City of Tallahassee
Your Own Utilities℠

300 South Adams Street, Tallahassee, Florida 32301, (850) 891-4YOU (4968), talgov.com

September 11, 2006

Hand Delivered

Jonthan Holtom
Florida Department of Environmental Protection
2600 Blair Stone Road, M.S. 5500
Tallahassee, Florida 32399-2400

Re: Amendment to Title V Air Operation Permit Revision Application
NOx Emissions during Startup, Shutdown and Fuel Switching
Combustion Turbine Unit Nos. HC3 (EU-031) and HC4 (EU-032)
Arvah B. Hopkins Electric Generating Station
Facility I.D. No. 0730003

Dear Mr. Holtom:

As we discussed on the telephone on August 31, 2006, this letter and attachments serve to amend the Title V Air Operation Permit Revision Application the City of Tallahassee (City) submitted to the Florida Department of Environmental Protection (Department) on March 24, 2006, which requested the incorporation of the two new LM6000 Combustion Turbines at the Arvah B. Hopkins Electric Generating Station (Hopkins) into the existing Hopkins Title V Air Operation Permit.

More specifically, the City is requesting the incorporation of revised excess emissions language to address the startup, shutdown, selective catalytic reduction and water injection tuning, and fuel switching operations for the Hopkins Combustion Turbine Unit Nos. HC3 (EU-031) and HC4 (EU-032), and as more fully described in the City's August 22, 2006, letter to the Department attached hereto for your review and convenience.

As stated in the August 22, 2006 letter, there is considerable variability in the duration, emissions concentrations and mass emissions observed during certain startup, shutdown and fuel switching activities. This is most especially seen in the startup activities. This variability is caused by such things as fluctuations in ambient temperature, time since the unit was last operated, time required for the control system to settle out from the transient conditions, and the amount of advanced notice provided to the Hopkins Plant by the City's Electric Control Center to dispatch these units to meet customer demand.

Based on our conversation, the City understands that the most efficient way to incorporate these revisions is to amend the previously submitted Title V Air Operation Permit Revision Application, and to thereby reclassify it to a combined Air Construction Permit and Title V Air Operation Permit Revision Application which can be processed by the Department concurrently.

As such, please find attached those pages from the original application which require revision as a result of the City's proposed excess emissions revisions. In addition, please also find a revised Responsible Official and Professional Engineer certification page.

Please do not hesitate to contact me at (850) 891-8851, or Rob McGarrah, Manager of Power Production at (850) 891-5534, if you have any questions or require additional information.

Sincerely,

John K. Powell, P.E.
Interim Environmental and Safety Manager

Attachments

cc: Jeff Koerner, FDEP TLH
Rick Bradburn, FDEP NWD
Rob McGarrah, COT
Cynthia Barber, COT
Triveni Singh, COT

Department of
Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for any air construction permit at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air permit. Also use this form to apply for an air construction permit:

- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- Where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- Where the applicant proposes to establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial/revised/renewal Title V air operation permit.

Air Construction Permit & Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **City of Tallahassee, Electric Utilities**	
2. Site Name: **Arvah B. Hopkins Electric Generating Station**	
3. Facility Identification Number: **0730003**	
4. Facility Location... Street Address or Other Locator: **Route 4, Box 450, 1125 Geddie Rd. (C.R. 1585)** City: **Tallahassee** County: **Leon** Zip Code: **32304**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Robert E. McGarrah**
2. Application Contact Mailing Address... Organization/Firm: **City of Tallahassee, Electric Utilities** Street Address: **2602 Jackson Bluff Road** City: **Tallahassee** State: **Florida** Zip Code: **32304**
3. Application Contact Telephone Numbers... Telephone: **(850) 891 - 5534** ext. Fax: **(850) 891 - 5162**
4. Application Contact Email Address: **McGarraR@Talgov.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	4. Siting Number (if applicable):

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

☐ Air construction permit.

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☒ Air construction permit and Title V permit revision, incorporating the proposed project.

☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☒ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

This application requests to incorporate two GE LM6000 combustion turbines denominated as Unit Nos. HC3 (EU-031) and HC4 (EU-032), and a Detroit Diesel Emergency Black Start Generator (EU-033), which were previously permitted and constructed pursuant to PSD Permit No. 0730003-005-AC, into the existing City of Tallahassee Arvah B. Hopkins Electric Generating Station's Title V Air Operation Permit No. 0730003-007-AV. The Black Start Generator meets the generic exemption thresholds of Rule 62-210.300(3)(b), F.A.C.

This application also requests revisions to the excess emissions provisions of PSD Air Construction Permit No. 0730003-005-AC to address startup, shutdown, selective catalytic reduction and water injection tuning, and fuel switching activities.

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
EU-031	GE LM6000 Turbine (Unit No. HC3)	AV02	N/A
EU-032	GE LM6000 Turbine (Unit No. HC4)	AV02	N/A
EU-033	Emergency Black Start Generator	AV02	N/A

Application Processing Fee

Check one: ☐ Attached - Amount: $_____ ☒ Not Applicable

Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name: **Robert E. McGarrah**
   Manager of Power Production

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):
   - ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
   - ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
   - ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
   - ☒ The designated representative at an Acid Rain source.

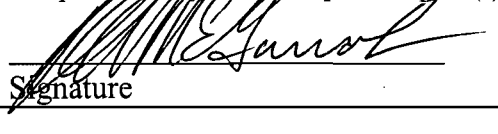
3. Application Responsible Official Mailing Address...
   Organization/Firm: **City of Tallahassee, Electric Utilities**
   Street Address: **2602 Jackson Bluff Road**
   City: **Tallahassee** State: **Florida** Zip Code: **32304**

4. Application Responsible Official Telephone Numbers...
   Telephone: **(850) 891 - 5534** ext. Fax: **(850) 891 - 5162**

5. Application Responsible Official Email Address: **McGarraR@Talgov.com**

6. Application Responsible Official Certification:

   I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.



Signature

9/8/06

Date

Professional Engineer Certification

1. Professional Engineer Name: **John Powell**
   Registration Number: **58737**
2. Professional Engineer Mailing Address...
   Organization/Firm: **City of Tallahassee, Environmental and Safety Manager**
   Street Address: **300 South Adams Street**
   City: **Tallahassee** State: **Florida** Zip Code: **32301**
3. Professional Engineer Telephone Numbers...
   Telephone: **(850) 891-8851** ext. Fax: **(850) 891-8277**
4. Professional Engineer Email Address: **powellj@talgov.com**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

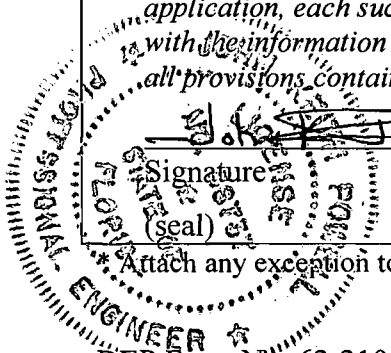
(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here [X]*, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.*

(4) If the purpose of this application is to obtain an air construction permit (check here [ ]*, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here* [X]*, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.*

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here [X]*, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.*



Signature (seal)

9/11/2006
Date

* Attach any exception to certification statement.

Additional Requirements Comment – HC3

The City is requesting that excess oxides of nitrogen (NOx) emissions from Hopkins Units HC3 be excluded from NOx compliance determinations during the first 45 minutes of startup, 15 minutes of shutdown, and 15 minutes of fuel switching. The City is also requesting that malfunctions of up to 120 minutes during any 24-hour period and periods of tuning of the water injection and Selective Catalytic Reduction (SCR) systems be excluded from NOx compliance determinations. And finally, the City is requesting that the excess emission data be excluded from any hourly averages that would otherwise be impacted by the excess emissions (i.e. excess emissions that occur over two hourly averaging periods be excluded from each hourly averaging).

Additional Requirements Comment – HC4

The City is requesting that excess oxides of nitrogen (NOx) emissions from Hopkins Units HC4 be excluded from NOx compliance determinations during the first 45 minutes of startup, 15 minutes of shutdown, and 15 minutes of fuel switching. The City is also requesting that malfunctions of up to 120 minutes during any 24-hour period and periods of tuning of the water injection and Selective Catalytic Reduction (SCR) systems be excluded from NOx compliance determinations. And finally, the City is requesting that the excess emission data be excluded from any hourly averages that would otherwise be impacted by the excess emissions (i.e. excess emissions that occur over two hourly averaging periods be excluded from each hourly averaging).

City of Tallahassee
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300 South Adams Street, Tallahassee, Florida 32301, (850) 891-4YOU (4968), talgov.com

August 22, 2006 Certified Mail No. 70031010000120674969

Jeff Koerner
Florida Department of Environmental Protection
2600 Blair Stone Road, M.S. 5500
Tallahassee, Florida 32399-2400

Re: NOx Emissions during Startup, Shutdown and Fuel Switching
Combustion Turbine Unit Nos. HC3 (EU-031) and HC4 (EU-032)
Arvah B. Hopkins Electric Generating Station
Facility I.D. No. 0730003

Dear Mr. Koerner:

This letter serves to follow up on our recent telephone conversation concerning the status of our analysis of the startup, shutdown, and fuel switching operations and data for Combustion Turbine Unit Nos. HC3 (EU-031) and HC4 (EU-032) at the City of Tallahassee's Arvah B. Hopkins Electric Generating Station (Hopkins). When we met with you and Ms. Trina Vielhauer on May 24, 2006, you had suggested that the City consider a concept where an alternative emission standard, on a mass emission basis, might be established for these activities in lieu of emissions from these activities being excluded from compliance demonstrations through revisions to the excess emissions provisions of Air Construction Permit No. 0730003-005-AC.

Based on our efforts since that meeting, we have determined that there is considerable variability in the duration, emissions concentrations and mass emissions observed during startup, shutdown and fuel switching activities. This, along with considerations for how we implement monitoring for excess emissions episodes by the Hopkins operations staff, have led us to conclude that the best approach would be to modify the excess emissions provisions of Air Construction Permit No. 0730003-005-AC to be similar to the draft Hopkins Unit No. 2 Repowering permit.

The City is therefore requesting that excess oxides of nitrogen (NOx) emissions from Hopkins Units HC3 and HC4 be excluded from NOx compliance determinations during the first 45 minutes of startup, 15 minutes of shutdown, and 15 minutes of fuel switching. The City is also requesting that malfunctions of up to 120 minutes during any 24-hour period and periods of tuning of the water injection and Selective Catalytic Reduction (SCR) systems be excluded from NOx compliance determinations. And finally, the City is requesting that the excess emission data be excluded from any hourly averages that would otherwise be impacted by the excess emissions (i.e. excess emissions that occur over two hourly averaging periods be excluded from each hourly averaging). We have provided below the information gathered since our May 24, 2006, meeting, that should provide the basis for this determination and our request.

As background, please recall that these units were constructed to provide the City with peaking and intermediate sources of power. As a result, these units operate both on a schedule when the start and stop times are typically known in advance, as well as being called on with little or no advance notice to address peak electrical conditions, the loss of one of the City's other generating units or when we are called on to provide spinning reserves as a part of the Florida reserve sharing group. To meet these operational needs, the units need to be able to go through the startup/shutdown cycles without a limitation on when these occur as well as being able to be started multiple times in a day if needed.

The City currently has self-imposed temporary operational restrictions on the units in order to remain within the current permit limitations on excess emissions until such time as the Air Construction Permit can be appropriately revised. These temporary operational restrictions include limiting the units to not more than two (2) starts per day and to limit startups and shutdowns to commence in the first quadrant of the hour (to prevent excess emissions from extending over a two-hour period). These modifications have resulted in the units not being able to be utilized as spinning reserve to meet the requirements of the Florida reserve-sharing group. The proposed permit modifications contained in this letter will resolve these issues and allow the units to be released to full duty.

Since our last meeting, we have conducted a number of oil-fired starts, oil-fired shutdowns and fuel swaps in an attempt to obtain sufficient data that represents the respective operating evolutions since we have completed the SCR tuning. We also collected data from primarily gas-fired starts and gas-fired shutdowns for the period following the NOx tuning completed on April 26, 2006. Based on this data we have the following number of data points for each of the activities.

Unit	Starts Gas	Starts Oil	Shutdown Gas	Shutdown Oil	Fuel Swap Gas to Oil	Fuel Swap Oil to Gas
HC3	28	5	27[1]	5[2]	3	3
HC4	19	5	19	5[3]	3	3

It is important to note that all of the data was collected during warmer seasonal conditions. We do not have any post-SCR tuning data for cold weather operations. Thus, we are not certain whether additional time will be necessary to complete startup as a result of seasonal or weather-related changes.

Attached are a series of tables that summarize the data that we have collected and analyzed. Tables 1 and 2 summarize the data that we have collected for gas-fired startup on units HC3 and HC4, and Tables 3 and 4 summarize the data collected for oil-fired startup on units HC3 and HC4, respectively (Figures 1 through 8 illustrate the startup data). Tables 5 and 6 summarize data collected for gas-fired shutdown for units

[1] Only 27 of the 28 gas-fired periods are included in the shutdown data. On May 19th, Unit HC3 tripped off-line rather than going through a normal shutdown.
[2] Five shutdowns were completed while firing oil. Only four exhibited excess emissions.
[3] Five shutdowns were completed while firing oil. Only four exhibited excess emissions.

