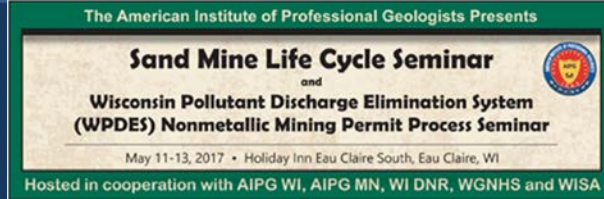


May 12, 2017 10:50-11:15
Overview of the Newly Revised WPDES Program

Mark Krumenacher, PG
Senior Principal
GZA GeoEnvironmental, Inc.
Waukesha, WI

Matt Schowengerdt, PE
Project Manager
Foth Infrastructure & Environment
DePere, WI

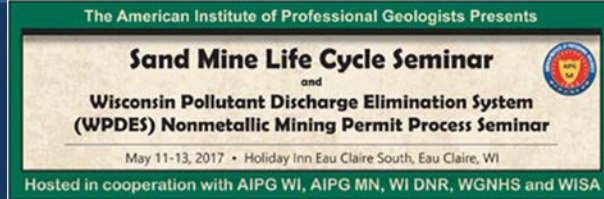




OVERVIEW - GENERAL PERMITS

- Overview of NMM in Wisconsin
- WDNR Estimates 2,500 mines
 - Construction Aggregate – Sand, Gravel, Limestone, Dolomite, Granite;
 - Dimension stone – Limestone, Dolomite, Granite;
 - Volcanic Andesite (Shingles);
 - Peat;
 - Industrial Sand;
 - Clay;
 - Others

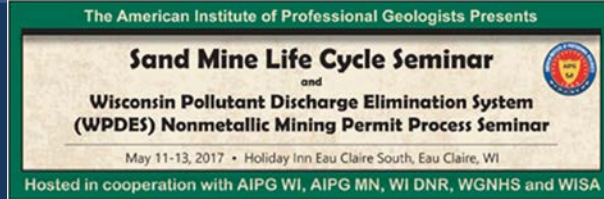




OVERVIEW - GENERAL PERMITS

- Permitting Overview
 - General Permit vs. Individual Permit
 - Revised Nonmetallic Mining WPDES General Permits Effective August 1, 2016
 - Nonmetallic Mining Operations For Non-Industrial Sand and Other Aggregates = WI-A046515-6
 - Nonmetallic Mining Operations For Industrial Sand Mining and Processing = WI-B056515-6

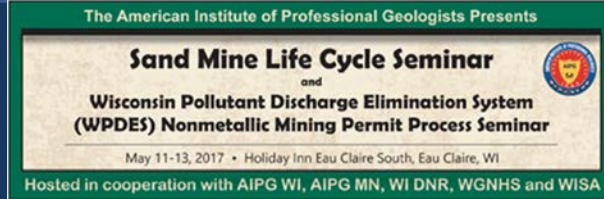




OVERVIEW - GENERAL PERMITS

- Permit Overview
 - Previous General Permit – Expired March 2014
 - Covered all NMM
 - 18 pages

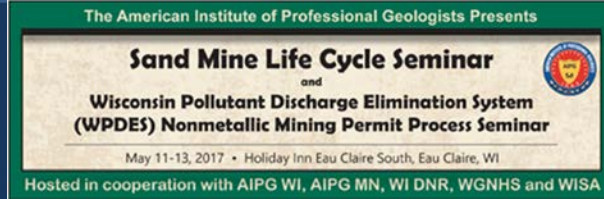




OVERVIEW - GENERAL PERMITS

- Permit Overview
 - New General Permits
 - WDNR Decision to Split Out SIC Code 1446
 - Drafts Reviewed - Feb 2015 Through Early 2016
 - Permits Signed July 29, 2016
 - Effective August 1, 2016
 - Expire July 31, 2021

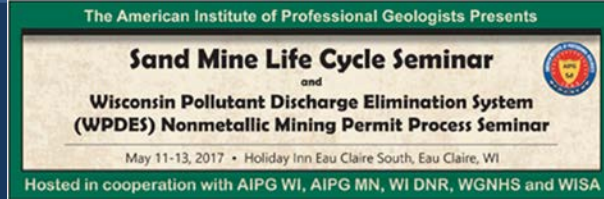




OVERVIEW - GENERAL PERMITS

- Section 1 – Applicability
 - Activities Covered – Same for Both
 - Storm Water and Contaminated Storm Water
 - Wastewater

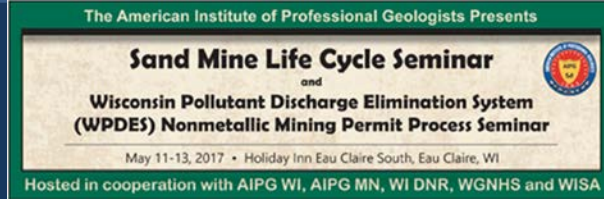




OVERVIEW - GENERAL PERMITS

- Section 1 – Applicability
 - Discharges Not Covered – Same for Both
 - List of 21
 - 11 New

