

# Stormwater Management Training for **ILLICIT DISCHARGE DETECTION AND ELIMINATION**



City of **Cottonwood**

**2024**

# Agenda

## PART 1

### Stormwater Overview

- What is stormwater?
- What is an illicit discharge?
- Permit compliance
- Identifying and reporting illicit discharges
- How you can help

## PART 2

### IDDE PROGRAM

- IDDE Program elements
- IDDE investigation
- Dry weather screening
- Wet weather monitoring
- General information

# What is Stormwater?



- Runoff due to rain or snow melt
- Stormwater is collected by natural channels, storm drains, ditches, and gutters
- Along the way, stormwater picks up sediment, pathogens, oil, fertilizer, pesticides, and other **pollutants**
- Stormwater enters streams and rivers **without treatment**

# Where does stormwater go?

Retention basins, washes, rivers, lakes...





# Where does YOUR stormwater go?

Ultimately, to the Verde River



# How does stormwater get there?

Through the Municipal Separate  
Storm Sewer System (**MS<sub>4</sub>**)



And exits through outfalls.

The MS<sub>4</sub> consists of:

- Curbs and gutters
- Storm drains
- Catch basins
- Ditches
- Pipes





# Why is stormwater quality important?

## Polluted stormwater harms:

- Human health and safety
- Wildlife and habitat
- Recreation and tourism
- Land preservation



