



Hydraulic Fracturing

Understanding and Managing the Risks and Resources

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Earl L. Hagström is an environmental litigation partner residing in Sedgwick LLP's San Francisco office. He holds a:

- Bachelor of Arts in Geology, Boston University 1976
- Master of Science, *magna cum laude*, in Sedimentation and Stratigraphy, University of Rhode Island 1978
- Juris Doctorate, University of San Francisco 1990

He was an:

- Exploration Geologist in Phillips Petroleum's, Frontier Exploration and California Exploration Groups 1978-1982; and a
- Senior Exploration and a Development Geologist in British Petroleum's, North Alaska Group 1982-1986



Mr. Hagström has represented:

- Multi-national petroleum companies in groundwater litigation
- Deep well injection operators in frack fluid disposal litigation
- Insurance interests in Natural Resource Damage litigation
- Co-Chair of Sedgwick's Hydraulic Fracturing Group
- Co-Editor of Sedgwick's Hydraulic Fracturing Digest
- Appointed to Advisory Board of Environmental Claims Journal: 2012-2014
- Adjunct Professor of Environmental Policy and Land Use: 2009-2012
- Editor and Contributing Author "Perchlorate: A Scientific, Legal and Economic Assessment" (Lawyers and Judges Publishing, March 2006)
- Awarded Sedgwick's Mentor of the Year Award in 2009



THE SHALE REVOLUTION IS HERE TO STAY

■ Why is Fracking a Leading Edge Issue?

- Energy independence
- Economic impacts
- Politics
- Risk Reward Ratio
- Competition for water resources





Surface Environmental Risks


- Erosion and storm water runoff during well pad construction and drilling
- Source of water used in fracking process
- Handling and disposal of flowback fluids
- Installation and maintenance of oil and gas collection facilities and pipelines
- Impact on habitat and surface resources from exploration and production






Subsurface Environmental Risks

- Highly folded and fractured source rock and reservoirs
- Depths of water bearing zones and confining layers
- Vertical and horizontal migration paths (faults)
- Behavior of contaminants (degradation, fate and transport)
- Short term and long term environmental risks
- Injection of Flowback Fluids





Fracking Industry Best Practices – A Driller's Perspective

1. Well sites lined with plastic to prevent surface leakage.
2. Use of steel tanks for all well fluids (no earthen pits)
3. Installation of shallow monitor wells surrounding drilling sites
4. Extended depth for surface casing to protect groundwater
5. Use of intermediate casing to prevent natural gas leakage
6. Follow industry best practice for design, execution and evaluation of the casing cementation process
7. Simple and safe hydraulic fracturing fluids (all fluid additives and volumes published on company website and approved in advance by Environment Agency)
8. Real time seismic monitoring during hydraulic fracturing
9. Use of gas seal threads in production casing and tubing
10. Use of subsurface safety shut-off valve for producing wells

Source: Cuadrilla Resources

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7

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Risk Minimization

“The hydraulic fracture treatments are being conducted to formations very deep into the ground as long as you have good isolation of your casing strings with good cement jobs and you’ve established that you have good casing and cement quality between casing and formations down to this shale formation, you should have absolutely no problems performing properly designed fracture treatments.”

- Dan Mason, MatthewsDaniel

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8

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Players

- Land owners
- Oil and gas exploration and production companies
- Drilling, casing and cement companies
- Fracking companies
- Oilfield Service Companies
- Wellhead equipment manufacturers and suppliers
- Chemical manufacturers and suppliers
- State and Federal Agencies
- Injection well owners/operators
- Pipeline owners & operators
- Professional consultants
- Trucking companies
- Testing companies
- Waste disposal companies
- Wastewater recycling companies
- Natural gas processors
- Power plants
- LNG export facilities

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9

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Claims Arising Out of Hydraulic Fracturing Operations

- Groundwater Contamination
- Property Damage and Stigma
- Bodily Injury
- Failed Well and Fracking Equipment
- Trucking/Hauling Claims
- Damage to Roads & Infrastructures
- Flowback Water Disposal Claims
- Injection Well Claims
- Taking of Water Resources
- Damage to Oil & Gas Reservoirs
- Leasing Disputes
- Investor Actions

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10

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Regulations

- **Well Construction Statutes**
 - Most oil and gas producing states have them.
 - Not specific to hydraulic fracturing.
 - California Public Resources Code §§ 3106, 3203, 3211, 3222, 3224 and 3255 and Title 14 C.C.R. § 1722.2 et seq.

