



DEPARTMENT OF THE NAVY

COMMANDER
NAVY REGION HAWAII
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JBPHH, HAWAII 96860-5101

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October 8, 2019

CERTIFIED NO: 7016 0910 0001 0898 4798

Mr. Richard Takaba
Hawaii State Department of Health
Environmental Management Division
Solid and Hazardous Waste Branch
Underground Storage Tank Section
2827 Waimano Home Road, Suite 100
Pearl City, HI 96782

Dear Mr. Takaba:

**SUBJECT: RED HILL TANK COMPLEX
SOIL VAPOR SAMPLING RESULTS FOR AUGUST 2019
DOH FACILITY ID NO. 9-102271
DOH RELEASE ID NO. 990051, 010011, 020028, AND 140010**

Soil vapor samples were collected from beneath all active and accessible Red Hill tanks on August 21, 2019.

Soil vapor VOC concentrations were measured in the field using a photo-ionization detector. The soil vapor sampling results are being submitted as Enclosure 1.

A conservative approach is to assess the integrity of the associated tank system if VOC concentrations exceed 280,000 ppbv in soil vapor monitoring points (SVMPs) beneath tanks containing JP-5 or JP-8, or 14,000 ppbv in SVMPs beneath tanks containing marine diesel fuel. These values are 50 percent of the calculated vapor concentration from fuel-saturated water.

At Tank 5, the concentrations of VOCs detected in the front, middle, and outer edge soil vapor monitoring probes were 417 ppbv, 2,618 ppbv, and 3,103 ppbv, respectively. Tank 5 was emptied in January 2014 and has not contained fuel since that time. VOC concentrations in all down-gradient soil vapor monitors were below 700 ppbv.

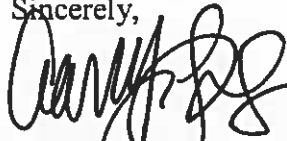
All other VOC concentrations measured in August were about 68 to 1,918 times below the action levels, with no consistent trends observed. NAVSUP FLC Pearl Harbor Causative Research Report is submitted as Enclosure 2. Possible reasons for the results are speculative and may include, but not be limited to, ongoing projects in the tunnel, groundwater level fluctuations, rainfall (or lack thereof), bi-product of biodegradation, and fuel movement in the tanks and piping.

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Soil vapor VOC concentration trends will continue to be monitored. The next soil vapor sampling event is scheduled for September 2019, and will include collecting samples from soil vapor monitoring probes beneath all active and accessible tanks.

If there are any questions regarding this matter, or if more information is needed, please contact Mr. Melvin Muraoka at (808) 471-3869.

