

Utility Environmental Regulatory Landscape

Air and Beyond

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REGFORM Air Seminar
March 3, 2016

GEOENGINEERS 

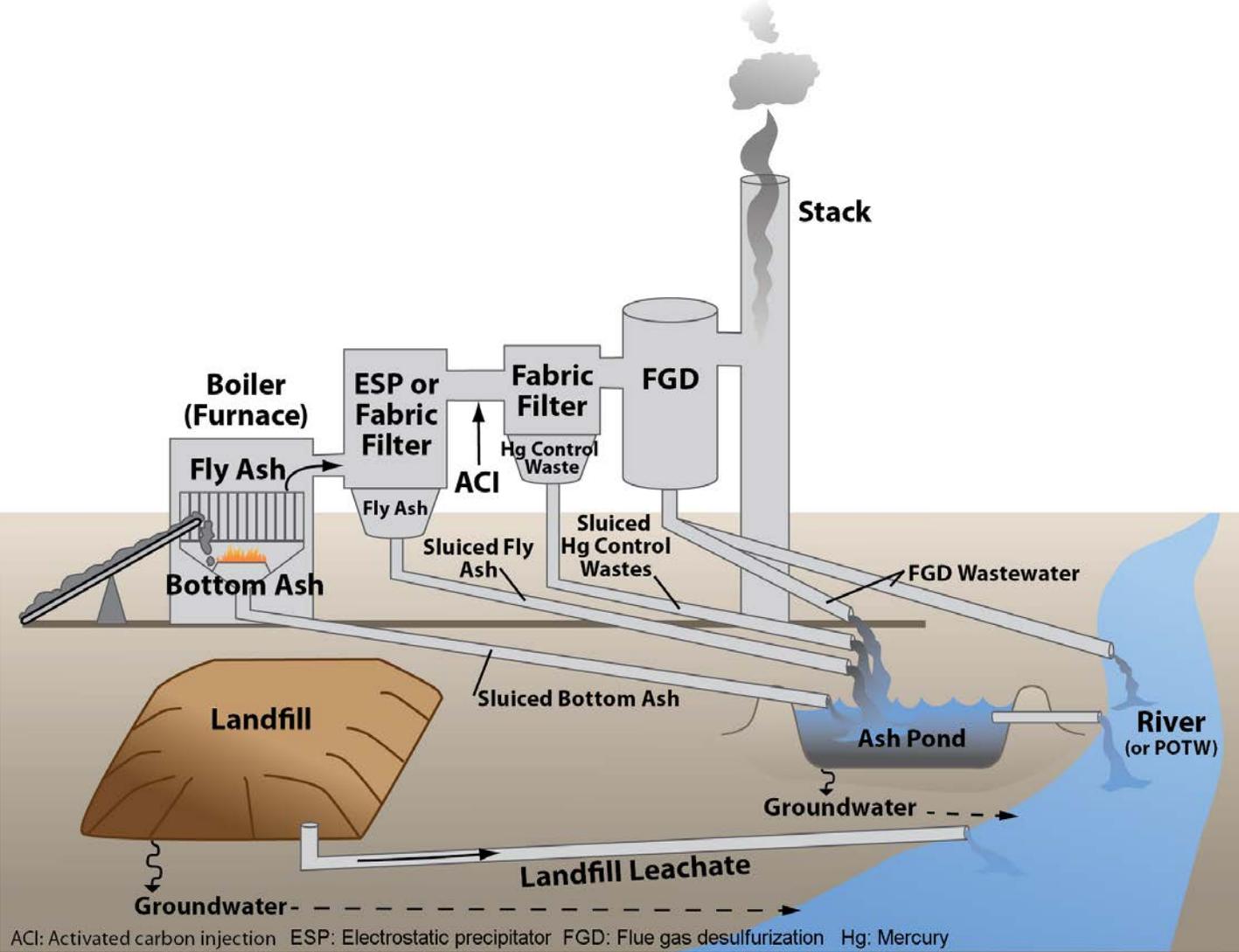


The Crystal Ball Circa 1989

- Annual Review of Energy article from 1989 examines regulatory agenda for coal-fired power plants in 1990s – 2000s*
- Predictions for next decade (1990s)
 - Further reductions in sulfur dioxide (SO₂) and nitrogen oxides (NO_x) to address regional and transboundary air pollution (specifically acid rain and ozone)
 - Short-term (1-hour) SO₂ ambient air quality standard
 - Regulations to address wastewater discharges, ash ponds and disposal sites deemed to threaten groundwater supplies
- Greenhouse gas regulations in 2000s