HC3 and HC4, and Tables 7 and 8 summarize data collected for oil-fired shutdown on units HC3 and HC4, respectively (Figures 9-16 illustrate the shutdown data). Tables 9 and 10 summarize the data collected for fuel swaps on units HC3 and HC4, respectively (Figures 17 through 20 illustrate the fuel switch data). Table 11 summarizes the highest values that appear in the Tables 1 through 6. For each table we have identified the following information:

- Duration: This is the total minutes lapsed to complete startup or shutdown pursuant to the definitions contained in Chapter 62-210, Florida Administrative Code (F.A.C.), or the time lapsed from the point that NOx emissions deviate above 5 ppmvd to the point that NOx emissions once again achieve 5 ppmvd after switching the type of fuel combusted.
- Average NOx (concentration and mass): The average concentration or emission rate of NOx during the startup, shutdown or fuel switching episode. Averaging begins at the point that startup, shutdown, or the alternate fuel initiates and ends when compliance with the 5 ppmvd standard is sustainable.
- Maximum NOx (concentration and mass): The maximum concentration or emission rate of NOx during startup, shutdown or fuel switching episode. Data included begins at the point that startup, shutdown, or the alternate fuel initiates and ends when compliance with the 5 ppmvd standard is sustainable.

There have been three (3) alternatives identified for addressing the excess emissions during these episodes. These are: (i) utilizing the excess emission exclusions as we are recommending; (ii) establishing alternative standards, on a concentration basis, for startup, shutdown and fuel swaps; and (iii) establishing alternative standards, on a concentration basis, for startup, shutdown and fuel swaps. We believe that the best course of action is utilizing the excess emission exclusion provisions as we are recommending. By utilizing this course of action:

- The historical and current practice most familiar to Hopkins operations and DEP personnel will be followed
- ~~The allowable excess emissions are limited based on the time limitation~~
- Compliance demonstration can be performed more easily by both field personnel and DEP staff
- Record keeping is more easily addressed
- Does not rely on when operations are occurring (winter vs. summer) like a mass emission standard would require
- Does not require significant data collection to ensure that the alternative standard is achieved

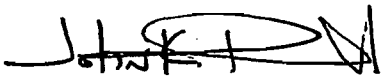
Utilization of either of the two (2) other alternatives will result in:

- The establishment of a new practice unfamiliar to both operations personnel and DEP personnel
- Will require additional data collection to ensure that the alternative standard is being achieved
- More difficult for field personnel to understand whether the unit is in compliance on a contemporaneous basis

- Increased complexity in record keeping and documentation (by establishing both a duration limit and maximum standard)
- Requires the same level of data exclusion as Alternative 1 does to ensure 24-hour block average compliance is achieved

The City appreciates the Department's assistance regarding this issue, and believes the above information should be sufficient to meet the Department's needs regarding this request. Please do not hesitate to contact me at (850) 891-8851, or Rob McGarrah, Manager of Power Production at (850) 891-5534, if you have any questions or require additional information.

Sincerely,



John K. Powell, P.E.
Interim Environmental and Safety Manager

cc: Trina Vielhauer, FDEP TLH
Rick Bradburn, FDEP NWD
Rob McGarrah, COT
Cynthia Barber, COT
Triveni Singh, COT
Phil Bucci, COT

ATTACHMENTS

TABLE 1 UNIT HC3 GAS-FIRED STARTUP DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
May 4th	22	5.87	27.4	6.55	9.70
May 8th	7	19.9	36.8	15.8	30.2
May 10th	40	11.0	48.6	6.61	27.0
May 13th	23	17.8	67.8	12.5	30.2
May 18th	55	8.52	50.8	8.80	30.9
May 19th	17	28.5	63.1	18.0	40.3
May 20th	10	29.1	47.8	22.8	41.6
May 22nd	14	28.9	67.6	14.1	29.2
May 23rd	30	26.4	55.7	14.2	27.1
May 24th	16	24.7	55.8	14.9	34.4
May 25th	11	26.2	54.6	14.8	34.4
May 27th	15	26.9	49.8	22.2	31.5
May 28th	12	23.4	39.6	23.1	40.1
May 29th	10	23.9	38.4	26.5	44.9
May 30th	12	42.5	69.4	24.3	50.6
May 31st	8	24.6	41.0	23.4	45.8
June 1st	8	20.1	37.3	17.8	40.9
June 5th	36	7.67	34.4	8.68	34.7
June 6th	11	23.3	41.3	26.3	43.8
June 8th	38	13.6	43.4	16.3	44.4
June 11th	35	8.32	32.1	8.69	37.6
June 12th	9	29.6	50.9	19.9	34.6
June 14th	7	29.0	50.7	28.1	69.0
June 15th	31	14.5	30.7	20.8	49.1
June 16th	7	17.6	32.2	17.5	32.8
June 17th	32	8.33	33.2	9.45	36.5
June 19th	8	22.6	41.3	19.4	39.2
June 20th	6	25.0	34.8	23.9	35.0
Average	**18.9**	**21.0**	**45.6**	**17.3**	**37.3**
Maximum	**55**	**42.5**	**69.4**	**28.1**	**69.0**
Minimum	**6**	**5.87**	**27.4**	**6.55**	**9.70**

TABLE 2 UNIT HC4 GAS-FIRED STARTUP DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
13-May	8	27.1	34.8	32.3	46.7
18-May	46	12.8	51.8	13.9	31.1
19-May	10	26.9	46.8	22.4	31.2
22-May	9	21.0	41.1	24.9	50.8
23-May	20	27.7	42.7	43.1	55.8
24-May	10	36.1	83.0	27.0	43.7
26-May	9	23.5	36.1	25.2	41.8
28-May	23	24.7	37.3	34.6	41.0
29-May	9	25.1	36.9	29.0	43.7
30-May	12	40.3	65.7	24.9	40.1
31-May	8	33.2	58.8	30.6	47.2
1-Jun	8	27.4	50.9	27.5	52.7
2-Jun	41	7.95	39.0	11.0	40.1
7-Jun	8	24.1	37.9	29.2	44.9
8-Jun	9	19.1	34.7	25.2	48.6
10-Jun	8	23.4	33.0	28.1	49.0
16-Jun	18	19.6	36.2	9.22	24.9
19-Jun	11	29.9	49.1	22.3	45.1
20-Jun	32	25.3	46.7	31.9	46.6
Average	**15.7**	**25.0**	**45.4**	**25.9**	**43.4**
Maximum	**46**	**40.3**	**83.0**	**43.1**	**55.8**
Minimum	**8**	**7.95**	**33.0**	**9.22**	**24.9**

TABLE 3 UNIT HC3 OIL-FIRED STARTUP DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
May 3rd	42	28.3	118.2	21.6	84.7
June 9th	52	17.3	76.6	24.2	66.4
June 29th	42	16.3	79.2	23.1	76.0
June 30th	39	14.9	80.3	18.4	74.4
July 1st	13	57.2	105.1	51.3	129.8
Average	**37.6**	**26.8**	**91.9**	**27.7**	**86.3**
Maximum	**52**	**57.2**	**118.2**	**51.3**	**129.8**
Minimum	**13**	**14.9**	**76.6**	**18.4**	**66.4**

TABLE 4 UNIT HC4 OIL-FIRED STARTUP DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
May 3rd	47	28.0	118.2	16.2	76.6
June 9th	31	34.9	89.9	53.9	105.8
June 27th	12	45.1	231.0	28.5	88.4
June 29th	14	67.4	102.9	39.5	133.3
June 30th	8	49.1	95.7	53.5	120.2
Average	**22.4**	**44.9**	**127.5**	**38.3**	**104.9**
Maximum	**47**	**67.4**	**231.0**	**53.9**	**133.3**
Minimum	**8**	**28.0**	**89.9**	**16.2**	**76.6**

TABLE 5 UNIT HC3 GAS-FIRED SHUTDOWN DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
May 4th	2	25.2	33.7	7.57	9.57
May 8th	24	6.64	23.6	5.27	26.4
May 10th	2	18.0	22.2	5.25	5.93
May 13th	3	18.1	31.7	5.12	7.85
May 18th	13	7.26	28.9	3.24	7.83
May 20th	2	23.9	31.5	7.89	10.4
May 22nd	3	22.9	32.8	4.93	8.58
May 23rd	2	19.9	26.7	6.59	8.88
May 24th	10	8.51	27.9	3.95	7.71
May 25th	9	9.34	22.0	2.95	6.42
May 27th	2	22.2	28.2	6.56	7.74
May 28th	2	15.0	19.9	4.85	6.37
May 29th	11	10.6	32.2	3.94	10.1
May 30th	2	20.1	23.1	4.37	5.67
May 31st	13	10.5	27.1	4.07	6.71
June 1st	3	13.5	19.4	4.12	5.33
June 5th	3	16.9	26.2	4.05	5.67
June 6th	11	7.70	26.0	2.68	5.57
June 8th	3	15.7	21.5	3.70	5.47
June 11th	2	15.4	19.9	4.59	5.58
June 12th	2	21.5	27.8	6.40	7.77
June 14th	17	5.63	14.6	3.34	15.7
June 15th	3	13.5	19.4	3.26	4.84
June 16th	2	6.25	7.00	1.89	1.98
June 17th	3	19.6	27.8	4.61	7.03
June 19th	3	16.3	23.9	3.25	5.85
June 20th	3	16.0	25.1	3.67	5.51
Average	**5.74**	**15.0**	**24.8**	**4.52**	**7.87**
Maximum	**24**	**25.2**	**33.7**	**7.89**	**26.4**
Minimum	**2**	**5.63**	**7.00**	**1.89**	**1.98**

TABLE 6 UNIT HC4 GAS-FIRED SHUTDOWN DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
13-May	2	29.5	40.1	9.50	12.8
18-May	2	26.5	36.5	8.78	12.0
19-May	2	24.3	33.4	7.89	10.7
22-May	3	20.0	28.8	4.32	7.58
23-May	3	22.8	31.8	4.43	9.04
24-May	6	15.4	28.9	3.60	11.1
26-May	3	19.8	36.9	5.85	10.2
28-May	2	23.9	36.2	7.93	12.0
29-May	3	28.3	38.1	7.58	11.4
30-May	2	26.3	37.2	8.27	11.4
31-May	3	25.6	38.4	5.68	10.0
1-Jun	2	11.3	16.3	5.67	9.62
2-Jun	3	24.1	28.3	4.90	9.33
7-Jun	2	24.1	30.4	6.28	6.71
8-Jun	3	22.7	32.8	5.13	7.93
10-Jun	1	7.80	7.80	2.62	2.62
16-Jun	5	14.5	31.8	4.19	7.44
19-Jun	2	10.1	14.7	3.34	4.88
20-Jun	2	11.3	16.3	2.86	3.64
Average	**2.68**	**20.4**	**29.7**	**5.73**	**8.97**
Maximum	**6**	**29.5**	**40.1**	**9.50**	**12.8**
Minimum	**1**	**7.80**	**7.80**	**2.62**	**2.62**

TABLE 7 UNIT HC3 OIL-FIRED SHUTDOWN DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
May 3rd	3	6.90	7.00	1.78	2.38
June 9th	2	14.5	22.9	0.045	0.071
June 29th	3	39.5	52.7	12.7	18.1
June 30th	4	26.2	53.9	8.44	18.5
July 1st	No Excess Emissions Occurred During Shutdown on This Date				
Average	**3**	**21.8**	**34.1**	**5.74**	**9.76**
Maximum	**4**	**39.5**	**53.9**	**12.7**	**18.5**
Minimum	**2**	**6.90**	**7.00**	**0.045**	**0.071**

TABLE 8 UNIT HC4 OIL-FIRED SHUTDOWN DATA					
Date	**Startup Duration (min)**	**Average Concentration (ppmvd)**	**Maximum Concentration (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Mass Emission Rate (lb/hr)**
May 3rd	5	23.4	55.5	7.07	19.4
June 9th	3	32.3	56.4	10.7	17.7
June 27th	2	5.95	6.60	1.57	1.73
June 29th	No Excess Emissions Occurred During Shutdown on This Date				
June 30th	3	32.1	49.4	10.2	16.5
Average	**3.25**	**23.4**	**42.0**	**7.39**	**13.8**
Maximum	**5**	**32.3**	**56.4**	**10.7**	**19.4**
Minimum	**2**	**5.95**	**6.60**	**1.57**	**1.73**

TABLE 9 UNIT HC3 FUEL SWAP DATA						
Date	**Type**	**Startup Duration (min)**	**Average Concent. (ppmvd)**	**Maximum Concent. (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Emission Rate (lb/hr)**
June 29th	Oil to Gas	5	124.3	211.1	166.9	325.7
June 30th	Oil to Gas	5	113.2	211.1	136.5	318.2
July 1st	Oil to Gas	5	124.4	211.5	161.2	332.6
June 29th	Gas to Oil	6	88.9	211.1	133.1	334.8
June 30th	Gas to Oil	4	121.3	210.7	187.3	356.0
July 1st	Gas to Oil	4	122.6	211.5	189.9	358.5
Average		**4.8**	**114.1**	**211.2**	**161.6**	**340.0**
Maximum		**6**	**124.4**	**211.5**	**189.9**	**358.5**
Minimum		**4**	**88.9**	**210.7**	**133.1**	**318.2**

