

US EPA ARCHIVE DOCUMENT



FPL Energy

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June 29, 2007

Mr. Donald Dahl
US EPA, Region 1
One Congress Street
Boston, MA 02114-2023

**Subject: Startup and Shutdown Limits
Bellingham Cogeneration Facility**

Dear Mr. Dahl:

The Bellingham Cogeneration Facility ("the Facility") requests that the following limits on the combustion turbines be incorporated into the PSD permit as part of the fuel oil flexibility application that EPA is currently processing:

- Startup
 - NO_x average of 865 pounds per hour over a 2-hour period
 - CO average of 1000 pounds per hour over a 2-hour period
 - VOC average of 80 pounds per hour over a 2-hour period
- Shutdown
 - NO_x average of 1080 pounds per hour over a 2-hour period
 - CO average of 1000 pounds per hour over a 2-hour period
 - VOC average of 80 pounds per hour over a 2-hour period

Actual emissions from the turbines are compared to these limits at a common stack location. These limits have already been incorporated into the 310 CMR 7.02 air plan approval letter (#W081465-A1) issued by the Massachusetts Department of Environmental Protection ("MassDEP") on 1/11/07. The NO_x and CO limits are also in the initial Operating Permit (signed 7/9/02).

As you requested, a sample of recent startup and shutdown NO_x and CO pounds per hour data is presented in Attachment 1. The data set includes the cold startups that occurred since May 2006 and all of the startups that occurred during the first four months of 2007. The data set only includes gas-fired startups and shutdowns since representative oil-fired data is not yet available.

The normal startup procedure in place during this data set staggers the time in which each combustion turbine lights off. The second combustion turbine does not light off until the steam turbine has been warmed up and is ready to accept the additional steam (typically at least two

hours after the first combustion turbine); otherwise, if both combustion turbines started at once, the surplus steam generated would have to be sent to the air cooled condenser as wasted energy. As a result of the staggered startups, actual mass emission rates are generally well below the startup permit limits. However, this will not always be the case. The Facility used to start both combustion turbines concurrently. The Facility would revert back to this procedure under the following two scenarios:

1. In the event of an emergency, the Facility may be directed by the ISO to generate the most MW as soon as possible, in which case the Facility would be required to start both combustion turbines concurrently
2. If the steam turbine generator was damaged and/or down for repairs, the combustion turbines would be capable of operating in simple cycle mode, in which case both combustion turbines could be started concurrently.

Another reason why the current startup and shutdown limits are appropriate is that fuel oil is expected to result in higher NO_x, CO and VOC emission rates than on gas. Representative oil-fired startup and shutdown data was not available when the limits were initially developed.

You have also indicated that EPA intends to include startup and shutdown concentration limits in terms of pounds per million British thermal units (lb/MMBtu). Proposed concentration limits were derived by dividing the mass-based startup and shutdown limits by an average heat input rate during a startup or shutdown. The average heat input rate was estimated to equal half of the units' maximum rated heat input capacity (i.e. $(0 \text{ MMBtu/hr} + 2560 \text{ MMBtu/hr}) / 2 = 1280 \text{ MMBtu/hr}$). The Facility proposes the following limits:

- Startup
 - NO_x average of 0.676 lb/MMBtu over a 2-hour period
 - CO average of 0.781 lb/MMBtu over a 2-hour period
 - VOC average of 0.063 lb/MMBtu over a 2-hour period
- Shutdown
 - NO_x average of 0.844 lb/MMBtu over a 2-hour period
 - CO average of 0.781 lb/MMBtu over a 2-hour period
 - VOC average of 0.063 lb/MMBtu over a 2-hour period

If you have any questions, please feel free to contact Sean Gregory at 978-730-9977 or me at 508-966-4872 x225. Thank you for your attention to this matter.

