WorleyParsons

resources & energy

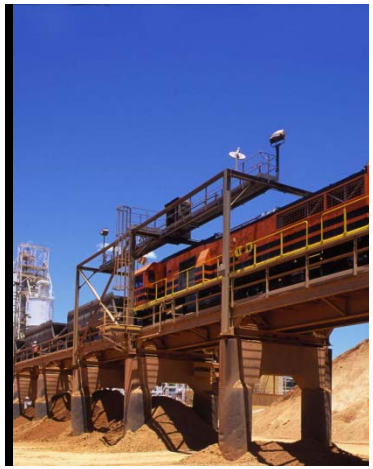
Water Rule Implications for Industrial Facilities

A presentation for CIBO – June 12, 2013

By WorleyParsons

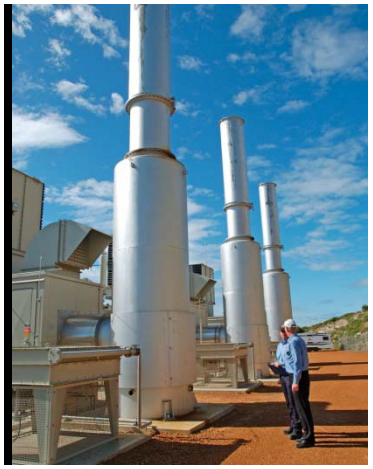
EcoNomics

Organized into Four Customer Sector Groups



Infrastructure & Environment

Resource Infrastructure
Urban Infrastructure
Ports & Marine
Terminals
Water & Wastewater
Transport
Environment



Power

Advanced Coal
Coal
Gas
Nuclear
Renewable Energy
Power Networks

Minerals, Metals, & Chemicals

Base Metals
Coal
Chemicals
Ferrous Metals
Alumina
Aluminium
Iron Ore
Gas Cleaning

Hydrocarbons

Arctic
Gas Processing
Heavy Oil & Oil Sands
INTECSEA
LNG
Onshore Production & Enhanced Oil Recovery
Pipeline Systems
Offshore Topsides
Petrochemicals
Refining
Sulphur Technology
Unconventional Oil & Gas

Clean Water Act – Effluent Limitations and Guidelines

- Effluent Limitations Guidelines for different industries appear in Parts 405 through 471
- So, 40 CFR Part 423 is the Effluent Limit Guidelines for the Steam Electric Generating Industry

Facilities Impacted

- Power plants that use fossil fuel
- Power plants that use nuclear fuel
- Power plants that use fossil fuel derived fuels
- Commercial & Manufacturing facilities with power plants:
  - *As proposed* – **NOT IMPACTED** by 40CFR Part 423
  - *However:* States may take up the banner with Water Quality Based Limits (WQBLs) or establish own limits
- There is a potential for existing small generating units (50 MW or smaller) to be exempt

Wastewater Effluents Impacted

- Flue Gas Desulphurization (FGD) wastewater
- Fly ash transport water
- Bottom ash transport water
- Combustion residual landfill leachate and surface impoundment
- Flue Gas Mercury Control (FGMC) wastewater
- Gasification wastewater
- Non-chemical cleaning wastewaters

How Effluents will be Impacted

- Power plants will need to treat/manage effluents to meet new requirements for metals, nutrients, and total suspended solids (TSS) limits in wastewater.
- Need to manage these effluents at point of generation, i.e., no comingling
- Notable items to be regulated:
  - Selenium, mercury, and arsenic for FGD
  - Mercury and arsenic for Ash landfill leachate
  - Fly ash transport water and FGMC wastewater will have zero discharge limits
  - Bottom ash may also have zero discharge limits

Impacts on Regulated Contaminant List

- Take NOTICE – EPA collected much data regarding Power Plant Effluents and published it
- This data was used to draft the proposed regulation
- That study identified MANY pollutants present;
- Consider Se, As, and Hg to be the shortlist and expect to be regulated on other chemicals and elements such as:
  - Boron
  - Vanadium
  - Chromium
  - Zinc
  - Etc., etc., etc.

