



The slide has a blue background with a collage of images similar to the first slide. At the top center is the text "FORT WORTH" in a stylized, serif font, with a longhorn silhouette below it. The main title is "FORT WORTH CITY COUNCIL – 2008 GAS DRILLING TASK FORCE JOINT PIPELINE WORKSHOP AGENDA" in white, bold, sans-serif font. Below this, the date "Tuesday, October 14, 2008" is centered. The location and address are listed: "Will Rogers Memorial Center, Amon G. Carter Exhibit Hall Stagecoach Room", "3400 Burnett Tandy Drive", "Fort Worth, Texas 76107". The time "1:30 – 4 pm" is centered below the address. The presenter information is: "Presenter", "John W. Krauhs, P.G.", "Shaw Environmental, Inc.". At the bottom left is a small number "2". At the bottom right is the Shaw logo and tagline "a world of Solutions™". A small vertical copyright notice "©2008 Shaw Group Inc." is on the left side, and "The Shaw Group Inc." is at the bottom center.

Barnett Shale Exploration & Production

- Drilling & Production Chemicals
- Drill Site & Production Facility Runoff
- Waste Storage & Transport

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Drilling & Production Chemicals

- Resource Conservation & Recovery Act (RCRA)
- Superfund Amendments & Reauthorization Act (SARA) Title III
 - Emergency Planning & Community Right-to-Know
- OSHA Hazard Communication Standard (HAZCOM)
- Comprehensive Environmental Response, Compensation and Liability (CERCLA) Act “Superfund”
- Typical Barnett Shale Well Chemical Use

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Drilling & Production Chemicals (cont'd)

- Resource Conservation & Recovery Act (RCRA)
 - Enacted by Congress 1976
 - Control solid waste and encourage recycling
 - Regulates hazardous & nonhazardous waste
 - Generation-storage-transport-disposal

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Drilling & Production Chemicals (cont'd)

- RCRA (Cont'd)
 - Hazardous wastes
 - Listed
 - Characteristic
 - Ignitability
 - Corrosiveness
 - Reactivity
 - Toxicity
 - Mixed wastes

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Drilling & Production Chemicals (cont'd)

- RCRA (Cont'd)
 - Penalties
 - Administrative - up to \$25,000 per day per violation
 - Civil - up to \$25,000 per day per violation
 - Criminal - up to \$50,000 per day per violation & 2-5 years prison
 - Knowingly violation that endangers others
 - Individual: fine up to \$250,000 & 15 years prison
 - Organization: \$1,000,000 fine

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Drilling & Production Chemicals (cont'd)

- RCRA (Cont'd)
 - Exploration and production (“Oil & Gas”) exemption
 - Congressional amendment in 1980
 - Exempts select E&P wastes from hazardous classification
 - Drilling fluids
 - Produced waters
 - Other associated wastes
 - Exempt wastes clarified in EPA determination publications
 - Anything that comes from the wellbore is nonhazardous*

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Drilling & Production Chemicals (cont'd)

- RCRA (Cont'd)
 - Texas Solid Waste Disposal Act
 - RRC jurisdiction over oilfield E&P wastes
 - TCEQ jurisdiction over other industrial wastes

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Drilling & Production Chemicals (cont'd)

- Superfund Amendments & Reauthorization Act (SARA) Title III “Emergency Planning & Community Right-to-Know”
 - Enacted by Congress 1986
 - Annually report chemical hazards to responders & emergency planners
 - Penalties
 - Civil & Admin fines up to \$25,000
 - Allows for criminal penalties

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Drilling & Production Chemicals (cont'd)

- SARA Title III (cont'd)
(Texas Hazardous Chemical Right-to-Know Act)
 - Annual inventory reporting by facility
 - State - TCEQ
 - County Local Emergency Planning Committee (LEPC)
 - Local responders – fire departments
 - Penalties - admin & civil up to \$25,000 per day of violation

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Drilling & Production Chemicals (cont'd)

- Hazard Communication Standard
(HAZCOMM)
 - OSHA in 1988
 - Hazardous vs. Nonhazardous
 - Hazardous
 - Listed
 - Characteristic
 - Fire
 - Reactivity
 - Health

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Drilling & Production Chemicals (cont'd)

- Hazard Communication Standard (HAZCOMM) (cont'd)
 - Manufacturer's Material Safety Data Sheet (MSDS)
 - Operator written employee hazard communication program
 - Container labeling – manufacturer, chemical name, hazard warning
 - Penalties
 - Admin: \$10,000 per violation
 - Criminal: \$10,000 and 6 months in jail

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Drilling & Production Chemicals (cont'd)

- Comprehensive Environmental Response, Compensation and Liability (CERCLA) Act
 - “Superfund” 1988
 - EPA established reportable quantities (RQ) for each substance for a release
 - Release – substance enters the environment (air, water, soil)
Spill low volatility onto concrete not a release – no media impact
 - Penalties
 - Individual: \$25,000 and 3 years in jail
 - Organization: \$500,000

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Drilling & Production Chemicals (cont'd)

- Drilling Fluids “muds”
 - Control fluid properties, formation damage, wellbore stability
 - Predominately fresh water-based with synthetic polymers
 - Some clay-based with lignosulfonate polymer
 - Some oil based
 - Chemical additives
 - Fluid density “weight” materials
 - barite, mica
 - Lost circulation materials
 - cedar flakes, walnut hulls, cotton seed hulls