Sincerely,



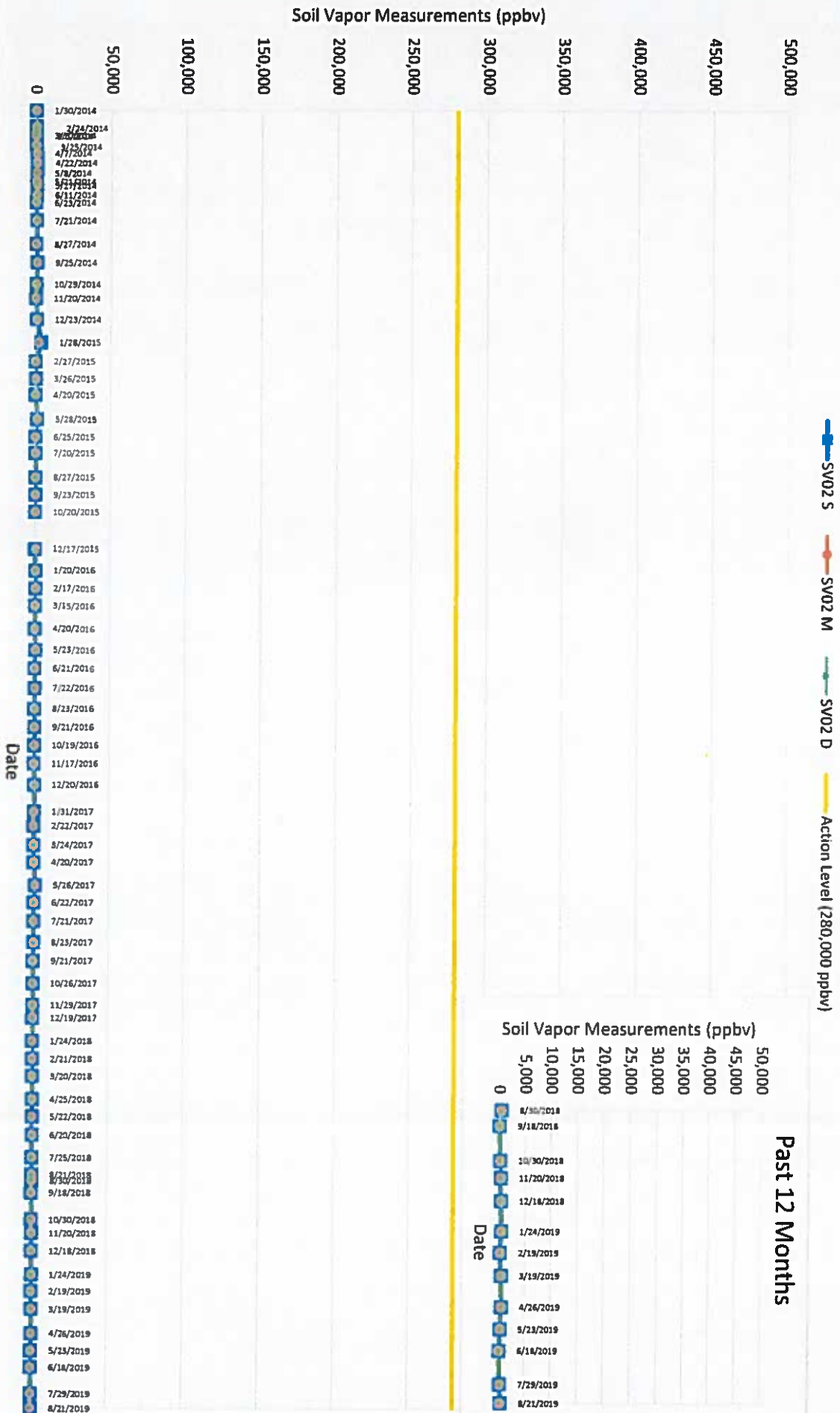
AARON K. POENTIS
Director

Regional Environmental Department
By direction of the
Commander

- Enclosures: 1. Summary of Soil Vapor Sampling Results for Tanks 2 through 18 and 20 through August 2019 (18 pages)
2. NAVSUP FLC Pearl Harbor Causative Research Report IRT Red Hill Soil Vapor Monitoring Report for August 2019

Copy to: Mr. Omer Shalev, U.S. EPA Region 9, Underground Storage Tank Program Office
Mr. John Floyd, NAVSUP FLC Pearl Harbor
Mr. Ralph Wells, DLA Energy Pacific

