

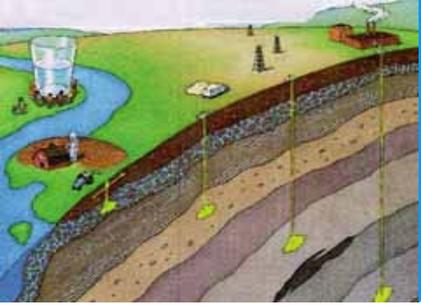
March 2013

ELGs for Unconventional Oil and Gas

Overview for EPA's Science Advisory Board

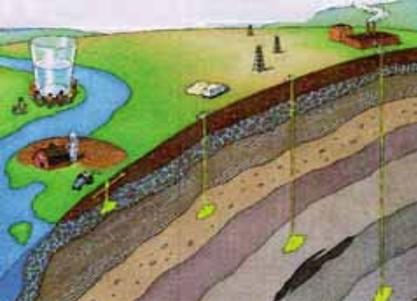


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Technology Based Discharge Requirements

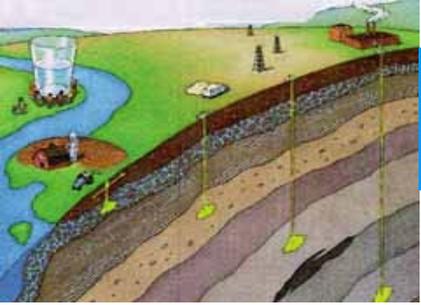
- EPA promulgates national technology-based Effluent Limitations Guidelines and Standards (ELGs) to limit discharges directly into water or into a POTW
- Industry-specific (e.g., paper mills, oil & gas activities, steel mills)
 - ELGs have been issued for over 57 industry sectors
 - Apply to all facilities as defined in the regulation throughout the country within the industry sector
- Based on the performance of best available treatment technologies
 - Requirements typically expressed as a numerical limit
 - performance based (do not mandate the use of a specific technology)
 - Process changes and best management practices (BMPs) may also be specified
 - Must be economically achievable
 - Goal is zero discharge
- ELGs typically include requirements for those that discharge directly to waters of the U.S. and those that discharge to POTWs (also for existing and new sources)



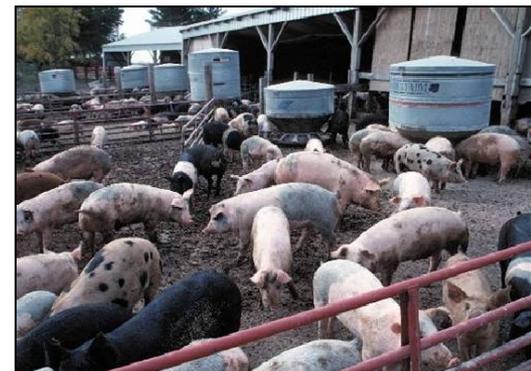
Revisions to Oil and Gas Extraction ELGs

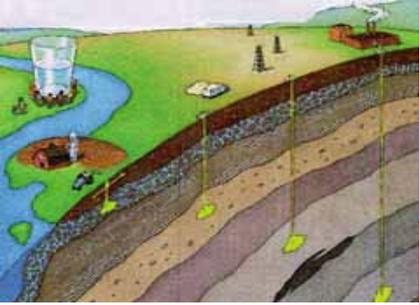
- Discharges from most oil and gas extraction activities are subject to ELGs for the Oil and Gas Extraction Point Source Category, 40 CFR Part 435
 - Except in limited circumstances, wastewaters associated with oil and gas extraction are prohibited from being directly discharged to waters of the U.S.
 - In order to meet the existing ELGs, industry typically:
 - Re-injects the wastewater into brine wells
 - Re-uses the wastewater typically to hydraulically fracture another well
 - Transports the wastewater to a public or privately owned treatment plant
 - The ELGs do not currently include pretreatment standards for discharges to POTWs
 - Discharges from coalbed methane extraction are not currently subject to the ELGs
- In Fall, 2011, EPA announced it was initiating rulemaking to revise existing ELGs for the oil and gas subcategory
 - Develop pretreatment standards for shale gas extraction discharges under the existing oil and gas ELGs
 - POTWs are not equipped to treat all pollutants in shale gas extraction wastewater
 - EPA plans to propose new standards for public comment in 2014
 - Develop requirements for coalbed methane extraction discharges
 - Potential new subcategory of the existing oil and gas ELGs
 - Considering requirements for direct discharges to waters of the U.S. and pretreatment standards for discharges to POTWs