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11

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Legislation

Disclosure Statutes

- Full or Modified – State and Federal
 - United States Interior Department proposal to disclose chemicals used on Federal Land.
 - SB 2248 and HR 4322 – States have sole authority to regulate disclosure on Federal Land within boundaries of the State.
 - California – March 2012 DOGGR requested O&G Companies to voluntarily disclose on FRACFOCUS.ORG
 - Harvard Study (April 2013): FRACFOCUS inadequate tool.
- Trade Secret Protections/Exemptions – most State statutes allow trade secret protection.

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12

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California – The New Battleground

- AB 7 – Wieckowski (Nat. Res. Com. Recm'd Passage Ref'd Back to Com.)
- AB 288 – Levine (Inactive at Levine's Request)
- AB 649 – Nazarian (Bill Advanced April 29, 2013)
- AB 982 – Williams (In Com. Held Under Submission)
- SB 4 – Pavley (Cleared Nat. Res. & Water Com. by 5-2 vote. April 9, 2013; Passed 28-11 on May 28, 2013)
- SB 395 – Jackson (Cleared Sen. Env. Q. Com. by 6-3 vote. May 1, 2013; Ordered to Inactive on May 30, 2013)
- SB 483 – Jackson (Passed 37-0; Ordered to Assembly May 28, 2013)

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13

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CEQA and NEPA as Regulation

- *DOGGR Generally Exempts Drilling Permits from CEQA Review*
- *Center for Biological Diversity v. Bureau of Land Mgmt. (U.S.D.C. ND CA Dec. 8, 2011)*
 - *BLM Failed to Acct. for Increased Development Potential*
 - *Full EIS Required*
 - *Remedy Briefing (6/03/2013)*
- *Center for Biological Diversity et al. v. Dept. of Conservation (January 24, 2013) (Amended Answer 06/06/2013)*
- *Sierra Club et al. v. Dept. of Conservation (October 17, 2012) (Answer to Compl. In Intervention 06/10/2013)*
- *Kern County Sierra Club v. DOGGR (July 13, 2012)*

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Home Rule: Municipal and Local Regulation

- 50+ Local Governments in New York have enacted bans.
- *Norse Energy Corp. USA v. Town of Dryden, et al., ___ AD3d ___, 2013, N.Y. Slip Op. 03145 (May 3, 2013) (Tomkins County)*. Dryden Town Board had banned all activities relating to oil and gas extraction, development and production. Ban "prohibit[ed] the exploration and extraction of natural gas and or petroleum and the storage, treatment or disposal of natural gas exploration and production wastes within the Town."
- *Cooperstown Holstein Corp. v. Town of Middlefield, ___ AD3d ___, 2013, N.Y. Slip Op. 03148 (May 2, 2013) (Otsego County)*. Middlefield's town board had passed a new zoning law in June 2011 that prohibited heavy industry and all oil, gas or solution mining and drilling.
- May 2013
 - Affirmed Trial Courts' Grant of Summary Judgment in Favor of Two Towns.
 - Held that zoning ordinances only limited the use of land and did not attempt to regulate oil and gas exploration, as regulated under New York's Oil, Gas and Solution Mining Law.

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Increasing Demand Limited Resource



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16

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It's All About the Water

- Water Resources (The Water Report; April 15, 2013)
 - 150 Trillion Gallons Year (2005 Data)
 - 85% Fresh Water
 - Hydraulic Fracking Uses 0.1%
 - All Water Use is "Local"
- Water Quality
 - Contamination from Fracking Process
 - Surface Storage Leakage
- Wastewater Disposal (U.C. Berkeley; April 2013 Study)
 - Produced Water and Flow Back Water
 - Underground Injection in Class II Disposal Wells
 - 31,000 Underground Injection Control Class II Wells in California
- Overlapping Jurisdiction: (1988 MOU)
 - DOGGR
 - SWRCB
 - BLM

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17

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Withdrawal vs. Consumption

- Water Demand In Energy Production
 - Electricity Production
 - Natural Gas Production
 - Oil Production
- Watershed Demands
 - Order of Withdrawal Matters
 - Agricultural → Power Plant → Municipal Use
 - Agricultural → Municipal Use → Power Plant


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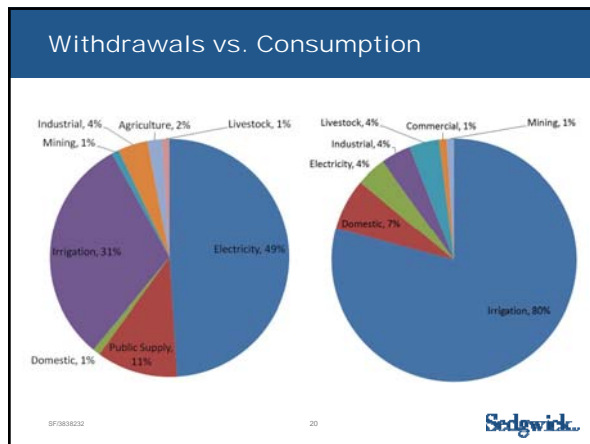
18