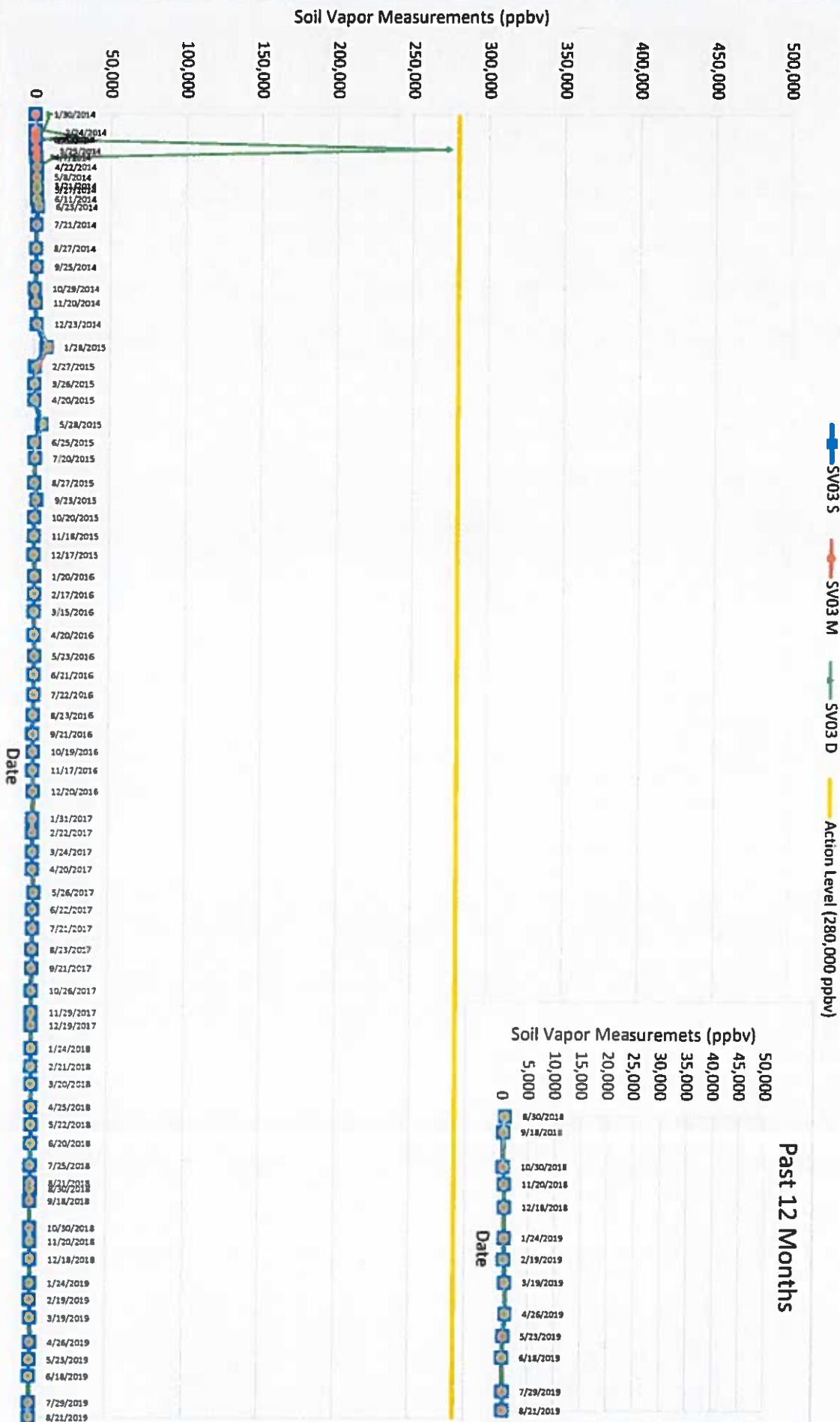
Figure 1
Soil Vapor Measurements - SV02 (F-24)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

Figure 2
Soil Vapor Measurements - SV03 (F-24)

