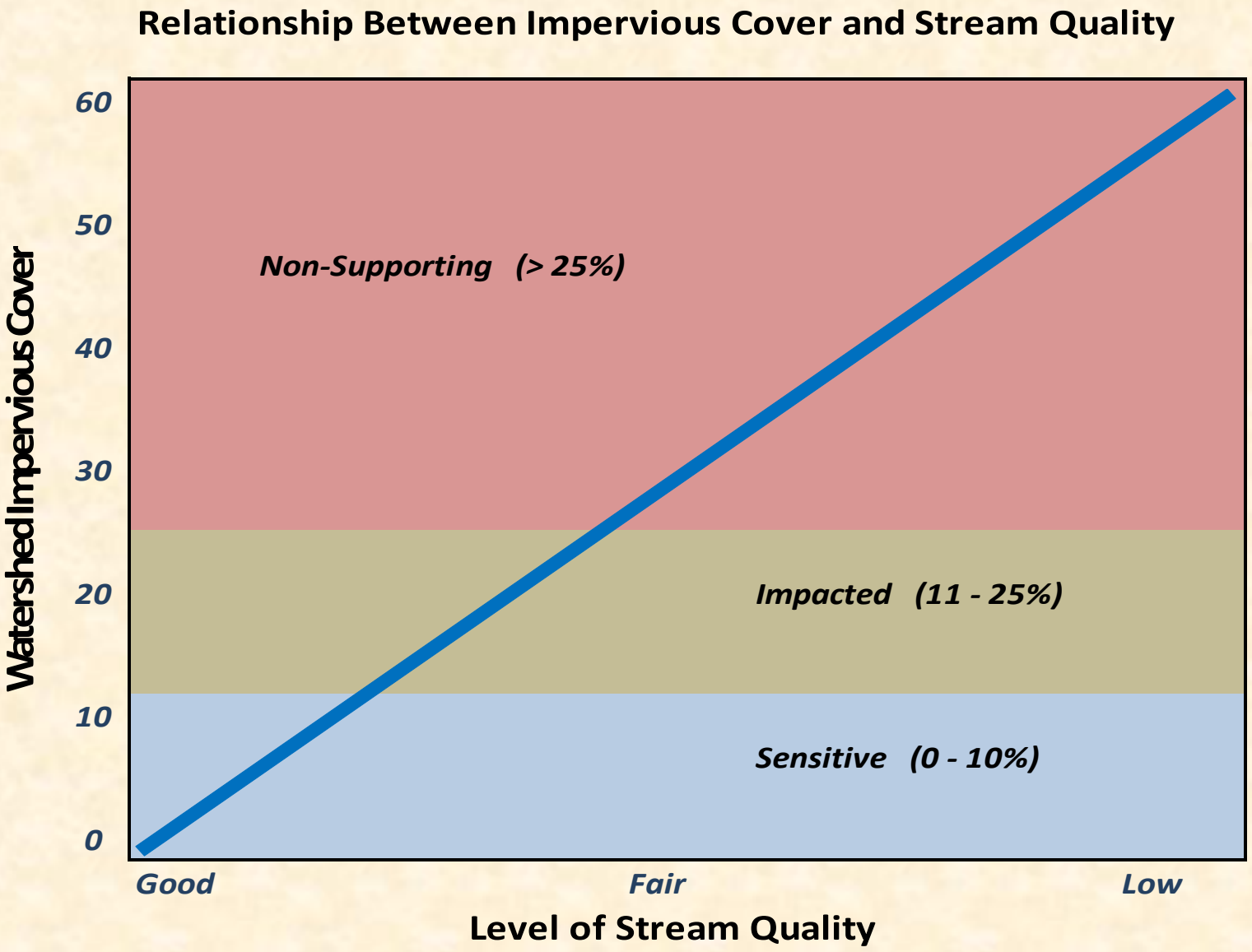
- **Reduce flow by**:
  1. *Removing impervious cover,*
  2. *Disconnecting impervious cover,*
  3. *Increase use of porous surfaces,*
  4. *Attenuate impervious cover using flow-based LID.*

Virginia District Court ruled water is not a pollutant, therefore EPA has no jurisdiction to control.

- **TMDL goal**: Avoids individual pollutant TMDL goals.
- **Already being done** in many states (18 as of 2013).

It's uncertain how the Virginia court decision will affect EPA-6 & Oklahoma.

Impervious Cover & Runoff Quality



LID and GI Requirements

Low Impact Development & Green Infrastructure

- Techniques that manage stormwater on-site and promote infiltration.
- Results in pollution reduction as well as volume reduction.
- Usually addressed in terms of "Best Management Practices" (BMPs).
- Can be regional, but usually are localized to the property (on-site management).

Photo by Vernon Seaman, INCOG

Present OKR04 Post-Construction Text

- [must]…"Develop, implement and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre…"
- [must]…"Develop and implement strategies which include a combination of structural and/or non-structural…BMPs …"
- [must]…"Use an ordinance…to address post-construction runoff…"
- [must]…"Ensure adequate long-term operation and maintenance of BMPs."

