

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771



Reply to Attn of: 250

July 25, 2019

Mr. Steve Lang
Maryland Department of the Environment
Air and Radiation Administration
1800 Washington Boulevard, Suite 715
Baltimore, MD 21230-1720

Dear Mr. Lang:

Please find enclosed the Semi-Annual Fuel Use Report for Boilers and Generators (January 2019 – June 2019) for the National Aeronautics and Space Administration (NASA)'s Goddard Space Flight Center (GSFC). The report includes operation data for five 49.5-MMBtu/hour Boilers (MDE Registration numbers 5-0808 through 5-0812), one 500-kW generator (MDE Registration number 9-1433), seven 1,000-kW generators (MDE Registration numbers 9-1054 through 9-1058, 9-1366, and 9-1422), five 1,450-kW generators (MDE Registration numbers 9-1049 through 9-1053), and two 500-kW portable generators (MDE Registration numbers 9-1045 and 9-1047). The report shows that all the permit operating limits were satisfied.

If you have any questions or comments concerning this matter, please call Ms. Kathleen Moxley at (301) 286-0717.

Sincerely,

A handwritten signature in black ink, appearing to read "KAF".

Kimberly Finch, P.E.
Chief, Medical and Environmental Management Division

Enclosure



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Goddard Space Flight Center

Greenbelt, MD 20771

Semi-Annual Fuel Use Report January 2019 – June 2019

Prepared By:



**613 Lynnhaven Parkway, Suite 100
Virginia Beach, VA 23452
Phone: 757-498-0100**

Enclosure

**Federal Operating Permit Program (40 CFR Part 71)
CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)**

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) Finch (First) Kimberly (MI) _____

Title Chief, Medical and Environmental Management Division

Street or P.O. Box 8800 Greenbelt Road

City Greenbelt State MD ZIP 20771 - 2400

Telephone (301) 286 - 4230 Ext. _____ Facsimile (301) 286 - 1644

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) 

Name (typed) Kimberly Finch, P.E. Date: 07 125 1 2019

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1. Overview

The National Aeronautics and Space Administration (NASA)'s Goddard Space Flight Center (GSFC) is located in Greenbelt, Prince George's County, Maryland. NASA GSFC is a research and development facility, whose mission is to study the Earth, the Sun, the solar system, and the universe. Work activities at NASA GSFC include research, fabrication, and satellite tracking.

NASA GSFC is required by the Maryland Department of the Environment (MDE) Title V Part 70 Operating Permit No. 24-033-00675 and the Environmental Protection Agency (EPA) regulations codified at 40 CFR 60.48c, to submit a Fuel Use Report on a semi-annual basis due no later than July 30th for the period of January through June. The report includes the following data:

- Amount of Steam Produced by the Boilers (Section 2).
- Records of Fuel Combusted per Day (Section 3).
- Hours of Operation and Fuel Usage for Each Generator (Section 4).
- Fuel Oil Supplier Certifications (Section 5).

The NASA GSFC January through June 2019 Semi-Annual Fuel Use Report includes operational data for five 49.5-MMBtu/hour Boilers (MDE Registration numbers 5-0808 through 5-0812), one 500-kW generator (MDE Registration number 9-1433), seven 1,000-kW generators (MDE Registration numbers 9-1054 through 9-1058, 9-1366, and 9-1422), five 1,450-kW generators (MDE Registration numbers 9-1049 through 9-1053), and two 500-kW portable generators (MDE Registration numbers 9-1045 and 9-1047).

This report provides data analyses that demonstrate NASA GSFC compliance with the fuel use requirements of the Title V Part 70 Operating Permit.

2. Amount of Steam Produced by the Boilers

2.1 Limits

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.2.1.D.2 states the following condition for boilers EU24-1 through EU24-5: The total 12-month rolling heat input consumed by the five boilers shall not exceed 750,000 MMBtu.

2.2 Monitoring

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.2.3.D.3 states the following condition for boilers EU24-1 through EU24-5: Monthly calculate the heat input to the boilers at the end of each month for the prior rolling 12-month period.