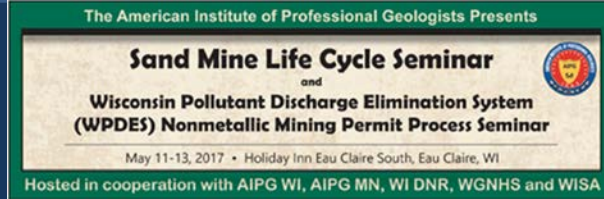




OVERVIEW - GENERAL PERMITS

- Section 1 – Applicability
 - Discharges Not Covered – Same for Both
 - Unique Additions
 - Construction Aggregate Chemical Floatation and Separation
 - Industrial Sand Chemical Floatation and Acid Leaching Extraction
 - Concern With Sediment and Sludge From Wastewater Treatment Practices

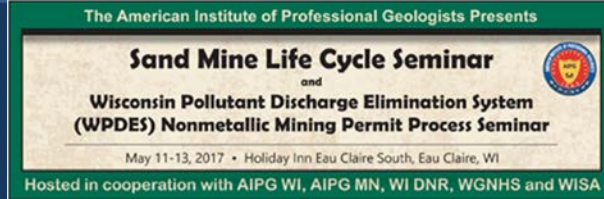




OVERVIEW - GENERAL PERMITS

- Section 2 – Requirements For All Sites
 - New Requirements – Same for Both
 - Management of Dewatering Water From Sediment From Storm Water BMPs
 - Storm Water Diversion
 - Outside Washing Activities
 - Polyacrylamide Use Limitations
 - Fish and Aquatic Life Waters
 - Toxic Pollutants

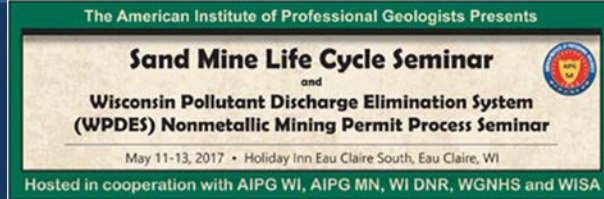




OVERVIEW - GENERAL PERMITS

- Section 2 – Requirements For All Sites
 - New Requirements
 - Initial Permit Coverage – For Industrial Sand Only
 - SWPPP Must be Completed Prior to NOI
 - SWPPP Summary Included with NOI
 - Above Not Required if Internally Drained [Permit A]
 - Existing Permit Coverage
 - Permit Transfers
 - Permit Coverage Termination





OVERVIEW - GENERAL PERMITS

- Section 3 – Storm Water Control Requirements
 - New Requirements – Same for Both
 - Minimize Dust and Off-Site Tracking
 - Minimize Exposure of Storm Water to Pollutants
 - Maintain Control Measures
 - **Train Employees**



Reasons to Manage Stormwater

- Changes in hydraulic properties
- Water quality
 - Surface & groundwater



Ways to Prevent Contaminated Stormwater

- **Prevent Soil Erosion**
 - Stabilize soil
 - *Divert overland flow - REQUIREMENT*
 - Minimization of tracking on roads

- **Prevent Contaminated Stormwater**
 - Good house keeping
 - Proper waste management
 - Visual inspections
 - Spill/leak prevention and response measures
 - Spill reporting