Sincerely,

JBW
For Peter G. Holzapfel

Peter G. Holzapfel
General Manager

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cc: Thomas Cusson, MassDEP CERO
James White, FPL Energy
Paul Aronian, FPL Energy
Skelly Holmbeck, FPL Energy
Tim Oliver, FPL Energy
Sean Gregory, DSG Solutions, LLC
Bellingham Cogeneration Facility, file copy

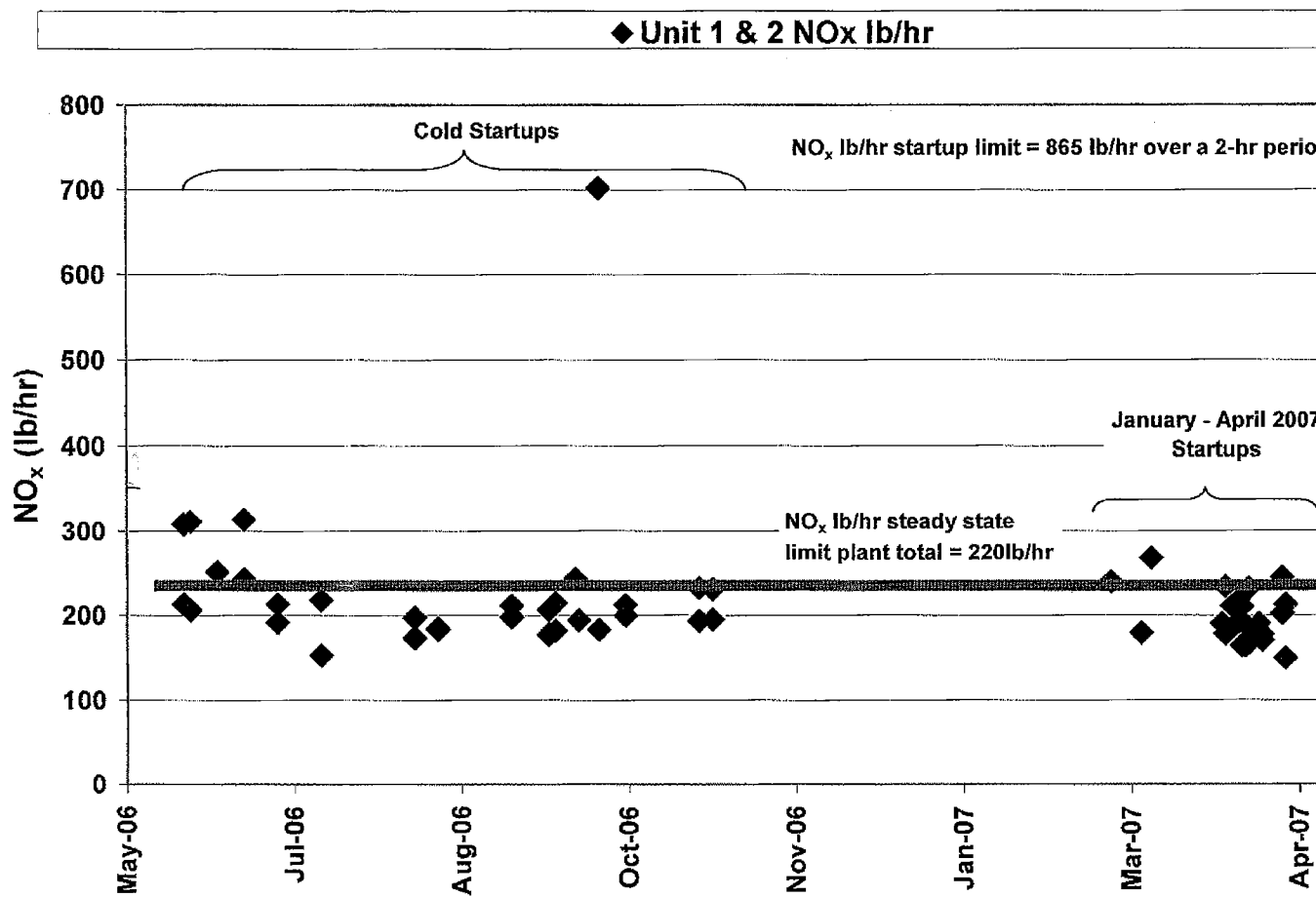
Attachment 1

Startup and Shutdown Data

Attachment 1

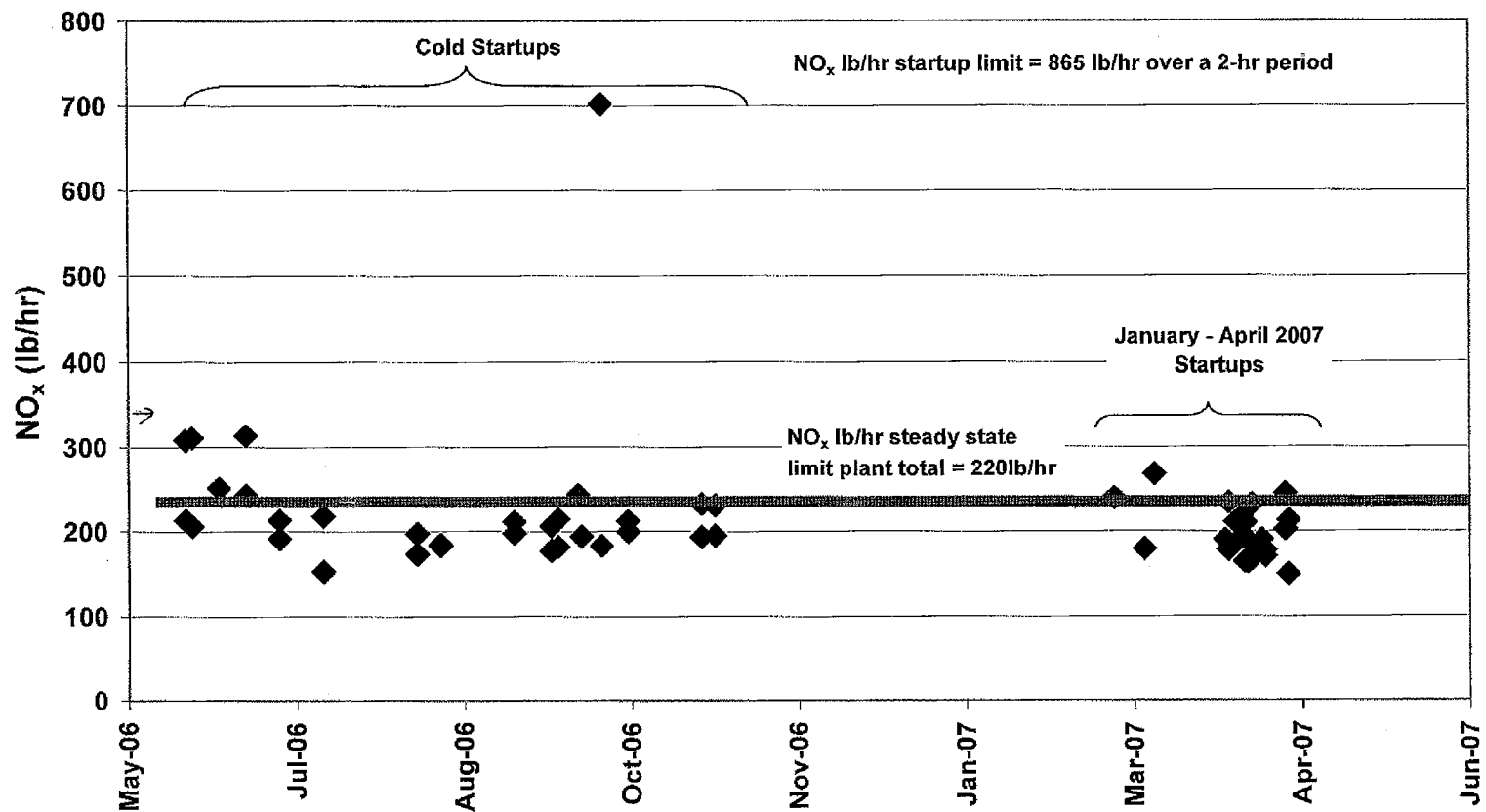
Startup and Shutdown Data

