Oil and Gas
Floodplain Management

Oklahoma Floodplain Managers Association
We need to regulate Oil and Gas in our Floodplains

• Many Oklahoma communities are not following floodplain regulations for oil and gas development in their floodplains.

• O/G is heavily regulated by the Oklahoma Corporation Commission, but they don’t require any floodplain management practices.
Where We Are Headed

• The Oklahoma Water Resources Board and the Oklahoma Floodplain Managers Association are working toward standardizing oil and gas floodplain permitting across the state.

• We need cooperation from all counties in the NFIP!
Why do we need a statewide consistent effort?

• Some communities are requiring too much regulation of oil and gas in their floodplains.
  – ex: all production sites must be elevated and anchored.

• Some communities are requiring too little.
  – not regulating at all or simply giving a permit with no oversight.

• These widely varying requirements are difficult for the O/G industry and are causing problems for floodplain management.
Due Consideration

• Our efforts at permitting the industry must not place undue hardship on a business that is often required to be in the floodplain.

• This is STATE LAW: OS 82 Section 1614
Process your permits quickly

- The Oil and Gas industry often needs to move quickly once they decide to drill.
- It is in the best interest of our state floodplain management program and the O/G industry to process their permits without delay.
OFMA’s recommendation:
Regulate the industry in an expedient manner, enforcing the minimum NFIP standards.
FEMA Guidance

- *Interim Technical Guidance on Drilling Oil and Gas Wells in Special Flood Hazard Areas*
- Brief, general guidelines which are included in this presentation.
Why is it important to regulate the oil and gas industry in our floodplains?
Yukon, OK, August 22, 2007
Coffeyville, Kansas, July 2, 2007
Identifying O/G Equipment

• It’s hard to permit equipment if you don’t know what it is.

• Different counties and states may have different types of production equipment.
Safety

• Get permission to go onto site.
• Watch out for dangers at the site.
• Safety concerns:
  – Poisonous Gas
  – Chemicals
  – Energized Electrical Equipment
  – Potentially Explosive Atmosphere
Drilling Rig

Drills the production hole.

Photos courtesy Center for Local Government Technology, OSU
Well Head/Christmas Tree

Assembly of valves, pipes, and fittings used to control the flow of oil and gas. May need a flood protection fence.

Photos courtesy Center for Local Government Technology, OSU
Pump Jack

Lifts oil and water from the reservoir through the well bore to the surface. Does not need anchoring.

Photos courtesy Center for Local Government Technology, OSU
In-Line Heater

Used to facilitate crude oil and gas in cold temperatures, when the emulsion is very heavy, or when paraffin is present.
Separators

Separates natural gas from crude oil and water.

Photos courtesy Center for Local Government Technology, OSU
Heater Treater

Separates water from oil.

Photos courtesy Center for Local Government Technology, OSU
Tank Battery

Steel tanks store oil. Generally the saltwater is stored in fiberglass tanks.

Berm designed to hold tank fluids inside berm, not to keep flood waters out.
Production Unit

Separates the natural gas from the oil and water when production is primarily natural gas.
Dehydrator

Removes water vapor from natural gas using glycol as a drying agent.

Photos courtesy Center for Local Government Technology, OSU
Above-ground valve with meter to measure the gas. May need flood protection fence.
Compressor

raises the pressure of compressible liquids and/or gases.

Photos courtesy Center for Local Government Technology, OSU
Workover Rig

A recompletion is a change in the location of the downhole producing interval. Typically the permanent equipment set at the surface to handle existing production will be adequate to handle the new production.
Permitting Responsibilities
Notify Company of your Permit Requirements

• Many oil and gas companies (including pipelines) do not know they need a floodplain permit, especially in the unincorporated areas.

• After a few times, hopefully they will come to you for a permit.
So How Do You Find Them?

• Check the OK Corporation Commission website for Intent to Drill Permits.
• Drilling will often take place immediately after approval of Intent to Drill.
• Items to look for on Intent to Drill permit:
  – Operator name and contact info
  – Location of well site
  – Lease name, ex: Rother 1-6H
  – Drilling mud pit type
• Check to see if site is in the floodplain.
http://imaging.occeweb.com/  
Oil and Gas Well Records Forms

Choose Form 1000

Enter dates to check here

Click API to sort by county

Click here to view Form
So How Do You Find Them?

• Look for drilling rigs.
  – Find sign at road that lists phone number of company.