TABLE 10 UNIT HC4 FUEL SWAP DATA						
Date	**Type**	**Startup Duration (min)**	**Average Concent. (ppmvd)**	**Maximum Concent. (ppmvd)**	**Average Emission Rate (lb/hr)**	**Maximum Emission Rate (lb/hr)**
June 27th	Oil to Gas	5	69.0	130.9	97.6	199.6
June 29th	Oil to Gas	6	90.6	224.1	8.61	65.1
June 30th	Oil to Gas	5	113.7	222.5	10.4	61.7
June 27th	Gas to Oil	8	40.0	129.1	61.8	205.3
June 29th	Gas to Oil	5	114.5	218.0	179.9	369.3
June 30th	Gas to Oil	5	106.8	200.2	166.0	334.4
Average		**5.8**	**93.1**	**198.8**	**85.3**	**207.2**
Maximum		**8**	**114.5**	**224.1**	**179.9**	**369.3**
Minimum		**5**	**40**	**129.1**	**8.61**	**61.7**

Table 11
NOx Summary of Maximum Values

	HC3	Date	HC4	Date
NATURAL GAS				
Start Up				
Maximum Duration (min)	55	May 18th	46	May 18th
Max. Average Concentration (ppmvd)	42.5	May 30th	40.3	May 30th
Maximum Concentration (ppmvd)	69.4	May 30th	83.0	May 24th
Max. Average Emiss Rate (lb/hr)	28.1	June 14th	43.1	May 23rd
Maximum Emiss Rate (lb/hr)	69.0	June 14th	55.8	May 23rd
Shutdown				
Maximum Duration (min)	24	May 8th	6	May 24th
Max. Average Concentration (ppmvd)	25.2	May 4th	29.5	May 13th
Maximum Concentration (ppmvd)	33.7	May 4th	40.1	May 13th
Max. Average Emiss Rate (lb/hr)	7.89	May 20th	9.50	May 13th
Maximum Emiss Rate (lb/hr)	26.4	May 8th	12.8	May 13th
FUEL OIL				
Start Up				
Maximum Duration (min)	52	June 9th	47	May 3rd
Max. Average Concentration (ppmvd)	57.2	July 1st	67.4	June 29th
Maximum Concentration (ppmvd)	118.2	May 3rd	231.0	June 27th
Max. Average Emiss Rate (lb/hr)	51.3	July 1st	53.9	June 9th
Maximum Emiss Rate (lb/hr)	129.8	July 1st	133.3	June 29th
Shutdown				
Maximum Duration (min)	4	June 30th	5	May 3rd
Max. Average Concentration (ppmvd)	39.5	June 29th	32.3	June 9th
Maximum Concentration (ppmvd)	53.9	June 30th	56.4	June 9th
Max. Average Emiss Rate (lb/hr)	12.7	June 29th	10.7	June 9th
Maximum Emiss Rate (lb/hr)	18.5	June 30th	19.4	May 3rd
FUEL SWAPS				
Gas to Oil				
Maximum Duration (min)	6	June 29th	8	June 27th
Max. Average Concentration (ppmvd)	122.6	July 1st	114.5	June 29th
Maximum Concentration (ppmvd)	211.5	July 1st	218.0	June 29th
Max. Average Emiss Rate (lb/hr)	189.9	July 1st	179.9	June 29th
Maximum Emiss Rate (lb/hr)	358.5	July 1st	369.3	June 29th
Oil to Gas				
Maximum Duration (min)	5	June 29th	6	June 29th
Max. Average Concentration (ppmvd)	124.4	July 1st	113.7	June 30th
Maximum Concentration (ppmvd)	211.5	July 1st	224.1	June 29th
Max. Average Emiss Rate (lb/hr)	166.9	June 29th	97.6	June 27th
Maximum Emiss Rate (lb/hr)	332.6	July 1st	199.6	June 27th

