

# I Can't Hit My Stormwater Benchmarks, Now What?

Bill Lindsey, P.E.



# Stormwater Benchmarks -

- MDNR – Common Stormwater and General Permit Requirements:
  - SWPPPs
  - Best Management Practices (BMPs)
  - Sampling/Monitoring – Benchmarks
- Don't hit Benchmarks - problem?
- Am I a bad person?



# Stormwater Benchmarks

- Why are there Benchmarks?
- Background on Benchmarks?
- Laboratory Analysis for Benchmarks
- BMP's used to hit Benchmarks
  - Bad BMPs –why?
  - Good BMPs – why?
- What happens if Benchmarks exceeded?



# Stormwater Permits - MDNR



# Stormwater Permit - Benchmarks

- MDNR – 17 MORXXX General Stormwater Permits:
  - 12 have Benchmarks
  - 2 Effluent Limits (Construction Sites)
  - 3 No Sample Requirements
- MDNR – 28 MOGXXX General Permits plus Process Water:
  - 22 have Benchmarks

# Why are Benchmarks in Permits?

- MDNR get in line with EPA SW approach
- Stormwater events highly variable
- Want flexibility to evaluate technologies
- Effluent limits – create violations
- Benchmarks – allow Us/Them to evaluate technologies/BMP's/practices
- Allow time to evaluate and adapt

# How were Benchmarks Set?

- Permit Fact Sheets – Discuss Sources
- EPA Guidance – Multi-Sector General Permit - similar industries
- State Water Quality Standards and Effluent Limits
- Values reported by permittee
- Other state standards
- Best Professional Judgment



# Benchmarks – MOG49 Quarries and Concrete

- Total Suspended Solids – 100 mg/L
- Oil & Grease – 10.0 mg/L
- pH – 6.5 to 9.0 Standard Units
- Settleable Solids – 1.0 mg/L/Hour

# Benchmarks – MO60A

## Motor Vehicle Salvage

- Total Suspended Solids – 100 mg/L
- Oil & Grease – 10.0 mg/L
- Aluminum – 750 ug/L
- Iron – 1,000 ug/L
- Lead – 151 ug/L

# Benchmarks – MOR203 Structural Steel and Light Metal Fabrication

- Total Suspended Solids – 100 mg/L
- Oil & Grease – 10.0 mg/L
- pH – 6.5 to 9.0 Std Units
- Aluminum – 750 ug/L
- Copper – 21.2 ug/L
- Iron – 1,000 ug/L
- Zinc – 176.7 ug/L

# Benchmarks – MORA & MOR100 Construction & Land Disturbance

- **Settleable Solids – 2.5 mg/L**
- **2-Year, 24-Hour Rain Event**

# Additional Benchmarks

- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Metals
  - Aluminum, copper, iron, zinc
- Industry Specific Chemicals
  - Ammonia, nitrogen, phosphorus, nitrates, pesticides



# Benchmarks – What is Measured?

- Total Suspended Solids – 100 mg/L
- 1.0 Liter of sample water passed through a 1.5 micron filter, dried, weighed.
- Noted as cloudiness or turbidity
- Sources – fines, dust, dirt.
- Clay particle – 0.5 microns



# Common Benchmarks

- Oil & Grease – 10.0 mg/L
- Polar Fraction – Animal and vegetable
- Non Polar Fraction – Petroleum hydrocarbons
- Sources: fueling, lubricants, vegetable and animal fats (animal feeds)



# Common Benchmarks

- pH – 6.5 to 9.0 Standard Units
- Negative of the logarithm (Base 10) of activity of hydrogen ion.
- 0 to 7 = Acidic
- 7 to 14 = Alkaline or Basic
- Sources: Concrete washout water, cleaning solutions, acid rinses.





# Common Benchmarks

- Settleable Solids – 1.0 to 2.5 mg/L
- Imhoff Cone – 1.0 Hour test
- Measures volume of solids removed by settling



# Best Management Practices (BMPs)

- Source Control
- Treatment
- Temporary & Permanent Nonstructural BMPs
- Temporary & Permanent Structural BMPs

# Best Management Practices (BMPs)

- Nonstructural BMPs
- Housekeeping
- Maintenance – address drips
- Employee Training





# Best Management Practices (BMPs)

- Temporary & Permanent Structural BMPs
- Enclosed/covered storage areas
- Silt fencing, hay bales
- Filter socks
- Detention Basins/Sed Basins
- Grass lined swales/basins







08/22/2014





# Best Management Practices (BMPs)

- Effective BMPs:
- Covered roof over materials storage
- Housekeeping – especially street cleaning
- Dumpsters closed, not overfilled
- Grass-lined sed basins
- Long grass-lined ditches before outfall

# Best Management Practices (BMPs)

- Not Effective – BMPs, etc.
- Silt Fences and Hay Bales – overloaded or not maintained.
- Poor housekeeping, trash, oils stains
- Materials piles not maintained
- Boneyard – dirty, oily equipment
- Items close to outfalls – storage piles, empty drums

# Don't Hit Benchmarks?



# Don't Hit Benchmarks?

- Benchmarks do not constitute direct numeric effluent limits.
- BM exceedances alone, therefore are not a permit violation.
- BM monitoring data primarily for facility's use (and MDNR) to determine effectiveness of SWPPP & additional corrective actions needed.
- SW = 10-Year, 24-Hour rain.



