TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

TCEQ Fish Kill Investigations

- Deann Cline,
  Environmental Investigator
- Robin Pugh,
  Aquatic Scientist

TCEQ Regulatory Authority

- Reporting agency - by citizens or regulated entities
  - DFW Region Office – 817-588-5800
  - Water Quality Team – Fish Kill Duty
- Investigation Authority – onsite or in-house
  - Texas Water Code 26.014 – Property access
  - Texas Water Code 26.015 – Records access
- Enforcement Authority –
  - Texas Water Code 26.121 (spills/discharges)
  - 30 Texas Administrative Code – Chapter 305 (permits)
  - 30 Texas Administrative Code – Chapter 327 (reporting)

Reporting

- DFW Region Office – 817-588-5800
  Team email: WWTeamR4@tceq.texas.gov

- Water Quality Team – Fish Kill Duty
  - Bismark Otorino
  - Robin Pugh
  - Maite Martin
  - Deann Cline
  - Lucas Scroggins
  - Asadullah Shoaib

Investigations - In-house or On-site?

- Is cause known? And then it depends.
  - Potable water releases causing fish kills are *usually* in-house.
  - SSOs and spills will usually involve an on-site investigation.
  - Unknown causes depends on the case
  - Natural causes, if adequate evidence, is done in-house
- How is it being addressed?
  - local government involvement & communication
  - TPWD contact made & communication
- Is the fish kill tied to a citizen complaint?

Enforcement

- Texas Water Code 26.121 (spills/discharges)
- 30 Texas Administrative Code (TAC) – Chapter 305 (permits)
- 30 TAC – Chapter 327 & Texas Water Code (reporting)

Enforcement – Spills/Discharges

- Texas Water Code 26.121

- Alleged Violation:

  Failure to prevent the unauthorized discharge (UD) of a pollutant into or adjacent to the waters of the state. Specifically, the regulated entity experienced an UD of (pollutant) . The discharge entered the (receiving stream) killing a total of (XX) fish.

Enforcement – Permit Related Spills/Discharges

- Citation

- 30 TAC 305.125(4) - The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal or other permit violation which has a reasonable likelihood of adversely affecting human health or the environment.

Enforcement – Reporting

- 30 Texas Administrative Code 305.125(1) & 327.32(b)
- Texas Water Code 26.039(b)
- May include permit monitoring and reporting requirements

- Alleged Violation:

  Failure to provide notification of any noncompliance which may endanger human health or safety, or the environment. Specifically, the regulated entity did not notify the Region within 24 hours of discovery, nor has a 5-day written report been submitted regarding the (specific event).

Investigation

- Start investigation ASAP
  - conditions can change quickly
- No clean-up or removal
  - until an assessment can be conducted (unless instructed otherwise)
- Evidence Collection
- Assess Cause
- Complete Report

Evidence Collection

- Water Samples/ in-situ readings
  - Upstream, discharge/entry point, downstream
- Photos
  - Affected species
  - Size classes
  - Water color/ appearance

Assess Cause

- Potential Sources in Watershed
- Water Chemistry
- Geography
- Affected Species and Size Classes
- Unaffected Species
- Weather or Meteorological Data

Potential Causes

- Low Dissolved Oxygen
  - Number one cause of summertime fish kills
  - May be naturally occurring or due to a contaminant
- pH
  - High or low
  - If deadly usually due to a toxin, but can be affected by algal activity
- Toxin
  - Known or unknown discharge
- Illness

Case Study #1

- Early August fish kill reported in pond in local park
- Kill reported Saturday morning
- Investigated at 3 PM Monday
- No apparent discharges or spills
- Heavy rain previous Monday night, Tuesday morning
- Wed/Thurs clear skies, Friday overcast
- No chlorine residual
- Water appears green

Case Study #1

- Noted dead: sunfish, minnows and Gambusia, bass, a few channel catfish
- Noted alive: Gambusia, frogs, turtles
- No non-fish species noted dead
- pH 8.9, DO 9.4
- Watershed includes city park with grass and forest corridor, golf course, shopping center, metal fabrication facility, and plastic goods manufacturer

Cause?

Naturally Occurring Low DO Event

- Monday rain washed in nutrients
- Nutrient + Sunshine = algae bloom
- Overnight respiration reduces DO
- DO lowest before sunrise
  - Recovers with sunshine
- Sunshine =Photosynthesis=DO recovery

- Usually non-point source, naturally occurring nutrient
- MAY be point-source contaminant

Case Study #2

- Early April fish kill reported in stream on private property
- Kill reported Monday morning
- Over ½ mile of stream affected
- Investigated at 3 PM same day
- Heavy rain previous week
- overcast

Case Study #2

- Killed: fish, frogs, crayfish
  - Crayfish appear orange
- No chlorine residual
- Water appears orange
- pH 13.0, DO 7.4
- Watershed includes farmland, metal manufacturing facilities, plastics manufacturing, and highway construction

Cause?

Contaminant Discharge

- Farmland:
  - no activity past 30 days
- Highway construction:
  - Last limed >2 weeks ago
  - Greater than ¼ mile from stream
- Plastics manufacturing:
  - No reported discharges
  - On-site SW retention pond

Contaminant Discharge

- Metal processing A
  - All activities enclosed in building
  - Some metal product stored outside
  - Well maintained
  - Stormwater monitoring records
- Metal processing B
  - All activities enclosed in building
  - Nothing stored outside
  - Well maintained
  - No direct connection to stream

Contaminant Discharge

- Metal processing C
  - Sodium Hydroxide tanks outside
  - Tanks rusted & leaking
  - Secondary containment crumbling concrete
  - Visible etching and orange flow lines on concrete
  - SW drain outfall to stream
    - at upstream limit and peak pH reading

Contaminant Discharge

- Metal processing C
  - No records of SW monitoring
  - Recent repair to loading ports
  - Denied having spill or release
  - Active leaks and spills across facility at time of investigation
  - Many spills/leaks orange in color

Contaminant Discharge

- Sodium Hydroxide = Lye = drain cleaner= Caustic = high pH
- Fluid spilled from rusted tank and crumbling secondary containment

Case Study #3

- July fish kill in stream impacted by fire fighting runoff
- Early morning fire at swimming pool company
- Fish kill reported and investigated on the same day
- Runoff from firefighting flowed across property and into stream
- Natural dam in stream contained run off to a single pool
- Contaminated water pumped to storage tank for removal

Case Study #3

- Shiners and sunfish noted dead
- No non-fish species noted dead
- Chlorine 1.8 mg/L
- pH 6.3, DO 3.7
- Unimpacted area
- No chlorine
- pH 7.2, DO 15.8

Cause?

Contaminant Discharge

- Firefighting water containing pool chemicals
  - Chlorine and acids
- Killed algae and reduced DO

- Accidental fire
- Stream several hundred yards away from fire site
- Adequate notification, clean up, and response
- Variance on Enforcement

Questions ?

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