Bellingham NO_x lb/hr Startup Emission Rates

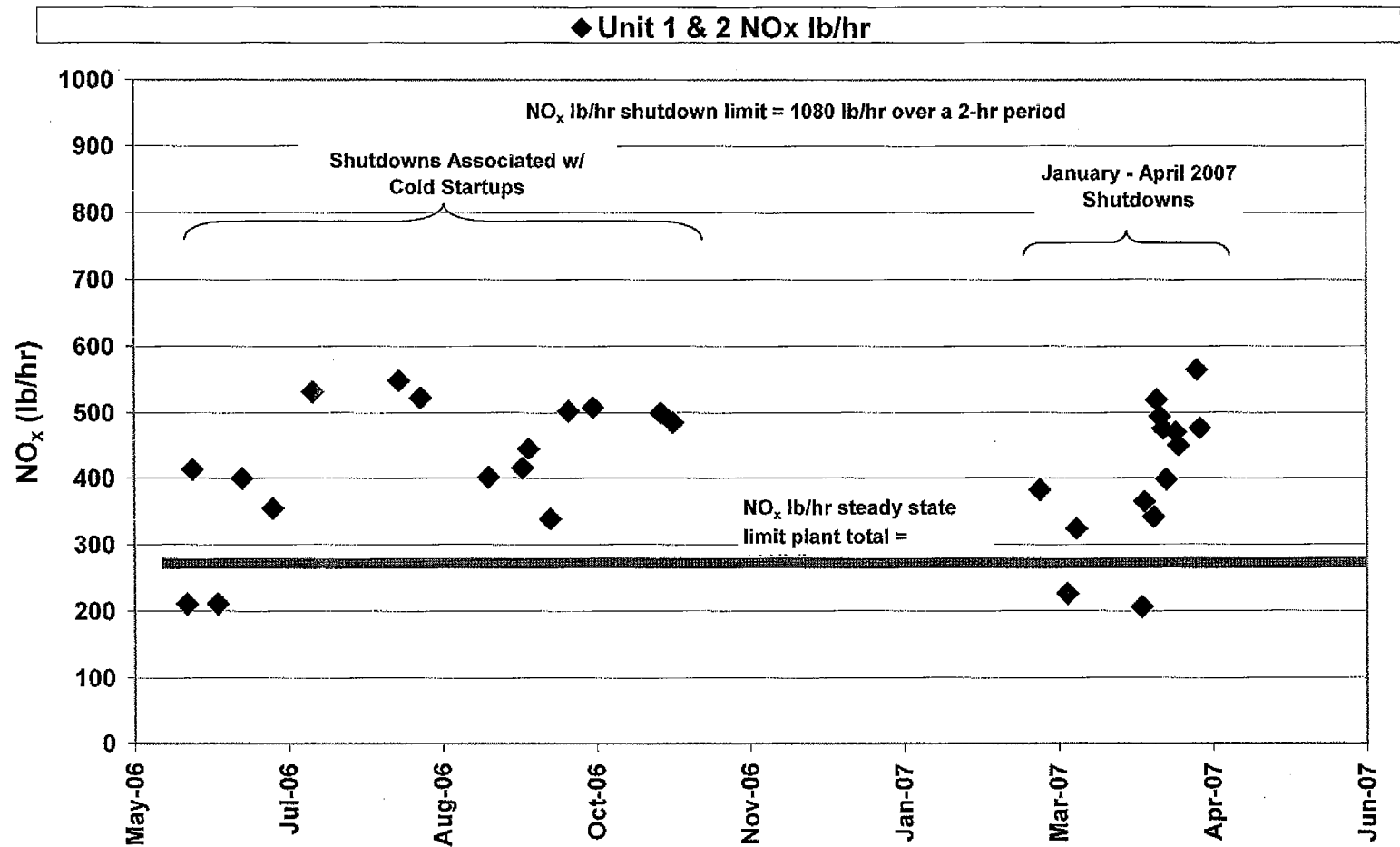


Bellingham NO_x lb/hr Startup Emission Rates

◆ Unit 1 & 2 NO_x lb/hr