OKR04 Examples of Structural BMPs

From Present ODEQ MS4 General Permit (OKR04)

- Wet ponds
- Extended-detention outlet structures
- Grassed swales
- Bio-retention cells
- Sand filters
- Filter strips
- Infiltration basins and trenches

= LID and GI

OKR04 Examples of Non-Structural BMPs

From Present ODEQ MS4 General Permit (OKR04)

Policies and ordinances that:

1. Direct growth to identified areas.
2. Protect sensitive areas (e.g. wetlands, riparian areas).
3. Maintain or increase open space.
4. Provide buffers along sensitive water bodies.
5. Minimize impervious surfaces.
6. Minimize disturbance of soils and vegetation.
7. Encourage infill development in higher density urban areas.

OKR04 Proposed Text and LID / GI

Part IV.C.4.b. MCM 4th Construction – Recommendations

(2) Develop outreach program for the local development community, including incentives for developers/builders, such as "green developer" recognition.

Part IV.C.5.a. MCM 5th Post-Construction – Requirements

(4) You must review local ordinances and regulations, and identify the barriers to Low Impact Development (LID). Develop a schedule to remove those barriers that prohibit LID practices in the permit term.

(6) You must include an education component for developers and the public about project designs that minimize water quality impacts, including LID strategies.

OKR04 Proposed Text and LID / GI

Part IV.C.4.b MCM 5th Post-Construction – Recommendations

(2) Consider requirements …to direct growth to identified areas, protect sensitive areas …increase open space … provide buffers … minimize impervious surfaces, …encourage infill development …

(3) Assess … street design and parking lot guidelines … that affect …impervious cover. Determine if …standards … can be modified to support LID design options.

(4) Complete an inventory of impervious area …determine the areas that may have the potential to be retrofitted with BMPs (such as LID) … to reduce the frequency, volume and peak intensity of storm water runoff to and from your MS4.

EPA & "Pre-Development" Concept

- "Pre-development refers to runoff conditions that exist onsite immediately before the planned development activities occur."

- "Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred."

Phase-In of Construction Activities

Photo by Vernon Seaman, INCOG

Grassy Swales With Sod & Plants

Photo by Vernon Seaman, INCOG

Increases infiltration.

Absorbs chemicals.

Reduces peak flows during heavy rains.

Can add aquatic plants to enhance ecosystem.

Design carefully to help lower maintenance.

Adds to property values.

Treatment Detention Ponds

Constructed wetlands and multiple-pond systems remove pollutants by impounding runoff to control runoff rates and settle and retain suspended solids and associated pollutants.

Photo by Richard Smith, INCOG

Porous Pavement

Photos by Richard Smith & Vernon Seaman, INCOG

Increases infiltration.

Absorbs chemicals.

Reduces peak flows during heavy rains.

Design carefully to help lower maintenance.

Photo by Richard Smith, INCOG

Protecting "Riparian"

Protects stream bank from erosion.

Absorbs chemicals.

Reduces peak flows during heavy rains.

Provides terrestrial wildlife habitat.

Shades stream in hot summer.

Adds to property values.

Bio-Filters (Rain Gardens)

Photos by Vernon Seaman, INCOG

Green Roofs (Roof Gardens)

Photo by Vernon Seaman, INCOG

Absorbs rainfall; less runoff.

Absorbs chemicals.

Reduces peak flows during heavy rains.

Provides gardens and wildlife habitat.

Shades building in hot summer.

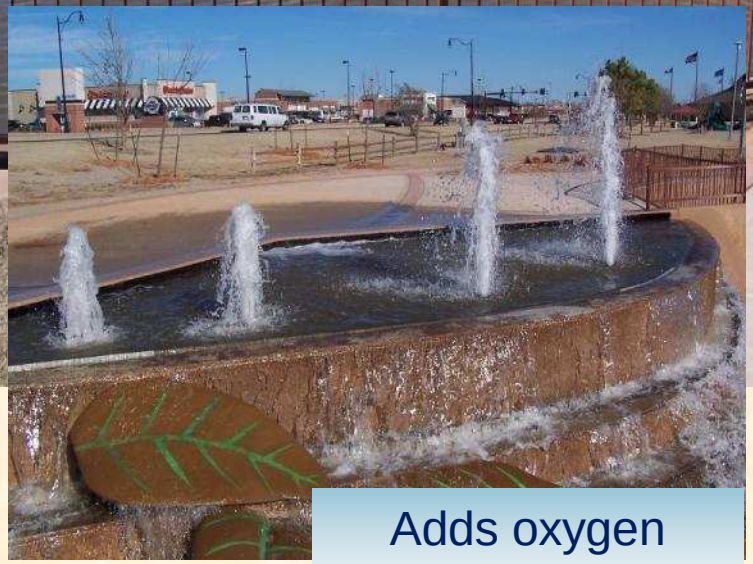
Adds to property values.

Example of Aeration & Solids Removal

Midwest City BMP

Reduces metals and nutrients

Trash & Sediment Removal



Adds oxygen

Photos by Richard Smith, INCOG

Are there any Questions ?