2.3 Analysis

Table 1 shows the monthly total steam production for the five 49.5-MMBtu per hour natural gas, landfill gas, and #2 fuel oil boilers in building 24. Table 2 shows the monthly total fuel consumption, heat input, and rolling 12-month heat input for the five 49.5-MMBtu per hour natural gas, landfill gas, and #2 fuel oil boilers in building 24.

As seen in Table 2, the total 12-month rolling heat input consumed by the five boilers did not exceed 750,000 MMBtu in any month during the past six months.

Table 1 Total Steam Production for the Five Boilers in Building 24

Date	Steam Produced (Pounds)
January-19	45,050,000
February-19	38,479,000
March-19	39,495,000
April-19	30,227,000
May-19	26,245,000
June-19	23,307,071
Total	202,803,071

Table 2 Fuel Used and Heat Input for the Five Boilers in Building 24

Date	Natural Gas		Landfill Gas		Fuel Oil		Total Heat Input (MMBtu)	Heat Input Rolling Sum (MMBtu)
	Volume (ft ³)	Heat Input (MMBtu)	Volume (ft ³)	Heat Input (MMBtu)	Volume (gals)	Heat Input (MMBtu)		
January-19	34,229,996	35,086	50,849,000	25,425	0	0	60,510	498,916
February-19	27,710,005	28,403	45,304,000	22,652	518	73	51,127	503,533
March-19	31,489,999	32,277	40,080,000	20,040	0	0	52,317	503,683
April-19	17,190,002	17,620	45,827,000	22,914	0	0	40,533	499,515
May-19	11,420,000	11,706	47,395,000	23,698	0	0	35,403	501,131
June-19	9,589,997	9,830	43,597,000	21,799	0	0	31,628	501,239

Notes:
 Natural Gas heating value used for calculation is 1,025 Btu/ft³
 Landfill Gas heating value used for calculation is 500 Btu/ft³
 Fuel Oil heating value used for calculation is 140,000 Btu/gal

3. Records of Fuel Combusted per Day

3.1 Limits

Natural gas, landfill gas, and #2 fuel oil are the fuel types used at NASA GSFC. Washington Gas reports the total natural gas delivered to NASA GSFC per day. Landfill gas, use of which became effective at NASA GSFC on January 7, 2003, is used in Boilers EU24-1, EU24-2, and EU24-4 of building 24. Natural gas is used in all five boilers in building 24 (EU24-1 through EU24-5). #2 fuel oil is used in all five boilers in building 24 (EU24-1 through EU24-5) during periods of natural gas curtailment.

3.2 Monitoring

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.2.5.B states the following condition: The permittee shall report and maintain records of the amounts of each fuel combusted during each day. The reporting period for the reports required under 40 CFR Part 60, Subpart Dc is each six-month period.

3.3 Analysis

Table 3 shows the total natural gas, landfill gas, and #2 fuel oil combusted per day by the boilers located in building 24. Table 4 shows the total facility-wide natural gas usage per day as provided by Washington Gas.