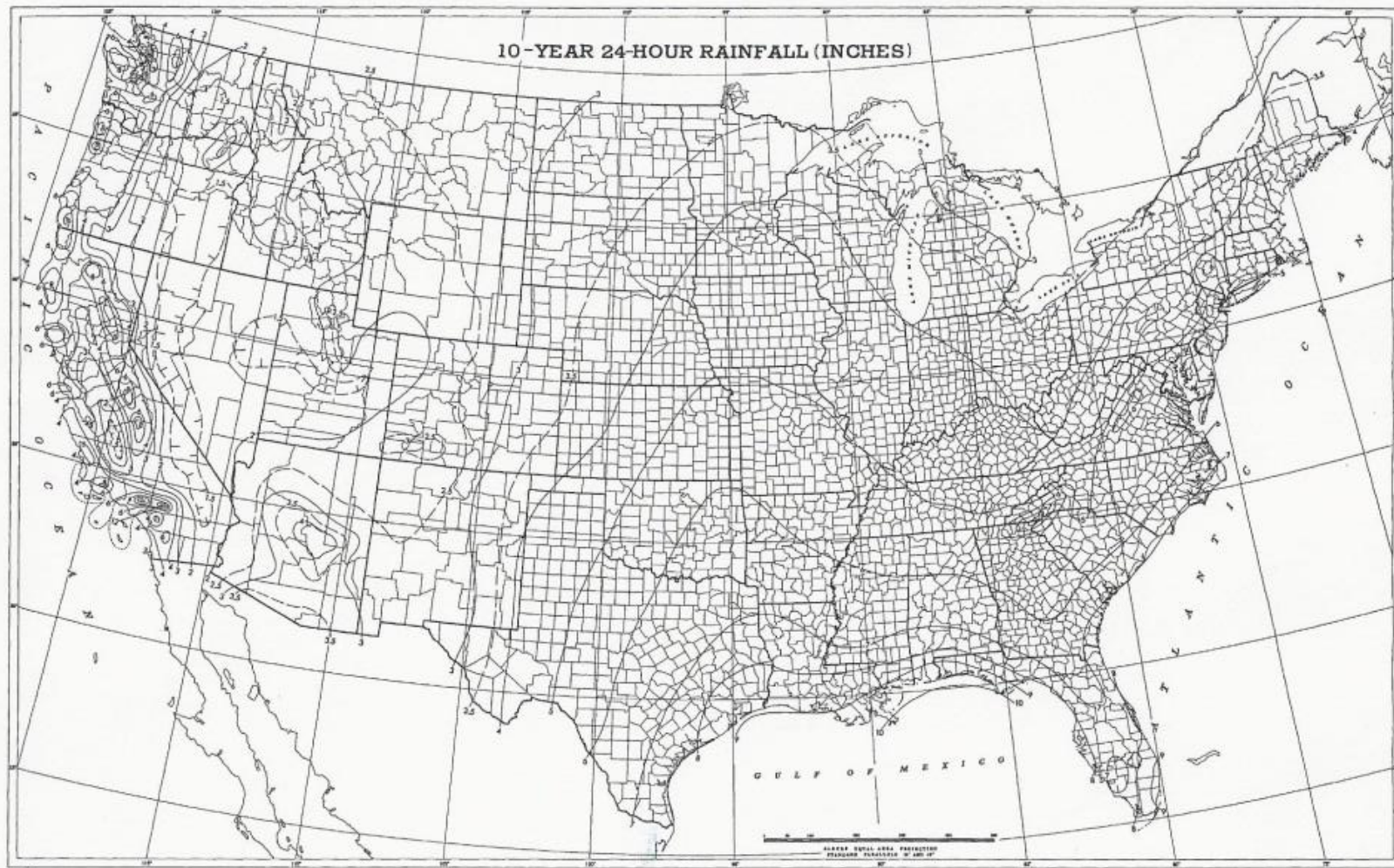
# Don't Hit Benchmarks?

- If BM exceeded, must review SWPPP and BMP's to determine improvements or additional controls needed.
- Failure to improve BMP's, address exceedance, and make tangible progress is a permit violation.
- Prepare Corrective Action Report (CAR)

# Don't Hit Benchmarks?

- BMP designed to hit BMs during rainfall up to 10-Year, 24-Hour rain.
- The 10-Year, 24-Hour Rainfall is:
- Technical Paper No. 40, Rainfall Frequency Atlas of the United States.
- For Mid-MO = 5.5 inches/24 hours.
- 2-Year, 24-Hour = 3.5 inches/24 hours.
- Keep rainfall records!





# Corrective Action Report (CAR)

- Records efforts undertaken by facility to improve BMP's and meet BM's in future samples.
- Can't hit BMs, demonstrate the BM cannot be achieved (multiple CARs) with BMPs available technology.
- Not feasible – no further reductions are technology available or economically practical – best practices.

# Can't hit BMs, I am a Bad Person?

- 50 Shades of Grey:
- At or below all BMs
- Only one parameter exceeds BM
- Parameters just barely exceeds BM
- Multiple parameters blow out BMs

# Exceed BMs, I am a Bad Person?

- No, this is not a permit violation.
- CAR to explain actions taken
- Working to replace/maintain BMPs
- Continually making effort to improve

# Exceed BMs, I am a Bad Person?

- Yes, this is a red flag to MDNR
- Failure to take action to improve BMPs
- Failure to make tangible progress.
- Failure to document CAR/letter to inform MDNR with DMR.

# Exceed BMs, I am a Bad Person?

- How many quarters can you miss Benchmarks without causing problems?
- Can't honestly answer that question
- Case-by-case situation
- Regional offices work with facility



# Stormwater Benchmarks - Summary

- Benchmarks in most SW permits
- Based on existing state & fed standards
- BMPs – grass & detention best
- BMPs – hay bales & sed fences OK
- BM exceedance not violation!
- Make effort to improve SWPPP & BMPs
- Failure to make effort – you are a bad person!

# Questions

## Midwest Environmental Consultants

Bill Lindsey, P.E. – [blindsey@mecpc.com](mailto:blindsey@mecpc.com)  
417-886-9200 ♦ Springfield, MO