MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Stormwater Operations Resource Manual (StORM)

A Focus on Compliance and Understanding

Cody Kimbell

Environmental Program Specialist

Water Protection Program

A Focus on Improved Compliance Through Understanding

- **Key Goal** - To help the permitted community and promote conscientious development of their Stormwater Pollution Prevention Plan (SWPPP)

The StORM is for industrial stormwater only and does not cover land
disturbance/construction stormwater or domestic stormwater.

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

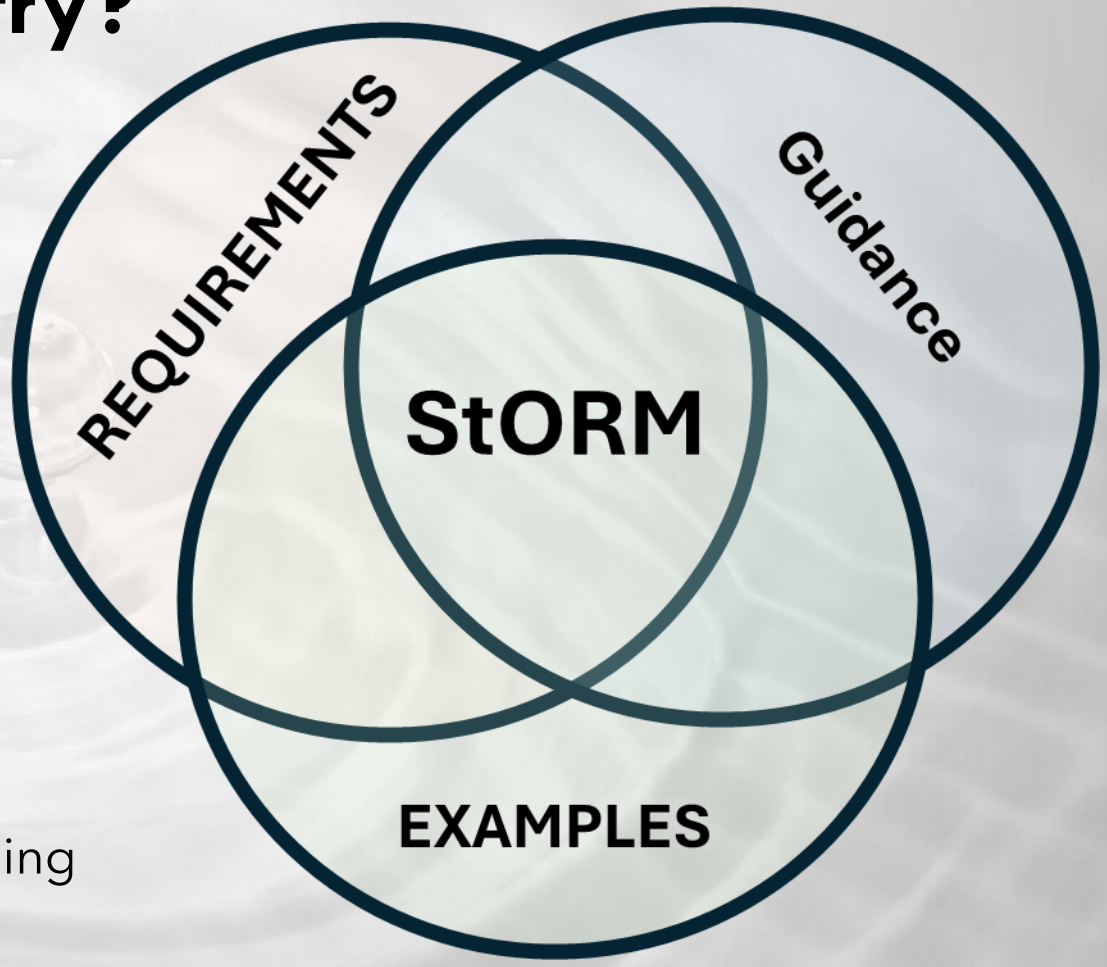
How Will This Benefit Industry?