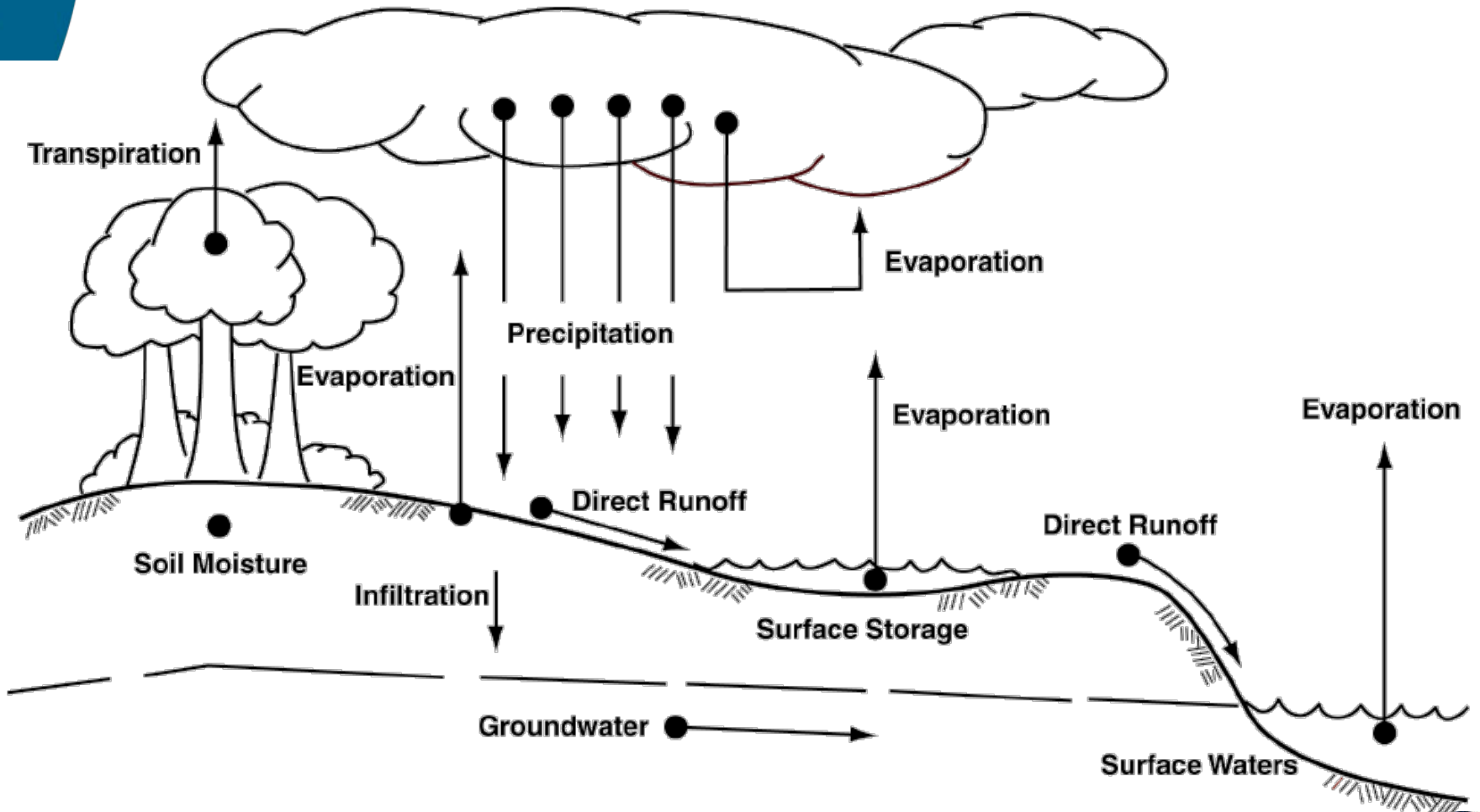
Rainfall / Runoff Process

Rainfall (Volume; Intensity; Duration)

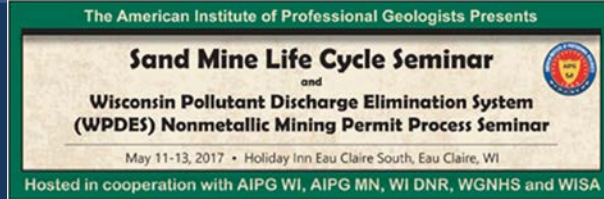
Watershed (Area; Land use; Soil type; Tc)

Runoff - How much; How fast; How long
(Hydrology)

Conveyance Structure – How deep/how
high? (Hydraulics)



Source: Fundamentals of Urban Runoff Management.