Table 3 Daily Fuel Consumption for the Five Boilers in Building 24

January 2019 Building 24 Boiler Fuel Use				February 2019 Building 24 Boiler Fuel Use				March 2019 Building 24 Boiler Fuel Use			
Date	Natural Gas (cuft)	Landfill Gas (cuft)	#2 Fuel Oil (gals)	Date	Natural Gas (cuft)	Landfill Gas (cuft)	#2 Fuel Oil (gals)	Date	Natural Gas (cuft)	Landfill Gas (cuft)	#2 Fuel Oil (gals)
1/1/2019	800,000	1,469,000	0	2/1/2019	1,520,000	1,572,000	0	3/1/2019	1,010,001	1,547,000	0
1/2/2019	930,000	1,624,000	0	2/2/2019	1,410,000	1,452,000	0	3/2/2019	950,000	1,515,000	0
1/3/2019	900,000	1,961,000	0	2/3/2019	990,000	1,765,000	0	3/3/2019	930,000	1,561,000	0
1/4/2019	800,000	1,664,000	0	2/4/2019	840,001	1,777,000	0	3/4/2019	1,040,000	1,620,000	0
1/5/2019	730,001	1,439,000	0	2/5/2019	570,000	1,772,000	0	3/5/2019	1,110,000	1,586,000	0
1/6/2019	780,000	1,666,000	0	2/6/2019	640,001	1,684,000	518	3/6/2019	1,330,000	1,629,000	0
1/7/2019	1,270,000	1,388,000	0	2/7/2019	690,000	1,706,000	0	3/7/2019	1,180,000	1,623,000	0
1/8/2019	920,000	1,497,000	0	2/8/2019	830,001	1,591,000	0	3/8/2019	1,060,000	1,534,000	0
1/9/2019	999,999	1,640,000	0	2/9/2019	1,230,000	1,526,000	0	3/9/2019	920,000	1,482,000	0
1/10/2019	1,310,000	1,795,000	0	2/10/2019	1,240,000	1,470,000	0	3/10/2019	690,000	1,562,000	0
1/11/2019	1,259,999	1,549,000	0	2/11/2019	1,050,000	1,622,000	0	3/11/2019	779,999	1,758,000	0
1/12/2019	1,180,000	1,646,000	0	2/12/2019	1,000,000	1,699,000	0	3/12/2019	920,000	1,743,000	0
1/13/2019	1,089,999	1,741,000	0	2/13/2019	910,001	1,800,000	0	3/13/2019	920,000	1,545,000	0
1/14/2019	1,180,001	1,806,000	0	2/14/2019	960,001	1,654,000	0	3/14/2019	680,001	1,653,000	0
1/15/2019	1,090,000	1,818,000	0	2/15/2019	670,000	1,777,000	0	3/15/2019	770,000	969,000	0
1/16/2019	1,090,001	1,791,000	0	2/16/2019	890,000	1,630,000	0	3/16/2019	1,410,000	0	0
1/17/2019	1,150,000	1,590,000	0	2/17/2019	1,010,000	1,613,000	0	3/17/2019	1,790,000	0	0
1/18/2019	1,039,999	1,694,000	0	2/18/2019	980,000	1,617,000	0	3/18/2019	1,360,000	16,000	0
1/19/2019	930,000	1,624,000	0	2/19/2019	1,200,001	1,412,000	0	3/19/2019	1,410,000	666,000	0
1/20/2019	950,000	1,739,000	0	2/20/2019	1,230,000	1,432,000	0	3/20/2019	979,999	1,750,000	0
1/21/2019	1,610,001	1,546,000	0	2/21/2019	900,000	1,679,000	0	3/21/2019	570,000	1,818,000	0
1/22/2019	1,979,999	475,000	0	2/22/2019	1,000,000	1,502,000	0	3/22/2019	1,229,999	889,000	0
1/23/2019	979,999	1,825,000	0	2/23/2019	1,039,999	1,597,000	0	3/23/2019	1,420,000	347,000	0
1/24/2019	660,000	1,936,000	0	2/24/2019	720,000	1,632,000	0	3/24/2019	890,000	1,536,000	0
1/25/2019	1,010,000	1,592,000	0	2/25/2019	1,070,000	1,657,000	0	3/25/2019	720,000	1,428,000	0
1/26/2019	1,260,001	1,755,000	0	2/26/2019	1,320,000	1,536,000	0	3/26/2019	1,010,000	1,704,000	0
1/27/2019	1,059,999	1,762,000	0	2/27/2019	1,050,000	1,561,000	0	3/27/2019	1,090,000	1,429,000	0
1/28/2019	1,150,000	1,771,000	0	2/28/2019	750,000	1,569,000	0	3/28/2019	840,000	1,749,000	0
1/29/2019	1,059,999	1,746,000	0					3/29/2019	630,000	1,347,000	0
1/30/2019	1,379,999	1,689,000	0					3/30/2019	840,000	1,078,000	0
1/31/2019	1,680,000	1,611,000	0					3/31/2019	1,010,000	996,000	0