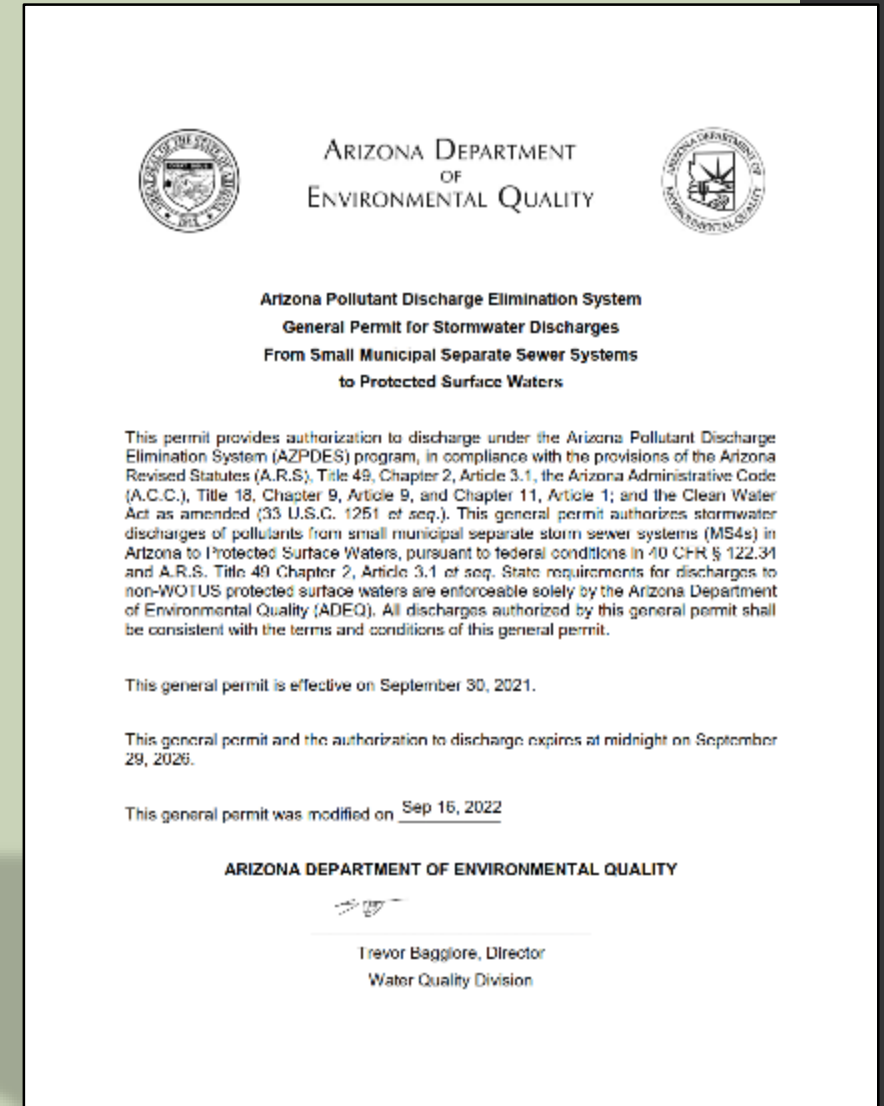
# Stormwater Regulations

- Clean Water Act, Section 402
  - EPA delegated authority to ADEQ in 2002
  - Arizona Pollutant Discharge Elimination System (AZPDES)
    - AZPDES permits allow the discharge of stormwater to Protected Surface Waters
    - MS<sub>4</sub> Permit, Construction General Permit (CGP), Industrial Permit (MSGP)
- Cottonwood City Code chapters 13.24 & 15.40
  - Regulates discharge of stormwater pollutants
  - Authorizes Cottonwood to take enforcement actions
- Cottonwood Engineering Design Standards Manual
  - Sets City requirements for stormwater management in construction and post-construction



# MS4 Permit Requirements

- Develop and implement a Stormwater Management Plan (SWMP)
- Minimize discharge of pollutants “to the maximum extent practicable”
- Education & Outreach
- Visual and analytical monitoring of stormwater
- Inspect construction sites
- Submit annual reports
- **Illicit Discharge Detection and Elimination (IDDE)**
- **Provide employee training**



# What is an Illicit Discharge?

Any discharge to the MS<sub>4</sub> not composed entirely of stormwater, except:

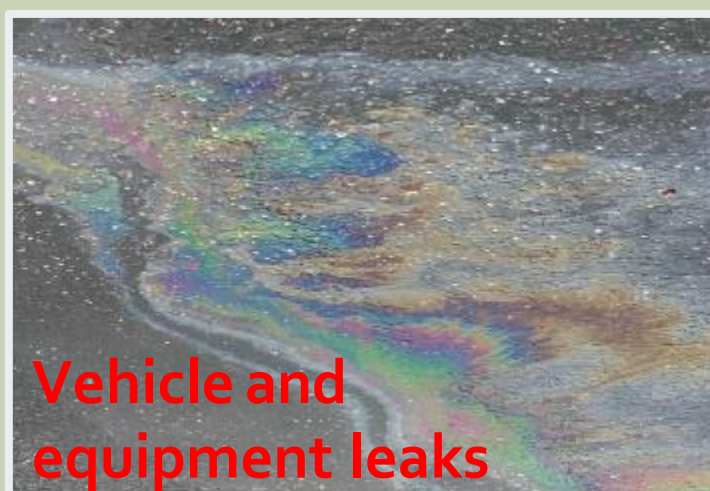
- Certain allowable non-stormwater (*we'll get to this*)
- Discharges covered under their own AZPDES permit

Illicit Discharges may be intentional or accidental





# Common Examples of Illicit Discharges



# Other Types of Illicit Discharges

## Littering and illegal dumping



## Illicit Connections

A physical connection of a non-stormwater source to the storm drain system.





# Some non-stormwater discharges are “allowable”

*... BUT they **must** be pollutant free!*

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Discharge from potable sources
- Fountain drains
- Air conditioning condensate
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Non-commercial, charity car washes
- Discharge from riparian habitats and wetlands
- Street wash water
- Discharges of flows from fire-fighting activities
- Building washing without added cleaning products

# Recognizing Potential Illicit Discharges

- Flow in a gutter or outfall without a rain event
- Unusual water characteristics (color, odor, bubbles, solids, etc.)
- Visual observation of discharge/disposal
- Pavement staining



# Illicit Discharges: What to Report?

- Chemical dumping
- Malfunctioning septic systems
- Leaking or blocked stormwater systems
- Dry weather discharges that may contain any pollutant
- Silt and sediment runoff from poorly controlled construction sites



