



NOx Emissions from Boilers and Heaters

Document Number: ECS0303A	Standard – Administrative	Applies To: Operations
Revision Date: 2015/12/17 Revision: 7 Review Cycle: 3 Years	Document Owner (Title): Director, Regional & Regulatory Compliance	

Summary of Changes

Rev No.	Section Changed	Revision Made
7	Document	1) Suncor Regulatory and Environment organizational changes 2) Regulatory agency changes 3) Governance Document Framework requirements 4) Usability mapping requirements 6) Framework created for regionalizing this standard.

Summary of Equivalent RC Tool Tasks in Document

Rev No.	Section	Equivalent Tasks
7	2.1	Equivalent to Fort Hills RC Task 20973
7	2.2	Similar to Fort Hills RC Tool tasks 31817, 31814, and OS Task 39390
7	2.6	Equivalent to RC Tool Task 36557 for all equipment.
7	2.7	Equivalent to RC Tool Task 36557, Firebag task 36309, MR task 31436
7	3.2	Equivalent to RC Tool Tasks - OS 38166, MR 31744, Firebag 38913.

Scope This standard addresses the operation of industrial boilers and heaters at Oil Sands, Fort Hills, Firebag, and MacKay River with respect to NOx Emissions.

Purpose To set the minimum environmental requirements for operating and monitoring new and retrofitted commercial/industrial boilers and heaters in order to meet the requirements of CCME’s National Emission Guideline for Commercial/Industrial Boilers and Heaters, the Continuous Emissions Monitoring System Code, REF. 107, Alberta Environment, and Suncor’s Environmental Operating Approvals.

Compliance On the date noted on the signature page, compliance to standard is applicable to the following business areas:

- Oil Sands
- Fort Hills
- Firebag
- MacKay River.

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Approved By: Sheila Chernys, Director, Regional & Regulatory Compliance

Roles and Responsibilities

The following individuals and groups have the following roles and responsibilities:

- Document Owner**
- Ensures this document is reviewed according to the required revision cycle.
 - Ensures the document is updated to accommodate changes to Suncor, provincial, and federal regulation.
 - Ensures the document is updated to mitigate risks found as the result of an incident.
- Document Approver**
- Ensures this standard is necessary and that it aligns with management and company direction.

References

- [ECS0107A Sampling, Monitoring, Reporting and Plant Modifications](#)
- [ECS0108A Environmental Reporting Requirements and Accountabilities](#)
- [ENP0001A Environmental Incident Reporting](#)
- [CEMS Code \(1998\)](#)
- *National Emission Guidelines for Commercial/Industrial Boilers and Heaters*, CCME, March 1998
- *Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-Fired Boilers*, Environment Canada, 1990.

Terms, Definitions and Acronyms

The following terms, definitions and acronyms are used in this standard:

AER	Alberta Energy Regulator
CEM	Continuous Emissions Monitor
CGA	Cylinder Gas Audit, as defined by the CEMS Code
CEMS Code	Continuous Emissions Monitoring System Code, 1998 REF. 107, Alberta Environment, as amended
Downtime	The period of time when equipment is not effectively functioning due to breakdown, repair, calibration, servicing, maintenance or replacement of any of its components.
EPEA	Environmental Protection and Enhancement Act
Manual Stack Survey	A survey conducted in accordance with the <i>Alberta Stack Sampling Code</i> , as amended.
QAP	Quality Assurance Plan
RATA	Relative Accuracy Test Audit, as defined by the CEMS Code.

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Standard**1. Operating Requirements**

- | Item | Description |
|------|---|
| 1.1 | Follow ECS0107A Sampling, Monitoring, Reporting and Plant Modifications to comply with all environmental operating requirements. |
| 1.2 | Suncor may emit effluent NOx streams to the environment through the furnaces and heaters approved in each site's specific Operating Approval. |
| 1.3 | NOx emissions (as nitrogen dioxide) in units of g/GJ from new (or retrofitted) boilers or heaters, according to primary fuel shall not exceed the following limits. |

Capacity		NOx Emission Limit (g/GJ)**			
GJ/hr	MMBtu/hr	Gaseous Fuel	Distillate Oil	Residual Oil <0.35% Nitrogen	Residual Oil ≥0.35% Nitrogen
10.5 – 105	10 – 100	26	40	90	110
> 105	> 100	40 (.0932lbs/ MMBtu)	50	90	125

- 1.4 The emission limit for carbon monoxide for all boilers or heaters is 125 g/GJ of CO.
- 1.5 The continuous emissions monitoring (CEM) equipment on the furnaces must operate for at least ninety percent of the time in a month in which the effluent is discharged from the monitored stacks.
- Note:** Follow [ENP0001A Environmental Incident Reporting](#) for required reporting when downtime resulting in less than ninety percent availability occurs.
- 1.6 Follow [ECS0107A Sampling, Monitoring, Reporting and Plant Modifications](#), the CEMS Code and appropriate QAP documents for stack CEMS operations and maintenance requirements.

