

# Clean Water. Clean World.

Exploring the Clean Water Act:  
Understanding, Implementing & Budgeting for  
Regulation in Construction Site Design

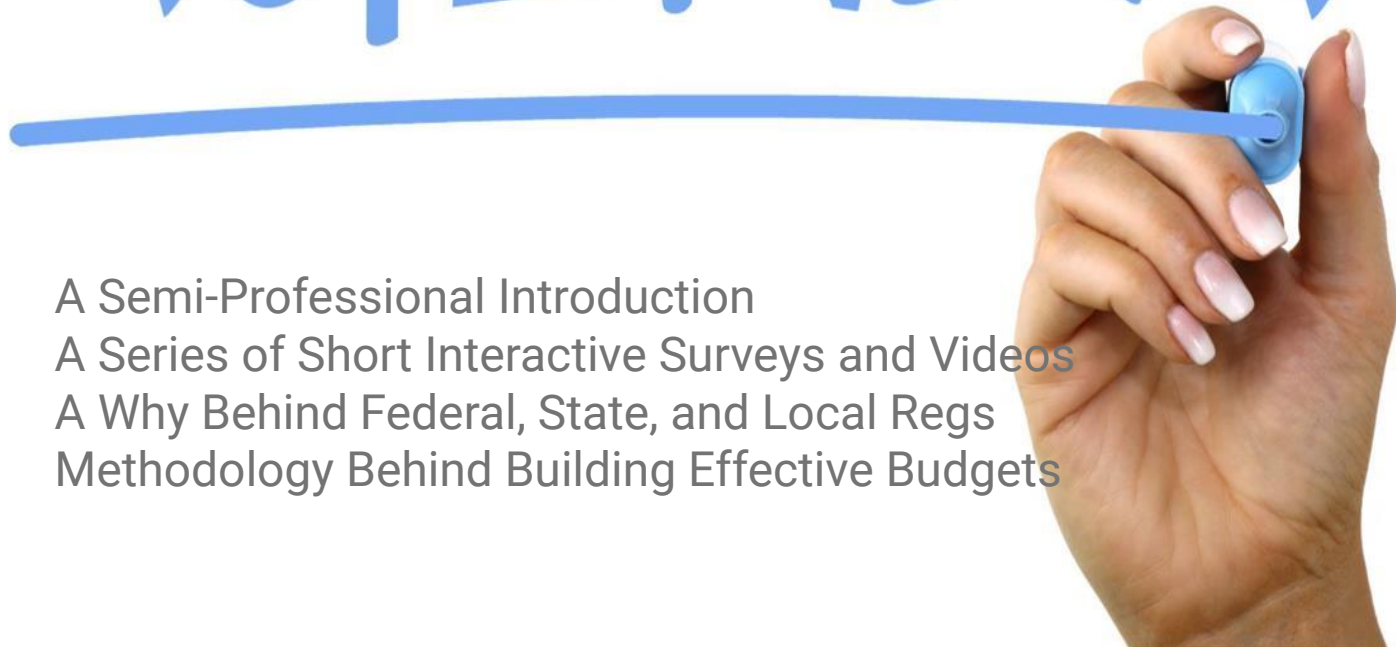


**SILTWORM™**



IECA  
Annual Conference  
and Expo

# AGENDA



- ❑ A Semi-Professional Introduction
- ❑ A Series of Short Interactive Surveys and Videos
- ❑ A Why Behind Federal, State, and Local Regs
- ❑ Methodology Behind Building Effective Budgets





# Joe Moore

*A Passionate, Clean Water NERD!*

## Purdue University

Pre-Med

Education

Science

1996-2001

Law School?

## Constructor

High Volume National

Stillwater River

Major Polluter

2001-2007

## Siltworm/ECS

Municipally Challenged

New Technology Siltworm

Good, Better, Best

2008-Present

## Affiliations

CPESC  
IECA/ECTC

Indiana MS4  
Partnership/NISWAG

Environmental  
Connection/Erosion  
Control Magazines

# Passionate Clean Water NERD!



**Why Am I  
Speaking  
Today?**



**PLEASE RAISE YOUR HAND IF YOU ARE....**



**Engineer/Design Professional  
A Constructor/Estimator  
Federal/State/ Or MS4 Regulator  
Or If you are Here For Work Today**

**IF YOU HAVE USED WATER...**

**20 Minutes**

**1 hour**

**1 day**

**3 days**



**LOWER THOSE HANDS**

# IF YOU PREFER CLEAN WATER



Kansas River crossing  
May 5, 1848



**Oregon Trail?**

# Milestones for our Water

January 1900

Cholera and Typhoid Fever 100 deaths per 100,000 people (CDC 61.3 Covid 2020)

June 1948

Federal Water Pollution Control Act

October 1972

Clean Water Act

Jan Feb Mar Apr May Jun Jul Aug Sept **Oct** Nov Dec

1920 Jersey City

Routine Disinfection of Drinking Water Results in lower rate of 33

July 1969

Cuyahoga River Fires (12)