Proposed changes
FGD Example Limits

- For example, proposed new limits for FGD wastewaters are:

Pollutant or Pollutant Property		**BAT Effluent Limitations**	
		Max for any 1 day	Average Daily Values for 30 Consecutive Days Shall Not Exceed
Arsenic, total	(ug/L)	8	6
Mercury, total	(ng/L)	242	119
Selenium, total	(ug/L)	16	10
Nitrate/nitrite as N	(mg/L)	0.17	0.13

A Big Impact - Proposed changes to **BAT for FGD**

- Physical/Chemical Systems:
  - Arsenic and Mercury removal with chemical precipitation systems
- Anaerobic Biological Systems:
  - Se – really targeting dissolved Se
- Need to manage separately

Another Potential Big Impact
Zero Discharge

- There is significant interest in pushing power plants to “zero discharge” systems
- Installing and operating zero liquid discharge systems is technically possible
- Many industries do this and incorporate water re-use
- EPA is seeking zero discharge limitations as technology becomes less expensive and more common

Impacts on Dischargers to POTWs

- This rule sets limits on metals being discharged to POTWs for specific waste streams
- Limits are so low, effectively meeting them would mean no need to discharge to POTW
- Now What?
  - Discharge to surface water?
  - Water-re-use?
  - Discharge “clean-water” to POTW
  - Isolate the newly regulated waste streams so your boiler blow down can keep going to POTW?

Increased challenge:
Sample Collection and Analysis

- Sample and Analysis Methods are Critical to Compliance
- Proposed regs describe new methods
- Low-level Hg testing is very difficult
- Requires **Sufficiently sensitive analytical method:**
  - **“**means a method that ensures the sample-specific quantitation level for the wastewater being analyzed is at or below the level of the effluent limitation”
- May need to try some new labs, manage multiple labs, expand your sampling program, incur higher risk of non-compliance until you establish your new sampling and analytical program

Proposed changes
CCR Management Requirement

- Manage and Treat Leachate from Coal Combustion Residual (CCR) Landfills
- Manage and Treat Discharge from CCR Surface Impoundments
- “New” inspection requirements to appear in NPDES Permits
  - Annual inspections
  - Monitoring wells
  - Annual reports
- Coordinated with Mine Safety and Health Administration (MSHA) and other agencies responsible for integrity of dams, dikes, etc.

Impacts of **CCR Management Requirement**

- Possibly new monitoring program for leachate and surface impoundments
- Treat or ship leachate off site for disposal
- Potentially new items in NPDES permit that will need to be tracked and maintained
- State agencies may expand on the requirements
- Closure of wet landfills/ponds

What kind of treatment?

- Anaerobic biological treatment for Se removal
  - Difficult technology with ONE commercialized proven system in the Power market place
  - This will impact cost and schedule until new systems are available
- Physical/Chemical treatment of As and Hg
  - Standard technology but treating to low levels
- Physical/Chemical and Biological treatments may be required for other parameters
  - State Agencies have ability to establish lower limits and specify required treatment

An Impact - Owning and Operating an Effluent Treatment System

- For some power plants this will be a big impact
- Wastewater Treatment plants require trained operators
- Certified/licensed operators maybe required on site 24-hrs/day for some states and treatment systems
- This is different beast than a water treatment plant:
  - more variable water quality to be processed
  - more variable water quantity to be managed
  - Different parameters to manage
- S**t happens!
  - Major rain storm comes through and now system must mange high volume of coal pile runoff!

IMPACT - Operating costs

- Increased Operating Costs:
  - Energy
  - Chemicals
  - Labor
  - Permits
  - Fees
  - Health & Safety
  - Training
  - Solids disposal
  - Maintenance

Actions to Take Now

- Review regulations and comment on them – 60 day comment period
- Conduct an engineering assessment of your water use, including water quality requirements, water quantity, and wastewater characteristics
- Develop a management strategy, recognizing water as a resource

Potential Future Actions

- Isolate and segregate your wastewater effluents to treat them separately
- Close surface impoundments
- Convert FGMC wastewater and fly ash transport water to no-discharge systems
- Develop a wastewater management strategy
- Comply with new discharge limits in your NPDES permit

WorleyParsons

resources & energy

Greg Nadeau, PE — gregory.nadeau@worleyparsons.com
T: 610-855-2136

Dean Ritts, PE, CEM — dean.ritts@worleyparsons.com
T: 832-858-6498

Effluent Limitation Guidelines
Main Acronyms

- BPT - Best Practicable Control Technology Currently Available
- BCT - Best Conventional Pollutant Control Technology
- BAT - Best Available Technology Economically Achievable
- NSPS - New Source Performance Standards
- PSES - Pretreatment Standards for Existing Sources
- PSNS - Pretreatment Standards for New Sources