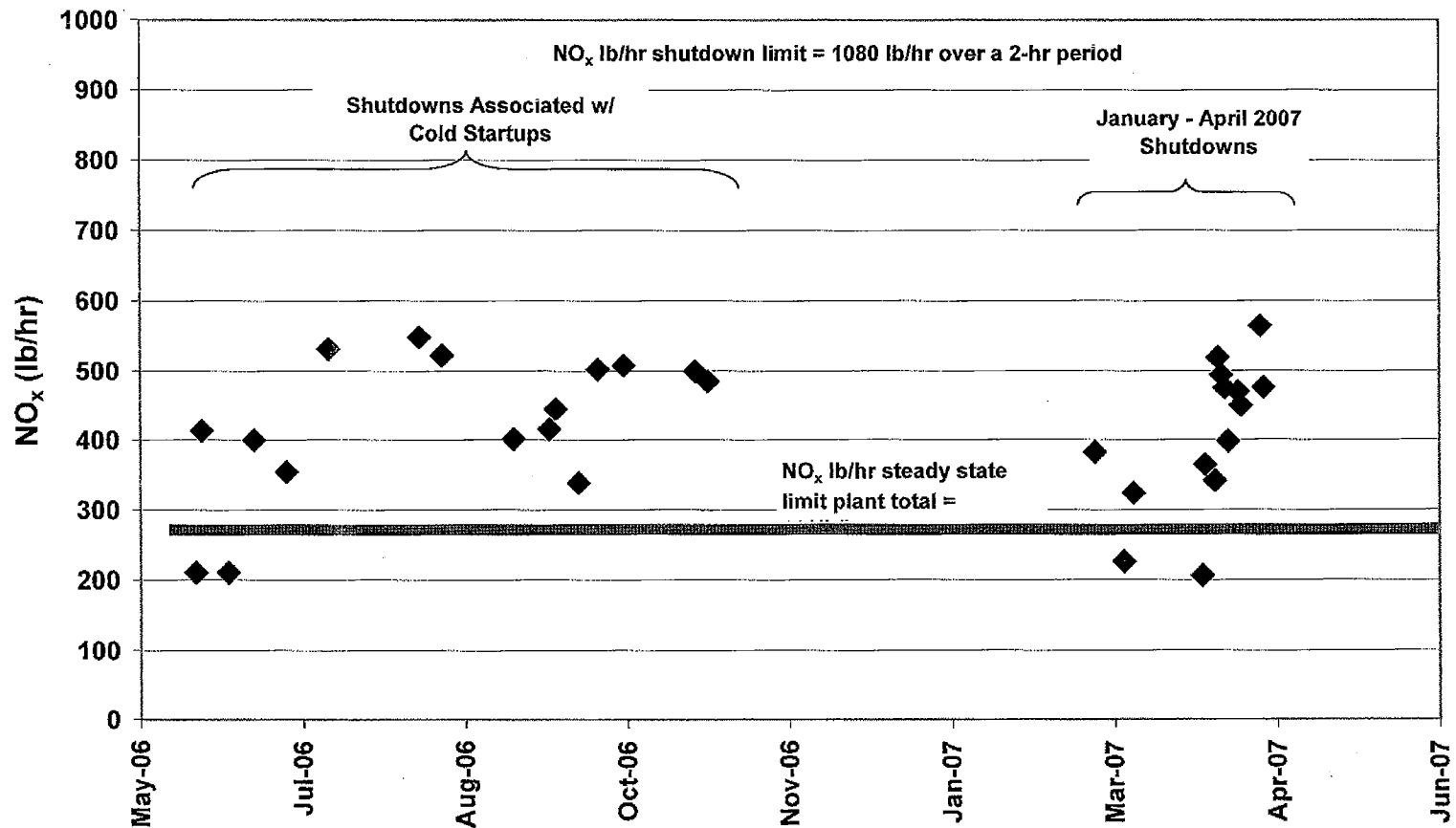


Bellingham NO_x lb/hr Shutdown Emission Rates



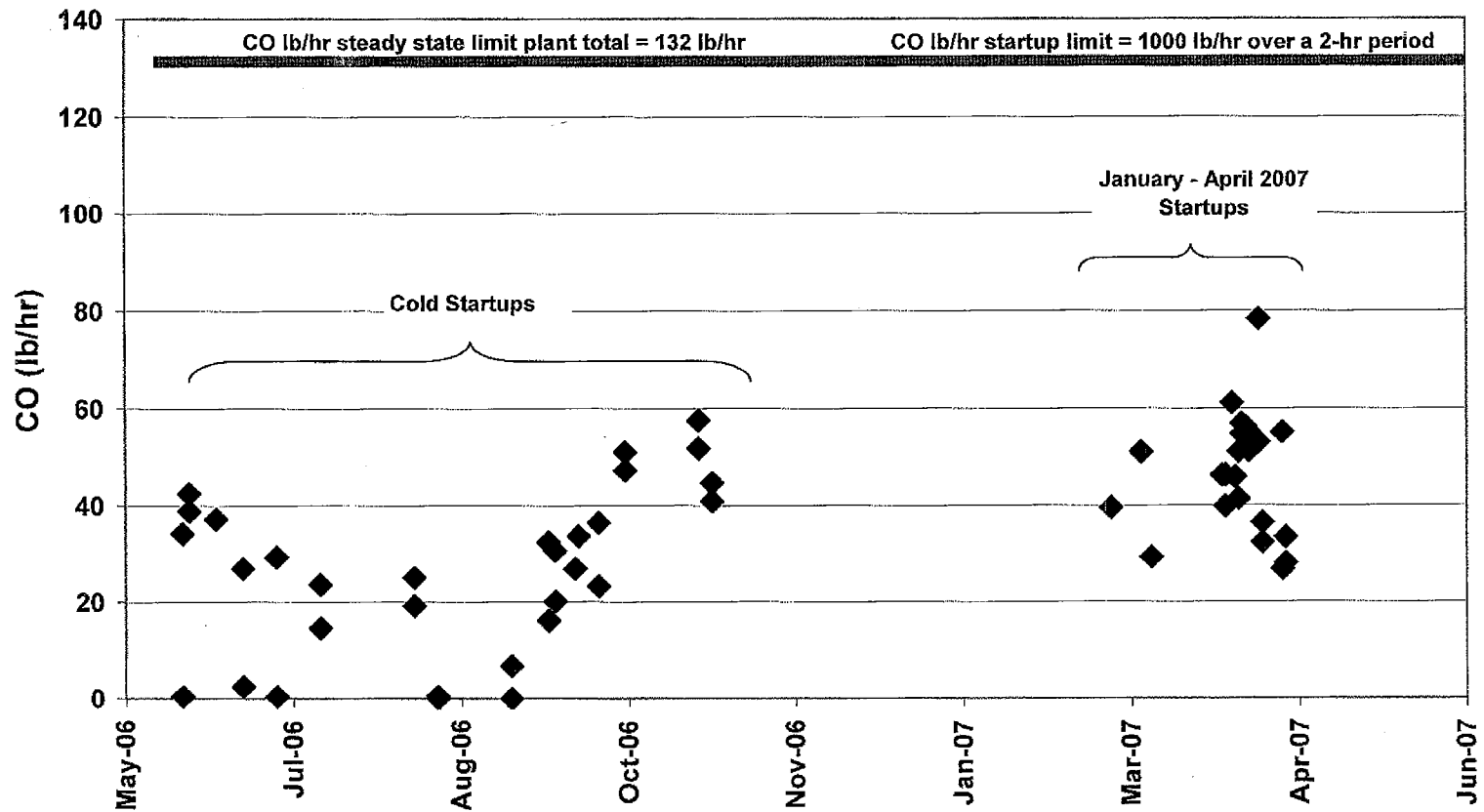
Bellingham NO_x lb/hr Shutdown Emission Rates