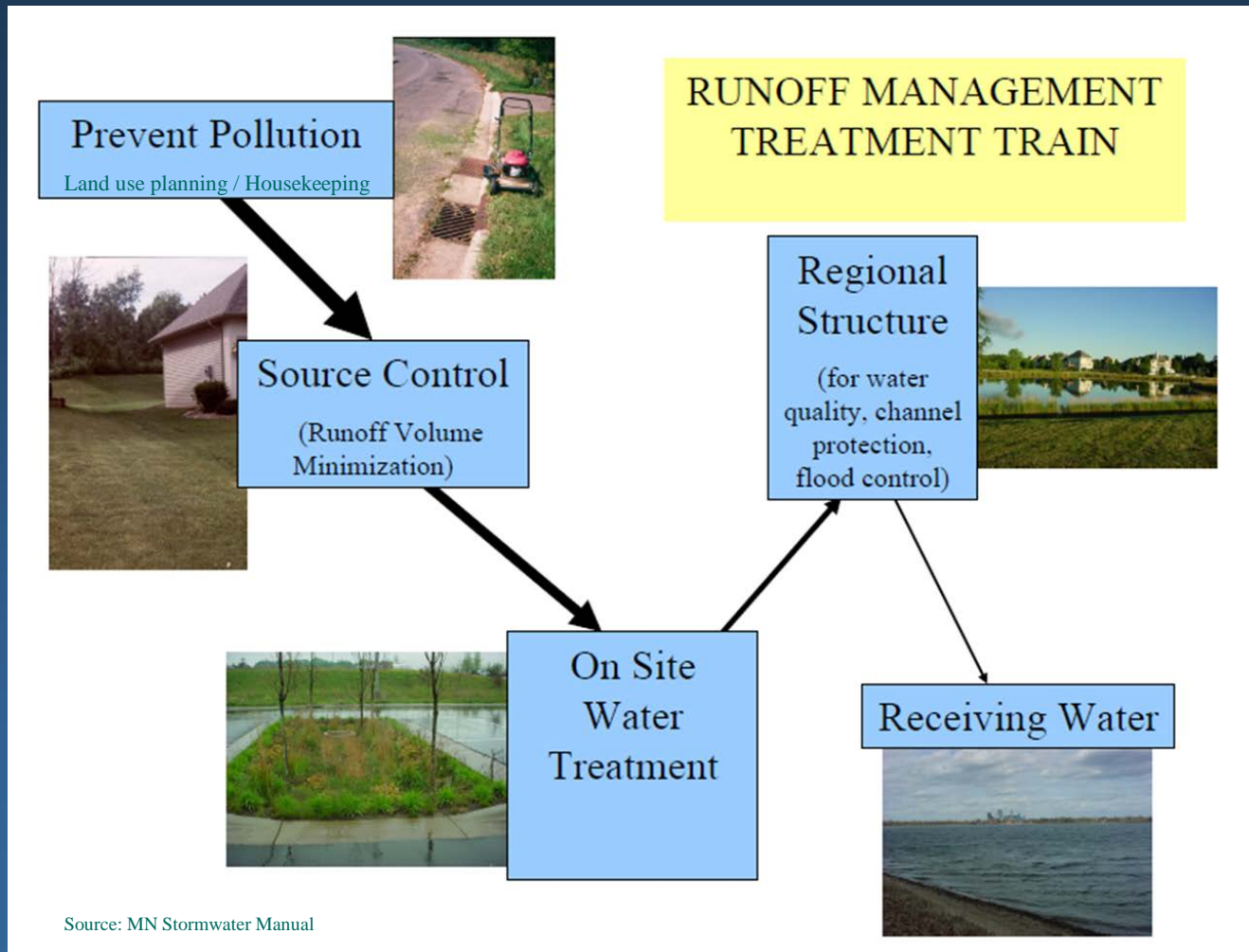


OVERVIEW - GENERAL PERMITS

- Section 3 – Storm Water Control Requirements
 - Annual Inspections
 - Different if Internally Drained [N/A for Ind. Sand]
 - SWPPP
 - Not Required for Internally Drained [N/A to Ind. Sand]
 - SWPPP Summary Required – New for Both



≡≡≡ 3.1 – Physical Controls

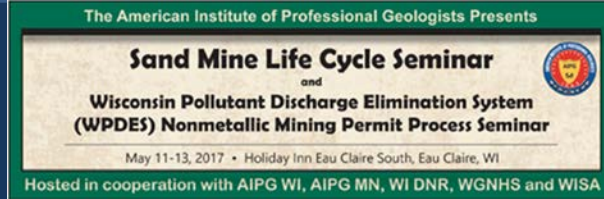


≡ 3.1 – Physical Controls - BMPs



≡ 3.1 – Physical Controls - BMPs





OVERVIEW - GENERAL PERMITS

- Section 4 – Requirements for Wastewater Discharges to Groundwater – Same for Both
 - Wastewater Only
 - Does Not Apply to Storm Water or Contaminated Storm Water
 - New
 - Monitoring May be Waived if:
 - Practice of Lined [Industrial Lagoon Standards]
 - Exfiltration less than 500 Gallons /Acre / Day
 - WDNR Could Request Groundwater Monitoring