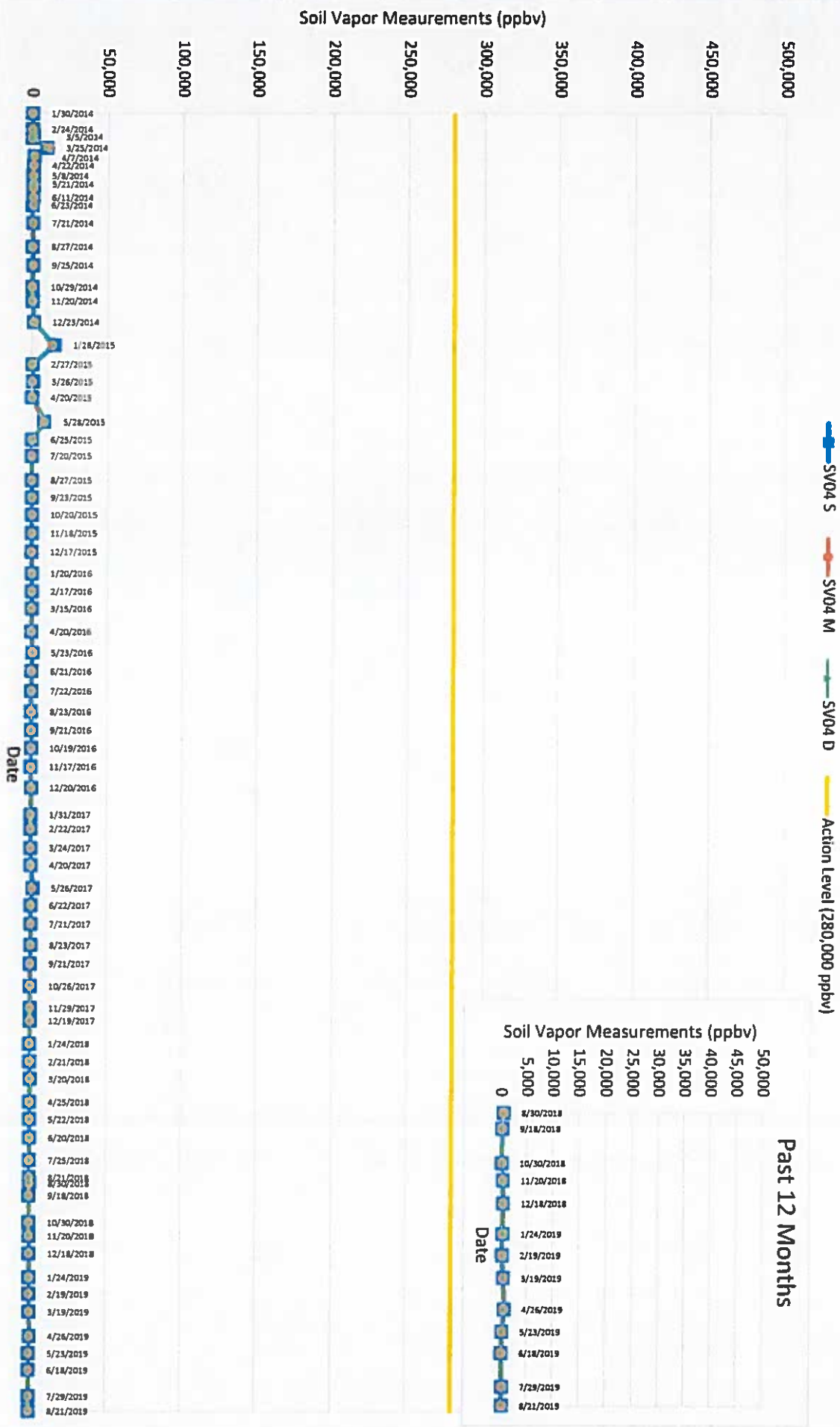


Notes:

ppbv: Parts Per Billion by Volume
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
 F-76: Marine Diesel, Fuel Number 76