** Implications of Future Environmental Regulation of Coal-Based Electric Power, Annual Review of Energy, Vol. 14: 19-45 (November 1989)*

Utility Waste Streams – An Integrated System



Reference Table of Current Air Regulations, Part 1

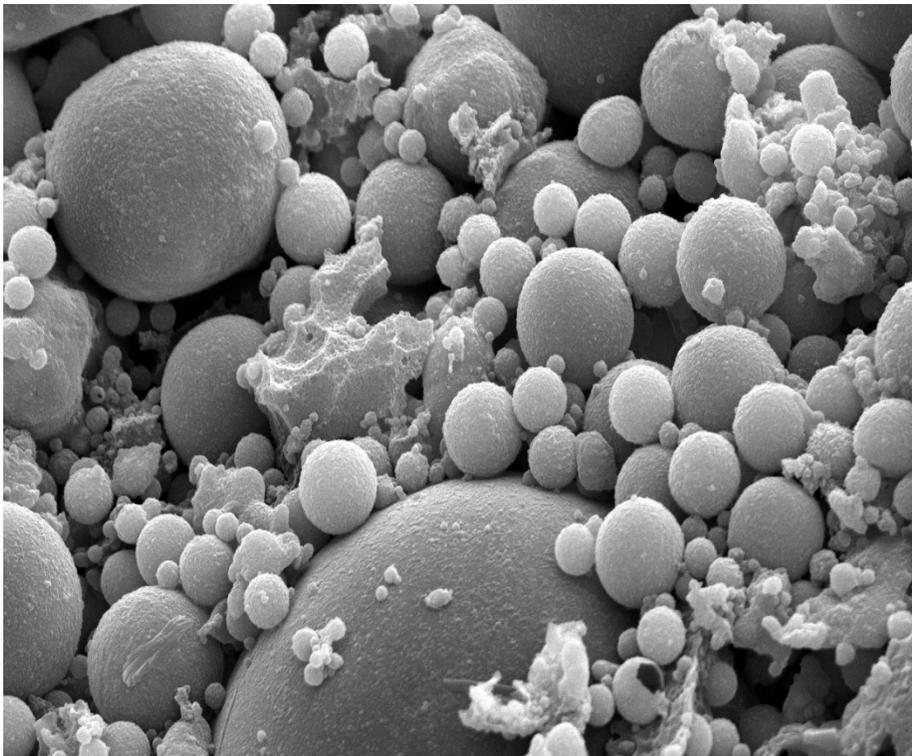
Regulation	General Applicability	Overview	Compliance Deadlines
<p>Clean Power Plan</p> <p>80 FR 64662, 10/23/15</p> <p>http://www.epa.gov/clean-powerplan/clean-power-plan-existing-power-plants</p>	<p>Fossil fuel-fired electric steam gen. units or stationary combustion turbines in operation or commenced construction as of 1/8/14</p>	<p>Guidelines for state plans for reducing CO₂ emissions from existing fossil fuel-fired EGUs</p>	<p>Interim CO₂ targets from 2022-2029; Final CO₂ targets in 2030 and beyond</p>
<p>1-hour SO₂ NAAQS Data Requirements Rule</p> <p>80 FR 51052, 8/21/15</p> <p>http://www3.epa.gov/airquality/sulfurdioxide/implementation.html</p>	<p>Sources that emit 2,000 tons per year or more SO₂</p>	<p>Requirements for evaluating 1-hr SO₂ compliance using dispersion modeling or monitoring data</p>	<p>Modeling-based designations in Dec. 2017 with nonattainment controls in place by Jan. 2022; Monitoring-based designations in Dec. 2020 with nonattainment controls in place by Jan. 2025</p>