*Anything that doesn't look like  
normal rain runoff!*



# How to report Illicit Discharges

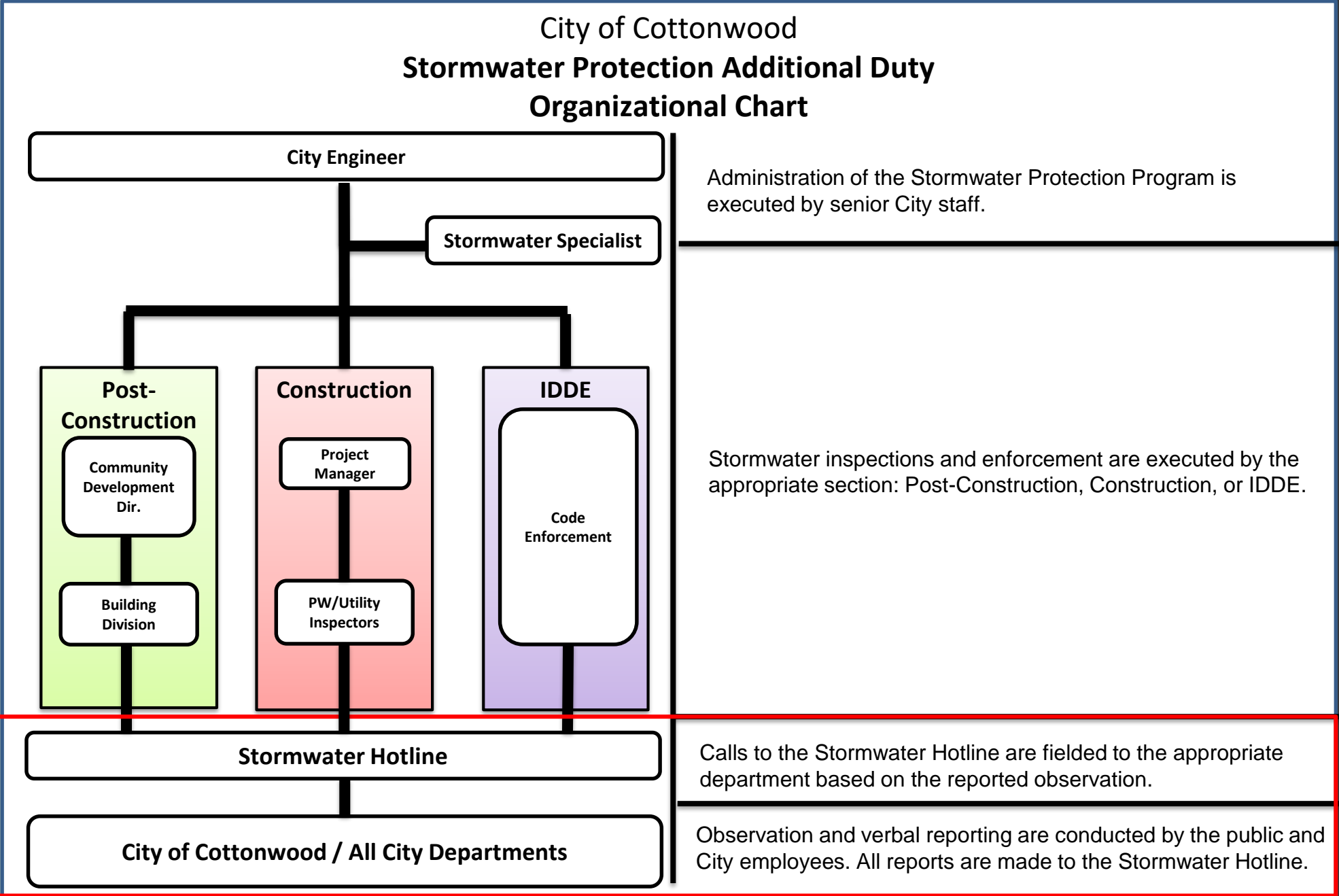
- If you see a potential illicit discharge:
  - Identify location, discharge characteristics, obvious sources
  - Take a picture or video (if it is safe to do so)
  - Notify Stormwater Staff:
    - Email: [stormwater@cottonwoodaz.gov](mailto:stormwater@cottonwoodaz.gov)
    - Call: (928) 340-2772
- If the discharge might be hazardous material/waste:
  - DO NOT touch it!
  - Call the Fire Department at 911
  - Then contact stormwater staff