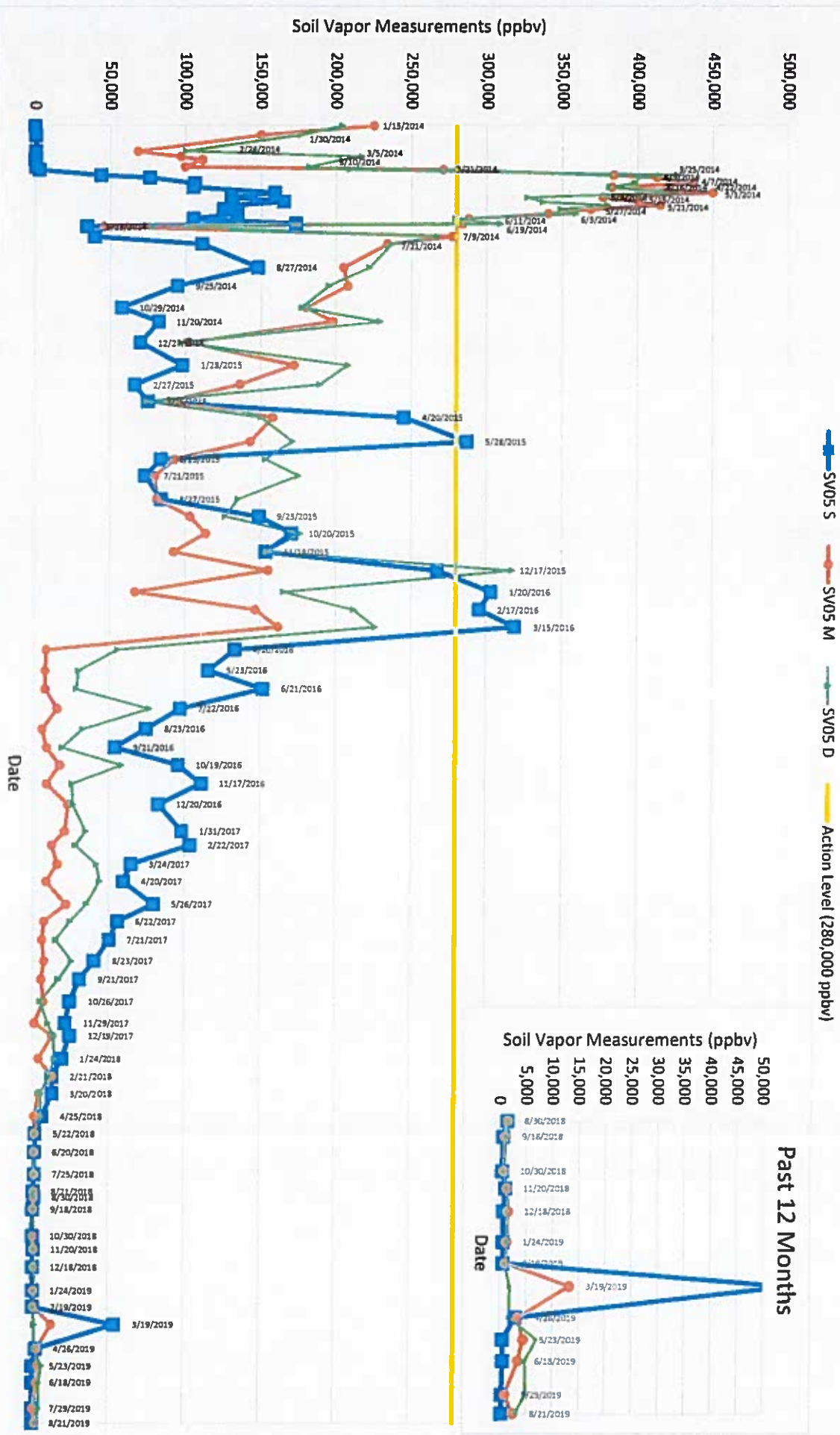
Figure 3
Soil Vapor Measurements - SV04 (F-24)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