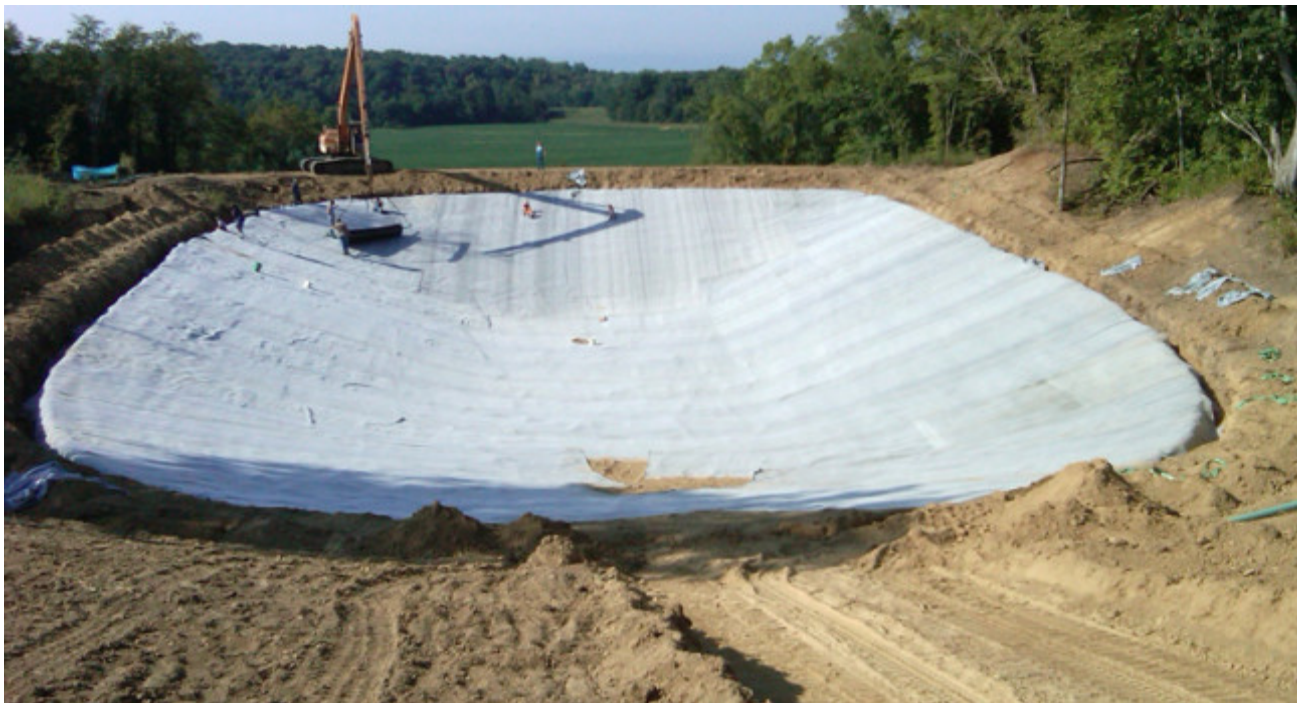


Table 1

Limitations for Groundwater Discharges		Monitoring Requirements	
Parameter	Daily Maximum ^(a)	Sample Frequency ^(b)	Sample Type ^(c,d)
Discharge Flow (Gallons per Day)	-	Quarterly, or as specified in section 4.2.1.1	Estimate
Oil and Grease	15 mg/l	Annually, or as specified in section 4.2.1.2	Grab
NEW pH	6.0-9.0 s.u.	Annually for A and quarterly for B, or as specified in section 4.2.1.3 If pH is outside range, then treat or pass through soil to get in range	Grab
Water Treatment Additives	-	Monthly	Keep records as specified in section 4.2.1.4



Geosynthetic clay liner under construction for pond

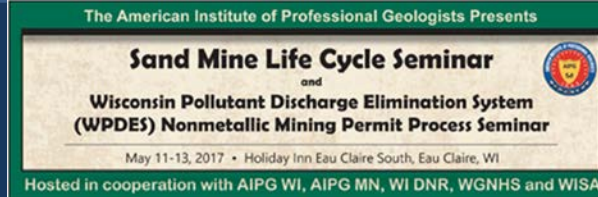




2. Existing wastewater treatment facility must provide data to the DNR (document) to show that the entire wastewater contact area is permanently sealed and remains at or below an exfiltration rate of 500 gallons per acre per day.

Rate compares to a clay soil with permeability (k) value equal to 5.4×10^{-7} centimeters/second (cm/s)



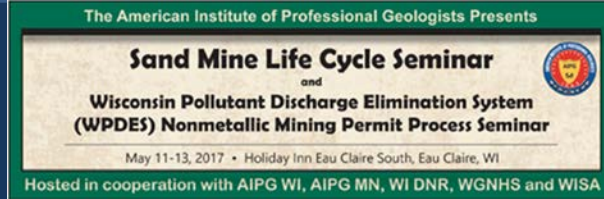


Matt Schowengerdt, PE



Sand Mine Life Cycle Seminar – May 12, 2017

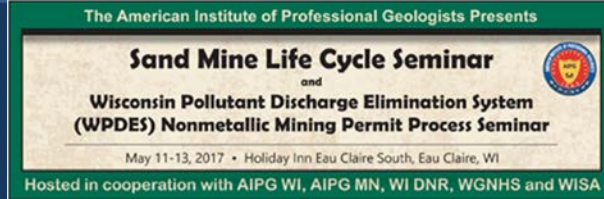




OVERVIEW - GENERAL PERMITS

- Section 5 – Requirements for Wastewater Discharges to Surface Water – Same for Both
 - Wastewater Only
 - Does Not Apply to Storm Water or Contaminated Storm Water