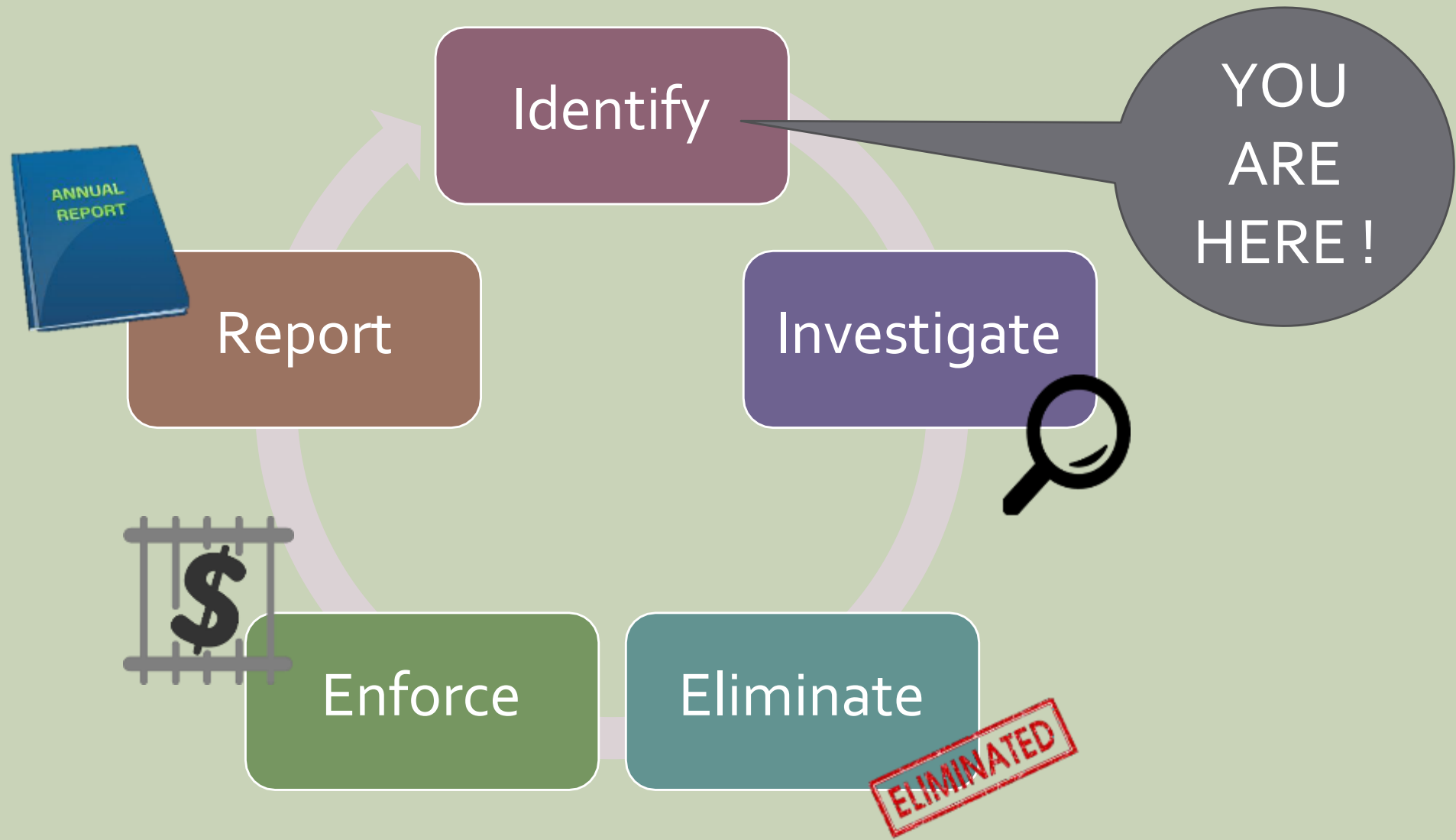


# Organizational Chart for Stormwater Program

Illicit  
Discharge  
Reporting



# City IDDE Program Responsibilities



# How can you help keep our water clean?



## As a Citizen...

- Maintain your vehicles
- Wash your vehicles at car washes
- Don't over-fertilize plants and lawns
- Pick up pet waste
- Maintain septic systems

## As an Employee...

- Put vehicles in for service as needed
- Clean vehicles and equipment in designated areas
- Maintain vehicles and equipment in designated areas
- Report illicit discharges