FIGURE 1
Average NOx Concentration vs Start Up Duration
Gas-Fired Operation

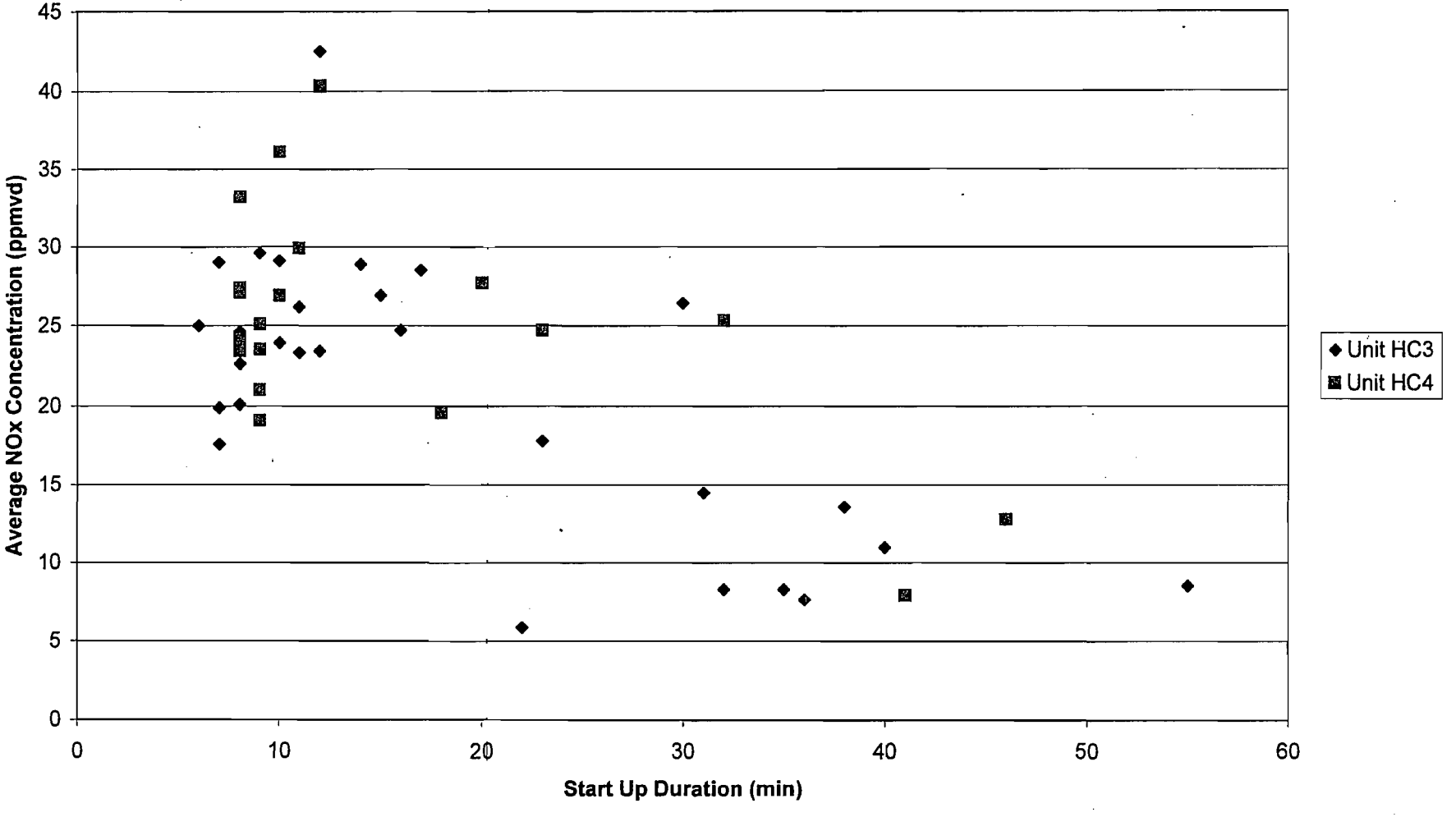


FIGURE 2
Maximum NOx Concentration vs Start Up Duration
Gas-Fired Operation

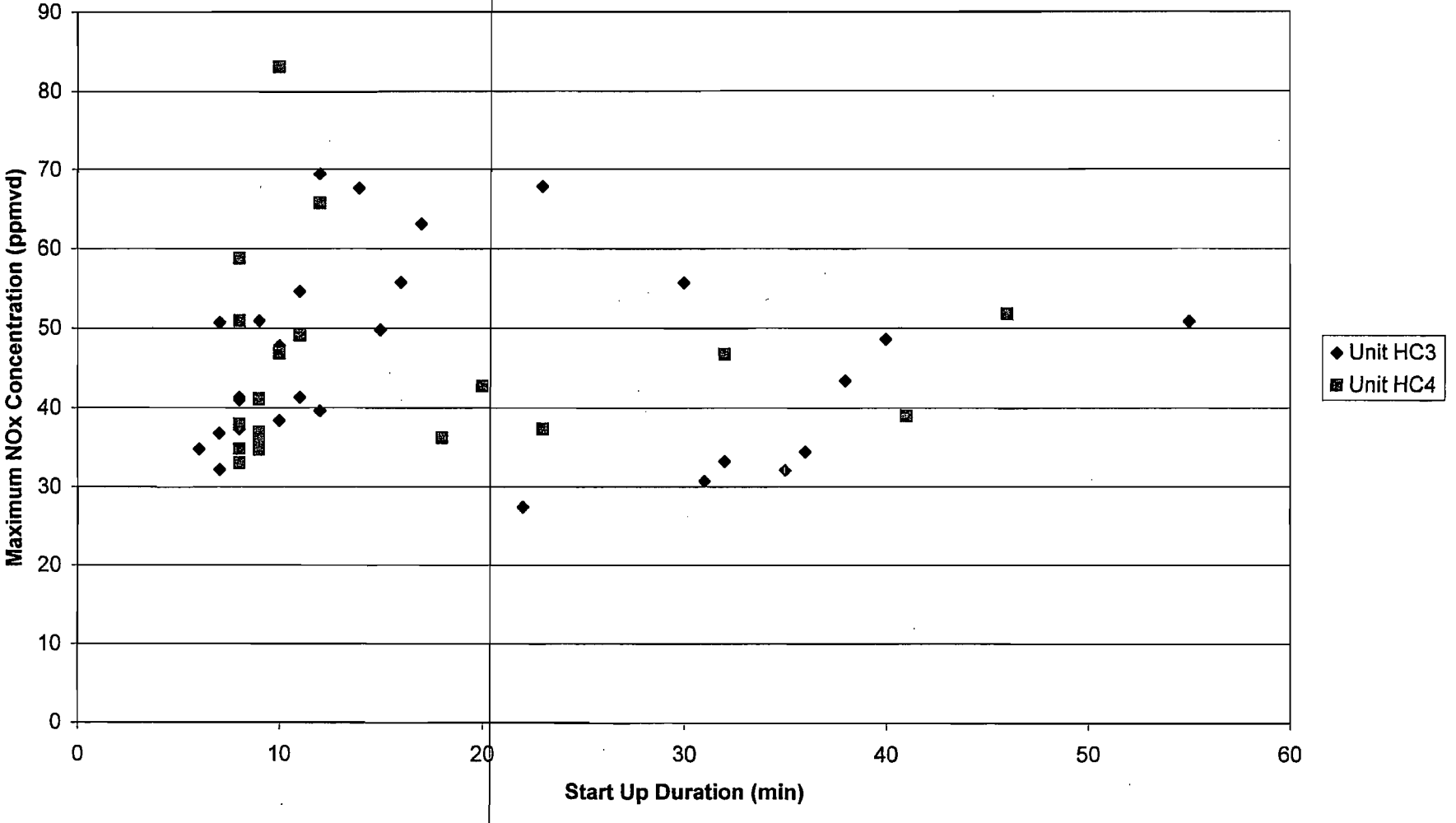


FIGURE 3
Average NOx Emission Rate vs Start Up Duration
Gas-Fired Operation

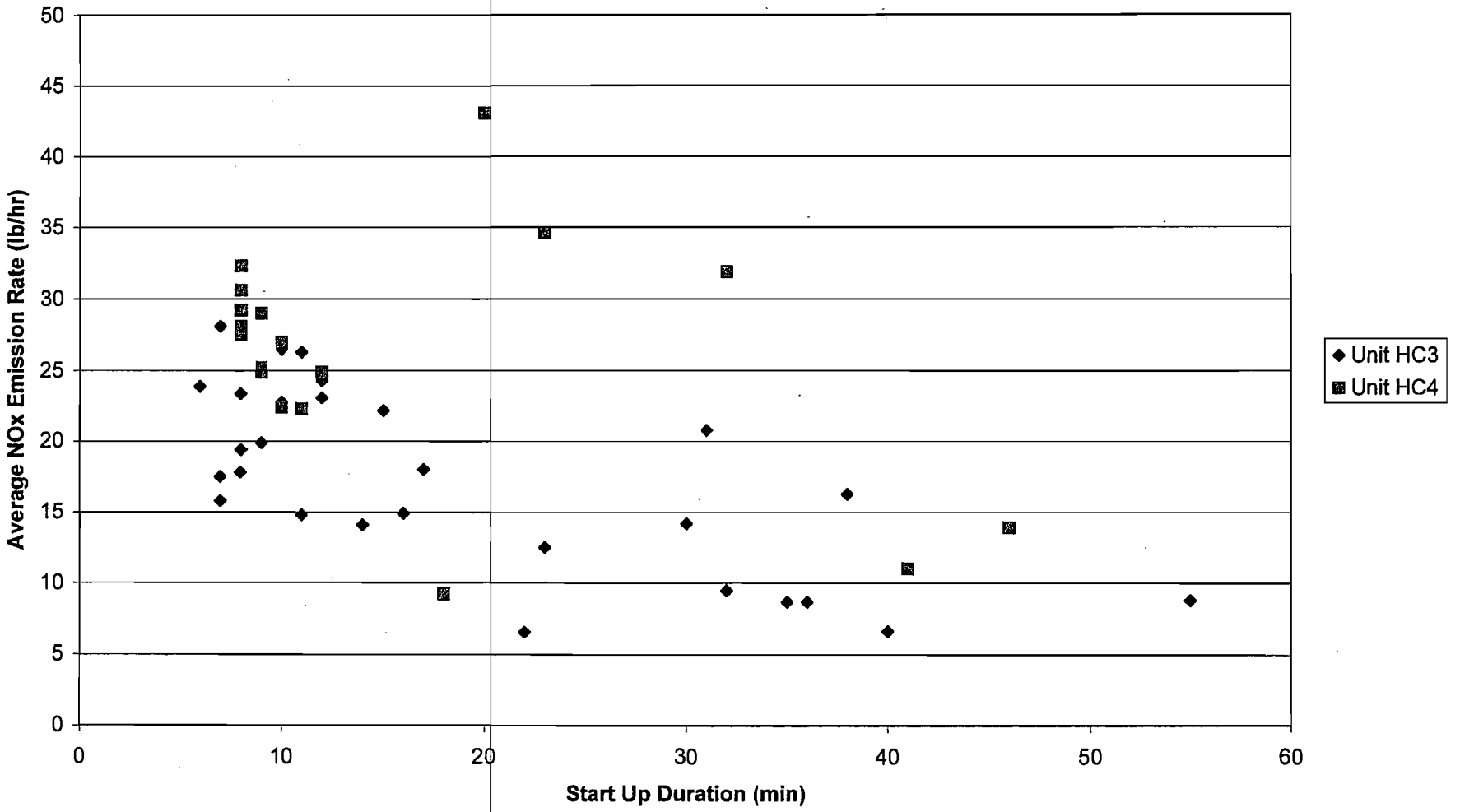


FIGURE 4
Maximum NOx Emission Rate vs Start Up Duration
Gas-Fired Operation

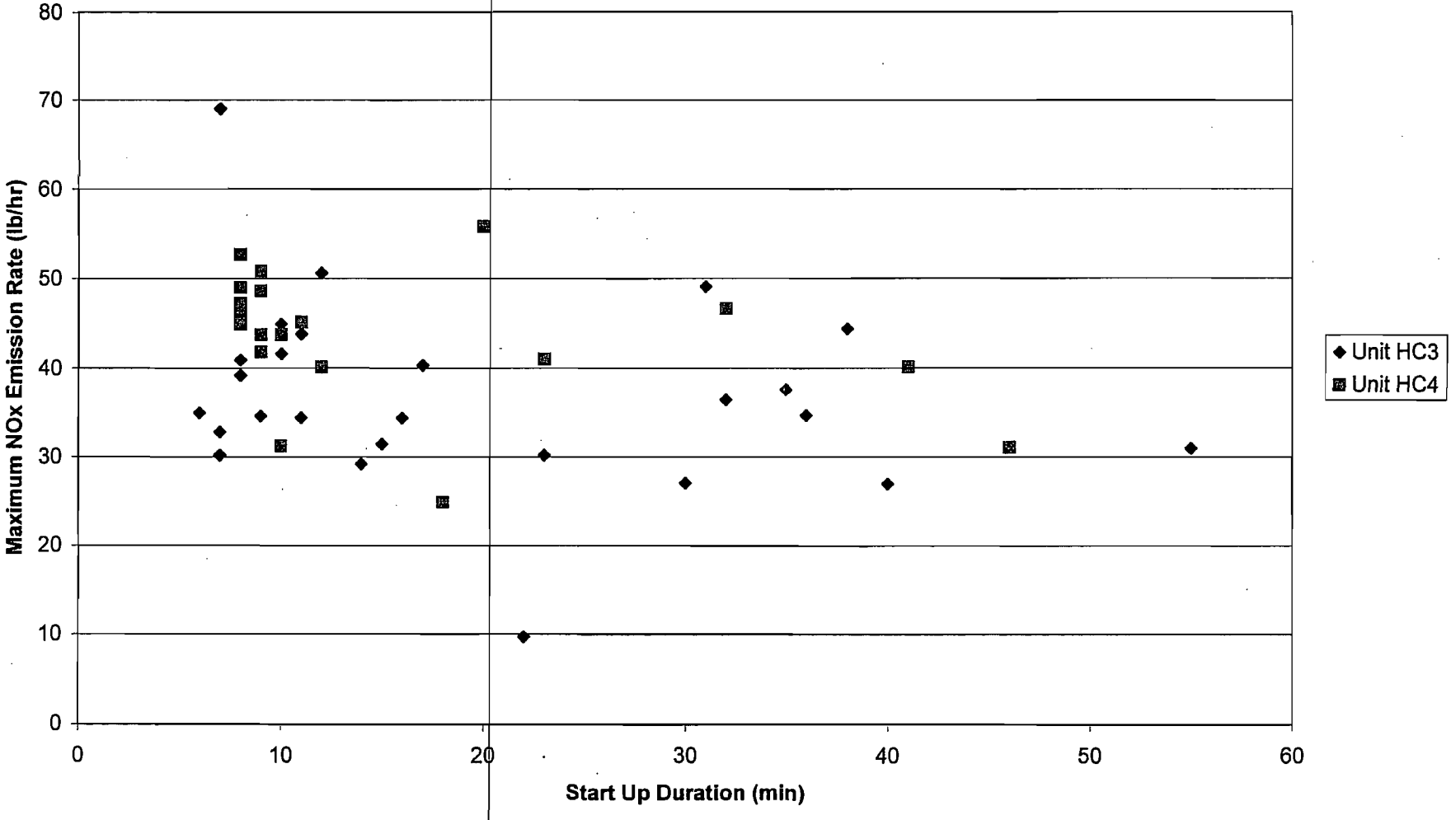


