

REINHOLD ENVIRONMENTAL[®]



2022 Reinhold/PCUG Round Table Presentation

Hosted by Duke Energy in the Charlotte Sheraton/Le Meridien
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Upcoming Landfill Leachate Limits and How to Treat on a Budget

Reinhold Roundtable
Charlotte, NC
28 June 2022

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Agenda

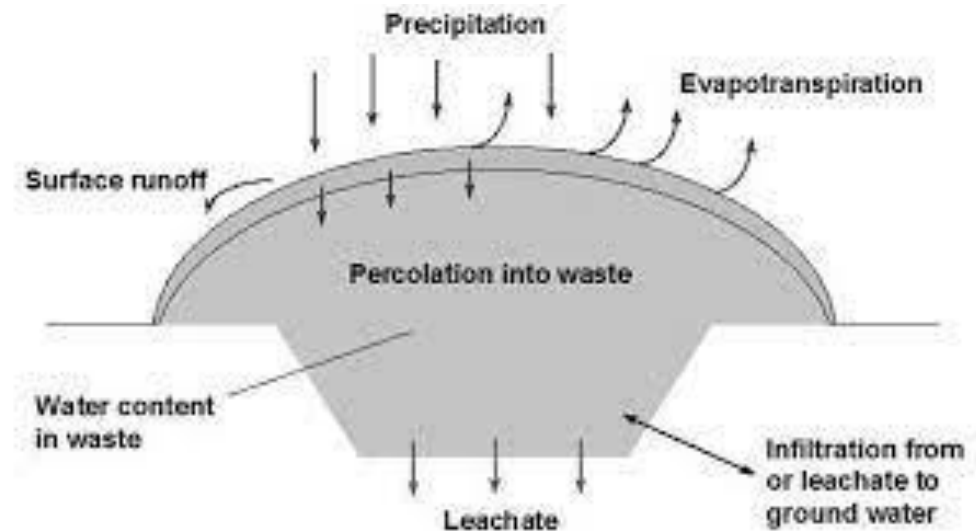
1. What is leachate?
2. Why do we care?
3. Life Cycle
4. Strategic Planning
5. The Future

Leachate?

What is Leachate?

Leachate includes liquid, including any suspended or dissolved constituents in the liquid, that has percolated through or drained from waste or other materials placed in a landfill, or that passes through the containment structure (e.g., bottom, dikes, berms) of a surface impoundment.

EPA revised the definition to make it clear that contaminated stormwater does not fall within the final definition of combustion residual leachate.



Why Do We Care?

Steam Electric Power Generating Effluent Limitation Guidelines

Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category – 40 CFR Part 423 (ELGs)

First published in 1982

| Milestone | Date |
|---------------------------------|-----------------|
| Proposed Revision Published | 2013 ✓ |
| “Final” Rule Published | 2015 ✓ |
| Portions Postponed | 2017 ✓ |
| Proposed Revision Published | 2019 ✓ |
| “Final” Rule Published | 2020 ✓ |
| Reconsideration | 2021 – 2022 ??? |
| The Next “Final” Rule Published | 2023 ??? |



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- Landfill Leachate
- Legacy Wastewaters



2021 ELG Revisions



EPA 2021 Reconsideration of ELGs

- EPA directed to review regulations issued within the past four years to ensure they are aligned with science, adequately protect the environment, and provide equal protection to minority or low-income communities (Exec. Order 13990, 1/20/21)
- EPA announced intent to issue a proposal to revise the ELGs for FGD and BATW if warranted
- EPA to reconsider whether ELGs for FGD and bottom ash transport water are sufficiently stringent or if appropriate to modify



2021 ELG Revisions



EPA 2021 Reconsideration of ELGs

- EPA to address whether membrane technology should be BAT for FGD wastewater instead of phys-chem + bio + UF
- EPA to review the three subcategories (low utilization, retirement, and high flow for FGD systems) to determine if revision needed
- Notice of proposed rulemaking scheduled for Fall of 2022
- During notice and rule making the 2020 ELGs continue to be applicable