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## PART 2

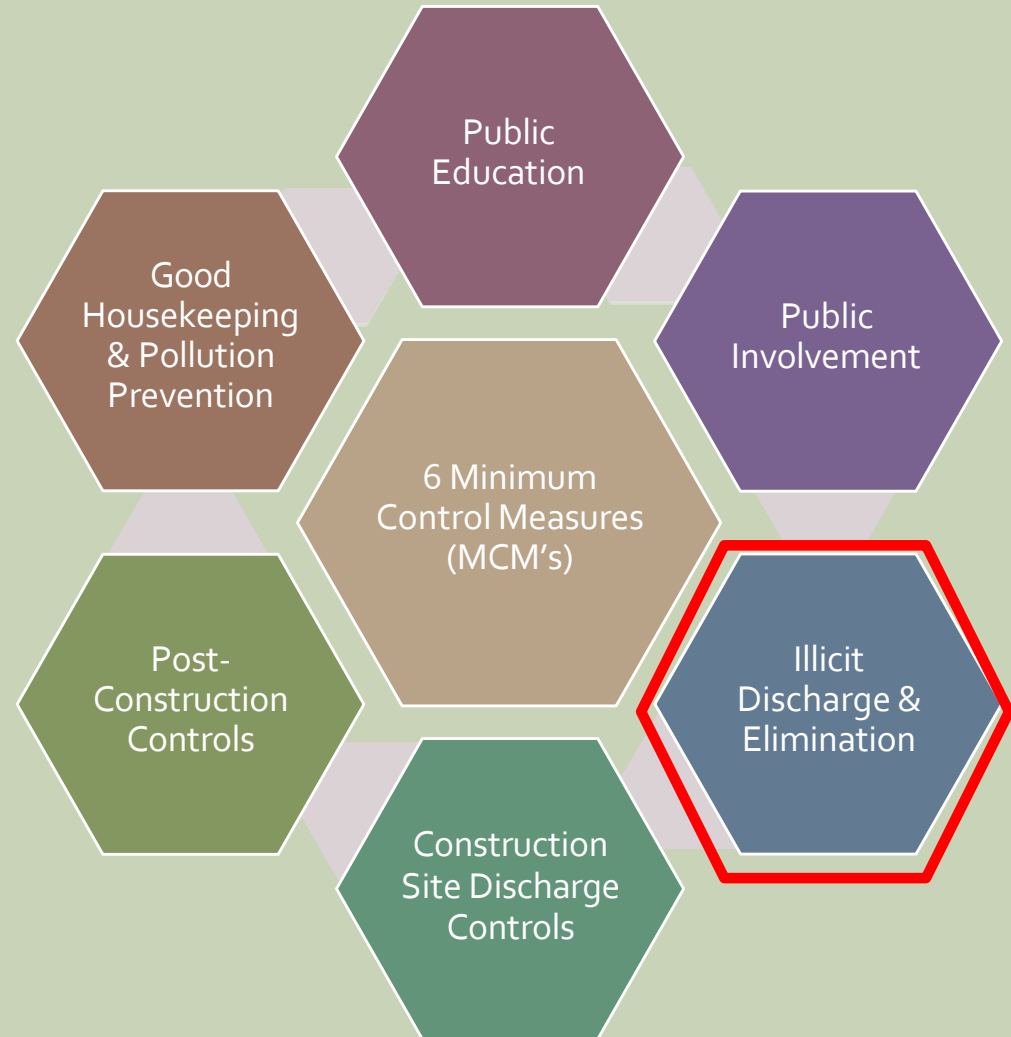
### IDDE PROGRAM

- IDDE Program elements
- IDDE investigation
- Dry weather screening
- Wet weather monitoring
- General information



# What is the IDDE program?

- IDDE is one program element described in the SWMP
- **Illicit Discharge Detection and Elimination** is a comprehensive program of detecting, identifying, isolating, regulating, and eliminating illicit discharges.