- Reduction of permit length
  - Makes the permit more “user friendly”
  - Ease navigation of technically complex documents
  - Real world and friendly language (not legalese)
- In depth guidance for SWPPP development
  - Provides the most help to smaller facilities who don’t have consultants
  - Improves consistency across permitting and the state as a whole

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

How Will This Benefit Industry?

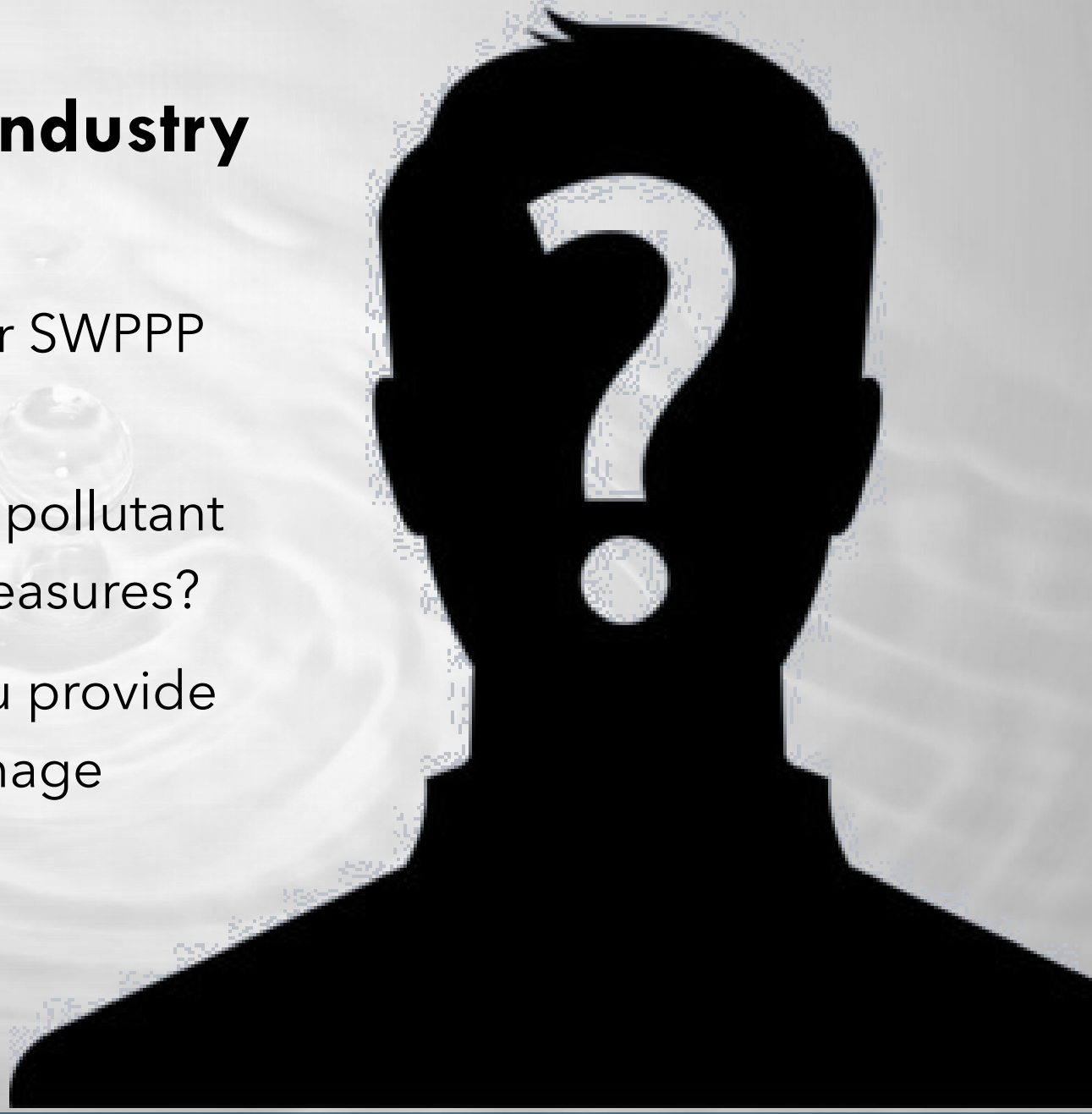
- One-Stop-Shop
  - Requirements and guidance together
  - Reduce burden for permittee in finding information
- Improving compliance
  - Clarifies directions and expectations
  - Improve understanding on how they can meet requirements
  - Increase compliance through understanding
- 60/40 (guidance/requirements)



