

Covanta Durham York Renewable Energy Limited Partnership

Acceptance Test Report

Executive Summary



November 2015

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Acceptance Test – Executive Summary

In accordance with the Acceptance Test Protocol agreed to by the Regions, its Consulting Engineers – HDR, and Covanta Durham York Renewable Energy Limited Partnership (Covanta), tests were performed at the Durham York Energy Centre from September 27 through November 9, 2015, for the purpose of demonstrating the Reliability, Throughput Capacity, Energy Production, Residue Quality & Quantity, Metals Recovery, and Environmental Compliance as set forth in the Project Agreement, by and between The Regional Municipality of Durham and The Regional Municipality of York as Owner and Covanta Durham York Renewable Energy Limited Partnership, as DBO Contractor (Covanta).

The test results are summarized in the table below.

Test	Test Requirements	Frequency/ Duration	Test Result
30-Day Reliability Test	Operation at a minimum boiler availability of 95% while operating at a minimum of 95% of design steam flow.	One 30-day test	This result passes the test requirement. Operated for 30 Days at 99.9% boiler availability averaging of 101.6% of design steam flow.
Throughput Capacity Test	Operation of the Facility at full load for 5 consecutive days to demonstrate compliance with the Throughput Guarantees in Exhibit 2 to Appendix 19.	One 5-day test	This result passes the test requirement. During the consecutive 5-day test period, at an average Waste HHV of 13.2 MJ/kg, processed 2,257 actual tonnes of Waste.
Energy Recovery Test	Demonstrate compliance with the Electricity Production Guarantees in Exhibit 2 to Appendix 19.	Minimum of 3 tests. Each test shall be a minimum of 8-hour duration (performed during the Throughput Capacity Test)	Both results pass the test requirement. During 5, 8-hour periods, generated electricity on a gross and net basis of 961.1 and 840.5 kWh/tonne of Waste processed, respectively.

Test	Test Requirements	Frequency/ Duration	Test Result
<p>Residue Quality Test</p>	<p>Residue Quality (bottom ash only) meeting Performance Guarantees for moisture content of less than or equal to 25%, unburned carbon of less than or equal to 3% during the Energy Recovery Tests and Throughput Capacity Tests.</p>	<p>5-day test measured during the Throughput Capacity Test period.</p>	<p>Both results pass the test requirement.</p> <p>Moisture: Generated Residue (Bottom Ash) with an average of 16.3% moisture by weight.</p> <p>Unburned Combustible: Generated Residue (Bottom Ash) with less than 0.8% unburned combustible by dry weight.</p>
		<p>8-hour test measured during the Throughput Capacity Test period.</p>	<p>Both results pass the test requirement.</p> <p>Moisture: Generated Residue (Bottom Ash) with an average of 17.3% moisture by weight.</p> <p>Unburned Combustible: Generated Residue (Bottom Ash) with less than 0.8% unburned combustible by dry weight.</p>

Test	Test Requirements	Frequency/ Duration	Test Result
<p>Residue Quantity Test</p>	<p>Residue Quantity meeting Performance Guarantee for the total Residue (including bottom ash and fly ash) weighing not more than 30% of the Tonnage combusted to produce such Residue during the 30-day Reliability Test and 5-Day Throughput Capacity Test, adjusted for the waste HHV in accordance with Table A10-2.</p>	<p>Measured during the 30-Day Reliability Test</p>	<p>This result passes the test requirement.</p> <p>During the 30-Day test period, produced Residue (Bottom Ash and Fly Ash) at 26.7% of Waste processed.</p>
		<p>Measured during the 5-Day Throughput Capacity Test.</p>	<p>This result passes the test requirement.</p> <p>During the consecutive 5-Day test period, produced Residue (Bottom Ash and Fly Ash) at 26.5% of Waste processed.</p>
<p>Metals Recovery Test</p>	<p>The ferrous and non-ferrous recovery systems to be tested to demonstrate the Metals and Other Metals Recovery Guarantees specified in Exhibit 2 to Appendix 19.</p> <p>(80% or greater ferrous recovery; 60% or greater non-ferrous recovery)</p>	<p>Minimum of 3, 8-hour tests on each system</p>	<p>Both results pass the test requirement.</p> <p>Ferrous:</p> <p>Recovered more than 87.8% of all magnetic ferrous metals.</p> <p>Non-Ferrous:</p> <p>Recovered more than 84.7% of all plus 10 mm (+3/8") non-ferrous metals.</p>