Developing Effluent Guidelines -- Major Elements



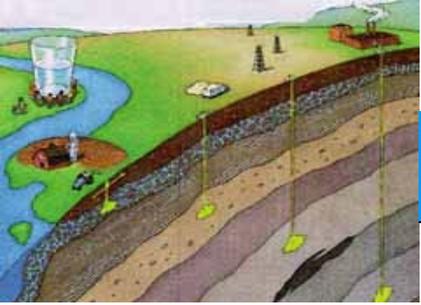
- Data Collection
- Technology Assessment
- Economic Analysis
- Environmental Assessment
 - Pollutant transport & exposure pathways; hazards
 - National & local impacts; benefits





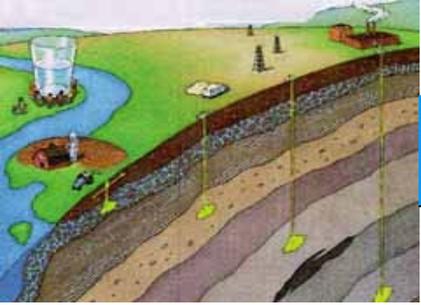
Data Collection

- Publically available sources
 - NPDES permits and permit information
 - Federal, National, and State organization websites and databases (e.g., US Geological Survey (USGS), Energy Information Administration (EIA), Pennsylvania Department of Environmental Protection (PADEP) Bureau of Waste Management)
 - Journal Articles and Technical Papers
 - Wastewater Treatment Vendor Websites
 - Financial databases (e.g. Dunn and Bradstreet/Hovers and RMA)
 - Individual company websites
- Site Visits/Conference Calls
 - Site visits enable EPA to understand industry processes, wastewater sources and generation, and current wastewater control practices within the industry
 - Enable us to collect company and/or facility specific information on operations and financial considerations
- Wastewater Sampling
 - Quantify pollutants currently present in an industry's discharge
 - Evaluate performance of wastewater treatment and control technologies
- Industry Surveys
 - May be extensive and require an Information Collection Request
 - May be limited to 9 or fewer companies



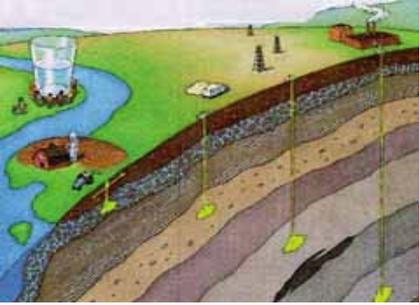
Data Collection (Continued)

- **Wastewater Sampling**
 - Quantify pollutants currently present in an industry's discharge
 - Evaluate performance of wastewater treatment and control technologies
- **Industry Surveys**
 - Allows us to collect facility specific information to support technical and economic evaluations
 - May be extensive and require an Information Collection Request
 - May be limited to 9 or fewer companies
- **Stakeholders**
 - These meetings can help identify, collect, and clarify information and analyses
 - To date, we have had extensive coordination with industry groups, technology vendors, and other stakeholders
- **States**
 - EPA initiated an EPA–State implementation pilot project with the Environmental Council of the States in coordination with the Association of Clean Water Administrators.
 - Goal is to consider the strengths and weaknesses of different approaches in order to select one that produces environmental results while more fully considering implementation burden



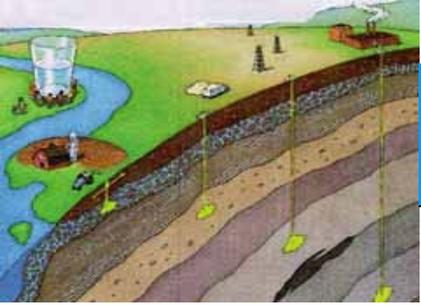
Effluent Guidelines Development--Technology Assessment

- Characterize Pollutant Discharges
- Develop candidate technology options for revising/establishing effluent guidelines
 - Performed for subcategories, if applicable
 - Nationwide feasibility
 - Performance
 - Statistical analysis to determine limits
 - Estimation of Pollutant Reductions
- Estimate compliance costs, pollutant reductions, and cross-media impacts
 - May be facility specific or based on a set of “model” facilities
 - Includes evaluation of transfer of pollutants to air and solid waste
 - Energy impacts



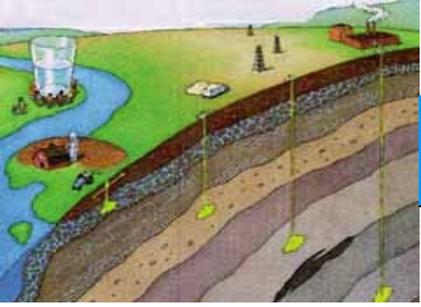
Effluent Guidelines Development --Economic Assessment

- Provides qualitative and quantitative assessment of the costs and impacts of the selected technology option
- Estimation of social costs
- Economic achievability
 - Facility level (if possible): closures or barrier to entry
 - Firm level (if cost center rather than profit center): closures, financial distress (limited access to credit)
 - Industry level: cost pass-through, employment effects
 - National level: market restructuring, balance of trade
 - Particular attention is given to impacts on small businesses
- Cost effectiveness