MISSOURI DEPARTMENT OF NATURAL RESOURCES

Common Questions From Industry

- Does Missouri provide guidance for SWPPP development?
- Do you have examples of common pollutant sources and appropriate control measures?
- I run a mom-and-pop shop, can you provide examples of how other people manage stormwater?



Separating Guidance From Requirements

- Outlines requirements for all permittees along with guidance that may help in SWPPP development
- Guidance is separated by indicator boxes
  - Pollution Solution
  - Picture Perfect
- Guidance and examples are non-enforceable and for industry use only

POLLUTION SOLUTION

Examples of BMPs & SCMs

Best Management Practices:

- Good housekeeping
- Staff training
- Site inspections
- Schedules for maintenance
- Emptying collection areas
- Stormwater sampling
- Basin cleaning
- Sweeping
- Spill prevention
- Retaining vegetation
- Storing items inside
- Controlling runoff rate

Stormwater Control Measures:

- Berms or perimeter barriers
- Settling basins
- Filtration systems
- Permeable pavement
- Detention basins
- Vegetated swales
- Vegetated buffers
- Check dams
- Inlet filters

Requirements

- Topics Covered (not all inclusive)
  - Basic site information
  - BMP implementation
  - Assessing activities
  - Spill prevention and response
  - Inspections and monitoring
  - Record keeping
- This manual does not supersede permit requirements
- Permits may have industry/site specific requirements

Getting started on your SWPPP

All SWPPPs must have a site description and contact information. Include the following (at minimum) in your SWPPP;

- Facility name, address, phone number (s), and email address (es).
- The Missouri State Operating Permit number.
- The facility's industrial activity or primary industrial activity Standard Industrial Classification (SIC) code.
- A general description of the industrial activities that occur on site.

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Requirements – Benefit

- Standard requirements for all facilities removed from permits
  - De-clutters the permit
  - Allows the permittee to focus on SWPPP requirements separately
- Consistency across industries and permit cycles
  - Less confusion/variation between permit cycles
  - Consistent framework for expectations across the state
- Simplified language where possible
- Optional SWPPP Template will be provided that reflects the manual

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Pollution Solution

- Additional guidance outside of permit requirements
- Provides further explanations to help with SWPPP development and explain requirements
  - Definitions
  - BMPs/SCMs examples
  - Considerations for common concerns

POLLUTION SOLUTION

Best Management Practices and Stormwater Control Measures

Best Management Practices (BMPs):

Actions, practices, the sequence of events, methods and structures that are used to manage stormwater runoff.

Record the date, and describe the actions, that take place at your facility.

Stormwater Control Measures (SCMs):

Physical structures or devices designed to remove pollutants from stormwater runoff before it leaves the permitted site. These can be permanent or temporary.

These will require regular maintenance, such as inspections, repairs, replacement, reinstallation, vegetation. management, and trash removal. Record the date and describe the maintenance that take place at your facility. Keep these records in your SWPPP.

BMPs and SCMs reduce the amount of pollutants reaching waters of the state.

MISSOURI DEPARTMENT OF NATURAL RESOURCES

POLLUTION SOLUTION

Assessment of your pollution sources.

Below is a table showing examples of different industries, activities preformed, potential pollutants, and examples of BMPs and SCMs that may be effective for stormwater pollution control for these facilities. Each facility is different and this is not a complete list.