April 2019 Building 24 Boiler Fuel Use				May 2019 Building 24 Boiler Fuel Use				June 2019 Building 24 Boiler Fuel Use			
Date	Natural Gas (cuft)	Landfill Gas (cuft)	#2 Fuel Oil (gals)	Date	Natural Gas (cuft)	Landfill Gas (cuft)	#2 Fuel Oil (gals)	Date	Natural Gas (cuft)	Landfill Gas (cuft)	#2 Fuel Oil (gals)
4/1/2019	900,000	1,675,000	0	5/1/2019	570,000	1,234,000	0	6/1/2019	239,999	1,523,000	0
4/2/2019	980,001	1,839,000	0	5/2/2019	400,000	1,509,000	0	6/2/2019	310,000	1,436,000	0
4/3/2019	610,000	1,791,000	0	5/3/2019	270,000	1,820,000	0	6/3/2019	240,000	1,729,000	0
4/4/2019	860,000	1,387,000	0	5/4/2019	250,000	1,608,000	0	6/4/2019	340,000	1,632,000	0
4/5/2019	840,000	1,479,000	0	5/5/2019	340,001	1,828,000	0	6/5/2019	280,000	1,619,000	0
4/6/2019	660,000	1,508,000	0	5/6/2019	480,000	1,505,000	0	6/6/2019	280,000	1,667,000	0
4/7/2019	580,000	1,511,000	0	5/7/2019	430,000	1,387,000	0	6/7/2019	240,000	1,738,000	0
4/8/2019	440,000	1,441,000	0	5/8/2019	390,000	1,452,000	0	6/8/2019	280,000	1,726,000	0
4/9/2019	230,000	1,838,000	0	5/9/2019	430,000	1,520,000	0	6/9/2019	240,000	1,405,000	0
4/10/2019	480,000	1,847,000	0	5/10/2019	300,000	1,566,000	0	6/10/2019	250,000	1,415,000	0
4/11/2019	640,001	1,693,000	0	5/11/2019	340,000	1,663,000	0	6/11/2019	280,000	1,643,000	0
4/12/2019	480,000	1,651,000	0	5/12/2019	460,000	1,698,000	0	6/12/2019	270,000	1,570,000	0
4/13/2019	370,000	1,734,000	0	5/13/2019	510,000	1,671,000	0	6/13/2019	330,000	2,023,000	0
4/14/2019	330,000	1,642,000	0	5/14/2019	580,000	1,627,000	0	6/14/2019	240,000	1,639,000	0
4/15/2019	680,000	1,280,000	0	5/15/2019	570,000	1,371,000	0	6/15/2019	210,000	1,320,000	0
4/16/2019	660,000	1,776,000	0	5/16/2019	430,000	1,532,000	0	6/16/2019	229,999	1,681,000	0
4/17/2019	460,000	1,684,000	0	5/17/2019	300,000	1,468,000	0	6/17/2019	440,000	1,158,000	0
4/18/2019	390,000	1,724,000	0	5/18/2019	280,000	1,612,000	0	6/18/2019	400,000	1,197,000	0
4/19/2019	280,000	1,693,000	0	5/19/2019	450,000	1,535,000	0	6/19/2019	240,000	1,550,000	0
4/20/2019	420,000	1,593,000	0	5/20/2019	340,000	1,329,000	0	6/20/2019	270,000	1,939,000	0
4/21/2019	680,000	916,000	0	5/21/2019	300,000	1,667,000	0	6/21/2019	240,000	1,134,000	0
4/22/2019	390,000	1,849,000	0	5/22/2019	370,000	1,511,000	0	6/22/2019	580,000	1,106,000	0
4/23/2019	370,000	1,700,000	0	5/23/2019	360,000	1,436,000	0	6/23/2019	410,000	1,271,000	0
4/24/2019	520,000	1,419,000	0	5/24/2019	310,000	1,399,000	0	6/24/2019	630,000	837,000	0
4/25/2019	670,000	755,000	0	5/25/2019	330,000	1,512,000	0	6/25/2019	680,000	593,000	0
4/26/2019	670,000	876,000	0	5/26/2019	310,000	1,408,000	0	6/26/2019	299,999	1,532,000	0
4/27/2019	790,000	1,331,000	0	5/27/2019	299,999	1,488,000	0	6/27/2019	350,000	1,404,000	0
4/28/2019	490,000	1,515,000	0	5/28/2019	280,000	1,511,000	0	6/28/2019	300,000	1,417,000	0
4/29/2019	660,000	1,546,000	0	5/29/2019	250,000	1,442,000	0	6/29/2019	290,000	1,157,000	0
4/30/2019	660,000	1,134,000	0	5/30/2019	250,000	1,464,000	0	6/30/2019	200,000	1,536,000	0
				5/31/2019	240,000	1,622,000	0				