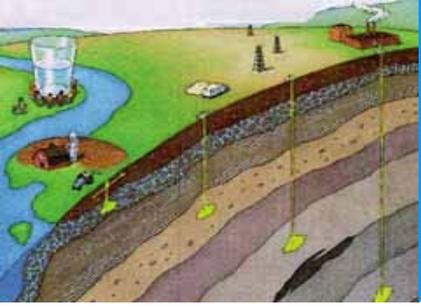
Effluent Guidelines Development --Environmental Assessment and Benefits Analysis

- EPA's attempt to quantify the current environmental impacts as well as the benefits for the proposed or final technology options
- Primary focus will be pollutants that pass through POTWs entering surface waters
 - Water quality impairment
 - Aquatic communities (e.g., fish, shellfish, etc.)
 - Human health (e.g., reduction in discharge of toxics)
 - Recreation (e.g., increased opportunity for fishing)
 - POTWS (e.g. ability to re-use biosolids)
- When possible, EPA tries to quantify these benefits in monetary terms – however, this is very difficult.



Interaction with ORD Study

- EPA's Office of Research and Development (ORD) is conducting a study of this practice to better understand whether hydraulic fracturing may impact drinking water resources and if so, what the driving factors may be
- The scope of the research includes the full lifespan of water in hydraulic fracturing, from acquisition of the water, through the mixing of chemicals and actual fracturing, to the post-fracturing stage, including the management of flowback and produced water and its ultimate treatment and disposal.
- While ORD's study is separate from today's rulemakings, EPA is internally coordinating to share information and prevent duplication between these projects

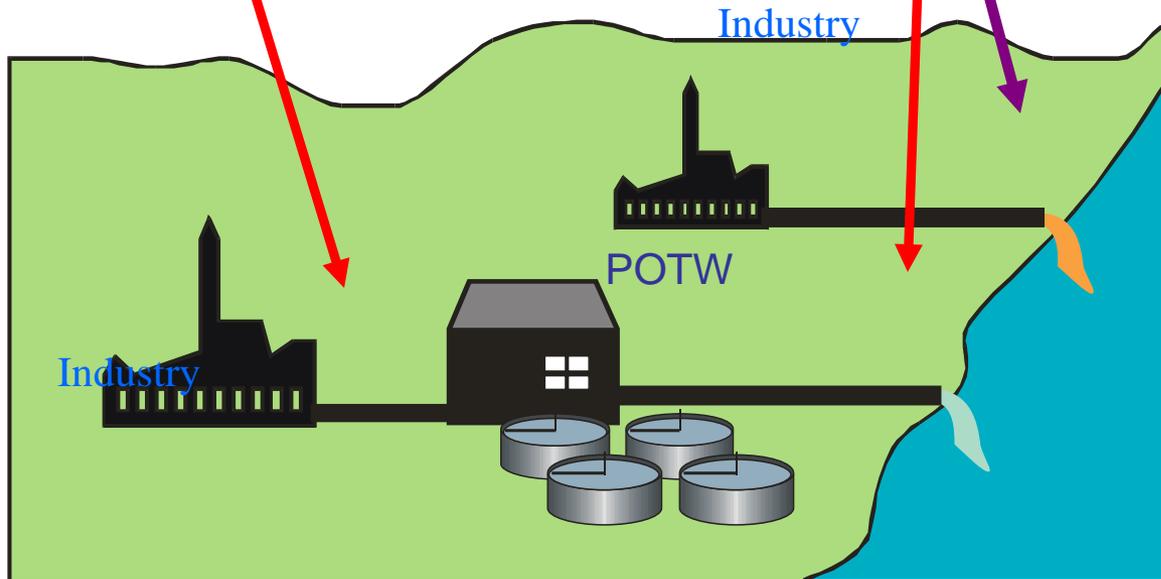


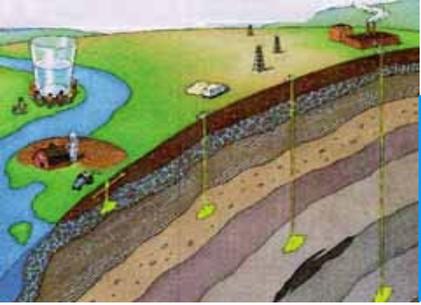
APPENDIX

CWA Programs to Control Industrial Discharges

- National Pretreatment Program
 - Controls for industrial & commercial facilities that discharge wastewater to sewage treatment plants (also called publically owned treatment works or POTWs)
 - Controls interference and pass-through of pollutants.

- National Pollutant Discharge Elimination System (NPDES) discharge permits
 - Permits for industrial & commercial facilities that discharge directly to surface waters (“direct dischargers”)
 - Permits for sewage treatment plants





Clean Water Act

For Direct Discharges into Waters of the U.S.
(e.g., rivers, streams)

For Indirect Discharges
(into sewers)