Industry	Activity	Pollutant(s)	BMPs and SCMs Examples
Lumber Production	Sawing and treating lumber	Sawdust, wood treating chemicals, and leachate	Settling basins, berms, sweeping and product control
Mineral Producers: non-metallic minerals: limestone, clay, sand	Mining, quarries, concrete, glass and asphalt production	Fines, material loss, pH	Track-out control, berms, settling basins sweeping, vehicle washdown, dust suppression
Chemical Manufacture	Chemical manufacture, loading, and unloading	Surfactants, nutrients, paints, oil and grease	Impact prevention for chemical storage structures, spill kits, loading/unloading under roofed structures
Transportation	Vehicles; fueling, leaking vehicles, wearing of parts	Petroleum, metal, rubbers, vehicle fluids, chloride	Oil Water Separators, secondary containment, berms, swales, covering salt piles and materials
Salvage Yards and Scrap Metal Recycling	Motor vehicle and metal recycling	Oil, grease, petroleum, vehicles fluids metal fines, rust, debris and trash	Collecting fluids, coverings, settling basins, oil water separators, removing trash or scrap, quarterly visual assessments
Metal Fabrication	Metal fabrication, cutting, and galvanizing	Metal fines and scraps, rust, cutting fluids, oil and grease	Cut and store metal under roof, maintain equipment in good repair, vegetated filter strips, sediment basins
Plastic Product Manufacture	Plastic and rubber producers, molders, and recyclers	Plastic particles, chemicals, metals, ammonia	Sweeping loading/ unloading areas, and waste collection areas, inlet filters, settling basins, vegetated buffers
Biodiesel Manufacture	Biodiesel production and transfer for transport	Production process chemicals, feedstock, petroleum, cleaning residuals	Secondary containment, spill kits, inlet protection, Spill Control and Countermeasure Plans
Solid Waste Transfer	Waste transfer, vehicles	Blown garbage, leachate, leaked oil	Cover transfer areas or facility when possible, sweep and pick-up debris regularly, perimeter control

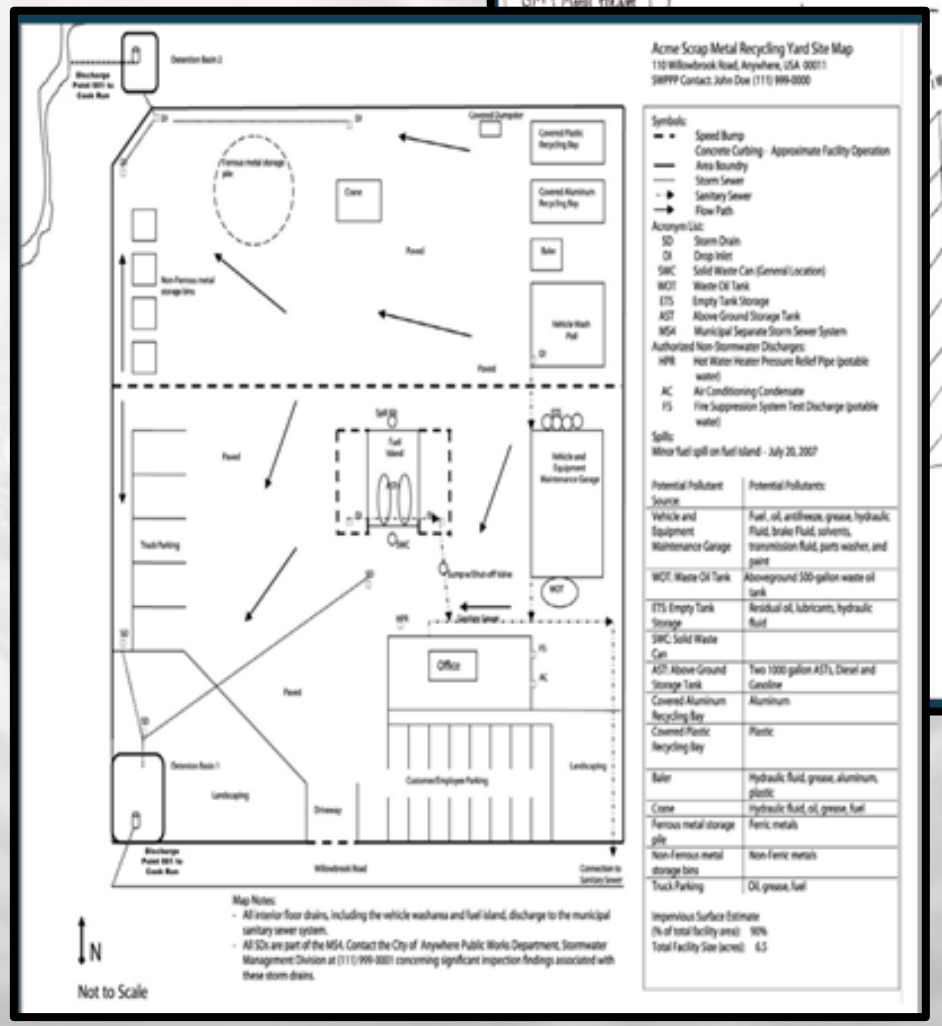
Guidance provided for addressing activities, pollution sources, and control measures by industry.