Test	Test Requirements	Frequency/ Duration	Test Result
<p>Environmental Compliance Test</p>	<p>The testing of all emission and operating parameters in accordance with requirements established by the ECA and the MOECC anytime during the 30-day Reliability Test.</p>	<p>Frequency and duration for each respective parameter is dictated by the Source Test Plan, the Ash Sampling and Testing Plan, the Odour Source Test Plan and the Noise Monitoring and Reporting Plan all as approved by the MOECC and respective requirements established by the ECA.</p>	<p>See summary rows below and referenced reports.</p>
	<p>CEM The CEMS shall be certified and used to demonstrate continuous compliance during the Test Period with all CEMS emission parameters.</p>	<p>Completed prior to the start of the Acceptance Test Period.</p>	<p>This result passes the test requirement.</p>
	<p>Air Source Emissions (In-Stack) Successful completion of stack test for each combustion unit in accordance with Schedule E (Source Testing Procedures) of ECA.</p>	<p>Frequency and duration established by the Source Test Plan</p>	<p>These results pass the test requirements. Results from all parameter test groups, particulates, metals, semi-volatile organic compounds, aldehydes, acid gases, volatile organic compounds demonstrated compliance with their respective Schedule C (Performance Requirements) of ECA. Detailed results are presented in ORTECH Report No. 21546-1.</p>

Test	Test Requirements	Frequency/ Duration	Test Result
	<p>Air Source Emissions (Out-of-Stack) Assess DYEC emissions against point of impingement criteria against Ontario Regulation 419/05.</p>	<p>Frequency and duration established by the Source Test Plan</p>	<p>This result passes the test requirement. Detailed results are presented in ORTECH Report No. 21546-1.</p>
	<p>Acoustic Audit Acoustic Audit Report is established by ECA condition 7.(5) and the Noise Monitoring and Reporting Plan (NMRP) as approved by the MOECC.</p>	<p>Representative acoustic monitoring data for a minimum of one week shall be collected at a minimum of 3 points of reception established by the NMRP.</p>	<p>This result passes the test requirement. DYEC sound emissions are not audible at the established point of receptions and are within the limits established by the MOECC in publication NPC-205 and NPC-300. See Valcoustics Canada LTD report 114-318-100 for more detailed results.</p>
<p>Residue Test Report (Fly Ash)</p>	<p>Test requirement established by the Ash Sampling and Testing Plan as approved by the MOECC to demonstrate that conditioned fly ash does not exceed toxic leachate criteria for all O. Reg 347 Schedule 4 parameters.</p>	<p>A single 5-day sampling program which collected composite shift samples with a minimum of 3 subsamples analyzed per day during the Acceptance Test Period. The 5-day sampling and testing program was repeated to demonstrate acceptable criteria of all Schedule 4 parameters for two different fly ash formulations to condition fly ash.</p>	<p>These results pass the test requirements. Both 5-day sampling programs demonstrated that no O. Reg 347 Schedule 4 parameters exceeded leachate toxic criteria. See the attached report Covanta 4060.</p>

Test	Test Requirements	Frequency/ Duration	Test Result
<p>Residue Test Report (Bottom Ash)</p>	<p>Test requirement established by the Ash Sampling and Testing Plan as approved by the MOECC to demonstrate that generated bottom ash meets the criteria of Incinerator Ash as defined by O. Reg 347.</p>	<p>A single 5-day sampling program which collected composite shift samples with a minimum of 3 subsamples analyzed per day during the Acceptance Test Period.</p>	<p>All test results from the 5-day sampling program demonstrated that generated bottom ash meets the criteria of Incinerator Ash as defined by O. Reg 347. See the attached report Covanta 4060.</p>