◆ Unit 1 & 2 NO_x lb/hr

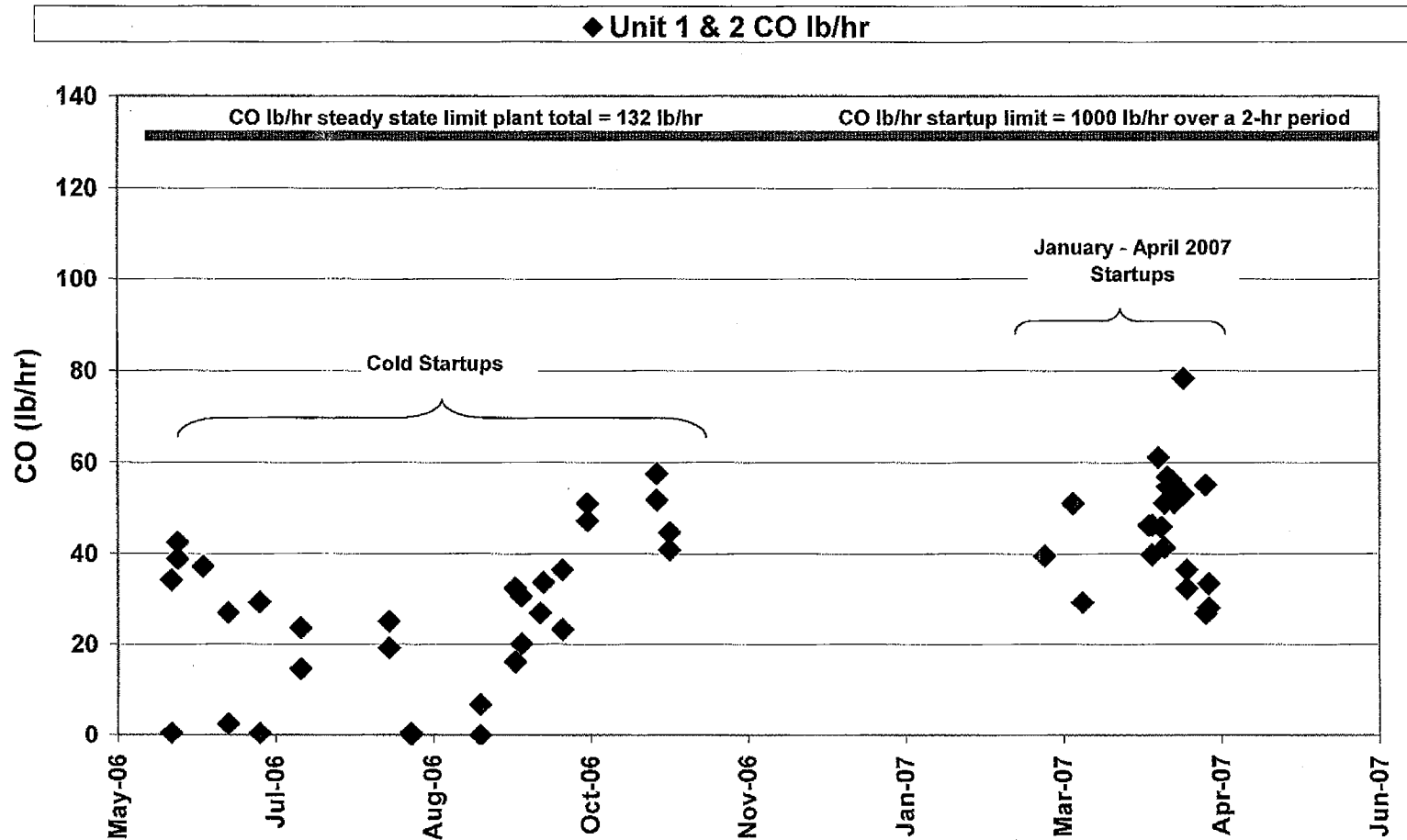


Bellingham CO lb/hr Startup Emission Rates

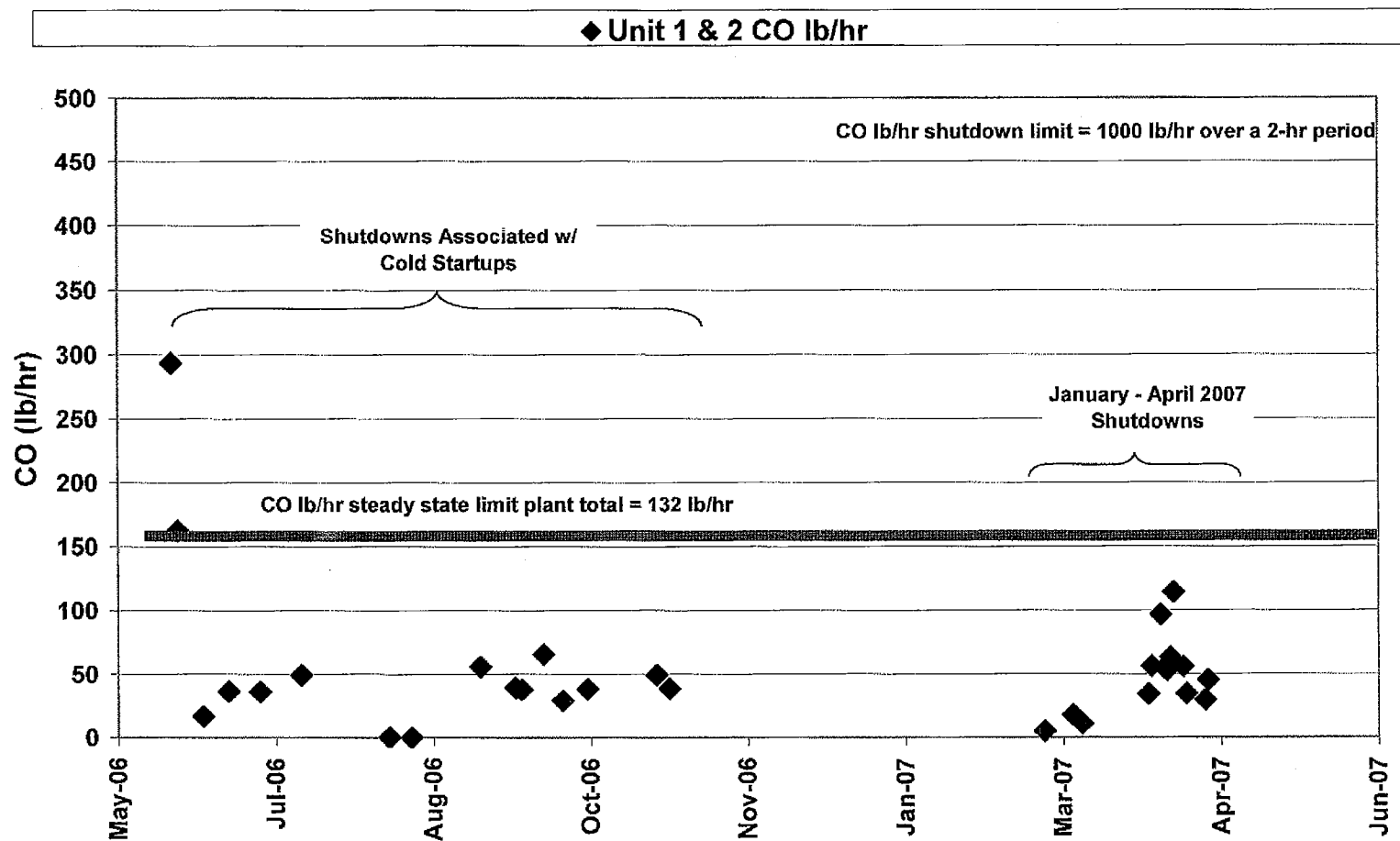
◆ Unit 1 & 2 CO lb/hr



Bellingham CO lb/hr Startup Emission Rates



Bellingham CO lb/hr Shutdown Emission Rates



Bellingham CO lb/hr Shutdown Emission Rates