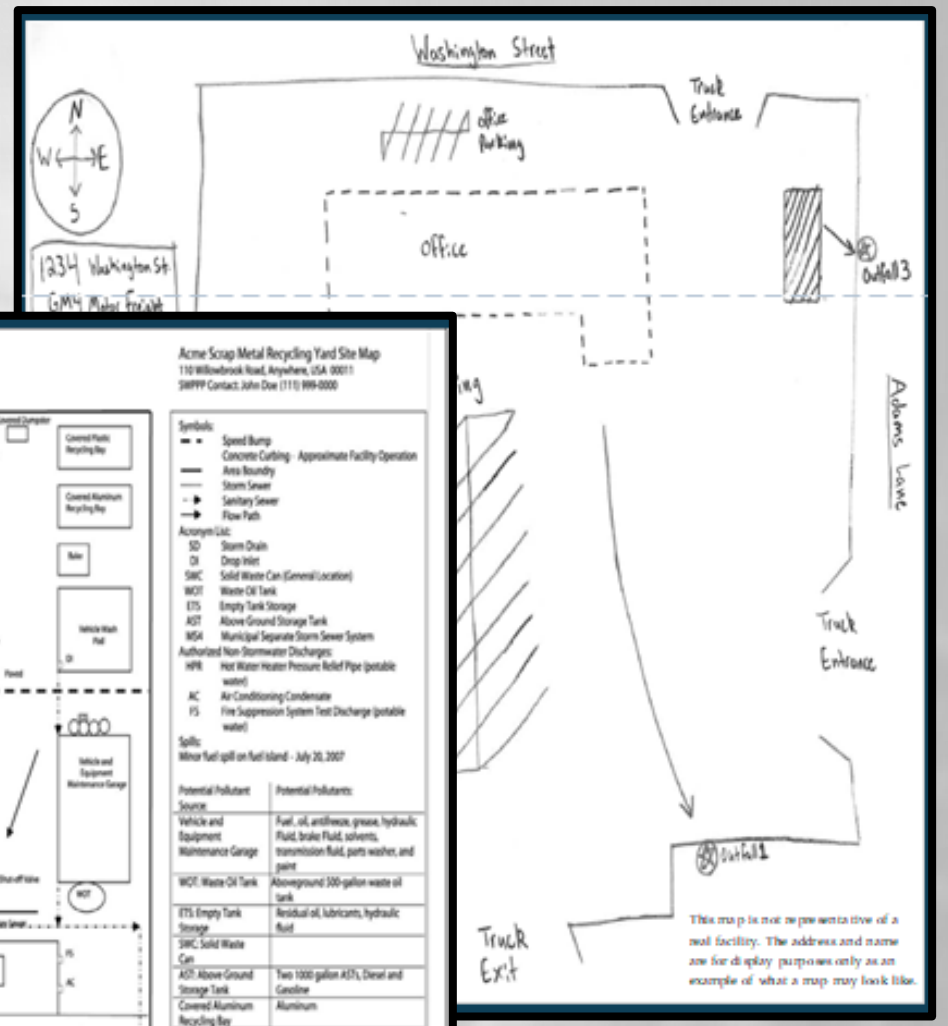
While not all inclusive it provides guidance for people starting in some of our most common industries.