Table 4 Total Facility-Wide Natural Gas Usage

Date	CCF Usage	BTU Factor	Therm Usage	Date	CCF Usage	BTU Factor	Therm Usage	Date	CCF Usage	BTU Factor	Therm Usage
1/1/2019	9,610	1.042	10,013.7	2/1/2019	9,040	1.055	9,538.0	3/1/2019	10,650	1.043	11,108.2
1/2/2019	8,380	1.049	8,790.8	2/2/2019	9,430	1.052	9,920.7	3/2/2019	9,350	1.038	9,705.4
1/3/2019	8,930	0.000	0.0	2/3/2019	9,430	1.048	9,882.3	3/3/2019	10,280	1.044	10,732.3
1/4/2019	7,870	1.043	8,209.0	2/4/2019	9,430	1.043	9,836.0	3/4/2019	11,680	1.047	12,229.1
1/5/2019	7,780	1.041	8,098.4	2/5/2019	9,430	1.044	9,845.6	3/5/2019	12,180	1.047	12,752.4
1/6/2019	10,290	1.042	10,722.2	2/6/2019	9,440	1.046	9,873.6	3/6/2019	13,370	1.050	14,038.5
1/7/2019	12,520	1.049	13,133.2	2/7/2019	9,430	1.048	9,882.3	3/7/2019	11,450	1.046	11,976.6
1/8/2019	8,460	1.041	8,807.0	2/8/2019	10,650	1.051	11,193.1	3/8/2019	10,410	1.044	10,867.9
1/9/2019	11,880	1.051	12,486.0	2/9/2019	13,690	1.047	14,333.5	3/9/2019	9,330	1.048	9,778.0
1/10/2019	13,550	1.047	14,186.9	2/10/2019	11,760	1.044	12,282.3	3/10/2019	7,060	1.043	7,363.5
1/11/2019	12,900	1.043	13,454.7	2/11/2019	10,830	1.043	11,296.0	3/11/2019	8,800	1.048	9,222.2
1/12/2019	11,800	1.042	12,295.5	2/12/2019	9,580	1.046	10,020.7	3/12/2019	10,110	1.046	10,575.1
1/13/2019	11,760	1.042	12,253.6	2/13/2019	9,970	1.046	10,428.8	3/13/2019	8,950	1.045	9,353.4
1/14/2019	11,840	1.044	12,360.9	2/14/2019	8,950	1.044	9,343.6	3/14/2019	4,880	1.040	5,075.2
1/15/2019	11,590	1.045	12,112.0	2/15/2019	7,110	1.046	7,437.0	3/15/2019	12,040	1.040	12,521.6
1/16/2019	10,960	1.042	11,420.6	2/16/2019	10,400	1.045	10,868.7	3/16/2019	15,990	1.042	16,661.5
1/17/2019	11,750	1.046	12,290.5	2/17/2019	9,840	1.042	10,253.6	3/17/2019	16,630	1.038	17,262.3
1/18/2019	9,830	1.038	10,203.5	2/18/2019	11,470	1.044	11,974.7	3/18/2019	17,460	1.044	18,228.4
1/19/2019	9,160	1.037	9,498.8	2/19/2019	12,580	1.047	13,171.4	3/19/2019	10,430	1.044	10,889.1
1/20/2019	13,520	1.041	14,074.5	2/20/2019	11,800	1.047	12,355.1	3/20/2019	7,660	1.040	7,966.4
1/21/2019	19,240	1.044	20,086.3	2/21/2019	8,580	1.045	8,966.9	3/21/2019	6,810	1.044	7,109.8
1/22/2019	16,290	1.050	17,104.5	2/22/2019	10,710	1.045	11,192.5	3/22/2019	17,600	1.046	18,409.6
1/23/2019	7,420	1.047	7,768.8	2/23/2019	9,940	1.048	10,417.1	3/23/2019	11,280	1.044	11,776.1
1/24/2019	8,830	1.051	9,280.5	2/24/2019	8,640	1.047	9,046.1	3/24/2019	8,360	1.036	8,660.9
1/25/2019	12,390	1.044	12,935.2	2/25/2019	11,670	1.048	12,230.4	3/25/2019	8,350	1.038	8,667.6
1/26/2019	12,210	1.045	12,760.0	2/26/2019	11,460	1.041	11,929.9	3/26/2019	11,350	1.043	11,838.2
1/27/2019	10,380	1.045	10,847.8	2/27/2019	10,090	1.045	10,544.5	3/27/2019	9,810	1.046	10,261.4
1/28/2019	11,990	1.047	12,553.5	2/28/2019	10,170	1.046	10,637.5	3/28/2019	7,010	1.044	7,318.3
1/29/2019	11,880	1.048	12,450.2	Total	285,520		298,701.9	3/29/2019	7,900	1.034	8,168.6
1/30/2019	16,150	1.054	17,022.0					3/30/2019	9,360	1.033	9,669.3
1/31/2019	16,820	1.059	17,812.4					3/31/2019	10,090	1.053	10,624.9
Total	357,980		365,033.0					Total	326,630		340,811.8