Reference Table of Current Air Regulations, Part 2

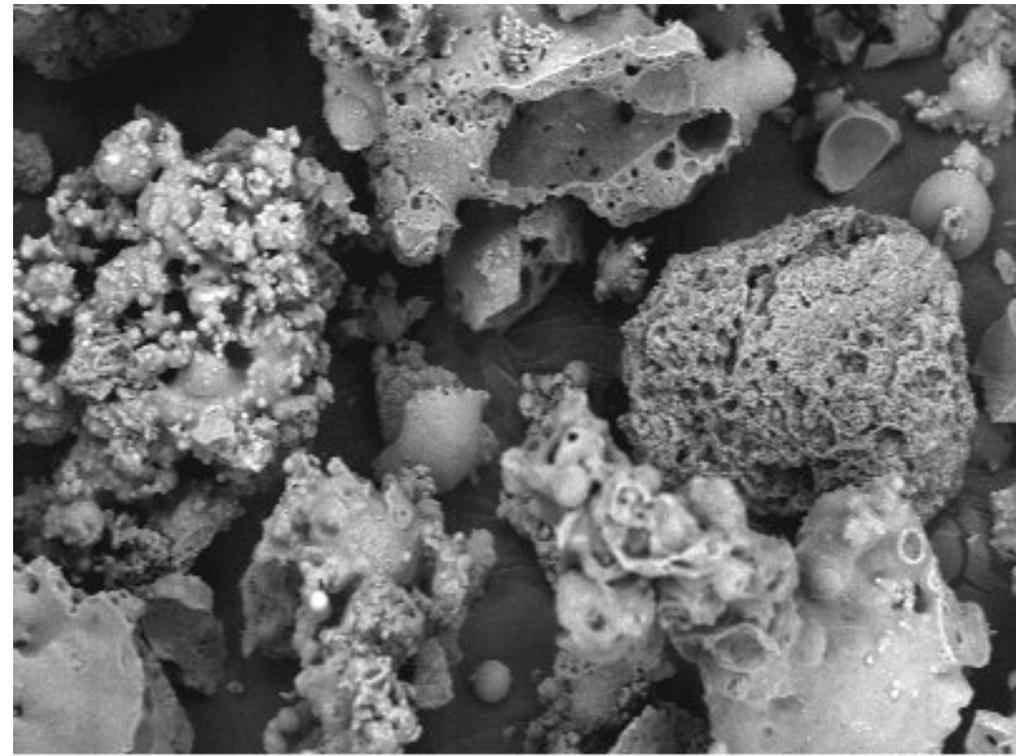
Regulation	General Applicability	Overview	Compliance Date
<p>Mercury and Air Toxics Standard (MATS) 77 FR 9304, 2/16/12</p> <p>http://www3.epa.gov/mats/actions.html</p>	<p>Coal- and oil-fired EGUs (new sources are those constructed after 5/3/11)</p>	<p>National technology-based emission limits to reduce mercury and other air toxics</p>	<p>April 16, 2015 with one-year extension (existing sources)</p>
<p>Cross State Air Pollution Rule (CSAPR)</p> <p>Final rule – 76 FR 48208, 8/8/11</p> <p>Proposed update for 2008 ozone standard – 80 FR 75706, 12/3/15</p> <p>http://www3.epa.gov/crossstaterule/</p>	<p>Coal-, gas- and oil-fired EGUs in 23 Eastern states</p>	<p>Emissions trading program to reduce annual and ozone season NO_x and annual SO₂ emissions; Proposed update replaces ozone season NO_x budgets in 2017</p>	<p>Phase I budgets – 2015 Phase II budgets – 2017</p>

Coal Combustion Residuals (CCR)

- CCR includes fly ash, bottom ash, boiler slag and flue gas desulfurization (FGD) materials



Excell F Ash 2000X 10 µm



Minerals Bottom Ash 100X 32Kv 200 µm

Coal Combustion Residuals Rule

- New federal requirements for CCR disposal in utility waste landfills and surface impoundments (ash ponds) with waste, water, air implications
- Location restrictions based on uppermost aquifer, wetlands, fault and seismic zones, unstable areas; demonstrations due Oct. 17, 2018
- Groundwater monitoring systems with initial 8 sampling events by Oct. 17, 2017 (existing units); semi-annual sampling for life of CCR unit and 30-year post-closure
- Other design and operational requirements, including fugitive dust control plans
- Closure and 30-year post-closure care; closure plans due Oct. 17, 2016 (existing units)
- Inactive surface impoundments that complete closure by April 17, 2018 no longer subject to rule requirements

CCR Rule – Summary of Key Provisions

Requirement	CCR Landfills		CCR Surface Impoundments	
	Existing	New & Lateral Expansions	Existing	New & Lateral Expansions
Location Restrictions: uppermost aquifer, wetlands, fault areas, seismic impact zones, unstable areas	X (unstable areas only)	X	X	X
Design Requirements: composite liner, leachate collection & removal system		X	X (liner only)	X (liner only)
Groundwater Monitoring	X	X	X	X
Fugitive Dust Controls	X	X	X	X
Run-on/Run-off Controls	X	X		
Structural Integrity Requirements			X	X
Hydrologic & Hydraulic Capacity Requirements			X	X
Closure Requirements & Post-Closure Care	X	X	X	X
Publicly Accessible Internet Site Requirements	X	X	X	X