FIGURE 5
Average NOx Concentration vs Start Up Duration
Oil-Fired Operation

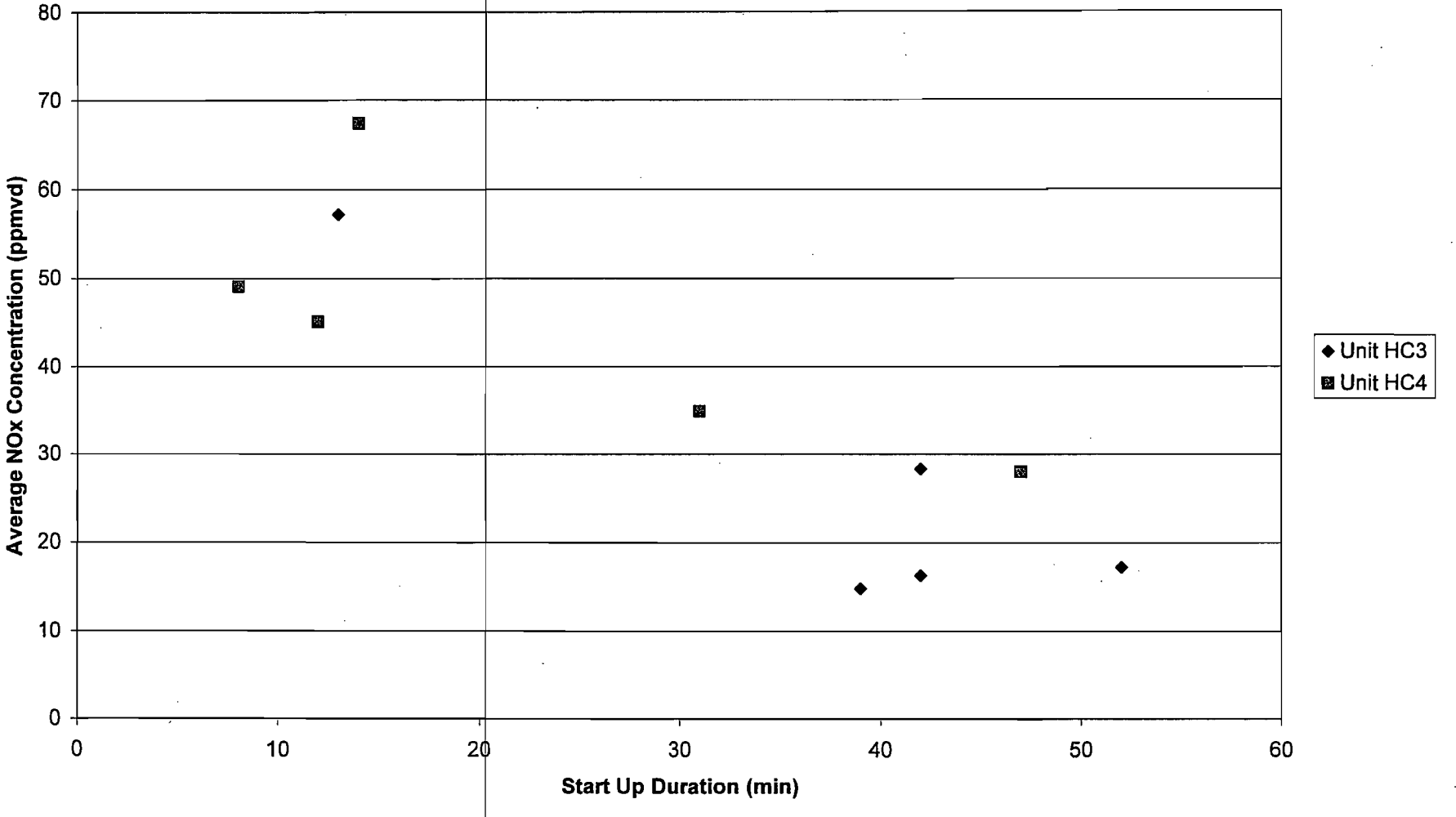


FIGURE 6
Maximum NOx Concentration vs Start Up Duration
Oil-Fired Operation

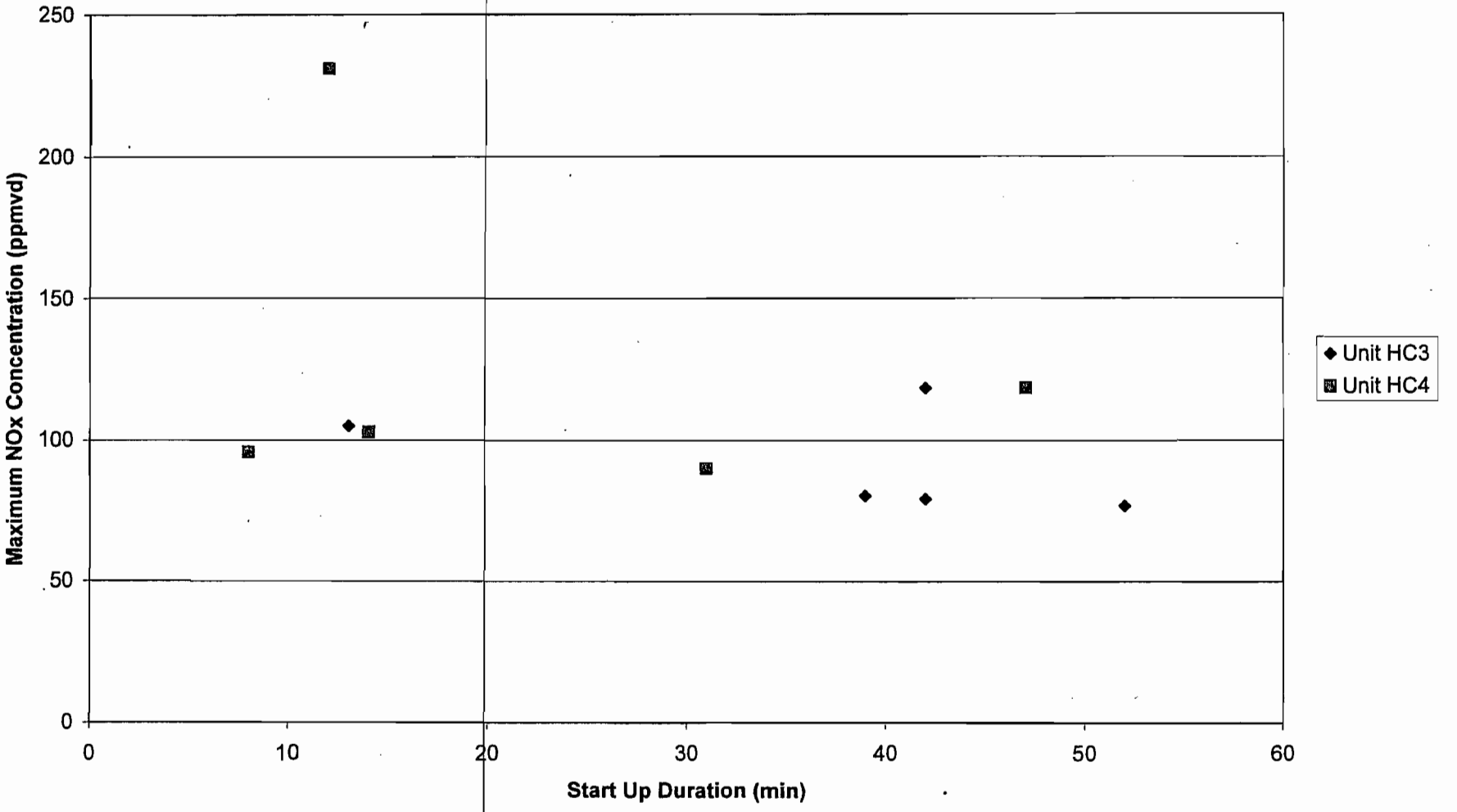


FIGURE 7
Average NOx Emission Rate vs Start Up Duration
Oil-Fired Operation

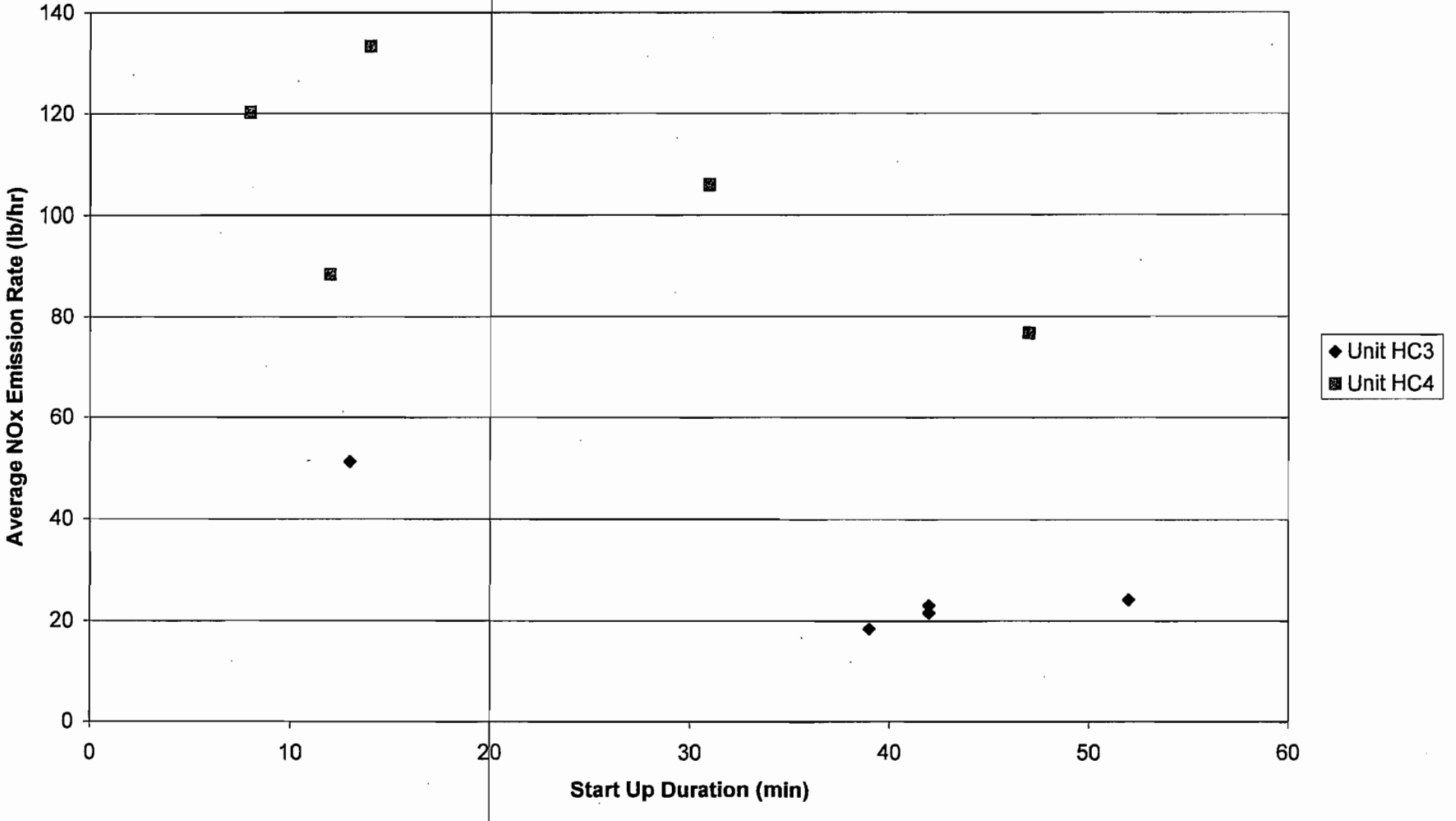


FIGURE 8
Maximum NOx Emission Rate vs Start Up Duration
Oil-Fired Operation

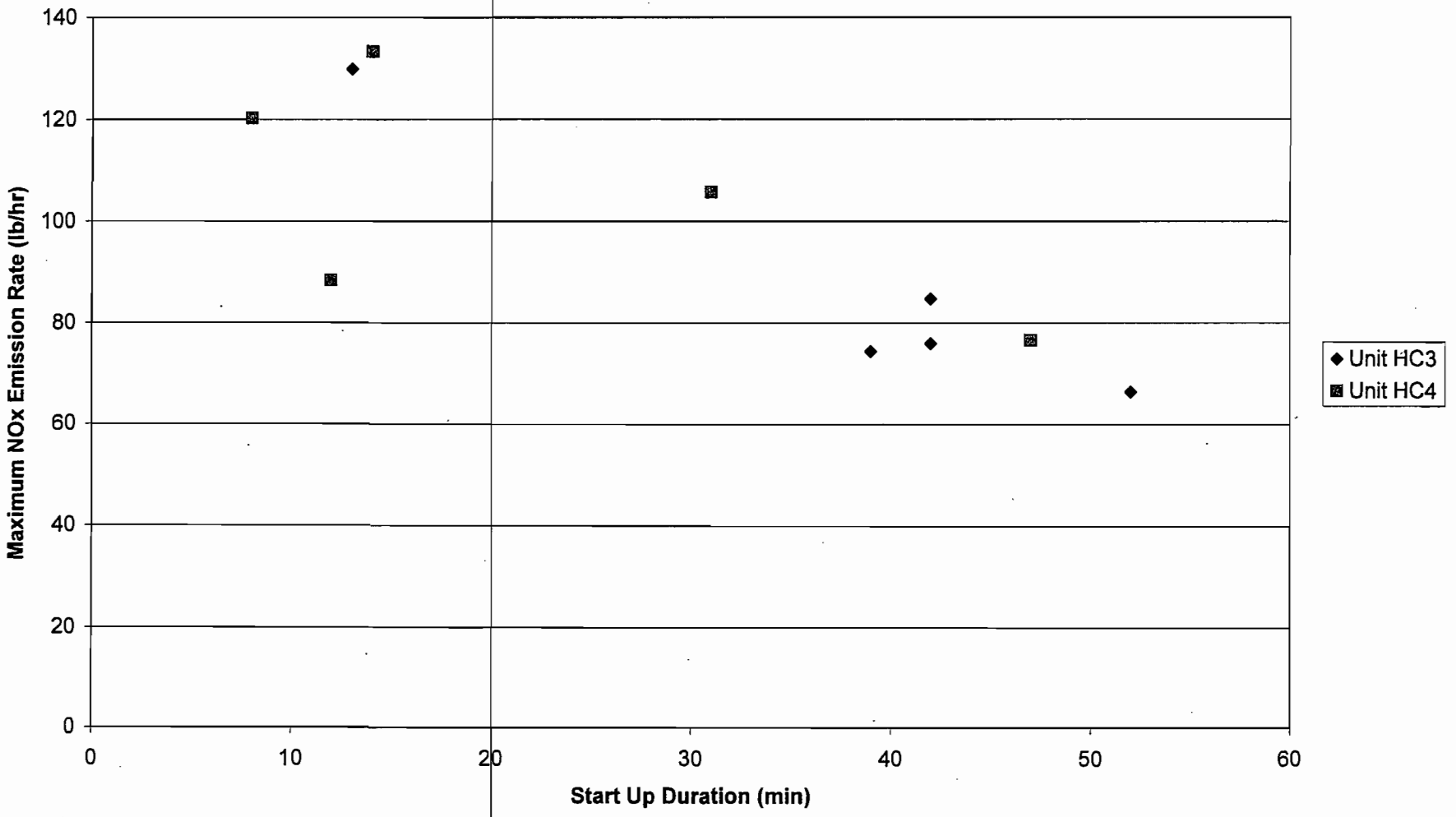