# IDDE Program Elements

Eliminating  
Illicit  
Discharges

Report  
Permit  
Non-filers

Analytical  
Monitoring

Visual  
Outfall  
Monitoring

Recordkeeping  
& Reporting

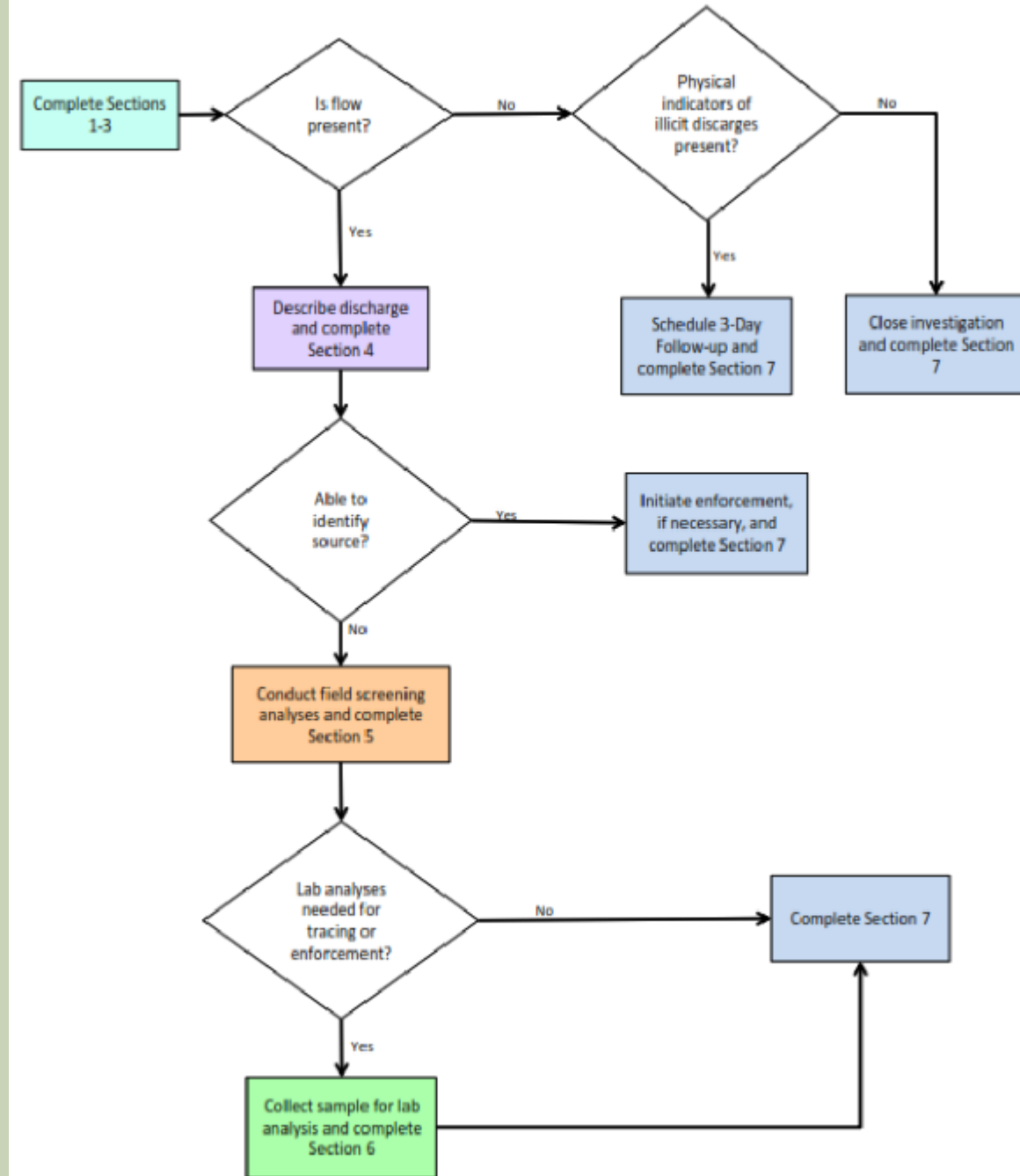
Follow-up  
Screening  
Procedures



# Illicit Discharge Detection

- Dry and wet weather outfall screenings
- Analytical monitoring (stormwater discharge sampling)
- Construction and post-construction inspections
- Community & staff reporting

FLOW CHART FOR DRY WEATHER INSPECTION/ IDDE INVESTIGATION FORM  
CITY OF COTTONWOOD



# Illicit Discharge Investigation Methods

- Above-ground tracking – track discharge upstream until you locate the source
- Below-ground tracking – review maps, gis, as-builts, etc.
  - Manhole inspection
  - Dye testing
  - Smoke testing
  - CCTV





# Illicit Discharge Investigation



- Initiate source tracking
- Indicate the potential source
- Use information from field analysis to help identify the suspected source

## WHO DONE IT?

# IDDE Investigation Form

- Thorough investigation information helps determine the source
- ADEQ requires documentation of all illicit discharges