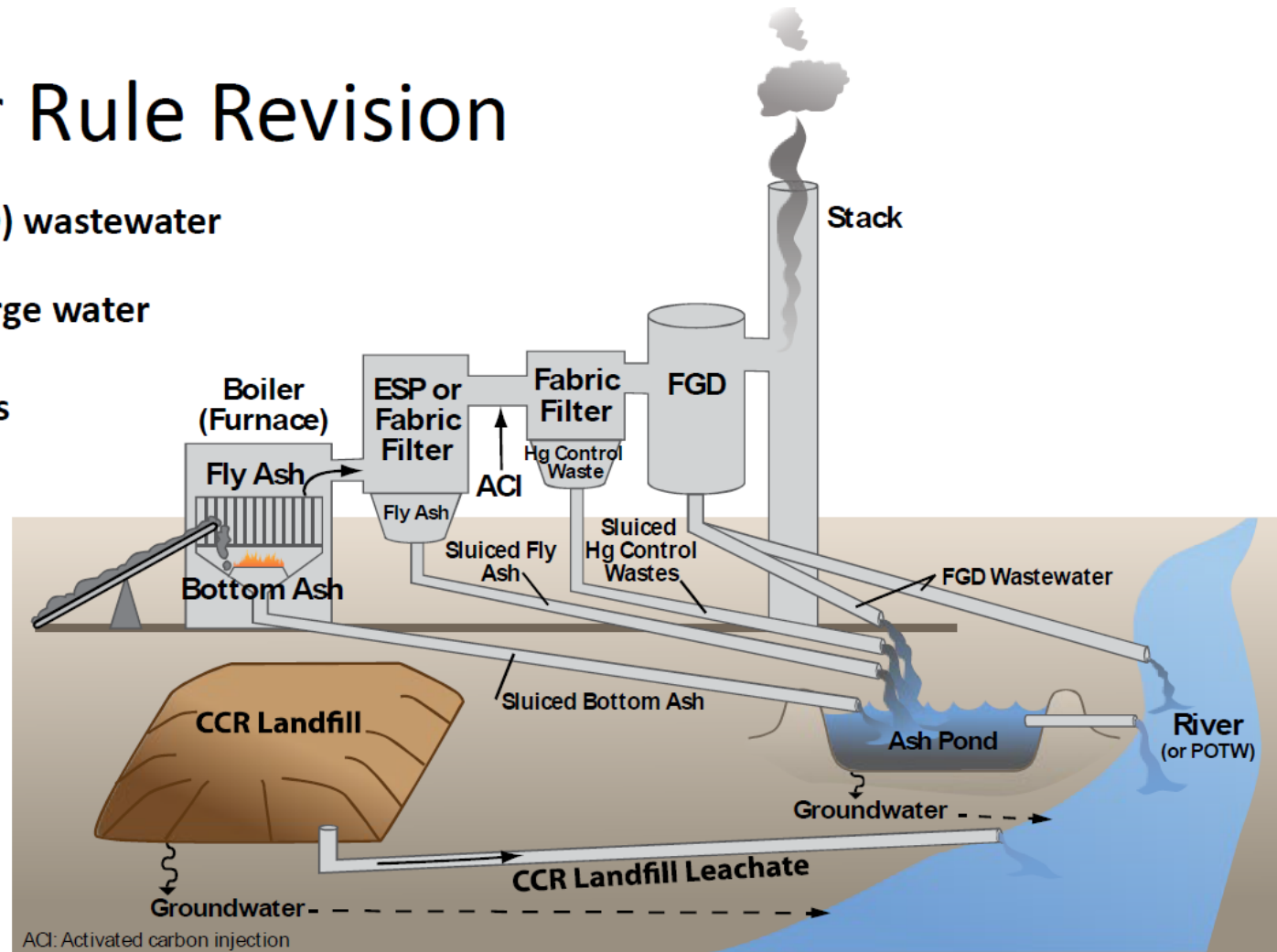
Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (Steam Electric ELG)

Federalism/UMRA Consultation Meeting
January 27, 2022

<https://youtu.be/Qbyasom1-38>

Key Areas for Rule Revision

- 1) Flue Gas Desulfurization (FGD) wastewater
- 2) Bottom ash transport and purge water
- 3) Leachate from ash/FGD ponds and landfills
- 4) Legacy wastewaters (i.e., those generated before the new limitations go into effect)
- 5) Subcategories (i.e., facilities receiving less stringent limitations)



Key Areas for Rule Revision: *Combustion Residual Leachate*

Several Possible New Considerations

1. Zero-discharge requirement based on membrane filtration and/or thermal treatment.
2. Numeric limitations based on chemical precipitation treatment.
3. Grace period for implementation of potentially more stringent limitations.

Several Possible Environmental Benefits

1. Installing zero discharge technologies will remove toxic pollutants, salts and nutrients found in combustion residual leachate.
2. Installing chemical precipitation will only remove some toxic pollutants.
3. More stringent limitations will remove more toxic pollutants.

What Plants are Impacted?

- Per ELG's – active steam cycle generating facilities
- What about retired sites without active generation that still have CCR landfills?



Life Cycle

Will Leachate be Around Longer than Generation?

Leachate volume does not typically tail off for 10+ years after closure.



Coal Fired Unit Retirement/Refueling

- Political Pressure/Public Image
- 2028 Early Retirement Subcategory
- Fuel Availability
- Economics – low gas prices

Coal capacity retirements by year (MW)



Data compiled Jan. 20, 2022.

Planned retirements include those approved by regulatory bodies, and those announced for closure but still pending regulatory approval. Also includes company announcements of broader coal capacity phaseouts.

Announced retirements are compiled on a best-effort basis.

Source: S&P Global Market Intelligence

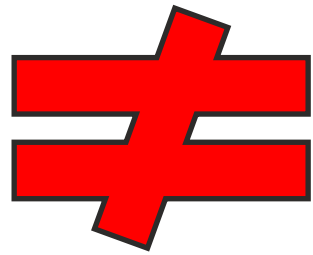
But that was last year...



Leachate Treatment Without Staff?



Regulatory Compliance is Independent of Generation



NPDES
Compliance
&
Monitoring

Strategic Planning

Gather Data



- Identify flow(s)
- Measure flows
- Segregate storm water and other non-leachate flows
- Minimize sources
- Characterize Leachate

SAMPLE
SAMPLE
SAMPLE

Keep the Rain Off!

Cover non-active cells



How Much Rain?

- 25-year/~~24-hour~~ storm?
- 50-year/~~24-hour~~ storm?
- 100-year/~~24-hour~~ storm?



Wrong Questions!

Think Holistically and
Outside the box.

100% Compliance
100% of the time



FGD WWT System?

- Factor in capacity for leachate treatment in new systems
- With lower unit utilization, likely existing FGD WWT has plenty of available capacity
- EQ Tanks are inexpensive
- Turn down capability?

Leachate Recirculation?



Leachate Evaporation?



Leachate Fixation?

Sequester constituents of
concern



Leachate Treatment?

Mobile?
Contract?
Permanent?



The Future



Future of Leachate

- Leachate treatment will be required
- Leachate treatment will likely extend beyond the life of the units
- Leachate treatment will not be passive
- Leachate limits will likely be beyond Low Volume Waste
- Leachate limits will likely be similar to FGD WW
- Time to start planning/acting is now



Questions?