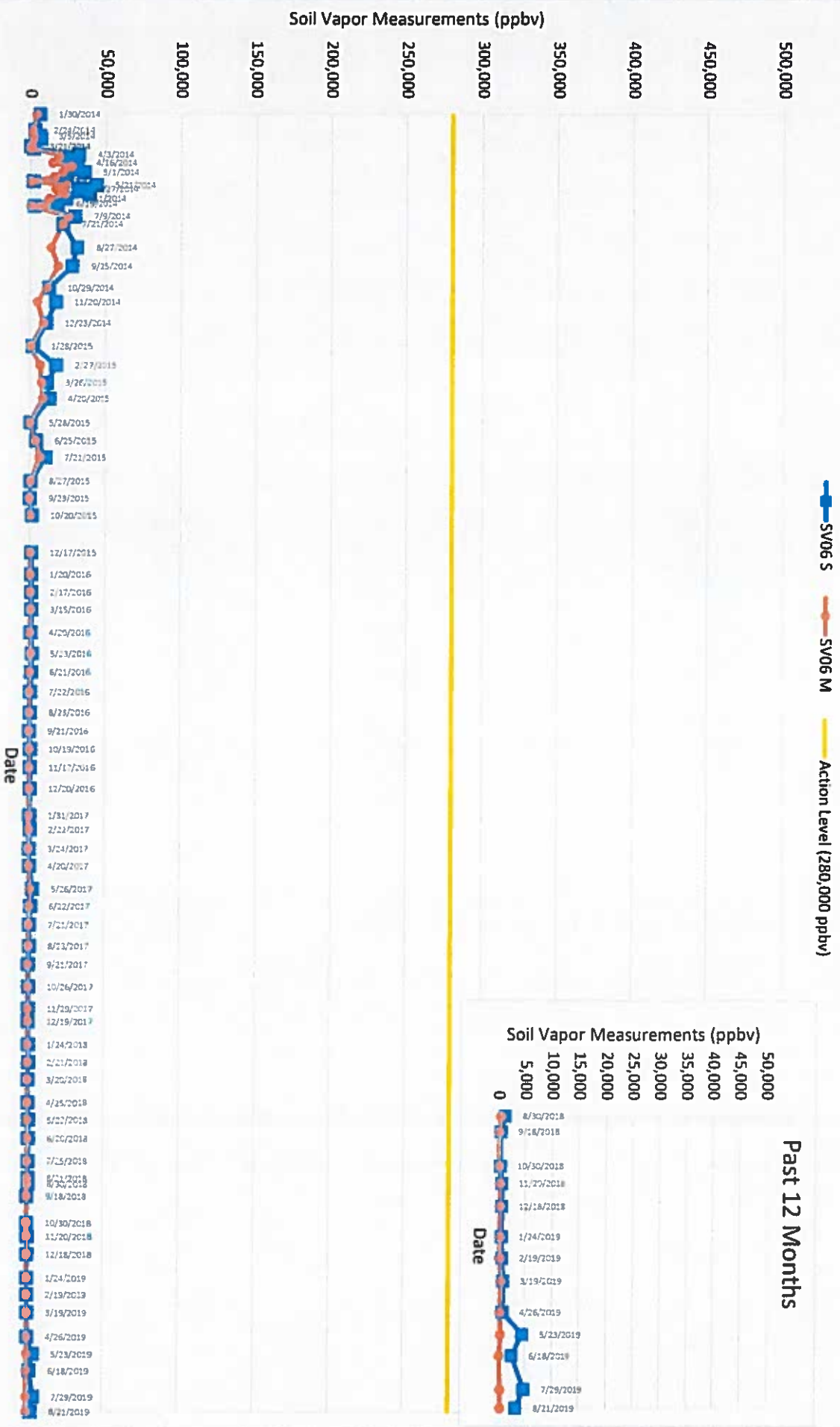
Figure 4
Soil Vapor Measurements - SV05 (F-24)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