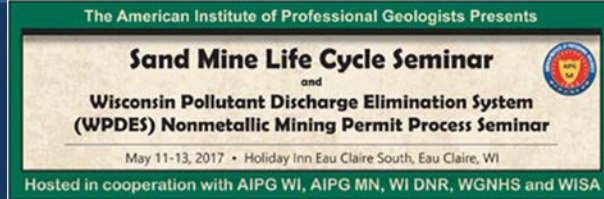




OVERVIEW - GENERAL PERMITS

- Section 5 – Requirements for Wastewater Discharges to Surface Water – Same for Both
 - New
 - Temperature
 - No Limits Specified
 - Quarterly For 1 Year
 - Total Phosphorous
 - Additional Monitoring if >0.1 mg/L
 - No Discharge of Water From Sediment or Sludge Removed From Wastewater Treatment

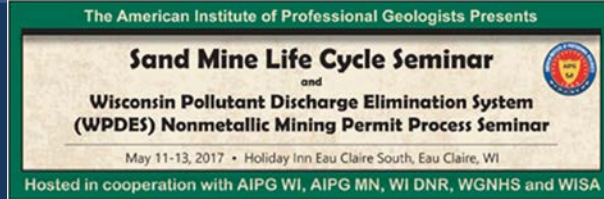




OVERVIEW - GENERAL PERMITS

- Section 5 – Requirements for Wastewater Discharges to Surface Water
 - New for Industrial Sand GP
 - Effluent Monitoring Required
 - Recurring Discharges [e.g., continuously, daily, weekly, monthly, quarterly]
 - Option A - Develop a Monitoring Plan
 - Option B – Whole Effluent Toxicity (WET) Testing

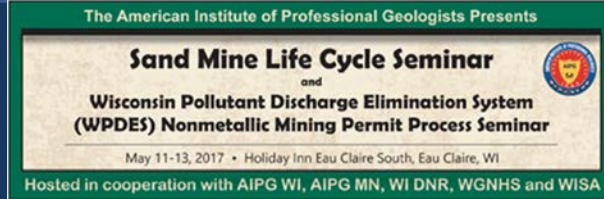




OVERVIEW - GENERAL PERMITS

- Section 5 – Requirements for Wastewater Discharges to Surface Water
 - For Recurring Discharges
 - Option A - Develop a Monitoring Plan
 - 15 Metals
 - Hardness
 - Ammonia-Nitrogen
 - Chloride
 - Total Phosphorous
 - Turbidity





OVERVIEW - GENERAL PERMITS

- Section 5 – Requirements for Wastewater Discharges to Surface Water
 - For Recurring Discharges
 - Option B – WET Testing
 - Acute and Chronic
 - Chronic Only When Instream Waste Concentration (IWC) is Greater Than 1%
 - $IWC = \frac{\text{Proportion of Effluent}}{\text{Total Volume of Water (Effluent + Receiving Water)}}$
 - Same Requirement for Nonrecurring Discharge of Wastewater – Industrial Sand Only





Requirements

- Temperature Monitoring
 - Monitored with a grab sample each quarter
 - May be discontinued after 4 consecutive quarterly results



Requirements

- Sampling for Total Phosphorus
 - Sampled for Phosphorus Annually
 - 0.1mg/L will require additional sampling
 - Once per quarter for 4 quarters





Floating Solids and Foam

- No discharge of floating solids or visible foam in other than trace amounts.
- Only biodegradable soaps and detergents shall be used; limited to the minimum amount needed to clean the object
- Only low (less than 0.5%) phosphate or nonphosphate soaps and detergents if the wastewater discharges directly to surface waters.

Effluent Monitoring – NEW FOR INDUSTRIAL SAND GP

- **Recurring discharge of Wastewater**
 - A discharge of wastewater to a surface water that occurs at a regular and repeated frequency (continuously, daily, weekly, monthly, quarterly)
 - Option A – Develop a Monitoring Plan
or
 - Option B – Whole Effluent Toxicity (WET) Testing





Effluent Monitoring

Recurring discharge of wastewater

- **Option A**

- Develop and implement a monitoring plan

- Location of surface waters
- Outfall locations
- Discharge monitoring locations
- Monitoring parameters
- Monitoring frequency
- Test Methods
- Plan implementation schedule

- Table 3 15 metals, hardness, ammonia-N, chloride, phosphorus, turbidity

Aluminum	Iron
Antimony	Lead
Arsenic	Mercury
Beryllium	Nickel
Cadmium	Selenium
Chromium +3	Silver
Chromium +6	Zinc
Copper	
Hardness	
Ammonia-Nitrogen	
Chloride	
Phosphorus, Total	
Turbidity	