# UNITED STATES CONGRESS

*EPA Clean Water Act of 1972*

## **NPDES**

National  
Pollutant  
Discharge  
Elimination  
System

## **Regulatory Structure**

National  
State  
County  
Municipal  
Others

## **Elimination of CSS/MS4**

Municipal  
Separate  
Stormwater  
Systems

## **Identifying Pollutants and Sources**

Regulated Waterways  
What Pollutants  
Where From  
What Is The Danger



At that time it was the largest piece of Federal Legislation Ever. It took 40 meetings to get it out of Conference, passed House 366 to 11, and the senate 74 Senators saying yes (out of 100)

Vetoed by Richard Nixon: @ projected cost of \$24 billion

Senate Overrides Veto: 52-12, House: 247-23



## Richard Nixon:

*"I hope to attack pollution in a way that does not ignore other very real threats to the quality of life, such as spiraling prices and increasingly onerous taxes."*



# Aim Small Miss Small

## FEDERAL | EPA

National Waterway  
System



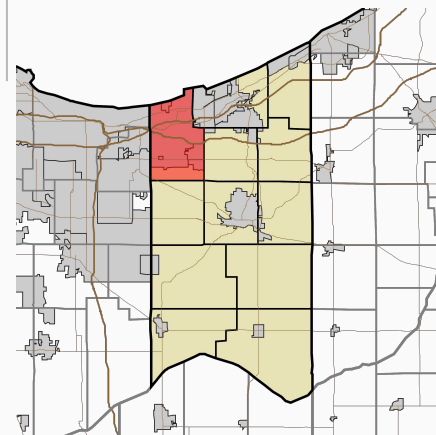
## STATE | IDEM

Waters of the State



## LOCAL | LAKE COUNTY

Waters of the County





## INDUSTRIAL POLLUTION

Identification of Point Source Pollution

Identification Of Pollutants Themselves

Identify the Amounts of Pollutants

**WHO DONE IT?**



# AGRICULTURAL POLLUTION

Topsoil and Nutrients are a Farmers Gold (where their \$ is spent)

Infiltration/Absorption

Typical Grade Conditions/Irrigation



**WHO DONE IT?**

## CONSTRUCTION POLLUTION

Vegetation Stripped

Grading from Structures, Putting  
Erodible Soils in Motion

Waters On Site Discharge

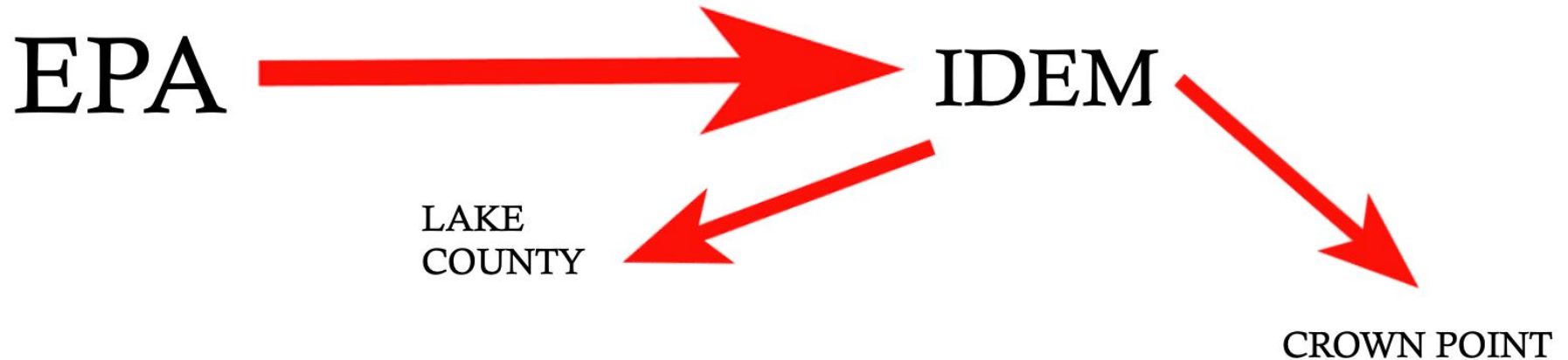


**WE HAVE A  
WINNER!!**



# UNDERSTANDING THE PERMIT PROCESS

AIM SMALL/MISS SMALL  
CONTINUED



# STATE

## (INDIANA PERMITS THROUGH US EPA)

### CONSTRUCTION PERMIT

### MS4 PERMIT

- Regulates SWPPP design and implementation
- BMP's
- Maintenance
- Inspections
- Phasing
- Vegetation/Buffers
- Permitting/Documentation.



- Regulatory Permit 6 MCM's
- Public Education and Outreach
- Public Participation and Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post Construction Stormwater Runoff Control
- Municipal Operations Pollution Prevention/Good Housekeeping

# LOCAL (CROWN POINT PERMITS THROUGH IDEM)

## CONSTRUCTION PERMIT

- Regulates SWPPP design and implementation
- BMP's
- Maintenance
- Inspections
- Phasing
- Vegetation/Buffers
- Permitting/Documentation.