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Drilling & Production Chemicals (cont'd)

- Drilling Fluids “muds” (cont'd)
 - Typically non-hazardous, may be characteristic health hazardous
 - Transported by truck & stored in steel tanks
 - Polymers in 5-gal containers
 - Lost circulation materials in sacks on pallets
 - Used mud and un-used chemicals recycled

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Drilling Well - Barnett Shale



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Drilling & Production Chemicals (cont'd)

- Completion & Workover Fluids
 - Predominately water
 - Biocide or bactericide
 - Scale inhibitor
 - Friction reducer
 - Hydrochloric acid
 - Sand
 - May be characteristic hazardous
 - Ignitability
 - Health

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Drilling & Production Chemicals (cont'd)

- Completion & Workover Fluids (cont'd)
 - On site for short time period
 - Transported by truck & stored in steel tanks or plastic tote-tanks
 - Un-used chemicals recycled
 - Used fluid becomes part of the production stream

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Well Completion – Barnett Shale



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Drilling & Production Chemicals (cont'd)

- Production Treating
 - On site during production
 - Transported by truck
 - Stored in steel or plastic tanks (150-300 gal) or 55-gal drums
 - Stored within secondary containment
 - May be characteristic hazardous
 - Ignitability
 - Health

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Drilling & Production Chemicals (cont'd)

- Production Treating (cont'd)
 - Pumped down the well
 - Corrosion inhibitors
 - Scale inhibitors
 - Produced gas stream
 - Glycol or Amine
 - Un-used chemicals recycled
 - Used fluid part of the production stream or recycled

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Well Treating – Barnett Shale



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Facility Runoff

- Clean Water Act
 - Rivers & Harbors Act (1899)
 - Federal Water Pollution Control Act (1972) “Clean Water Act”
 - Spill Prevention Control & Countermeasure (SPCC) Plans
 - Protect navigable waters & adjoining shorelines
 - Physical controls, management practices
 - Spill reporting
 - National Pollution Discharge Elimination System (NPDES) Permit
 - Permit point source and storm water discharges
 - Facility, Group, or General Permits
 - Storm Water Pollution Prevention Plan (PPP)

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Facility Runoff (cont'd)

- Clean Water Act (cont'd)
 - Penalties
 - SPCC Plan
 - Civil - up to \$5,000 per day of violation
 - NPDES
 - Admin – up to \$10,000 per violation per day
 - Civil - up to \$25,000 per day per violation
 - Criminal - up to \$100,000 per day per violation & 6 years prison
 - Corporations - up to \$1,000,000

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Facility Runoff (cont'd)

- Clean Water Act (cont'd)
 - SPCC Plans
 - Applies to essentially all drilling rigs and production facilities
 - Operator management certifies commitment of manpower & resources
 - Certified by a Registered Professional Engineer
 - Recognize oil storage equipment & spill potential
 - Assessment of equipment & piping
 - Adequate secondary containment for oil storage
 - Spill contingency plan
 - Employee training & operating practices
 - Annual inspections & PE re-certification every 5 years
 - Applicability to substantial harm criteria
 - Hard copy at closest site staffed 8-hr a day

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Facility Runoff (cont'd)

- Clean Water Act (cont'd)
 - Production Facilities SPCC Plans
 - No leaks or drips
 - Load line valves locked or secured
 - Load line drip-catch devices
 - Secondary containment for storage containers
 - Facility design
 - Reportable quantity release notification to National Response Center
 - Railroad Commission spill reporting requirements

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Load Line Valve Drip Catch



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Facility Runoff (cont'd)

- Clean Water Act (cont'd)
 - NPDES Permit
 - Individual, group and general permits
 - Production facilities under EPA general permits
 - Permits prohibit all discharges of pollutants:
 - » Drill cuttings
 - » Produced fluids or solids
 - » Rig wash
 - » Treating chemicals

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Facility Runoff (cont'd)

- Clean Water Act (cont'd)
 - PPP Plans
 - Apply to construction of a drilling pad

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Waste & Transport

- Drill Cuttings
 - Closed loop system, tanks, transported to permitted landfill
 - Earthen reserve pit – closed per SWR 8
- Used Lubricating Oil & Oil Filters
 - Vendor services equipment and transports off site for recycle/disposal
 - Operator services equipment
 - Waste containerized on site or transported to central storage
 - Picked up by vendor transport for off site recycle/disposal
- Treating chemicals
 - Coat the piping
 - Diluted and become part of the production stream

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Waste & Transport (cont'd)

- Tank bottoms, equipment & piping scale
 - Treating chemicals to reduce or eliminate
 - Monitored and removed as necessary
 - Equipment taken out of service
 - Physically removed tank bottoms / scale
 - Truck transport for off site recycle/disposal
- Produced water & Completion fluids
 - Aboveground storage tanks
 - Truck transport to permitted disposal well
 - Pipeline to central storage or permitted disposal well
- Dehydration glycol or amine & water
 - Transported by truck for recycle

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Dehydration Unit – Barnett Shale



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FORT WORTH CITY COUNCIL – 2008 GAS DRILLING TASK FORCE
JOINT PIPELINE WORKSHOP AGENDA

END OF PRESENTATION

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