Effluent Monitoring

Recurring discharge of wastewater

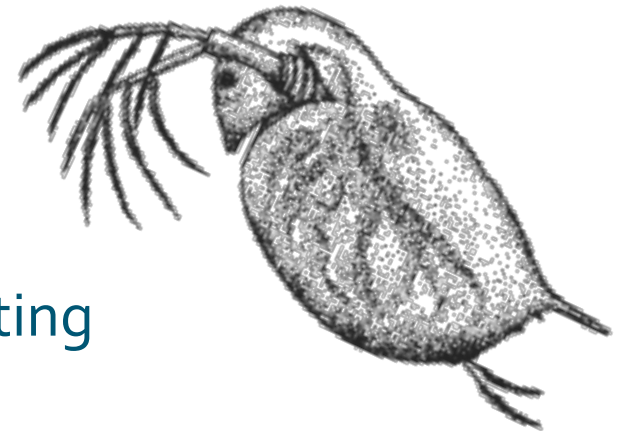
- **Option B**
 - Whole Effluent Toxicity (WET) testing

- WET Testing
 - Aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater
 - Expose living aquatic organisms (plant, vertebrates and invertebrates) to a sample of wastewater
 - Receiving water is used as the dilution water

Effluent Monitoring

Recurring discharge of wastewater

- **Option B**
 - Whole Effluent Toxicity (WET) testing
 - Acute
 - Designed to determine the “end of pip” conditions
 - (effects in 100% effluent)
 - Tested on Flathead Minnow and Ceriodaphnia Dubia
 - Duration ranges from 24 to 96 hours
 - Effluent that causes 50% lethality (LC50)





Effluent Monitoring

Recurring discharge of wastewater

- **Option B**
 - Whole Effluent Toxicity (WET) testing
 - Chronic
 - Tested on the Flathead Minnow, *C. Dubia*, and *S. Capricornutum* (green algae)
 - 4-7 days with continuous exposure
 - Effluent concentration that causes 25% reduction in growth or reproduction of test organisms (IC₂₅) – compared to the instream waste concentration (IWC)

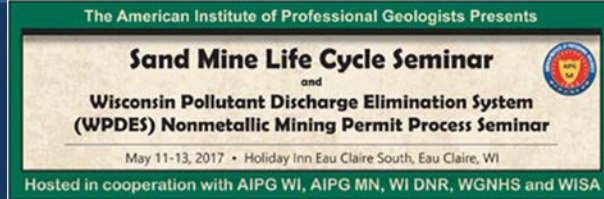


“Only required when instream waste concentration (IWC) is greater than 1%”



Effluent Monitoring

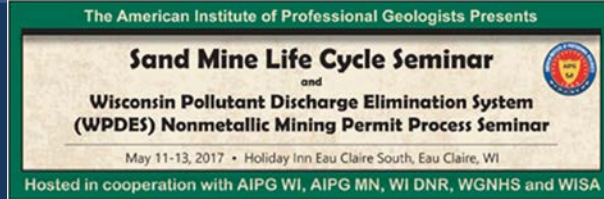
- **Nonrecurring Discharge of Wastewater**
 - Discharge to a surface water may occur occasionally or irregularly
 - *Option B only*
 - Whole Effluent Toxicity (WET) testing
 - Acute
 - Chronic
 - Prior to Each Discharge



OVERVIEW - GENERAL PERMITS

- Section 6 – General Conditions
 - Previously Named - Standard Requirements
 - Same for Both
 - Essentially Unchanged From Previous

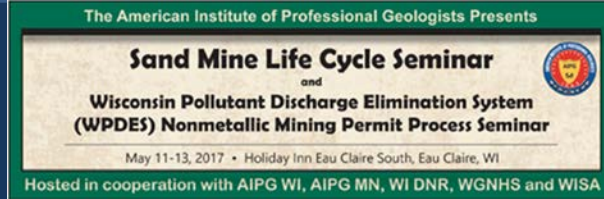




OVERVIEW - GENERAL PERMITS

- Section 7 – Compliance Schedule
 - New for Both
 - Helpful for Establishing a Compliance Plan





OVERVIEW - GENERAL PERMITS

- Section 8 – Definitions
 - New for Both
 - Same for Both – Except Industrial Sand GP Includes
 - Recurring Discharge of Wastewater
 - Nonrecurring Discharge of Wastewater



Stage Gate WPDES Process (A)

Is Storm Water Internally or Externally Drained

Internally

Externally

Is SW or CSW mixed with wastewater

Is SW or CSW mixed with wastewater

No (CSW only)

Yes

No

Yes

- 1) Source Control
- 2) BMP's
- 3) Annual Inspection

- 1) Source Control
- 2) BMP's
- 3) Limited Sampling
- 4) Annual tasks
- 5) Monitoring