## MS4 PERMIT

- Regulatory Permit 6 MCM's
- Public Education and Outreach
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# Local (My Permitted MS4)

## CROWN POINT, INDIANA

### 2 ACTIVE PERMITS:

Adheres to IDEM MS4 Permit

Adheres to IDEM Construction Permit

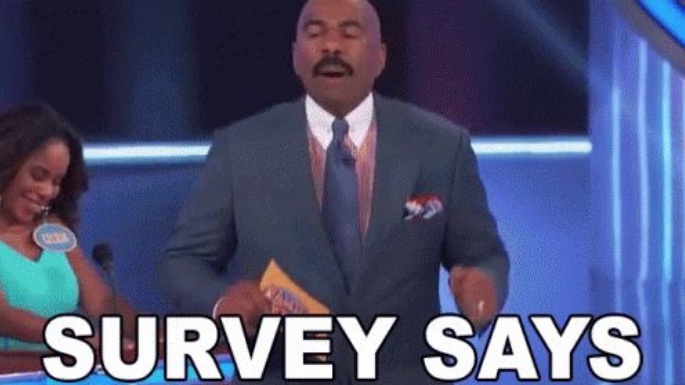


Raise Your  
Hand if you  
would  
answer  
YES  
to the next  
question





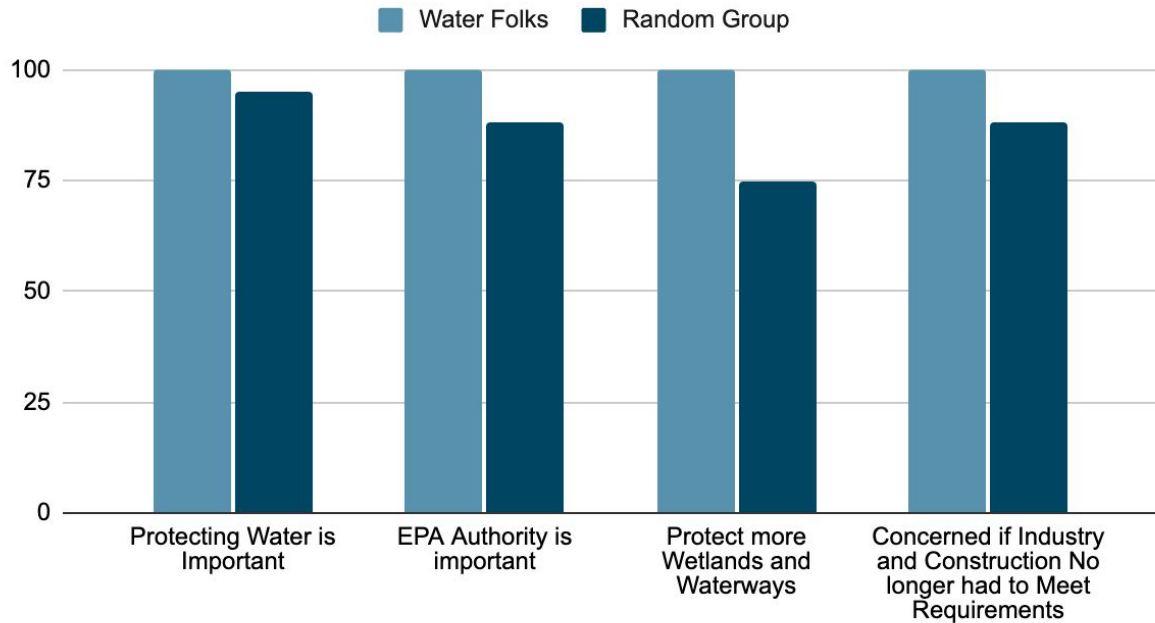
**Do we need all of  
this clean water  
regulation?**



# SURVEY SAYS

Wetlands, Water and Waterways, Regulation, and the EPA are all wanted, and needed!

Walton Family Foundation Survey Sept 2022




**THE FIGHT WAS NEVER ABOUT CLEAN WATER. THE FIGHT WAS, AND STILL IS ABOUT WHAT CLEAN WATER WILL COST US**



**MUNICIPALITIES #1 ISSUE: FUNDING**

**CONSTRUCTOR'S #1 ISSUE: ALSO FUNDING**



An aerial photograph of a construction site. The ground is heavily eroded and covered in thick, yellowish-brown mud. In the upper left, there are stacks of wooden planks and beams. A small blue generator or pump sits in a muddy trench. A large yellow crane is visible on the right side of the frame. The overall scene depicts significant damage and disruption to the construction project.

**How many of us have  
laid awake at night  
wondering what the  
storm is doing to our  
construction site?**

**How many of us  
would never like to  
have this worry  
again? I know a  
way...**

**How many of us have laid  
awake at night wondering  
how much this event will  
cost?**



**QUIT YOUR JOB**

# Since We Are Not Quitting:

1. WHAT Do We Need to Do?
2. HOW Do We Keep Erosion Control From Eroding Our Margins?

**PLAN AHEAD!**



# WHAT DOES THAT MEAN?

## STEPHAN COVEY



*"I believe that everyone chooses how to approach life. If you are proactive you focus on preparing. If you are reactive, you end up focusing on repairing."* 7 habits of Highly Effective People

## WILL SMITH



*"If you stay ready you don't have to get ready"*

# First things First: Build a Plan That Meets the Regulatory Requirements



# When a Budget Matches the Regulation?

## INSTALLATION

- Adhere to Engineered Specifications/Manuals
- Choose and Place BMPS per manufacturer/engineered Recommendations
- Study the SWPPP to ensure the details on it make sense for your site

## INSPECTIONS

- Required Weekly and after every ½ rainfall event.
- Many municipalities are asking for copies of them
- Municipalities are also required By state and federal agencies to inspect your sites
- In most cases this work can be done professionally for less, while meeting the requirement.