## DRY WEATHER INSPECTION/ IDDE INVESTIGATION FORM CITY OF COTTONWOOD

### Section 1: Background Data

Outfall ID:	Date:	Time:
Inspector/Investigator:		
<input type="checkbox"/> Dry Weather Inspection <input type="checkbox"/> IDDE Investigation <input type="checkbox"/> 3-Day Follow-up Inspection		
Photos? <input type="checkbox"/> Yes <input type="checkbox"/> No    If yes, append photos to this report.		
Precipitation w/in last 48 hours? <input type="checkbox"/> Yes <input type="checkbox"/> No		Weather (approx. temp, etc.):
Land Use in Drainage Area (check all that apply): <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> Commercial		<input type="checkbox"/> Open Space Other: _____ Known Industries: _____

### Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
Storm Sewer (Closed Pipe)	<input type="checkbox"/> RCP <input type="checkbox"/> PVC <input type="checkbox"/> Steel <input type="checkbox"/> CMP <input type="checkbox"/> HDPE <input type="checkbox"/> Clay/drain tile <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Elliptical <input type="checkbox"/> Box <input type="checkbox"/> Other: _____	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter / Dimensions: _____ X _____	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully In Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully
	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth: _____ Top Width: _____ Bottom Width: _____		

### Section 3: Physical Indicators

INDICATOR	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/> None <input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion <input type="checkbox"/> Other: _____	
Deposits / Stains	<input type="checkbox"/> None <input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other: _____	
Abnormal Vegetation	<input type="checkbox"/> None <input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor Water Quality	<input type="checkbox"/> None <input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds <input type="checkbox"/> Excessive: Algae <input type="checkbox"/> Other: _____	
Pipe Algae Growth	<input type="checkbox"/> None <input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other: _____	
Do physical Indicators suggest an illicit discharge has occurred? <input type="checkbox"/> No <input type="checkbox"/> Yes		
Flow Present?	<input type="checkbox"/> Yes    If yes, describe: <input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial    And go to Section 4. <input type="checkbox"/> No    If no flow and no physical Indicators, skip to Section 7 and close investigation. If no flow but physical Indicators are present, skip to Section 7 and schedule 3-Day Follow-Up.	

# Visual Monitoring – Dry Weather

- Look for signs of illicit discharges:
  - Dry weather flows
  - Stains in gutter, storm drain
  - Sediment deposition
- Follow IDDE Investigation SOP
- Trace any illicit discharges identified upstream ASAP
- Investigate potential facility discharge
- Re-inspect to ensure no additional discharge is present





# Visual Monitoring – Wet Weather



- Look for signs of illicit discharges:
  - Unusual color or odor in water
  - Oily sheen or murky runoff
- Follow IDDE Investigation SOP
- Trace any illicit discharges identified upstream ASAP
- Investigate potential facility discharge
- Re-inspect to ensure no additional discharge is present



DRY WEATHER INSPECTION/ IDDE INVESTIGATION FORM  
CITY OF COTTONWOOD

Section 4: Discharge Description (flowing outfalls only)

INDICATOR	CHECK if Absent	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/> (No odor)	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/Sour <input type="checkbox"/> Sulfide <input type="checkbox"/> Laundry <input type="checkbox"/> Petro/gas <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1-Faint	<input type="checkbox"/> 2-Easily detected	<input type="checkbox"/> 3-noticeable from a distance
Color	<input type="checkbox"/> (Colorless)	<input type="checkbox"/> Gray <input type="checkbox"/> Brown <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Red/Orange <input type="checkbox"/> Multicolor <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1-Faint color visible in sample bottle	<input type="checkbox"/> 2-Color clearly visible in sample bottle	<input type="checkbox"/> 3-Clearly visible in outfall flow
Turbidity	<input type="checkbox"/> (Clear)	See severity	<input type="checkbox"/> 1-Slightly cloudy	<input type="checkbox"/> 2-Cloudy	<input type="checkbox"/> 3-Opaque
Floatables – does not include trash!	<input type="checkbox"/> (Clean)	<input type="checkbox"/> Sewage <input type="checkbox"/> Suds/Foam <input type="checkbox"/> Oil sheen <input type="checkbox"/> Plant Debris <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1-Few/slight; origin not obvious	<input type="checkbox"/> 2-Some indications of origin	<input type="checkbox"/> 3-Some; origin obvious
Do physical indicators suggest an illicit discharge is present? (Y/N)					
Able to trace flow to source? <input type="checkbox"/> Yes If yes, proceed to Section 7. <input type="checkbox"/> No If no, proceed to Section 5.					