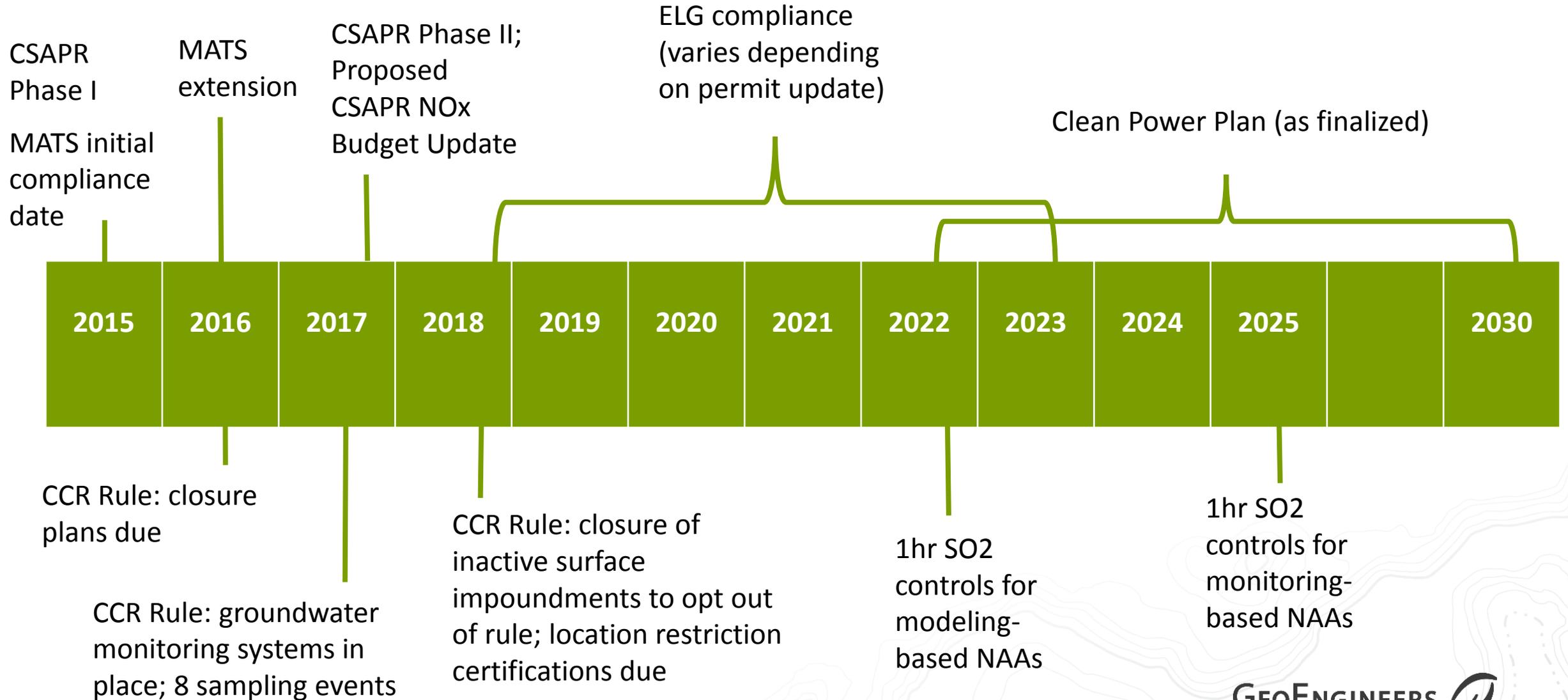
Effluent Limitations Guidelines

- Federal rule revises technology-based effluent limitations guidelines and standards for steam electric power plant discharges
- New requirements for wastewater streams from flue gas desulfurization (FGD), fly ash, bottom ash, flue gas mercury control and gasification of fuels such as coal and pet coke
- Establishes effluent limits
 - Arsenic, mercury, selenium and nitrogen for FGD wastestreams
 - Zero discharge of pollutants in fly and bottom ash transport water
- Effluent limits must be incorporated into plants' National Pollutant Discharge Elimination System (NPDES) permits beginning Nov. 1, 2018 and no later than Dec. 31, 2023

Putting It All Together

- Utility air, water, waste streams are part of an integrated system
- Effective air compliance strategies require consideration of non-air regulations

Timeline



Conclusions

- It's complicated!
- Litigation and other factors have delayed finalization and implementation of many utility air regulations
- Multiple layers of air and non-air regulations impacting utility sector over the next 10+ years
- Need to keep “big picture” of air and non-air regulations in mind to develop cost-effective compliance strategies

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