## CORRECTIVE ACTIONS

- All BMP's require Maintenance
- Sun, Wind, Snow, Rain, and construction activity are all factors that affect maintenance
- As Sites Change, so do the requirements and BMPS

# Is This Why We Are Losing Sleep?

## LOCAL | CROWN POINT

- Has an ordinance that includes **\$2500** per violation, per day?
- Is there a stop work order, and what does that cost?

## STATE | IDEM

- New MS4/Construction Permits complete
- More field presence as a result
- \$22k** per day per violation

## FEDERAL | US EPA

- \$54,833** per day per violation
- Consent Decrees



# How Can Regulatory Help Constructors/Designers?

1. Become Members of Regional MS4 Groups (IE: NISWAG)
2. Be Consistent with Ordinances and Process
3. Involve Building and Utility Departments to be on “Same Page”
4. Conduct Proactive Pre-Construction Routines/Meetings
5. Lead By Example Approach (Municipal Owned Projects)
6. Help to Establish Cost Effective Practices
7. Guidance on BMP Selections and Effectiveness





# WEBSITE

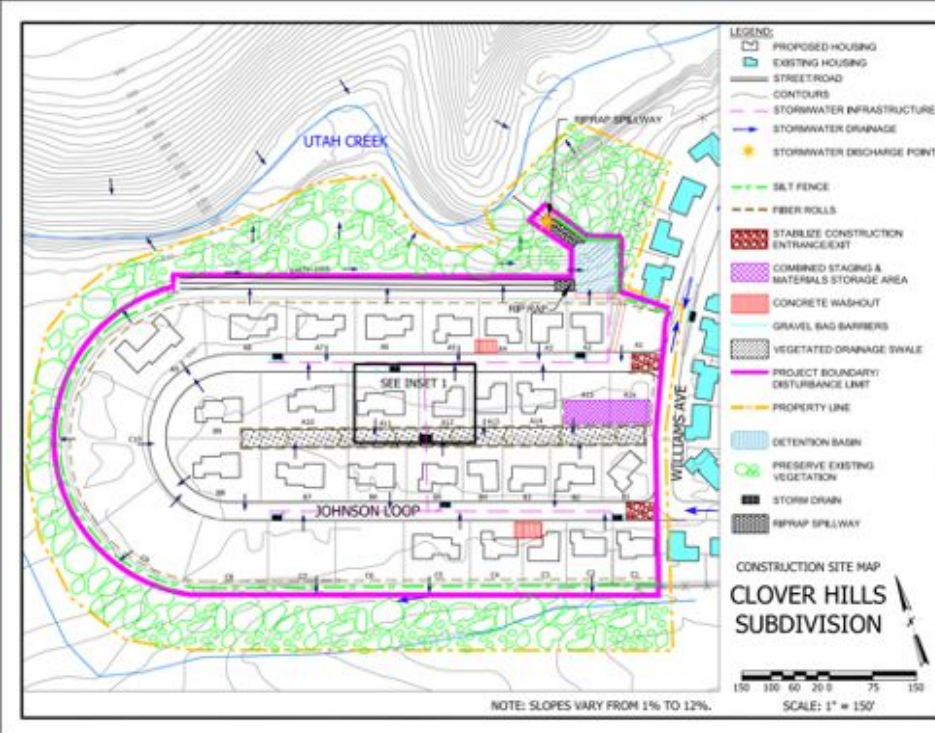


WHO HAS "REPORT A VIOLATOR" TAB?