Record all background data associated with the sampling event

Section 5: Field Screening Analyses (flowing outfalls only)

Parameter	Results	Comments	Equipment
Temperature			
pH			
Total Residual Chlorine			
Phenols			
Detergents			
Total Copper			

Document known details

Section 6: Sample Collected for Lab Testing (see flow chart) (flowing outfalls only)

1. Sample for the lab?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, explain (source identified, or other): _____
2. Chain of Custody (COC) completed:	<input type="checkbox"/> Yes <input type="checkbox"/> No	COC Information (Date, Time, Lab Name): _____
3. Analyses requested:	<input type="checkbox"/> E. coli <input type="checkbox"/> Metals <input type="checkbox"/> Oil & Grease <input type="checkbox"/> Total Petroleum Hydrocarbons <input type="checkbox"/> VOCs <input type="checkbox"/> SVOCs <input type="checkbox"/> Pesticides <input type="checkbox"/> PCBs <input type="checkbox"/> Other _____	

Document samples collected

Section 7: Enforcement and Resolution

<input type="checkbox"/> Source Identified (describe below) <input type="checkbox"/> 3-Day Follow-up Inspection required (describe reason why below)
<input type="checkbox"/> No flow and no sign of illicit discharge, investigation closed.
Enforcement action taken? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:
Source/Resolution:

Describe any actions taken to enforce ID

# Qualitative Screening

Qualitative data - *non-numerical*; describes qualities or characteristics.

Collect samples in a clear, clean container.

Characteristics to look for in the sample:

- Color
- Odor
- Turbidity (aka Clarity)
- Floatables (i.e. materials floating at or near the top of the sample bottle)
- Sediment
- Oil sheen



# Quantitative Screening

- Quantitative data – *numerical*; can be counted or measured.
- Measure flow rate and conduct field screening analysis (when appropriate)
- Analytes to record:
  - Temperature
  - pH
  - Phenols
  - Copper
  - Chlorine
  - Detergents
  - Organic Compounds (alcohols, benzene, methane, petroleum products, etc.)





# Permit Non-Fileers

- Identify:
  - Construction sites without CGP coverage
  - Industrial sites without MSGP coverage
  - Other discharges without AZPDES Permits



# Recordkeeping

Keep any records pertaining to the MS4 Permit for a minimum of 3 years

- This includes:
  - Reports
  - Inspection Records
  - Enforcement Actions
  - Follow-up Documentation



# Why Document?

Each year, an Annual Report must be prepared.

The Annual Report contains a summary of IDDE program activities:

- Number of dry/wet weather inspections
- Details on each incident:
  - Date incident discovered
  - Date City response began
  - Date City response ended
  - Did discharge reach a protected surface water?
  - Incident location
  - Pollutants involved
  - Source
  - Correction methods





# Illicit Discharge Enforcement

- The City has legal authority to prohibit illicit discharges to the MS<sub>4</sub>, conduct inspections, and carry out enforcement procedures
- The City applies the following enforcement measures:
  1. A verbal warning
  2. Written warning
  3. Notice of Violation (NOV)
  4. Civil or criminal penalties (if compliance is not met)



# SAMPLE FIELD EQUIPMENT AND PPE LIST

- Camera
- Clipboards
- Field Sheets
- First Aid Kit
- Flashlight or spotlight
- Gas monitor or probe
- Two-way radios
- Storm drain and street maps
- Waterproof marker/pen
- Sledgehammer
- Spray paint
- Rubber/latex gloves
- Manhole
- Handheld GPS
- Measuring Tape
- Hook/Crowbar
- Mirror
- Reflective safety vests



# HEALTH AND SAFETY CONCERNS

- If evidence of a health or safety issue exists....STOP the inspection.
- Notify the fire department, hazmat team, and then your supervisor.



# Questions / Comments?

For any questions or concerns, contact:

## Stormwater Hotline

[stormwater@cottonwoodaz.gov](mailto:stormwater@cottonwoodaz.gov)

(928) 340-2772

## City Engineer

(928) 340-2770



City of Cottonwood