FIGURE 9
Average NOx Concentration vs Shutdown Duration
Gas-Fired Operation

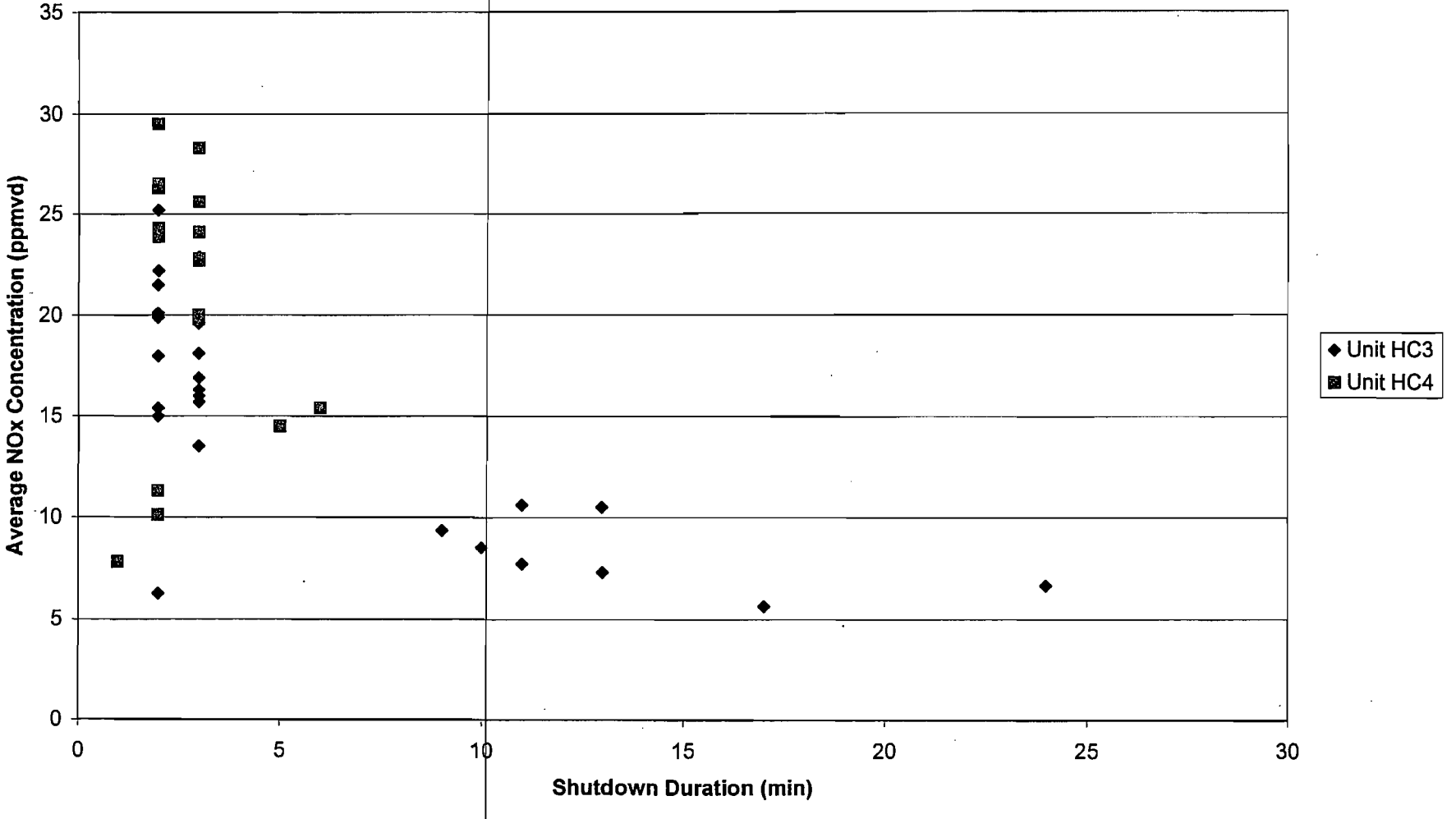


FIGURE 10
Maximum NOx Concentration vs Shutdown Duration
Gas-Fired Operation

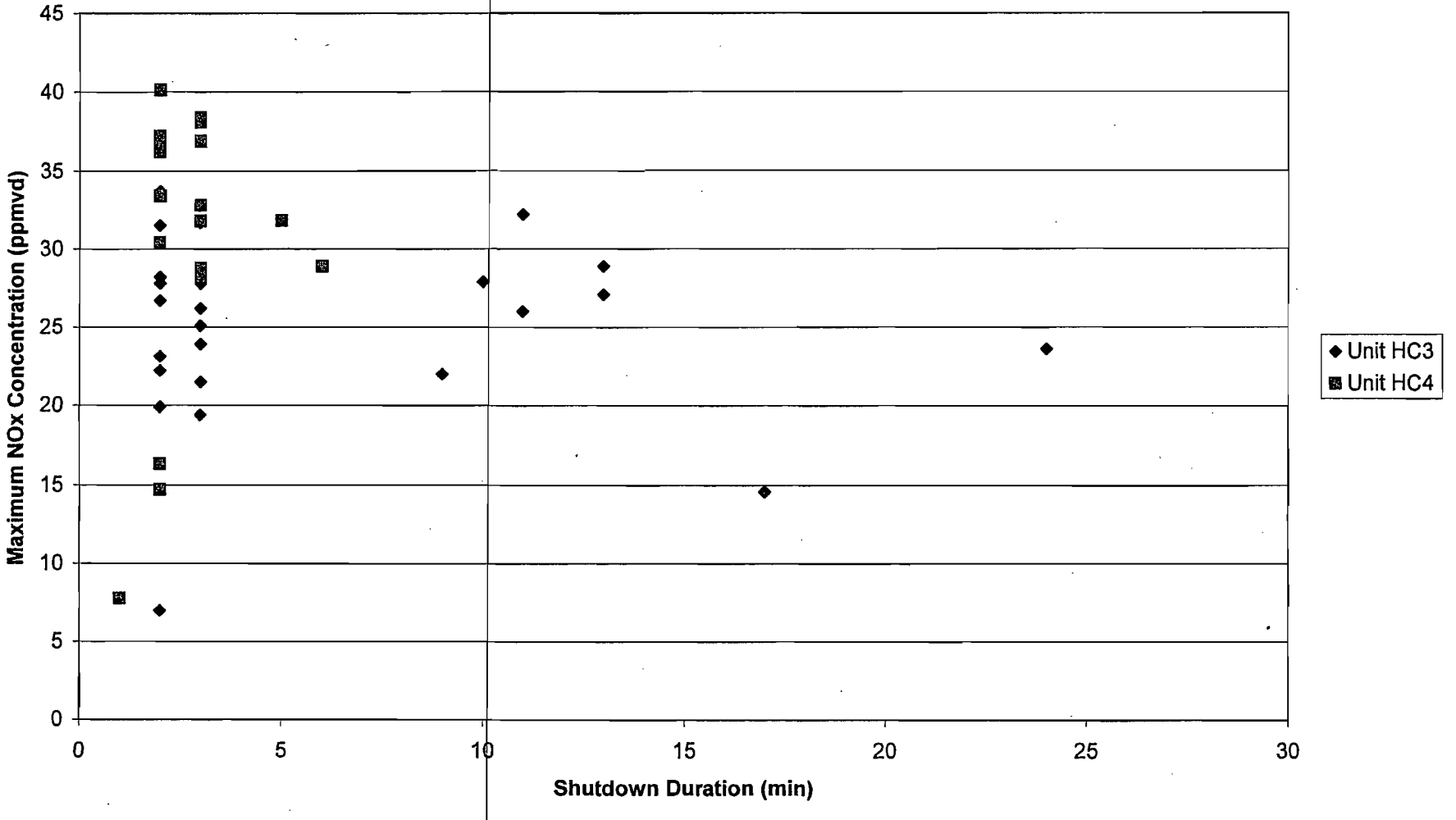


FIGURE 11
Average NOx Emission Rate vs Shutdown Duration
Gas-Fired Operation

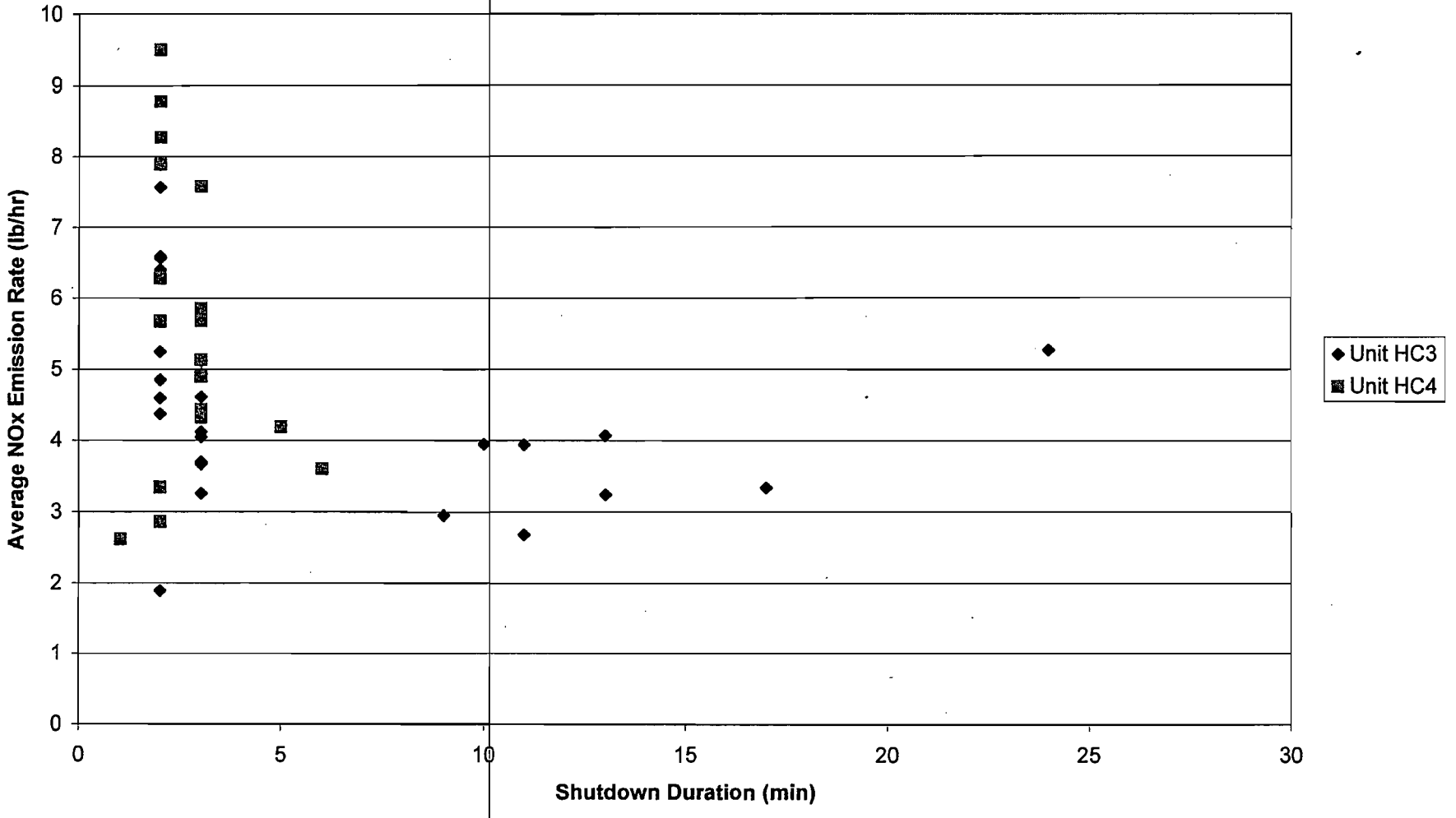


FIGURE 12
Maximum NOx Emission Rate vs Shutdown Duration
Gas-Fired Operation