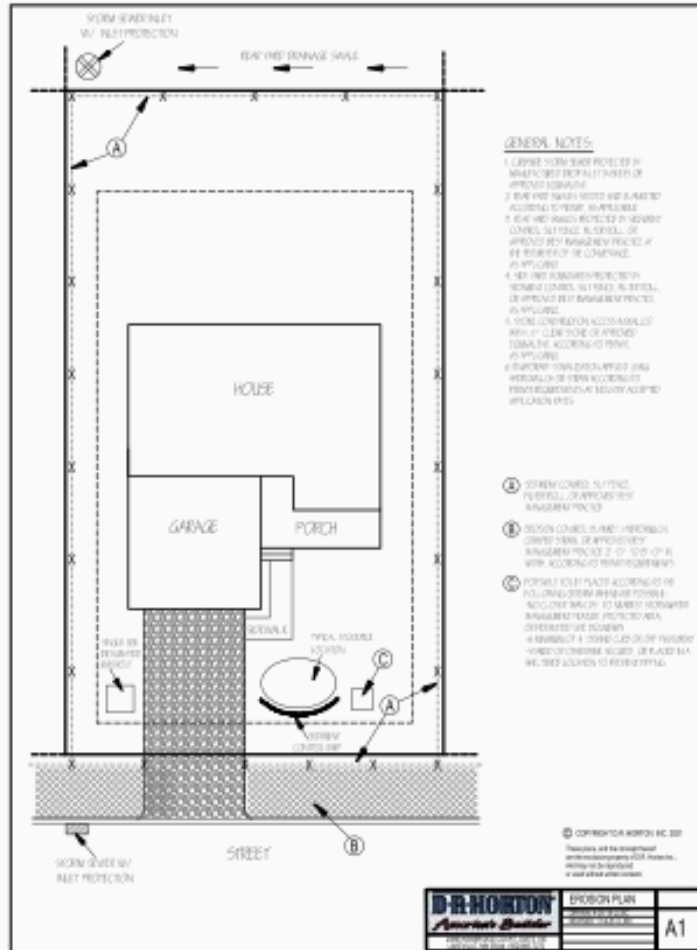
- US EPA
- STATE OF INDIANA
- CITY OF CROWN POINT
- MOST STATES/MOST MS4'S

# What Should We Plan For?

- ❑ Do we have a site specific SWPPP?
- ❑ Does that plan include manufactured BMP's?
- ❑ Are there specifications included for installation and maintenance?
- ❑ Are There Any Off Site Discharges Identified?
- ❑ Are there existing and proposed contours?



# What Should We Plan For?



- ❑ Do we plan for individual areas that are less than an acre?
- ❑ Do we consider the total of the some of these scenarios?
- ❑ Are Effective BMP's called out, or is the plan generic?
- ❑ Is it implemented as shown on the plan?
- ❑ Have we looked at the construction entrance detail?



Raise Your  
Hand if You  
Know What  
the Next  
Picture  
Represents

# Cation Exchange Capacity

Cations are positively charged ions:

Calcium/Magnesium

Potassium/Sodium

Hydrogen/Aluminum

Iron/Zinc/Copper



Soil Has a Negative Charge:  
elements held to it have a  
positive charge

# Sediment



# What Should We Plan For?

- ❑ 1.Perimeter Controls
- ❑ 2.Concrete Washout
- ❑ 3.Construction Phasing/Grading
- ❑ 4.Vegetation Efforts
- ❑ 5.Construction Entrances
- ❑ 6.Inlet Protection
- ❑ 7.Street Sweeping
- ❑ 8.Stockpile Protection
- ❑ 9.Dewatering Practices
- ❑ 10.Washout/Waste Facilities
  - ❑ Curb Cuts

# Curb Cuts vs. Other Controls

About 649,000 results (0.47 seconds)

A back-of-curb BMP that is easily maintained and effective during active construction is a curb-cut-back. A curb -cut-back is essentially a temporary sediment trap that is installed behind the curb. This sediment trap allows sediment eroded from the lot to settle in the trap before water exits onto the street.



Earthworks Environmental

<https://www.earthworksenv.com> > posts > back-of-curb-...

[Back of Curb BMP - Earthworks Environmental](#)

About featured snippets • Feedback

- Curb Damage
- Ponding
- Excessive Tracking and Overflow
- 252% more Inlet Maintenance
- 118% increase in Street Sweeping
- Additional Dewatering
- Municipal Requirements/Frozen Ground?
- Heaving Curbs/Stopped sub surface drainage
- Curb repair costs ?

# Choosing the most effective BMPs

Is Using Science, Physics, and Math the Best Practice?



Ponding and Sediment Build-up Behind Wattle at end of Flow



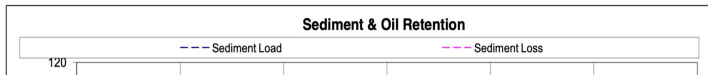
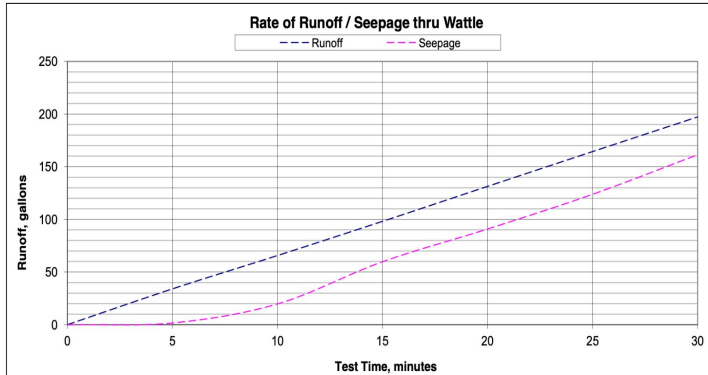
# Choosing the most effective BMPs



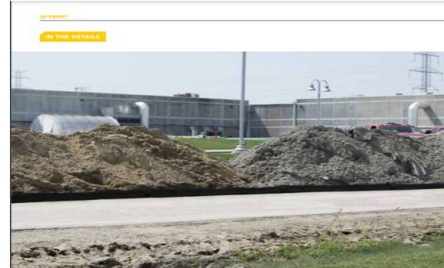
ASTM D7351 Testing of 6" Siltworm  
May 31, 2020  
Page 1

Project: ASTM D 7351  
Client / Listing # / Product: 6" Siltworm  
Test Date: 5/6/2020  
Test Setup: Toe-of-Slope Installation: 2" x 2" x 36" wood stakes on 32" centers  
Duration: 30 minutes  
Water / Soil / Oil Input: 1645 lbs water 105 lbs soil  
Sediment Concentration: Loam @ 6.0%

Soil Retention Effectiveness: 95.06%  
Seepage Effectiveness: 86.61%



## Is Using Science, Physics, and Math the Best Practice?



### Erosion Control

**Siltworm makes erosion control on construction sites much more efficient.** — JANA KROHN

**Jon Moore**, past owner and founder of Siltworm, Inc., describes the silt worm as the backbone of the erosion control industry today. He believes

that Siltworm's technology has been around a long time and used as an efficient and cost-effective way to control erosion on construction sites. "I've been in the industry for 20 years," he says. "I've worked on many sites with a variety of erosion control products. Siltworm is the most effective and cost-efficient product I've ever used."