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Withdrawal vs. Consumption


- Electricity Production
 - Uses Large Volumes of Water
 - Consumes Very Little
 - Accounts for 50% of Freshwater Withdrawals
 - Only 4% of Consumptive Use
 - Returned to Source
- Agricultural Production
 - Accounts for 30% of Withdrawals
 - But, 80% of Consumptive Use
- Environmental Requirements
 - Wetlands
 - Endangered Species

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Beneficial Use Battle

- Municipal Use
 - Drinking Water
 - Domestic Irrigation
- Agricultural Use
 - Crops
 - Livestock
- Energy Production
 - Oil and Gas
 - Electricity Generation
- Environmental Use
 - Marsh/Wetlands
 - Fish


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Market Place Pricing or Regulated Use

- Highest Bidder
- Paper Water Transfers
- Regulated Allocations
- Balance Supply and Demand
- Water Banking
- Beneficial Use aka Highest and Best Use

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Is Desalination the Answer



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Know Your Plaintiff – Your Defense Strategy and Money Depends On It

- Private Party Plaintiffs
- Agency Enforcement Actions
 - USEPA
 - State Attorneys General
 - Municipalities
 - Security and Exchange Commission
- Environmental Advocacy Groups
- Private Attorneys General

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Dual Track Actions: Agency Enforcement & Private Party Litigation

- Private Party Plaintiffs Seeking Monetary Damages
- State and Federal Administrative Actions Seeking Penalties and Injunctive Relief
- Environmental Advocacy Groups Seeking Injunctive Relief

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25

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Regulatory Standards in Litigation

- A. Compliance as a Defense
 1. Property Damage Claims
 2. Bodily Injury Claims
- B. Negligence
 1. Regulations are Minimum Compliance Standards
 2. Regulatory Safe Harbors – Do They Exist
 3. Do Permits Provide Protection
 4. Is a Trace Amount Enough to Trigger Liability
 5. Type of Duty Owed and To Whom

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26

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Litigation Strategies: Causation Can Be Your Friend

- Multiple Sources of Contaminants
- Naturally Occurring – Common Contaminants
- Exposure – Dose and Degree
- Release Mechanism
- Exposure Pathway(s)

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27

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Orders to Show Causation

Lone Pine Orders

- Require plaintiff to identify each substance from fracking fluid which plaintiff claims caused injury
- General Causation
 - Can any of the substances cause disease or illness claimed
- Specific Causation
 - Establish dose, timing and duration of each exposure to each substance
 - Competent medical diagnosis that disease or illness is recognized
 - Cause in fact illness or disease linked to fracking fluids

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28

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Groundwater and Methane Migration

- Injuries Claimed
 - Diminished Property Value and Stigma
 - Bodily Injury and Emotional Distress
 - Medical Monitoring
- Causation
 - Source of Methane
 - Naturally Occurring
 - Thermogenic or Biogenic Gas
 - Source of Thermogenic Gas
- Evidence
 - Duke Study 2011
 - Pavillion Wyoming Report
 - University of Texas Study 2012
 - MIT Study 2012



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29

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INSURING THE RISKS

- CGL (with Oilfield Industry Endorsements)
- Control of Well (Operators Extra Expense)
- Pollution
- Property & Business Interruption
- Products Liability
- Errors & Omissions (Professional Liability)
- Directors & Officers

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CGL – Commercial General Liability



- Fortuity
- Occurrence
- Indemnification & Insurance Procurement
- Pollution Exclusion
- Owned Property Exclusion
- Property Damage

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Control of Well (Operators Extra Expense)



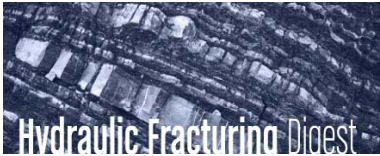
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Strategies

1. Be prepared to be sued.
2. Establish multi-discipline team(s) internally and externally.
3. Keep abreast of ongoing litigation at State and Federal level.
4. Know your client's operations and the chemicals used.
5. Be aware of the existing and proposed regulations and ongoing studies.
6. Establish a baseline pre-operations.
7. Know the conditions of the area in which you operate.
8. Critically assess your operations. Know your contractors and suppliers.
9. Stay ahead of technical developments. Reduce and manage waste streams.

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Sedgwick Hydraulic Fracturing Digest



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