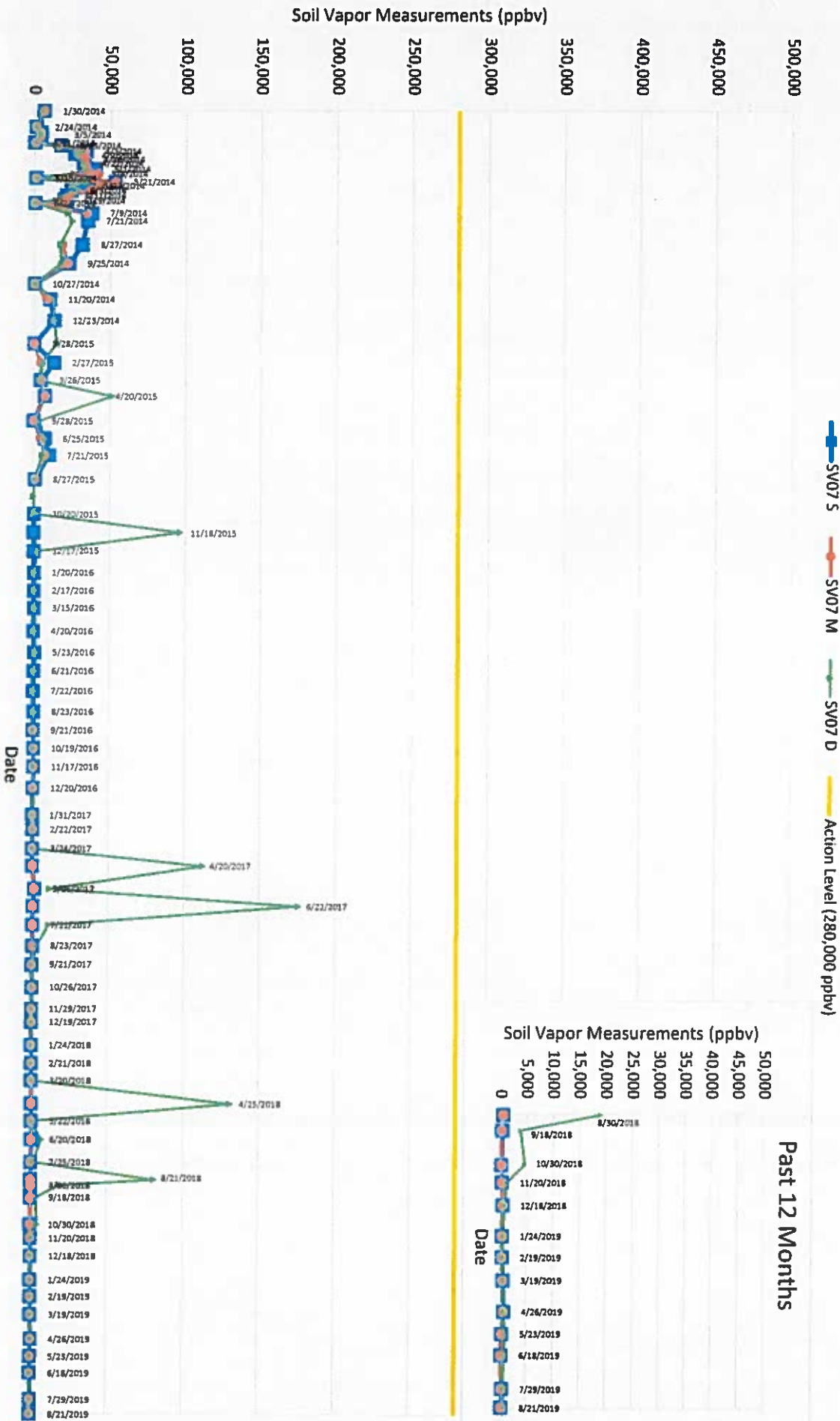
Figure 5
Soil Vapor Measurements - SV06 (F-24)



Notes:
 ppbv: Parts Per Billion by Volume
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
 F-76: Marine Diesel, Fuel Number 76