Because they can't hold the weight of the water and sediment buildup, Siltworm's product holds up even in heavy rain, making the job of an erosion control engineer. The silt worm's unique structure allows it to absorb water and create a barrier that prevents erosion. It's also made from natural materials and is biodegradable and compostable. "It's made of recycled materials, so



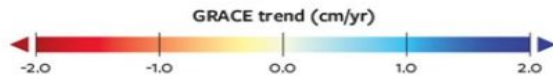
**How many of us  
think it's better to  
base our  
decisions on the  
results of Math,  
Science, and Data  
When Choosing  
BMPs?**



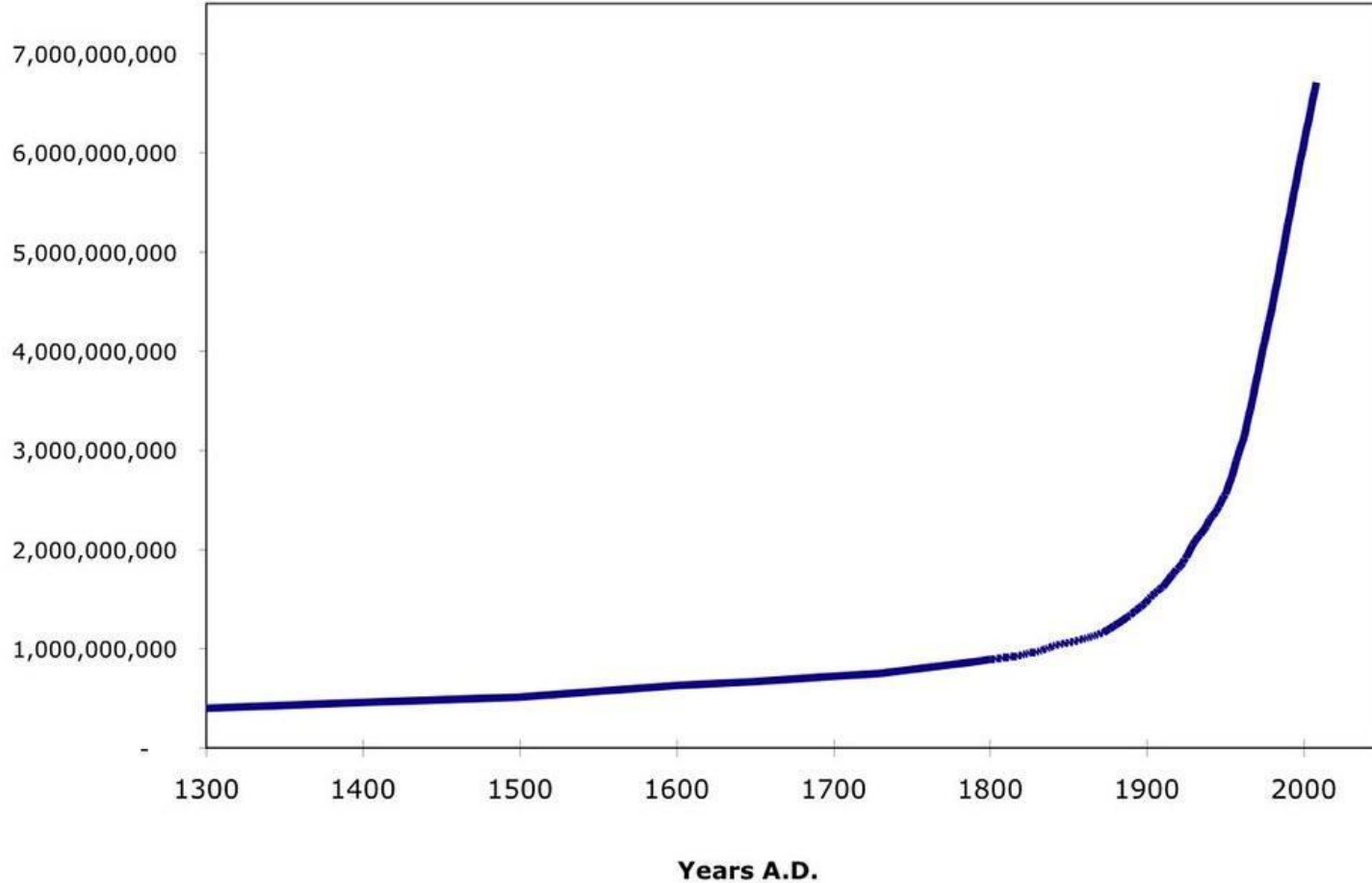


Raise Your  
Hand if You  
Know What  
the Next  
Picture  
Represents

# WORLD'S FRESHWATER AVAILABILITY MAP



# World Population



[CHECK OUT  
THIS  
POPULATION  
ODOMETER](#)

A scenic photograph of a stream flowing through a wooded area. The water is calm, reflecting the surrounding trees and sky. The banks are lined with lush green foliage.

