Case Studies

Examples from Region 5
Region 5 Case Studies

- There have been an increasing number of incidents in R5
- These case studies highlight issues encountered and lessons learned
- Issues can vary from spill to spill
- Some issues seem consistent regardless of the variables
Region 5 Case Studies

• Basics of biofuels response in R5 and what we have learned
  • The amount of feedstock and product greatly varies
  • The types of material on hand at production varies
  • Location of production facilities can be surprising
  • Generator knowledge is unpredictable
Region 5 Case Studies
Examples from 3 states – Michigan, Ohio and Indiana

Up first, the Buckeyes!

Defiance Biofuel Spill
Initial report called in to state: *COMPANY HAD AN EXPLOSION. THERE ARE 2 LARGE TANKS ON SITE CONTAINING GLYCERIN. SEWER BEING IMPACTED WITH FF WATER.*

- Ohio EPA OSC responded
- 2 tanks were in fire, a 10,000 gallon and 4,000 gallon
  - Only 1650 gallons of glycerin reported on hand
  - Also ~700 gallons of biodiesel
  - “empty” 55-gallon drums
- Release to ground and storm sewer
- Release threatened creek and river via storm sewer
Region 5 Case Studies – Defiance cont.

Fire and release point
Ohio EPA responded and assessed situation
  • called EPA spill phone duty officer
  • duty officer coordinated with OSC
  • both told Ohio EPA to respond as if diesel spill
  • were not sure what regs applied to biodiesel production
  • both continued research that night
  • advised state on limited info obtained
• Ohio determined spill contained, but not cleaned up
• They decided to wait till morning for removal
Region 5 Case Studies – Defiance cont.

Drums consumed in fire

Release came out of structure with FF water
Region 5 Case Studies – Defiance cont.

- “fats” floated
- 3 layers in water observed
- some suspended in water
- “milky” layer observed
• **Response Techniques**
  - Ohio EPA made PRP hire a contractor
  - the on-land spills were excavated
  - the spill to the ditch was collected and put in frac tanks
  - 3 distinct layers were noted in ditch waters
    - analytical of frac tank water revealed styrene and perchloroethylene
    - shows more than “glycerin” spilled
  - Some wastes suspended in the water column were lost
Region 5 Case Studies – Woods Ethanol

- July 7, 2008-Report from Hancock Co. EMA of yellow substance in a roadside ditch
- Owner of adjacent property dumped 5,000 gallons of corn distiller (byproduct of ethanol production) to feed wildlife on his property
- Corn distiller was rejected at disposal facility and sold to local farmer to feed deer
- Ethanol Plant on-site to provide “Technical Assistance”
- ODNR discovers up to 1,000 dead fish downstream of spill site
- PRP hired an environmental contractor:
  - Remove gross contamination from spill site
  - Provide aeration to tributary
  - Remove dead fish from downstream
  - Dispose of contaminated soil
- Direct Reading in tributary
  - DO Levels @ 0 mg/L
  - Ammonia @ 30 mg/L
Incident 0807-32-2899
Woods Corn Syrup Dumping
07/07/2008
OSC Gerber

Eagle Creek

D.O. 6.7 mg/l @ 23.7 C
Live Fish Noted

D.O. 5.4 mg/l @ 23.0 C

D.O. 0.2 mg/l @ 21.7 C

D.O. 2.5 mg/l @ 22.5 C

D.O. 7.0 mg/l @ 26.0 C
Live Fish Noted

Flow

Aeration

D.O. 0.4 mg/l @ 22.0 C
Ammonia 7.0 ppm
farm lane

D.O. 1.0 mg/l @ 25.9 after aeration
Sheep Field

Flow

Aeration

D.O. 0.4 mg/l @ 22.8 C

D.O. 4.5 mg/l @ 24.8 C

Earth dams

D.O. 0.4 mg/l @ 22.0 C

Dump site
Woods Ethanol Spill
Woods Ethanol Spill
Woods Ethanol Spill
Woods Ethanol Spill
Woods Ethanol Spill
Woods Ethanol Spill

Note fish crowding around available O2 at water inlet.
Region 5 Case Studies – Renewable Energy

Hoosier time

Indiana spill at “Renewable” Energy Resources
Region 5 Case Studies – Renewable Energy

- At biofuels production facility
- Spill from 50,000 gallon tank
- Surface soils and ditch water impacted
- Water in ditch a “milky” white (hear that before???)
- Soils excavated
- Tile field drains intercepted and plugged
Region 5 Case Studies

Note “milky” water
Normal fuel spill techniques not effective after initial spill

Ability of surface cleanup not really a viable option
Region 5 Case Studies – Private garage
Indiana cont.

- Small scale production
- used vegetable oil
- No tanks large enough for regulation
- However, 20 gallons spilled, some to the sewer
- IDEM advised resident on contingency plans and contractors
Region 5 Case Studies – Private garage
Region 5 Case Studies – Michigan

Wolverine’s turn

- Paint shop
  - reported as small biodiesel spill
  - was actually a paint shop
  - USCG was in area and offered to check on spill
  - USCG and MDEQ met on site
    - small spill observed
    - didn’t see any coming out of sewer
  - USGC left, conditions changed
  - MDEQ noted emerging issues at shift change
Paint shop cont.

- noted entering waterway, low flow
- “milky” white throughout water column
- MDEQ and EPA discussed options
- capture and removal not possible
  - little impact to fish observed
  - conditions did not change much due to no flow
- Decided to purge ditch and flush
- Flushing somewhat ineffective
- Heavy rains completed the flushing
Region 5 Case Studies
Lessons Learned

• Biofuel production can be anywhere
• “manufacturers” are heavily ignorant of regulations
• In R5, many facilities are being abandoned or going bankrupt due to market fluctuations
• Glycerin spills seem to be prevalent
  • Output from the transesterification
  • Not that much use for it as product
  • People are storing it and not disposing of it
  • Some waiting for “value” to increase
Region 5 Case Studies – Lessons learned
continued

- Biofuels degrade faster
- Causes extreme DO issues in creeks
- Not great for water treatment plants
- Other removal/cleanup techniques
  - Any ideas for treating “in stream” besides aeration?
  - Other sorbant technologies?
- Fast degradation can make cleanups faster
- Biofuel spills are many times not biodiesel or ethanol, but production products and byproducts