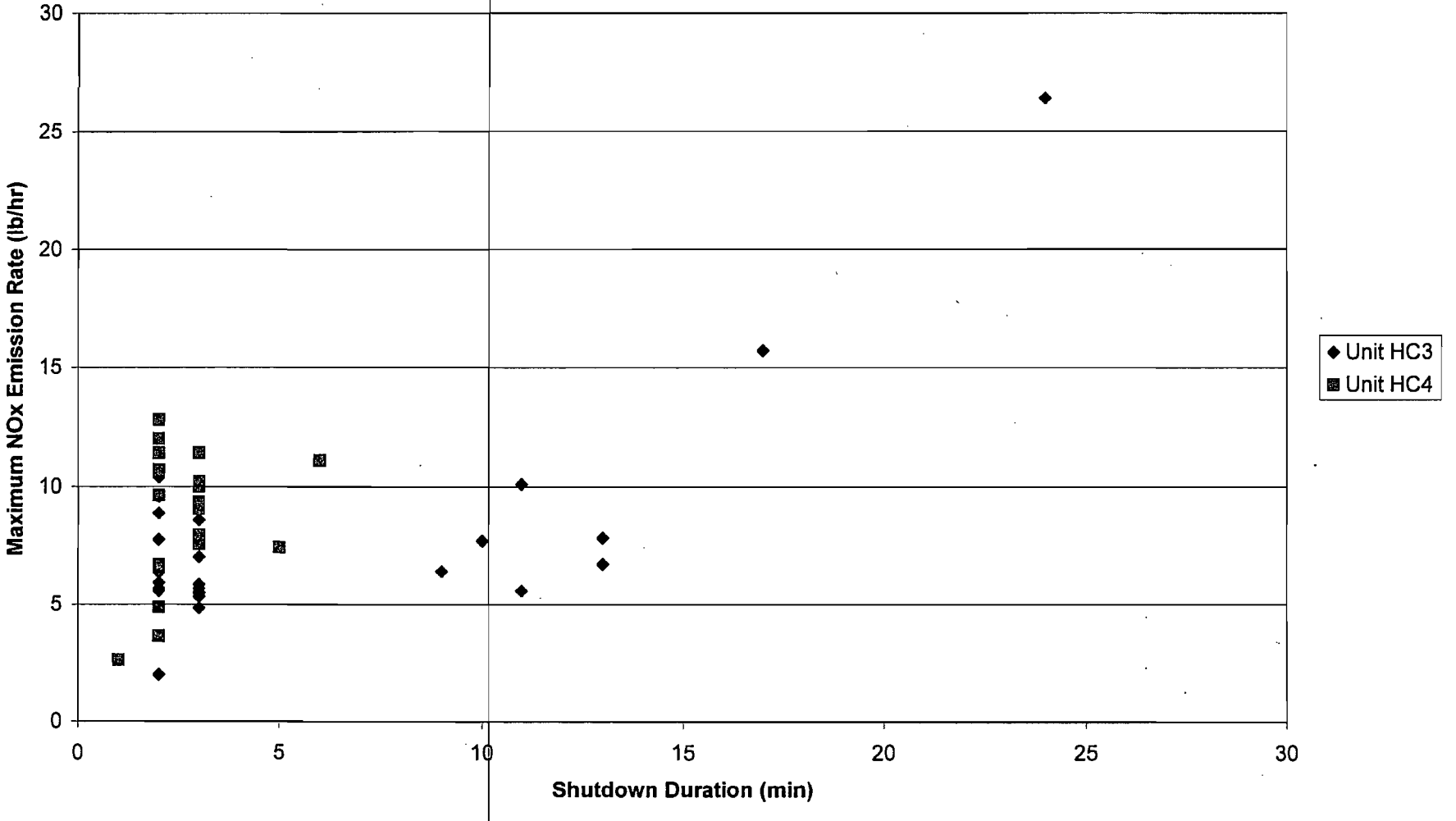


FIGURE 13
Average NOx Concentration vs Shutdown Duration
Oil-Fired Operation

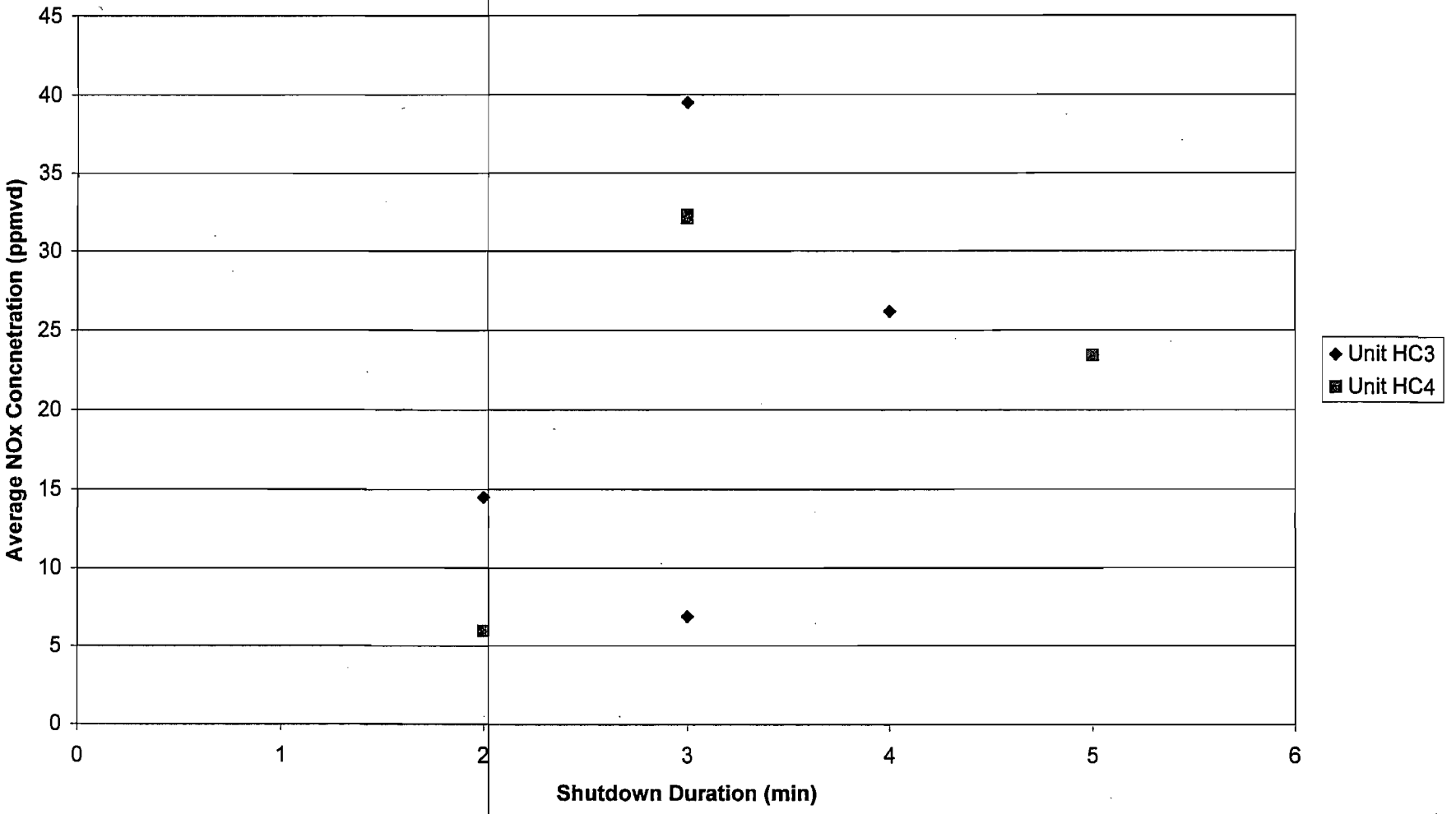


FIGURE 14
Maximum NOx Concentration vs Shutdown Duration
Oil-Fired Operation

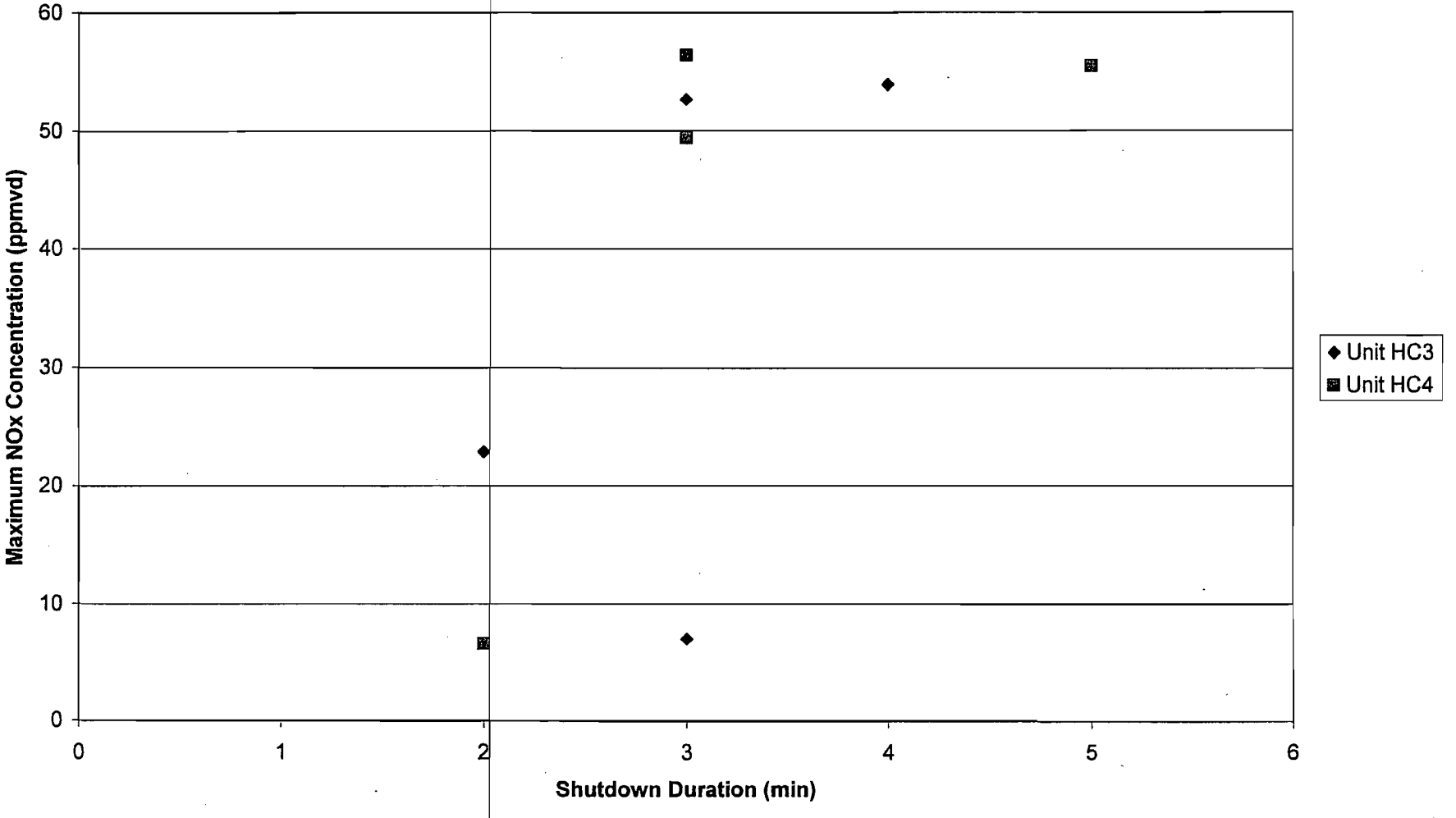


FIGURE 15
Average NOx Emission Rate vs Shutdown Duration
Oil-Fired Operation

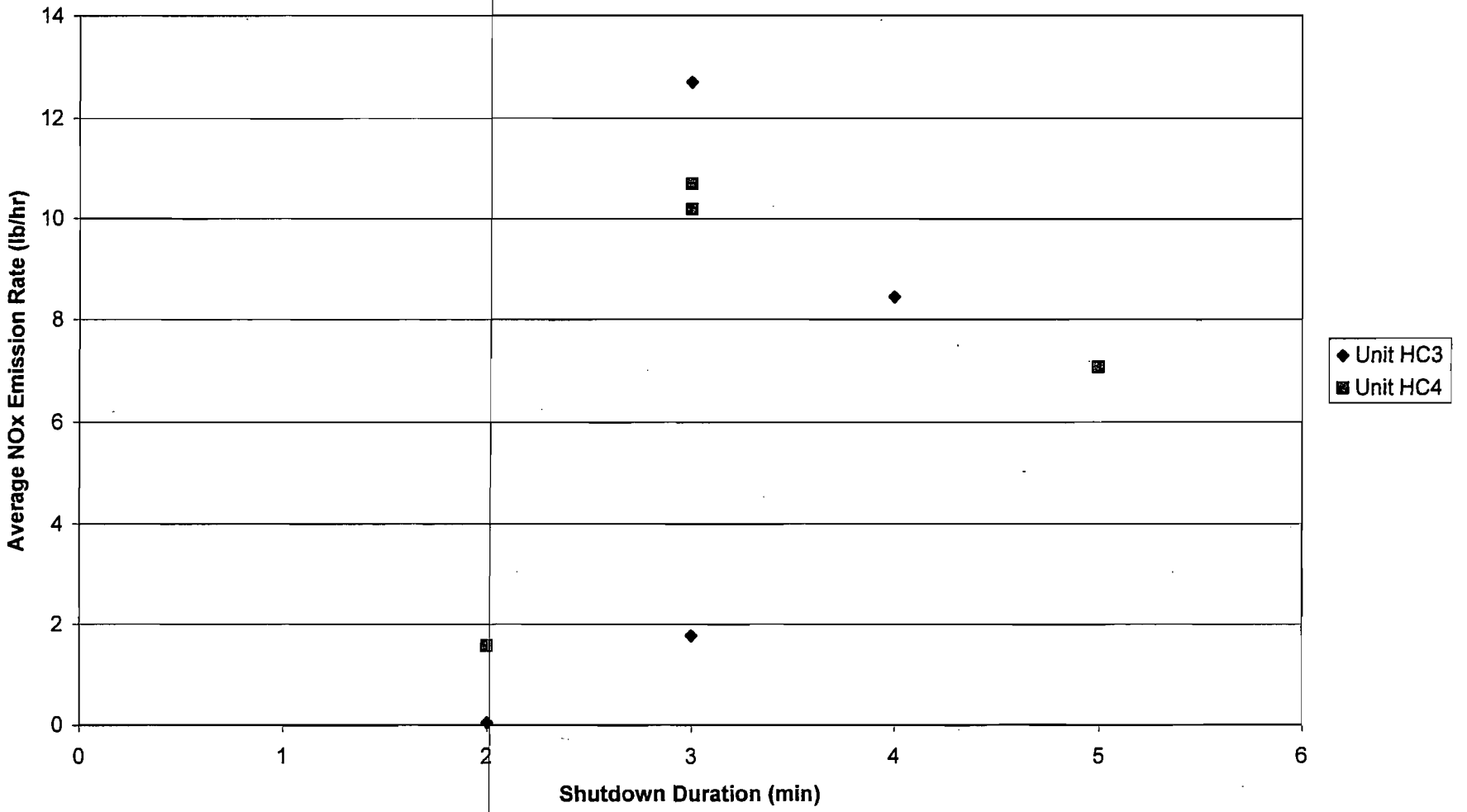


FIGURE 16
Maximum NOx Emission Rate vs Shutdown Duration
Oil-Fired Operation