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Mapping

- Maps are a common point of confusion
- Three pages dedicated to mapping
- Better explain requirements
- Two map examples





MISSOURI DEPARTMENT OF NATURAL RESOURCES

Other Guidance

- Other guidance provided throughout the manual
- Address common questions or concerns
- Key examples
  - BMPs/SCMs
  - Different activities that can impact stormwater
  - Managing dumpsters and trash holding/collection areas

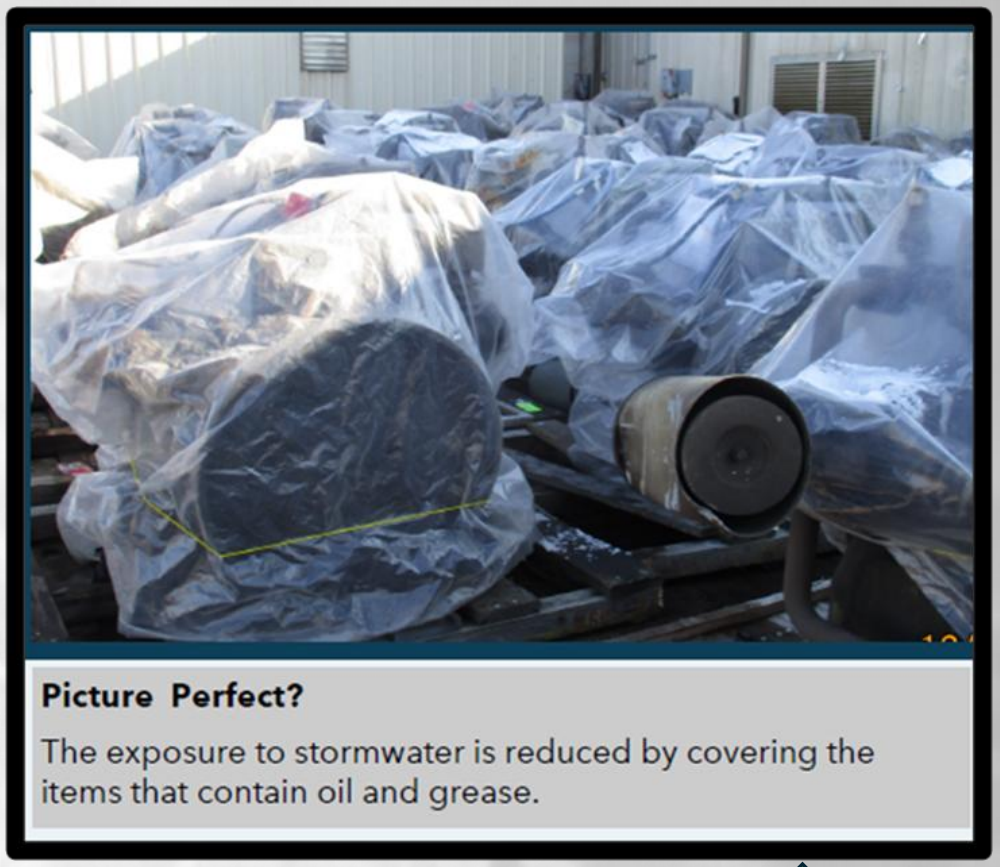
POLLUTION SOLUTION

Industrial activities that impact stormwater

- **Loading and unloading operations**
  Includes pumping from tankers, pneumatic transfer, transfer by conveyor, forklift or other equipment, transfer of bags, boxes, drums or other containers. Spills or losses can accumulate and be washed away during a rain event.
- **Outdoor storage**
  Includes fuels, raw materials, products, or process residuals. Materials may be stored in containers, bins, boxes, silos, or on platforms or pads, or as piles. Storage areas that are exposed to rainfall can add pollutants to stormwater.
- **Outdoor processing activities**
  Outdoor processing activities can result in liquid spills and loss of materials of any size, which makes pollutants available for discharge in runoff.
- **Dust or particulate generating processes**
  Some industries generate significant levels of dust that can mix with stormwater.
- **Non-stormwater discharges**
  These are discharges that do not originate from storm events. Most of these discharges are prohibited. This includes connections of process wastes or other pollutants to the stormwater collection systems, instead of to sanitary sewer.
- **Waste management**
  Most waste management is outdoors as waste piles or trash containment such as dumpsters. It must be controlled to prevent debris in the stormwater.