• Go through Landmen.
  – Make sure your County Clerk’s office of Land Records has a prominently displayed floodplain map(s) with permit requirement posted.
So How Do You Find Them?

• Get to know your OCC local inspector.

• Check the Road Crossing Permits in your County Commissioners Office for pipelines.

• Utilize your County District Shops and Assessor’s Office Field Appraisers.
  – These guys are out in the county and see everything.
What do the O/G companies have to do to be compliant?

They must:

• Get a floodplain permit before development (including pad construction) begins.

• Install flood protection measures (anchor, flood fence), elevate, or relocate production equipment.

• Get a licensed engineer to certify the design of the flood protection measures and elevation.
Floodway

• If the drilling and/or production site is in the floodway, the oil/gas company will have to demonstrate through an engineering study that there will be no increase in flood heights during the discharge of the 1% chance flood.
Permit Steps for the FPA

• Identify the site on the floodplain map.
  – What is the potential water velocity at the site? Or is the flood potential backwater only?
  – How far would they have to go to get tanks and equipment out of floodplain? This could be an option.
  – Note whether lease road will be under water during flood or will impede water flow.

• Visit the site—Know your site!
  – Take photos.
  – Note condition and location of trees and shrubs.
Permit Steps

• Establish a BFE
  – In rural A zones with no BFE’s on the maps, use the Simplified Method of Contour Interpolation – Line up the floodplain boundaries over a topo map.
  – Found in *FEMA 265: Managing Floodplain Development in Approximate A Zones.*
Permit Steps

• The Operator has 3 Options:
  – **Elevate** production site above BFE, Elevation Certificate required.
  – **Relocate** production site out of floodplain.
  – **Install flood protection measures**:
    • Anchor all production equipment to BFE.
    • Protect vulnerable equipment such as well head and gas valve with flood protection fence to prevent flood debris damage.
FEMA guidance on anchoring fuel tanks

- *FEMA Publication 348 Protecting Building Utilities from Flood Damage*
Permit Steps

• A closed drilling mud pit system must be used.
• The lease road must be constructed so it will not obstruct the flow of water.
• A culvert must be placed in the barrow ditch where lease road meets county road.
• Tree and brush debris may need to be removed from floodplain or burned if they could be washed downstream.
• Make agreement to be able to inspect the site periodically after permit is completed.
Permit Steps

- Permit application must include:
  - Completed permit application form
  - Detailed plans and specs for the site
  - Engineered and stamped anchoring plans
  - Staking plat
  - Other applicable permits
  - Spill Prevention and Counter Measure Plan
Permit Steps

• Floodplain board meets to consider approval of permit application.

• Issue permit and checklist of future tasks to be completed.
Use your Floodplain Board’s knowledge of the area

• Your Board probably knows the flood potential of your area very well.

• Some sites will require more flood protection than others.
  – Ex: A production site right next to a river may need elevation and flood protection fence around well head and gas valve. A site at the edge of the floodplain with only backwater may just need anchoring of production equipment.
Post-Construction Permit Steps
When site is complete

The O/G company will

• provide you with a list of production equipment on the site

• engineered certification of anchoring and fence designs.

• elevation certificates if elevation was used.

• notify you if
  – they add new equipment.
  – they sell the site to another company.
Post-Construction Permit Steps

FPA will

• do a final inspection of site.
• take photos.
• send out a permit completion letter.
• keep all records organized in files.
When they are in a big hurry…

• The Floodplain Administrator can issue a letter of permission to begin work before the permit is issued by the Floodplain Board.

• Do this for non-controversial sites.
Pipelines

• Have your Floodplain Board establish burial depth requirement.

• Recommendation:
  – 72 inches under creeks/rivers, 48 inches in the rest of the floodplain
  – Company must sign Statement of Burial Depth Compliance after construction is complete.
Examples of good and bad flood protection of production equipment
The Good

Proper anchoring
Proper anchoring
Proper anchoring on equipment other than tanks
Elevation of production site
Relocated production equipment
The Bad

Infringement on waterway
Inadequate well head guard
New unpermitted equipment added after final inspection
Partner with the Industry

- Approach them with an attitude of cooperation.
- If they don’t know about floodplain permitting, give them the benefit of the doubt.
- There are many different people and contractors involved with an oil and gas site. Educate them all.
- A good working relationship with the industry is the goal.
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