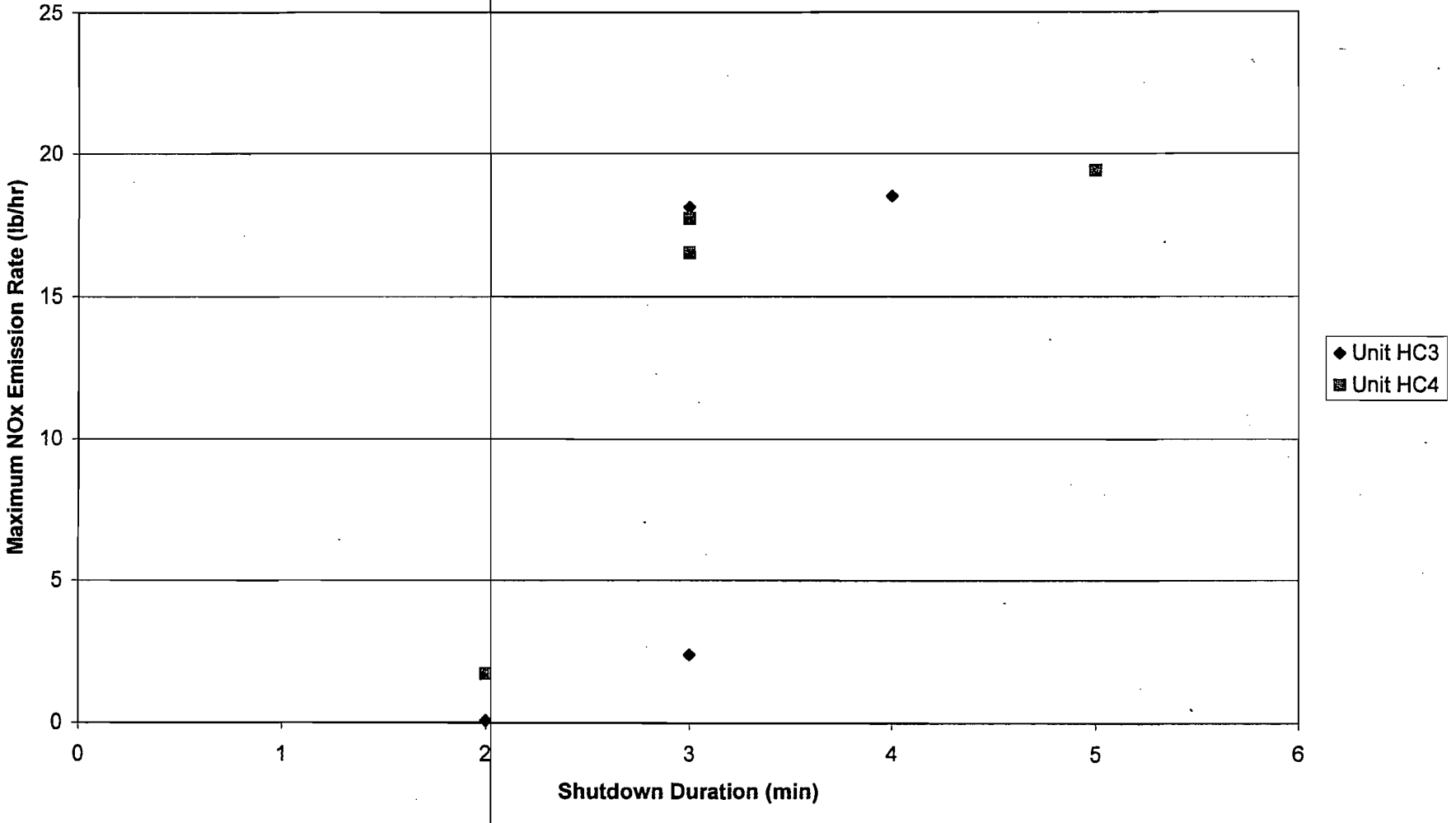


FIGURE 17
Average NOx Concentration vs Fuel Switch Duration
Fuel Switching

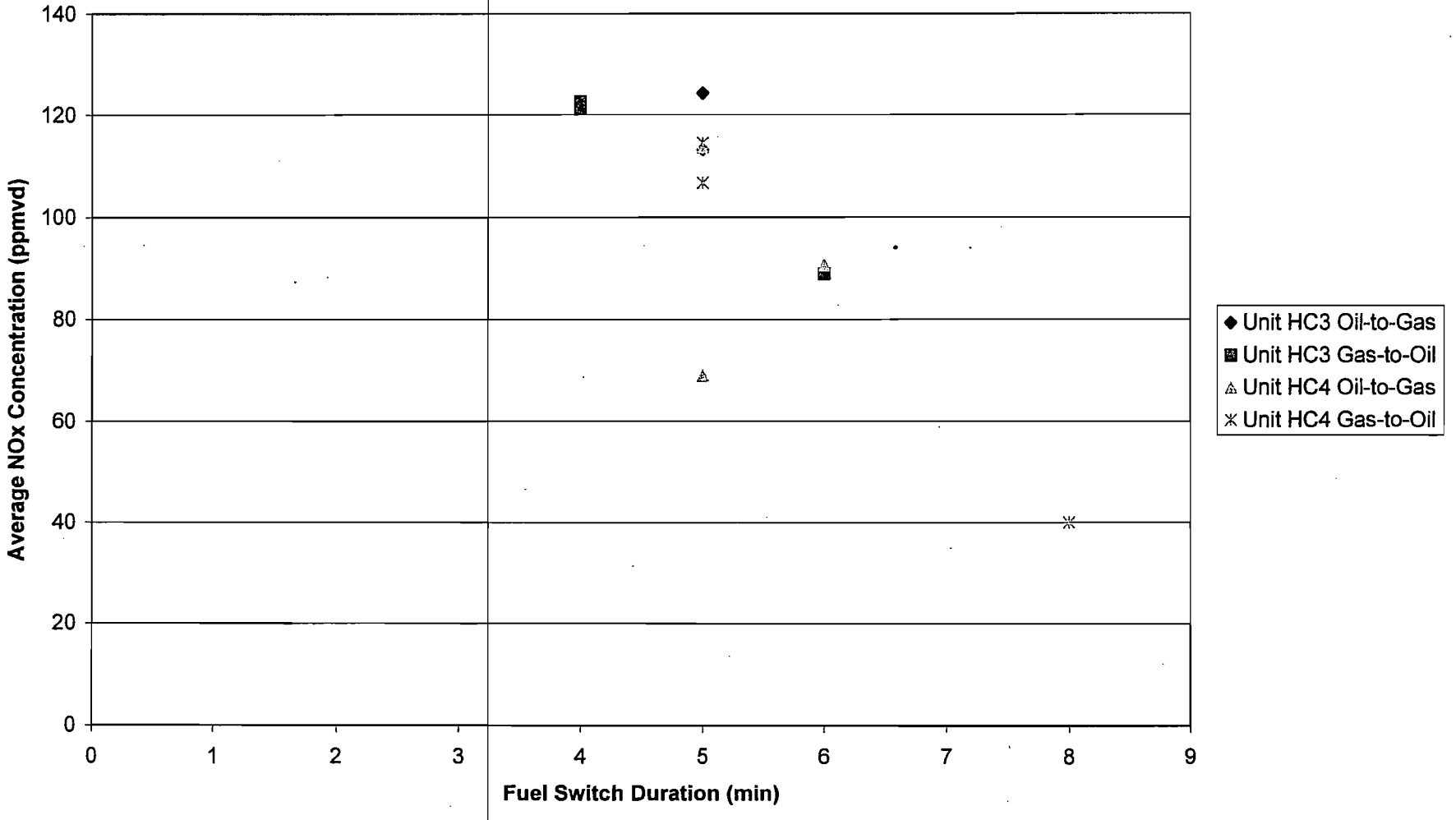


FIGURE 18
Maximum NOx Concentration vs Fuel Switch Duration
Fuel Switching

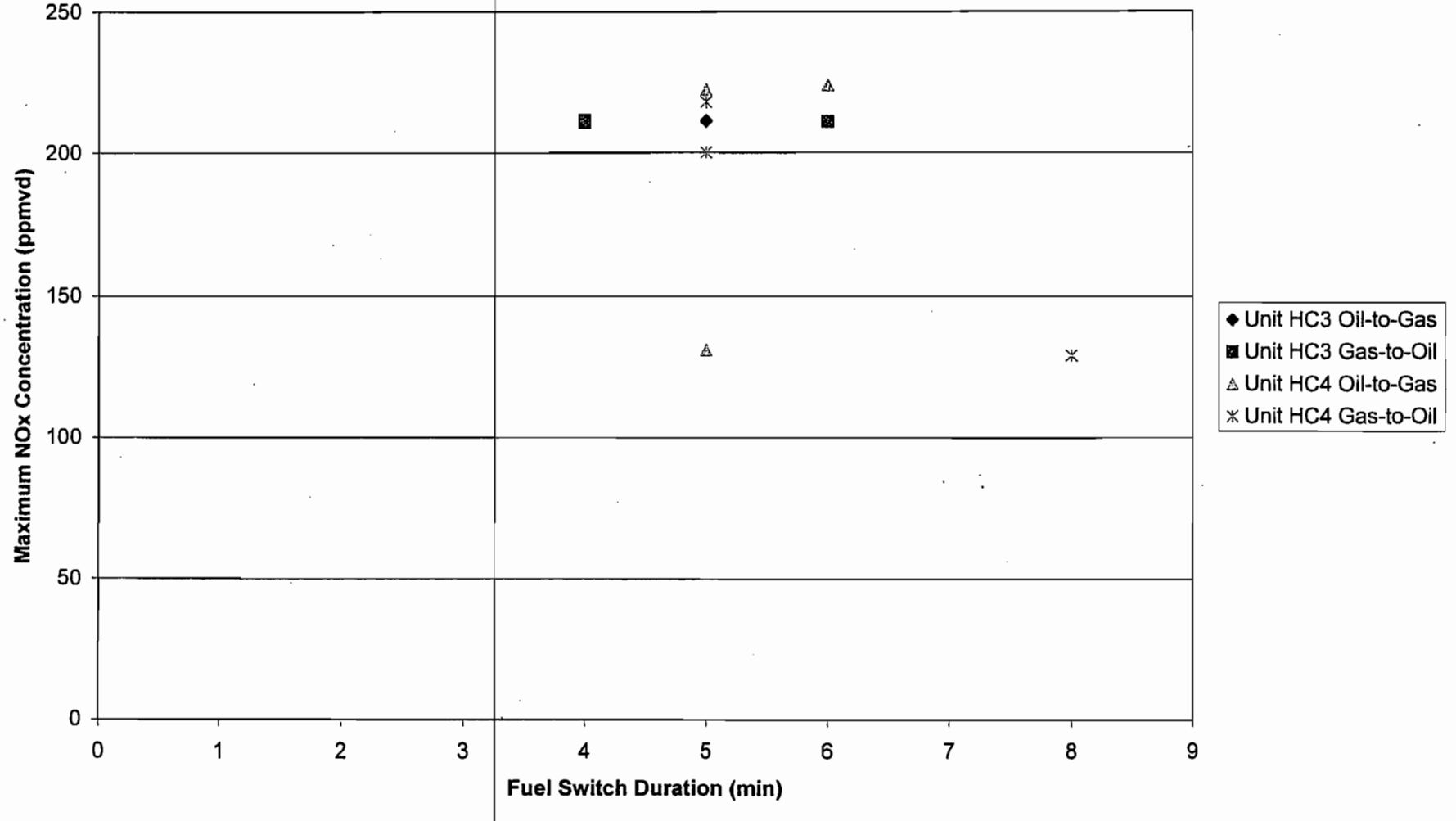


FIGURE 19
Average NOx Emission Rate vs Fuel Switch Duration
Fuel Switching

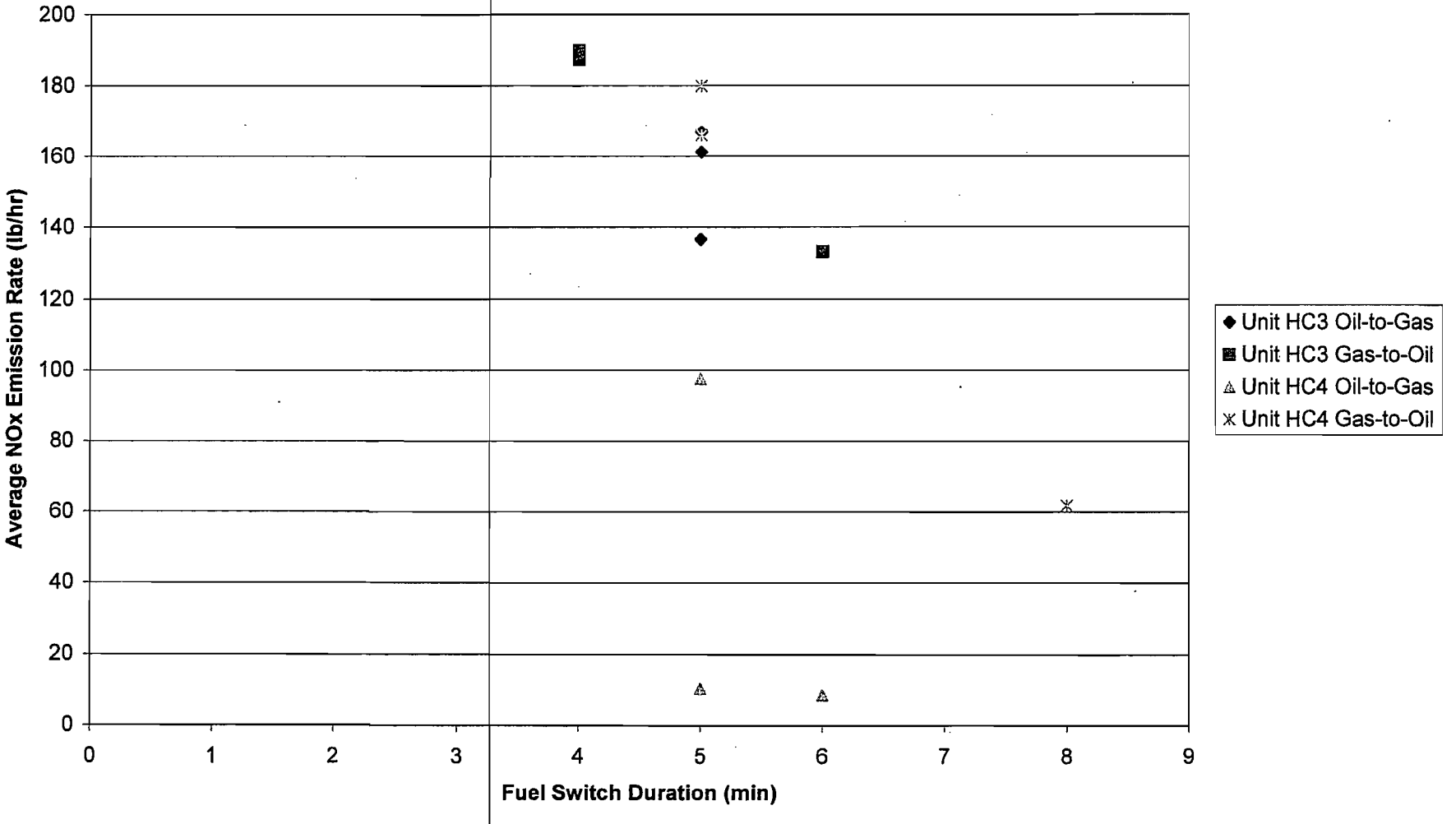


FIGURE 20
Maximum NOx Emission Rate vs Fuel Switch Duration
Fuel Switching