Date	CCF Usage	BTU Factor	Therm Usage	Date	CCF Usage	BTU Factor	Therm Usage	Date	CCF Usage	BTU Factor	Therm Usage
4/1/2019	8,750	1.047	9,161.3	5/1/2019	4,690	0.051	237.4	6/1/2019	2,430	1.025	2,490.8
4/2/2019	8,770	1.050	9,208.5	5/2/2019	3,120	1.033	3,222.9	6/2/2019	3,060	1.022	3,127.2
4/3/2019	7,510	1.054	7,915.7	5/3/2019	2,780	1.035	2,877.8	6/3/2019	3,120	1.024	3,194.8
4/4/2019	7,920	1.055	8,356.5	5/4/2019	2,680	1.033	2,768.6	6/4/2019	2,880	1.022	2,943.3
4/5/2019	7,990	1.051	8,397.2	5/5/2019	4,580	1.035	4,740.9	6/5/2019	2,490	1.023	2,547.1
4/6/2019	6,030	1.042	6,283.1	5/6/2019	4,450	1.039	4,623.2	6/6/2019	2,470	1.029	2,541.7
4/7/2019	4,810	1.035	4,979.0	5/7/2019	4,160	1.026	4,268.1	6/7/2019	2,530	1.025	2,593.6
4/8/2019	3,170	1.031	3,268.6	5/8/2019	4,300	1.036	4,454.8	6/8/2019	2,570	1.022	2,626.3
4/9/2019	3,750	1.036	3,885.0	5/9/2019	3,860	1.036	3,999.0	6/9/2019	3,010	1.021	3,072.9
4/10/2019	5,540	1.039	5,756.1	5/10/2019	2,900	1.028	2,981.2	6/10/2019	2,640	1.024	2,703.3
4/11/2019	6,550	1.038	6,798.9	5/11/2019	3,730	1.030	3,841.9	6/11/2019	2,650	1.023	2,710.8
4/12/2019	3,670	1.032	3,787.5	5/12/2019	5,430	1.043	5,663.4	6/12/2019	2,230	1.023	2,281.3
4/13/2019	3,380	1.034	3,494.9	5/13/2019	5,450	1.044	5,689.7	6/13/2019	2,740	1.023	2,803.1
4/14/2019	5,920	1.029	6,091.8	5/14/2019	6,260	1.039	6,504.2	6/14/2019	2,440	1.025	2,501.2
4/15/2019	6,490	1.044	6,775.4	5/15/2019	5,190	1.039	5,392.8	6/15/2019	2,450	1.026	2,513.9
4/16/2019	5,730	1.035	5,931.1	5/16/2019	3,690	1.031	3,804.5	6/16/2019	2,450	1.023	2,506.3
4/17/2019	4,730	1.037	4,904.9	5/17/2019	2,920	1.026	2,996.0	6/17/2019	5,890	1.025	6,037.7
4/18/2019	3,040	1.035	3,147.1	5/18/2019	3,410	1.024	3,491.8	6/18/2019	2,410	1.025	2,470.4
4/19/2019	2,620	1.033	2,706.5	5/19/2019	3,780	1.028	3,886.0	6/19/2019	2,400	1.028	2,467.2
4/20/2019	8,300	1.029	8,540.8	5/20/2019	3,270	1.026	3,355.3	6/20/2019	2,440	1.029	2,510.8
4/21/2019	4,060	1.027	4,169.8	5/21/2019	3,470	1.023	3,550.0	6/21/2019	4,250	1.029	4,373.3
4/22/2019	3,760	1.031	3,876.9	5/22/2019	3,910	1.025	4,008.2	6/22/2019	5,000	1.028	5,140.4
4/23/2019	3,250	1.031	3,350.6	5/23/2019	3,300	1.023	3,376.0	6/23/2019	4,200	1.029	4,321.4
4/24/2019	6,950	1.041	7,235.2	5/24/2019	3,280	1.023	3,356.0	6/24/2019	8,970	1.031	9,248.0
4/25/2019	7,580	1.033	7,830.1	5/25/2019	3,250	1.020	3,315.0	6/25/2019	3,570	1.030	3,677.1
4/26/2019	7,600	1.036	7,873.7	5/26/2019	2,890	1.021	2,950.4	6/26/2019	2,770	1.028	2,848.0
4/27/2019	5,670	1.032	5,851.6	5/27/2019	3,040	1.025	3,116.8	6/27/2019	3,640	1.026	3,734.8
4/28/2019	6,060	1.042	6,314.5	5/28/2019	2,450	1.021	2,501.4	6/28/2019	2,970	1.029	3,056.7
4/29/2019	5,920	1.042	6,168.6	5/29/2019	2,470	1.026	2,534.4	6/29/2019	3,000	1.033	3,099.7
4/30/2019	7,490	1.032	7,729.7	5/30/2019	2,440	1.023	2,496.1	6/30/2019	3,010	1.028	3,094.5
Total	173,010		179,790.6	5/31/2019	2,450	1.024	2,508.7	Total	96,680		99,237.6
				Total	113,600		112,512.5				