2. Measurement and Monitoring Requirements

- | | Item | Description |
|----------------------------|------|--|
| Initial Verification Tests | 2.1 | Upgrading and Energy & Utilities (or other responsible group) must complete an <i>initial verification test</i> by performing a <i>manual stack survey</i> on all new boilers and heaters with capacities between 10.5 and 105 GJ/hr (10 and 100 MMBtu/hr) |

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Item	Description
2.2	<p>Upgrading and Energy & Utilities (or other responsible group) must complete an <i>initial verification test</i> plus an <i>annual assessment</i> by performing a <i>manual stack survey</i> on all new boilers and heaters with capacities between 105 and 264 GJ/hr (100 and 250 MMBtu/hr).</p> <p>Note: At Oil Sands this requirement applies to furnaces 52F-101A, 52F-101B, 57F-1A, 57F-1B, 57F-2A, and 57F-2B.</p>
2.3	<p>Upgrading (or other responsible group) must complete an <i>initial verification test</i> plus four <i>annual assessments</i> by performing four <i>manual stack surveys</i> per year on selected furnaces.</p> <p>Note: At Oil Sands this applies to furnaces 52F-300, 52F-301, and 52F-102.</p>
Manual Stack Surveys	<p>2.4 Manual stack surveys shall be conducted under normal operating conditions at an operating level of at least ninety percent of average production or throughput for the facility over the previous month or as otherwise authorized by Alberta Energy Regulator (AER).</p> <p>2.5 Manual stack verification tests should be conducted using an automated system.</p> <p>Note: Must meet the monitoring methodology specified in PS1/RM/15, <i>Reference Method for the Monitoring of Gaseous Emissions from Fossil Fuel-Fired Boilers</i>, Environment Canada, 1990.</p>
Minimum Requirements for Manual Stack Testing	<p>2.6 Upgrading and Energy & Utilities (or other responsible group) shall ensure all required manual stack testing is completed.</p> <p>As specified in Suncor's EPEA Operating Approval for each stack, the four manual stack surveys requirement includes, as a minimum, two Relative Accuracy Test Audits (RATAs) and two additional Compliance Tests.</p> <p>As specified in the CEMS Code, the analyzer test requirement includes, as a minimum, two RATAs and two Cylinder Gas Audits (CGAs).</p> <p>Note: In both cases RATAs can be used to meet the requirements of the other tests, although a minimum of two RATAs must be performed each year.</p> <p>2.7 Upgrading and Energy & Utilities (or other responsible group) must maintain a current and accurate Quality Assurance Plan (QAP) for the CEMS equipment that meets the requirements of the CEMS Code.</p> <p>Regional Compliance Reporting is responsible for coordinating an annual third party audit of the QAP each calendar year.</p> <p>Note 1: Findings to be included in the Annual Air Report.</p> <p>Note 2: Audit findings to be maintained for a minimum of 10 years.</p>

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3. Reporting Requirements

Item	Description
3.1	Follow ECS0108A Environmental Reporting Requirements and Accountabilities for all required reporting of monitored stream parameters. Note: For inclusion in the Monthly and Annual Air Report.
3.2	Suncor shall notify the AER in writing of all planned manual stack surveys. Note 1: Upgrading and Energy & Utilities (or other responsible group) are responsible for notifying Environmental Affairs a minimum of two weeks prior to the event. Note 2: Suncor Environmental Affairs is responsible for communicating the request to the AER a minimum of two weeks prior to the event.
3.3	Follow ENP0001A Environmental Incident Reporting for all failures to complete required monitoring.

4. New Construction and Design Requirements

Item	Description
4.1	All stacks on boilers and heaters greater than 10.5 GJ/hr shall be designed to accept NOx monitoring ports.
4.2	NOx monitoring ports shall meet design specifications of the Alberta Stack Sampling Code, including placement in a preferably vertical length of stack such that it is at least 8 stack diameters downstream and a minimum of 2 stack diameters upstream from any flow disturbances such as a bend, expansion, or contraction.
4.3	Before construction of all new boilers and heaters, which have a capacity equal to or greater than 10.5 GJ/hour of energy input, the following details must be submitted to the AER for approval: <ol style="list-style-type: none">Stack dimensionsPredicted emissionsDemonstrated conformance with the requirements prescribed in <i>National Emission Guidelines for Commercial/Industrial Boilers and Heaters</i>, CCME, March 1998 or emission limits as established and adopted by AER.Written authorization from the Director permitting construction.

End of Standard

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The following individuals have approved and signed this document.

UserName: Sheila Chernys (schernys)

Title: Dir OS Enviro & Reg

Date: Thursday, 14 January 2016, 08:09 AM Mountain Time

Meaning: Approver 1 Signed

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