

Edwardsport – Gasification Wastewater Effluent Limits

Executive Summary

Duke Energy Indiana owns and operates the Edwardsport IGCC Station, an integrated gasification combined cycle (“IGCC”) electric generation facility, located in Edwardsport, Indiana. The Edwardsport IGCC Station began commercial operation in June 2013 and is the only operational “IGCC” clean coal plant and one of the most efficient coal plants in the country.

In September 2015, EPA issued the Steam Electric Effluent Limitations Guidelines (ELG) final rule, finalizing limits for IGCC plants that are not achievable, even with the most current, state-of-the-art equipment and which would apply only to Edwardsport. Additional control technology to meet the current ELG limits has not been identified, but could result in the complete replacement of the treatment system, which could cost upwards of \$100M. This is despite the fact that the facility is already environmentally protective, reducing key pollutants to a level lower than that required by federal drinking water standards.

As a result, Duke Energy submitted a variance request to Indiana’s Department of Environmental Management (IDEM) and EPA Region 5 on April 28, 2016, to provide immediate relief from the ELG rule’s overly burdensome limits for Edwardsport. While IDEM supports the variance request, EPA has refused to act on it for nearly one year.

Recommendation

EPA should expeditiously approve Duke Energy’s variance request and the alternative limits proposed in the variance application. If this were to occur, EPA could defer reconsideration of the IGCC issues, as they will be addressed by the variance approval. Duke Energy would then remove the IGCC issues from the consolidated litigation.

This will:

- Prevent the higher bills for electric customers of Indiana by avoiding \$100M for an additional control system that will provide virtually no additional environmental benefit.
- Promote cooperative federalism by deferring to the state’s request for approval of the variance.
- Provide regulatory certainty to Duke Energy and its customers and reduce the regulatory/litigation burden for EPA.
- Protect the country’s only operational IGCC “clean coal” plant.

Background on Edwardsport Facility

Duke Energy's Edwardsport IGCC Station began commercial operation in June 2013 and is one of the most efficient coal plants in the country, utilizing state-of-the-art treatment technology.

Edwardsport was only the third IGCC unit in the country at the time the final ELG Rule was issued: the other two were TECO's Polk Power Station in Florida and Wabash River Station in Indiana. Southern Company's Kemper station is still under construction (anticipated commercial operation April 30, 2017).

Following the finalization of the ELG rule, Wabash Valley Power Association announced IGCC operations would cease at Wabash River. The Polk Power Station does not discharge the gasification wastewater to surface water and therefore the ELG Rule is not applicable. Kemper is also not planning to discharge any gasification wastewater, leaving Edwardsport as the only unit in the country that is affected by these limits.

Highlights of Duke Energy's Variance Application

- ⇒ Discusses and provides references to statements in the final Steam Electric ELGs and the Technical Development Document for the Final ELGs (TDD) identifying evaporation technology as the model technology in treating gasification wastewater. Polk Station, Wabash River IGCC facility, and Edwardsport IGCC facility are identified in the TDD as employing this technology.
- ⇒ Includes succinct descriptions of each of the three facilities' gasification wastewater processes and treatment to **emphasize the fundamental differences** between the units.
 - Differences in fuels (and fuel constituents used)
 - Differences in preliminary cooling and cleaning of syngas
 - Differences in the type and configuration of the evaporative processes employed in treatment of gasification wastewater
- ⇒ The **need for an FDF variance** is shown by a comparison of monitoring data from mainly 2015 for the gasification wastewater generated by the Edwardsport IGCC facility with the BAT ELGs for gasification wastewater. Edwardsport IGCC Station cannot meet the ELGs for mercury or TDS. Arsenic limits could be problematic as well.
- ⇒ **Data Exclusions and Calculation of Limitations (Synopsis):**
 - Wabash data for arsenic and mercury were excluded from consideration by EPA since that data failed EPA's long-term average test.
 - Also, because EPA concluded that the data collected from the forced circulation (crystallizer) evaporator condensate at Polk did not demonstrate pollutant removal rates considered well treated by evaporation, EPA rejected use of the crystallizer condensate data from Polk in setting ELGs.
 - Thus, the ELGs for arsenic and mercury in gasification wastewater were determined from only four samples from the falling film evaporator at Polk.
 - EPA was unable to compare weekly sampling to the monthly average limitations since Polk's gasification wastewater was not sampled frequently enough.
- ⇒ **Compliance Costs:** EPA concluded that there would be no capital compliance costs associated with the ELGs for gasification wastewater since all IGCC plants currently operate

what they consider the Best Available Technology (BAT) treatment system – evaporation technology. Duke believes that this conclusion was reached prematurely and with inadequate information.

Timeline of Events

- 2010-2012 EPA collected data to inform the proposed rule
- April 19, 2013 EPA issued a proposed rule to revise the technology-based effluent limits
- June 2013 Edwardsport began commercial operation
- Sept. 19, 2013 Duke submitted comments on rule, which included comments on the IGCC gasification wastewater limits
- Sept. 29, 2015 Duke met with OMB to discuss IGCC limits
- Sept. 30, 2015 EPA issued final rule to meet a court-ordered deadline
- Nov. 10, 2015 Wabash River news release that they were shutting down their IGCC unit
- Nov. 19, 2015 UWAG filed legal challenge to the rule which included IGCC limits
- March 16, 2016 Duke Energy Indiana files separate legal challenge to IGCC limits
- April 28, 2016 Duke submitted the Fundamentally Different Factors (FDF) variance request to IDEM and EPA Region 5
- Oct. 4, 2016 IDEM submits letter to EPA Region 5 supporting our variance request, including the proposed limits
- Oct. 28, 2016 Administrative deadline for EPA to rule on variance request - 180 days from application filing [CWA Section 301(n)(3)]
- Dec. 2016 & Jan. 2017 EPA HQ requested additional data for variance request – Duke submitted info shortly after requests
- March 24, 2017 UWAG submitted Petition for Reconsideration of ELG Rule

Proposed Alternative ELG Limits

	Final ELG IGCC Limits ¹		Current Permit ² – Interim Limits		Variance Proposed Limits	
	Monthly Avg	Daily Max	Monthly Avg	Daily Max	Monthly Avg	Daily Max
Arsenic	--	4 µg/l	report	report	--	8 µg/l
Mercury ³	1.3 ng/l	1.8 ng/l	report	report	12.4 ng/l	30 ng/l
Selenium ⁴	0.227 mg/l	0.453 mg/l	report	report	0.227 mg/l	0.453 mg/l
Total dissolved solids (TDS)	22 mg/l	38 mg/l	report	report	36 mg/l	78 mg/l

¹ Edwardsport Permit currently has an applicability date for the final ELG limits of April 1, 2021.

² Edwardsport NPDES permit was renewed last year and included the new ELG limits for IGCC wastewater – effective date of permit is April 1, 2016.

³ Mercury ELG limit is below drinking water standard of 2 ng/l (ng/l also known as ppt - parts per trillion); Ohio River’s water quality limit is 12 ppt.

⁴ No limit change requested for selenium.