4. Hours of Operation and Fuel Usage for Each Generator

4.1 Limits

The NASA GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.3.1.D states the following conditions for generators EU24C-1 through EU24C-4 and EU24C-8 (1,000 kW), EU31-1 through EU31-5 (1,450 kW), EU7-2 (500 kW), EU7-3 (500 kW), and EU10-3 (500 kW): In order to remain exempt from the requirements of 40 CFR Part 63, Subpart ZZZZ per 40 CFR §63.6585(f)(3), the engines may not operate or be contractually obligated to be available for more than 15 hours per calendar year for emergency demand response or periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency. In addition, the engines may not operate for non-emergency situations to supply power as part of a financial arrangement with another entity.

The NASA GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.3a.1.F states the following conditions for EU24C-6 (1,000 kW) and EU29-1 (1,000 kW): There is no time limit on the use of emergency stationary internal combustion engine in emergency situations. Furthermore, the total annual operating time for each generator is limited to 100 hours per calendar year for any combination of maintenance and readiness checks, emergency demand response, and/or when there is deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

It should be noted that the conditions above have been rescinded and no generator at GSFC operates for emergency demand response purposes or periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency. Furthermore, the total annual operating time for each generator is limited to 100 hours per calendar year.

4.2 Monitoring

The NASA GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.3.3.D and IV.3a.3.F state the following conditions for all generators: The Permittee shall maintain for at least five years, an operating log for each generator, listing the dates, hours of operation, and reason for generator operation (i.e., maintenance, operational testing, power outage, etc.)