Picture Perfect

- Real world examples of Missouri facilities highlighting different levels of compliance



Picture Perfect?

The exposure to stormwater is reduced by covering the items that contain oil and grease.

SOME GOOD

Picture Perfect?

Appropriate use of secondary containment may have prevented the spill pictured to the right.

Secondary containment should be used for more than just petroleum and oil based products. Other common products where secondary containment is beneficial includes but is not limited to; paints, brine, chlorinated water, and bulk chemical storage structures.

SOME NOT SO GOOD

BUT WITH SUGGESTIONS

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Picture Perfect?

Materials such as asphalt are often stored under cover in the picture on the left.

The by-product of sawdust is exposed to stormwater in the picture on the right.

- Showcase different control measures and best management practices
- Offer facility operators a chance to see how other facilities manage stormwater

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Aiding in Inspections

- Not only lays out standard inspection requirements
- Also helps guide permit holders in identifying areas of potential concern for inspection

OUTFALLS

SECONDARY CONTAINMENT

COLLECTION AREAS

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Common SWPPP Violations How the StORM Can Help

- No SWPPP developed or maintained
  - SWPPS can be confusing
  - Historical lack of statewide guidance
  - Lack of understanding = Reduced compliance
- Failure to provide a detailed map
  - Better explanation of mapping and examples now provided
- Not documenting inspections
  - Inspection and reporting requirements were easily glanced over in permits
  - The StORM brings these to the forefront and provides extra tips for review

POLLUTION SOLUTION

As you conduct your routine facility inspections, look for visual indicators of poor or missing control measures:

- Rainbow colored sheen on the water may indicate the presence of oil or other hydrocarbons;
- Brown or other dark colored streaks in flowing stormwater could mean a leak or loss of material.
- Trash and other debris being carried off-site by stormwater.
- Overflowing storm drains could be caused by a clog or poor inlet design.
- Stains from leaks or spills.
- Dead or distressed vegetation can be from a leak or spill.

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Common SWPPP Violations
How the StORM Can Help

- Failure to select, implement, maintain, or install BMP's and SCM's
  - Tips provided for selecting BMPs/SCMs
  - Information provided for BMP design standards
  - Examples of good/bad provided
  - Guidance throughout for BMPs/SCMs and good house keeping
- Leaky fuel tanks
  - Secondary containment requirements detailed
  - Examples of good and bad secondary containment provided

Picture Perfect?

Appropriately sized and maintained secondary-containment structures can help prevent non-stormwater discharges.

Pictured above is a secondary containment structure sized appropriately to prevent discharge and contain incidental or emergency spills.

Development process & engagement

- Why, what is the need?
  - Developed at the request of industry, for industry
  - Provide the “one-stop-shop” for guidance and requirements
  - Improve permit legibility
- Informal stakeholder engagement
  - Discussion at multiple WPP forums
- Formal stakeholder engagement
  - Public preview for comment

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Resolution of Common Questions

- Does Missouri provide guidance for SWPPP development?
- Do you have examples of common pollutant sources and appropriate control measures?
- I run a mom-and-pop shop, can you provide examples of how other people manage stormwater?

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Compliance can be seen as a consequence of genuine understanding.

Individuals who comprehend the reasons behind rules or regulations are more likely to adhere to them.

Questions?

Cody Kimbell

cody.kimbell@dnr.mo.gov

573-526-3337

MISSOURI DEPARTMENT OF NATURAL RESOURCES