**Water Quality Trends in Indiana Streams:  
trends in concentrations of selected  
nutrients, metals, and ions,  
2011-2020**

# What Pollutants were Considered?

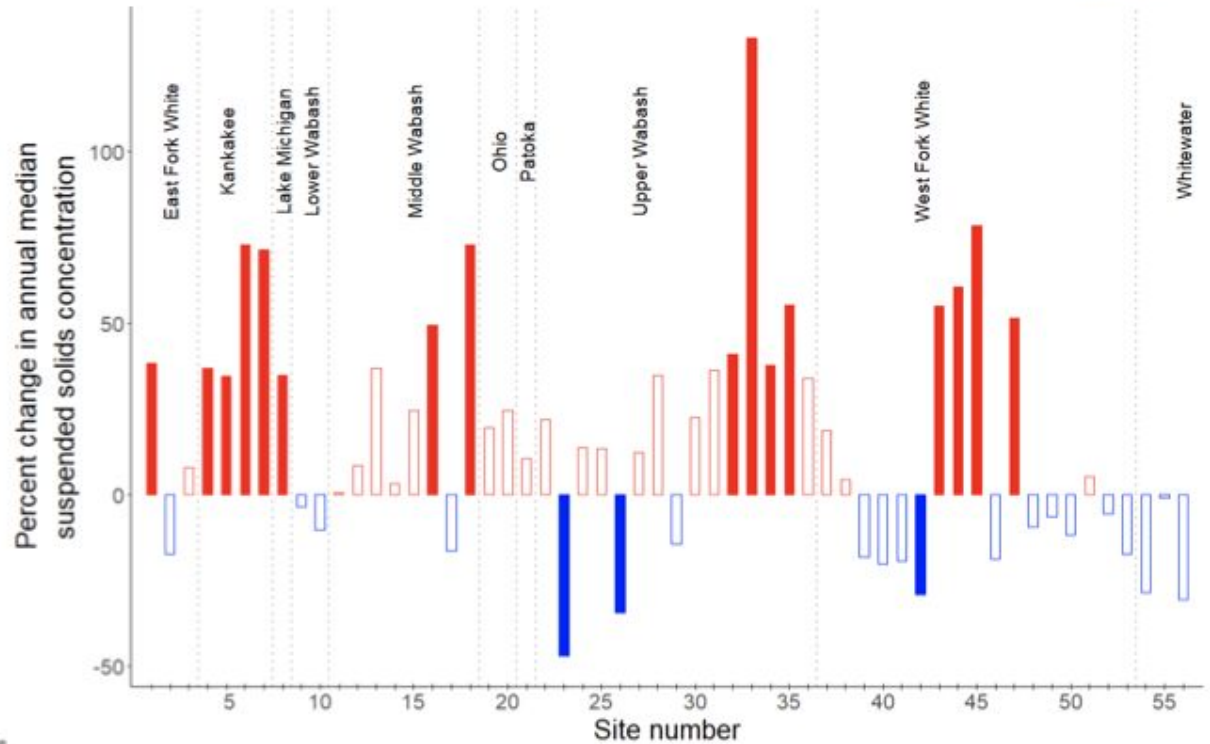
*Why were those the pollutants looked at?*

- **Nutrients:** Nitrate, organic nitrogen, phosphorus, and total suspended solids
- **Ions:** Chloride, sulfate, hardness, and total dissolved solids
- **Metals:** Lead, iron, copper, and zinc
- 8,530 stream samples
- 672 trend analyses





## Suspended solids



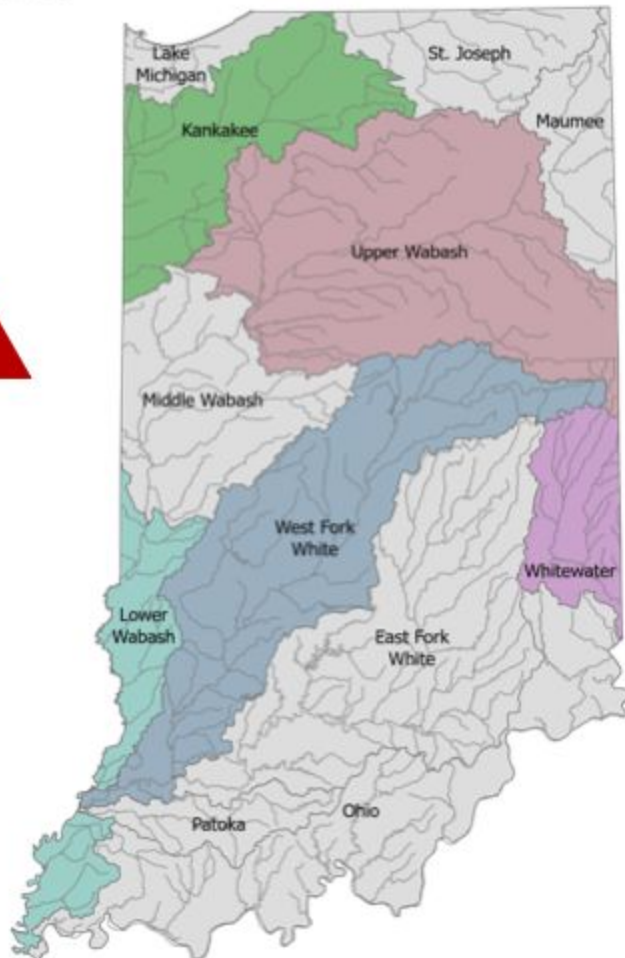
- Suspended solids declined in 3 sites
- Significant increases seen at 16 sites