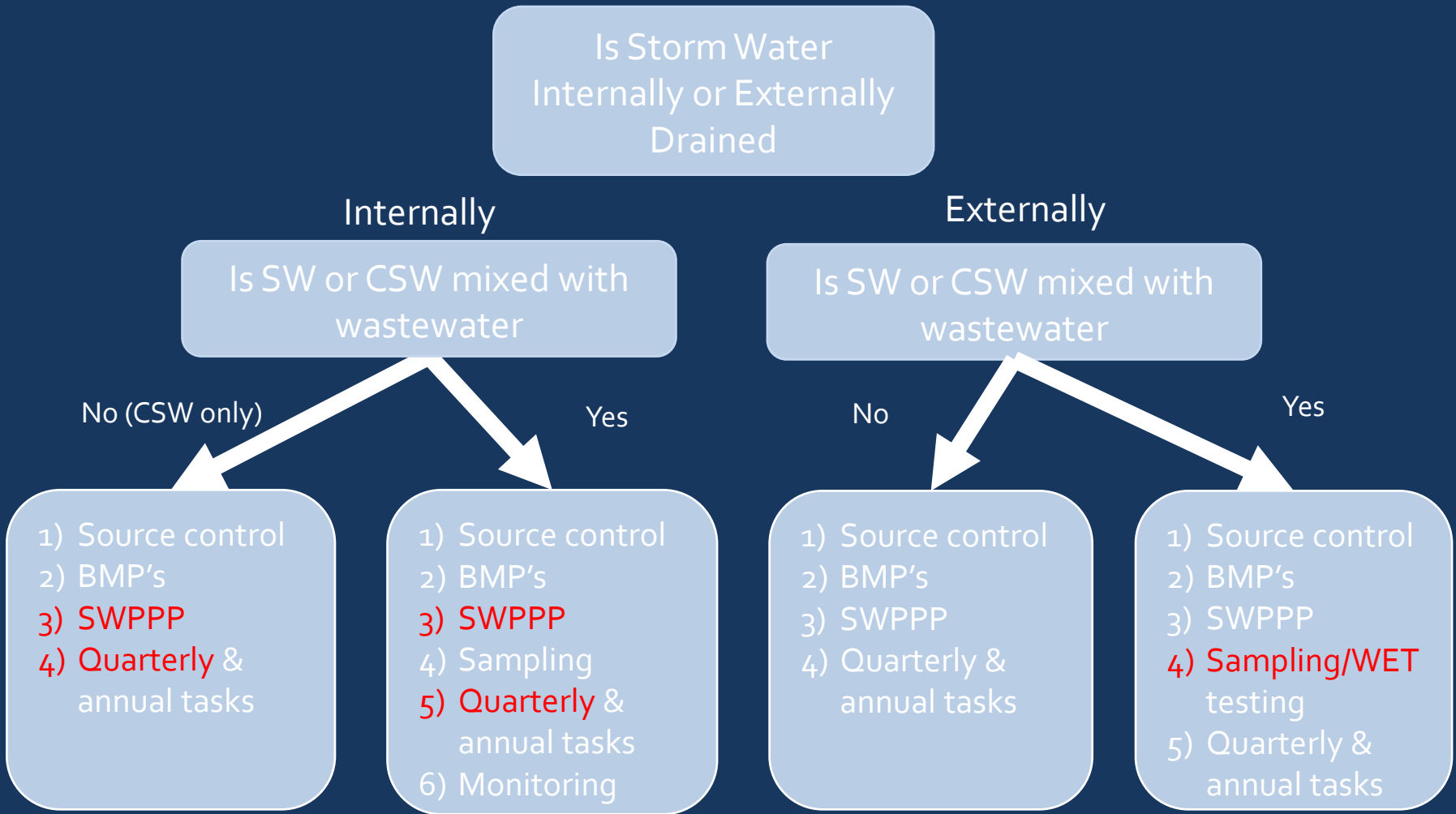
- 1) Source control
- 2) BMP's
- 3) SWPPP
- 4) Quarterly & annual tasks

- 1) Source control
- 2) BMP's
- 3) SWPPP
- 4) Sampling
- 5) Quarterly & annual tasks

SW – Storm Water
CSW – Contaminated Storm Water

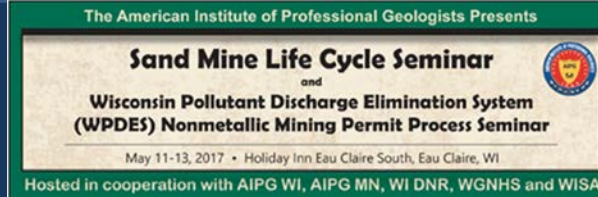


Stage Gate WPDES Process (B)



SW – Storm Water
CSW – Contaminated Storm Water





Mark J. Krumenacher, PG, CPG
Senior Principal/Senior Vice President
GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, WI 53186
262-754-2565 (O)
262-424-2046 (M)
mark.krumenacher@gza.com

Matt Schowengerdt, PE
Project Manager
Foth Infrastructure & Environment, LLC
2514 South 102nd Street
West Allis, WI
414-336-7932 (O)
208-699-5572 (M)
Matt.Schowengerdt@Foth.com