4.3 Analysis

Tables 5 through 7 show the total operating hours for each generator and Table 8 shows the fuel usage for each group of generators. For the past six months, all the generators operated for maintenance and operational testing purposes only. Furthermore, they operated for a total time ranging from 0.7 to 6.0 hours during the past six month. At this rate, they will not operate more than 100 hours in calendar year 2019.

Table 5 Building 24 Generator Operating Hours

Generator Operating Hours						
Date	EU24C-1	EU24C-2	EU24C-3	EU24C-4	EU24C-6	EU24C-8
January-19	0.0	0.0	0.0	0.0	0.0	0.0
February-19	1.0	1.0	1.0	1.0	1.0	1.0
March-19	1.0	1.0	1.0	1.0	1.0	1.0
April-19	1.0	1.0	1.0	1.0	0.0	1.0
May-19	0.0	0.0	0.0	0.0	0.0	0.0
June-19	0.0	0.0	0.0	0.0	0.0	0.0

Table 6 Building 31 Generator Operating Hours

Generator Operating Hours					
Date	EU31-1	EU31-2	EU31-3	EU31-4	EU31-5
January-19	0.0	0.0	0.0	0.0	0.0
February-19	0.0	0.0	0.0	0.0	0.0
March-19	1.0	1.0	1.0	1.0	1.0
April-19	1.0	1.0	2.0	2.0	2.0
May-19	2.0	2.0	2.0	2.0	2.0
June-19	1.0	1.0	1.0	1.0	1.0

Table 7 Other Generator Operating Hours

Generator Operating Hours				
Date	EU7-2	EU7-3	EU10-3	EU29-1
January-19	0.0	0.0	0.0	0.0
February-19	0.0	0.0	0.0	0.4
March-19	0.2	1.0	0.6	0.0
April-19	0.0	0.0	0.0	0.0
May-19	0.0	0.0	0.0	0.0
June-19	0.6	1.0	0.5	0.3

Table 8 Generator Fuel Usage

Generator Fuel Usage (gals)						
Date	Building 24C	Building 31	EU7-2	EU7-3	EU10-3	EU29-1
January-19	0.0	0.0	0.0	0.0	0.0	0.0
February-19	402.3	0.0	0.0	0.0	0.0	26.1
March-19	402.3	486.1	6.7	33.5	20.1	0.0
April-19	335.3	777.8	0.0	0.0	0.0	0.0
May-19	0.0	972.2	0.0	0.0	0.0	0.0
June-19	0.0	486.1	20.1	33.5	16.8	20.1

Notes:
 Fuel Oil heating value used for calculation is 140,000 Btu/gal
 Brake-specific fuel consumption used for calculation is 7,000 Btu/hp-hr

5. Fuel Supplier Certifications

5.1 Limits

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.2.1.B and Section IV.3.1.B state the following condition for the fuel oil sulfur content: A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations: (2) In Areas III and IV: (b) Distillate fuel oils, 0.3 percent.

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.3a.1.B states the following condition for the fuel oil sulfur content for generators EU24C-6 and EU29-1: The permittee must meet the non-road diesel fuel sulfur requirements of 40CFR80.510(b) as follows: (a) Maximum sulfur content 15 ppm and (b) Minimum cetane index of 40; or (c) Maximum aromatic content of 35 volume percent.

5.2 Monitoring

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.3.3.B states the following condition: The Permittee shall obtain a certification from the fuel supplier indicating that the fuel oil is in compliance with the limitation on the sulfur content of the fuel oil or obtain sulfur in fuel analyses of oil that is representative of the oil burned.

The GSFC Title V Part 70 Operating Permit No. 24-033-00675, Section IV.3a.3.B states the following condition for the fuel oil for generators EU24C-6 and EU29-1: The Permittee shall maintain for at least five years and make available to the Department upon request, records for each fuel delivery from the fuel supplier a fuel supplier certification consisting of the name of the oil supplier, the date of delivery, the amount of fuel delivered, and a statement from the fuel supplier that the diesel fuel oil complies with the specifications of 40 CFR §80.510(b).

5.3 Analysis

There was no fuel oil delivered at NASA GSFC during the past six months.