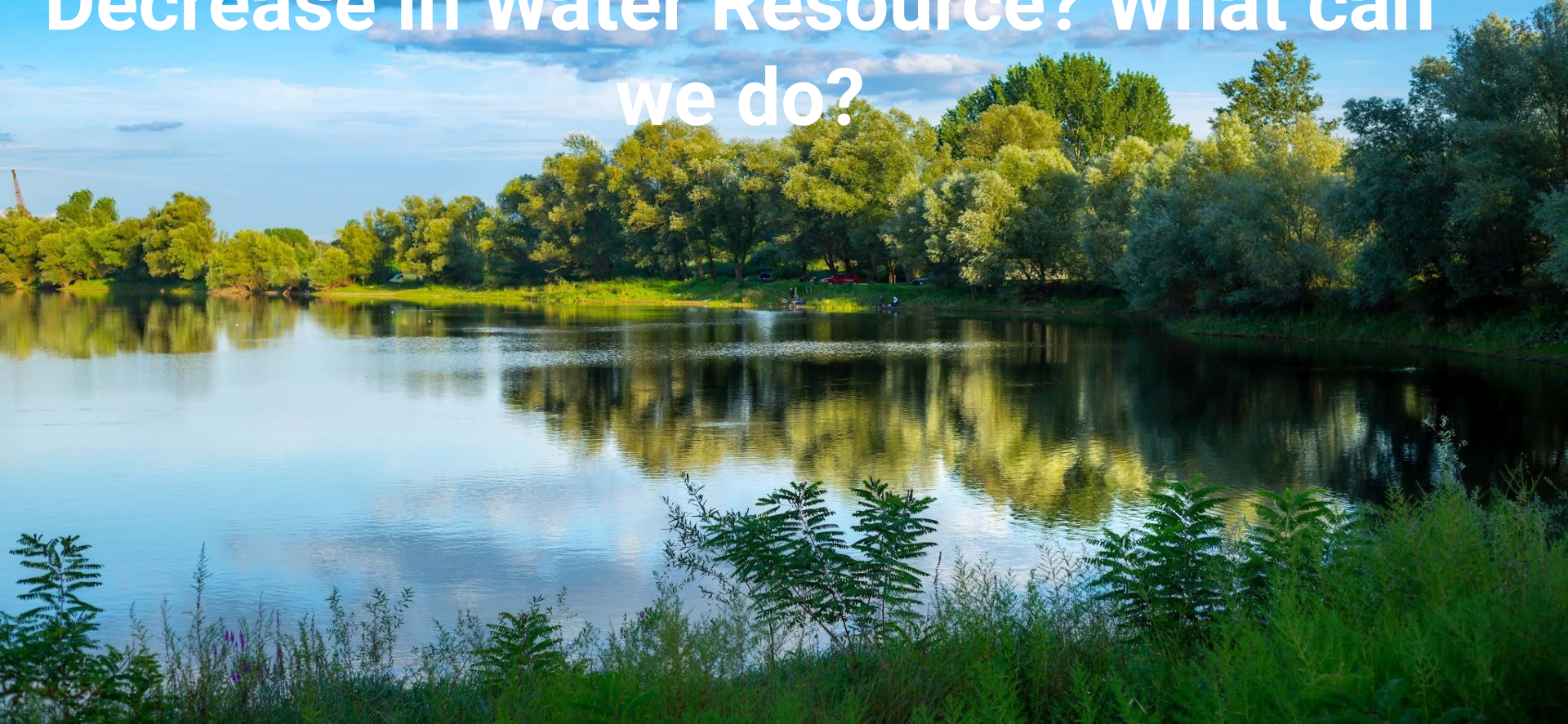


# Summary – Regional results

River Basin	Uptrends
Kankakee	29%
Upper Wabash	20%
Lower Wabash	17%
Whitewater	11%
West Fork White	10%



**We Have an Increase in Population and a  
Decrease in Water Resource? What can  
we do?**



# Pick Your Why



# The Survey Questions

*Answer the last question, "Why are we the ones to solve the problems we identified?"*



**Do you Prefer  
Clean Water?**

100 % of this polled group  
prefers clean Water



**When did you last  
use water?**

100% of this room used the  
resource of Water today



**Is there Value in  
Regulation?**

100% of us agreed that we  
want and need some type  
of regulation



**Should We be  
Using Data?**

100% of us agreed that we  
should use Science,  
Physics, and Math.



# Our Team

*Integrity. Professional. Safe. Passionate. Efficient*



**Joe Moore**

Founder/Chief Brand  
Ambassador



**Tiff Arcella**

National Accounts  
Manager



**Patrick Meacham**

Regional Sales



**Mike Lorenzo**

Operations Manager

**COME SEE US AT BOOTH #333**