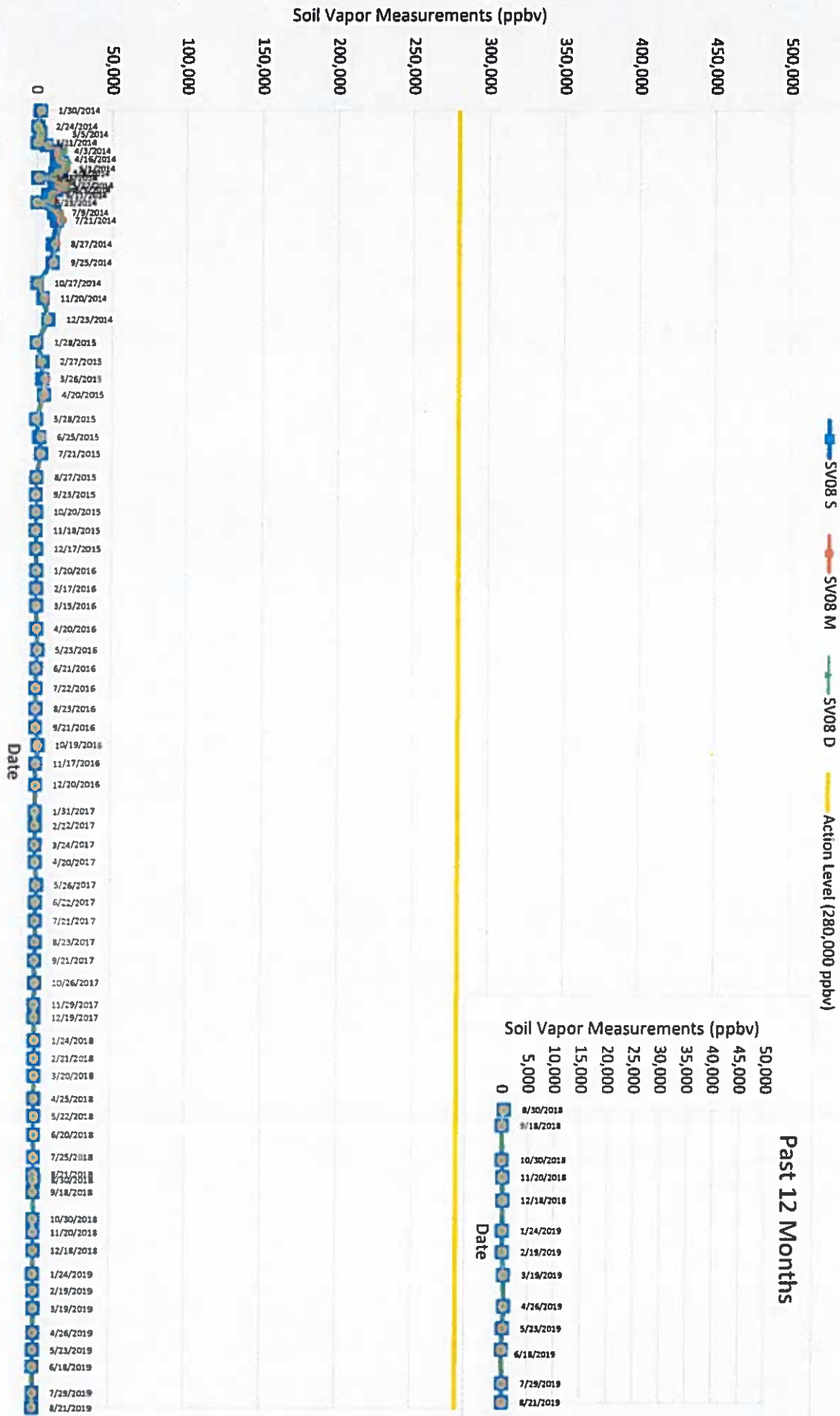
Figure 6
Soil Vapor Measurements - SV07 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

Figure 7
Soil Vapor Measurements - SV08 (JP-5)

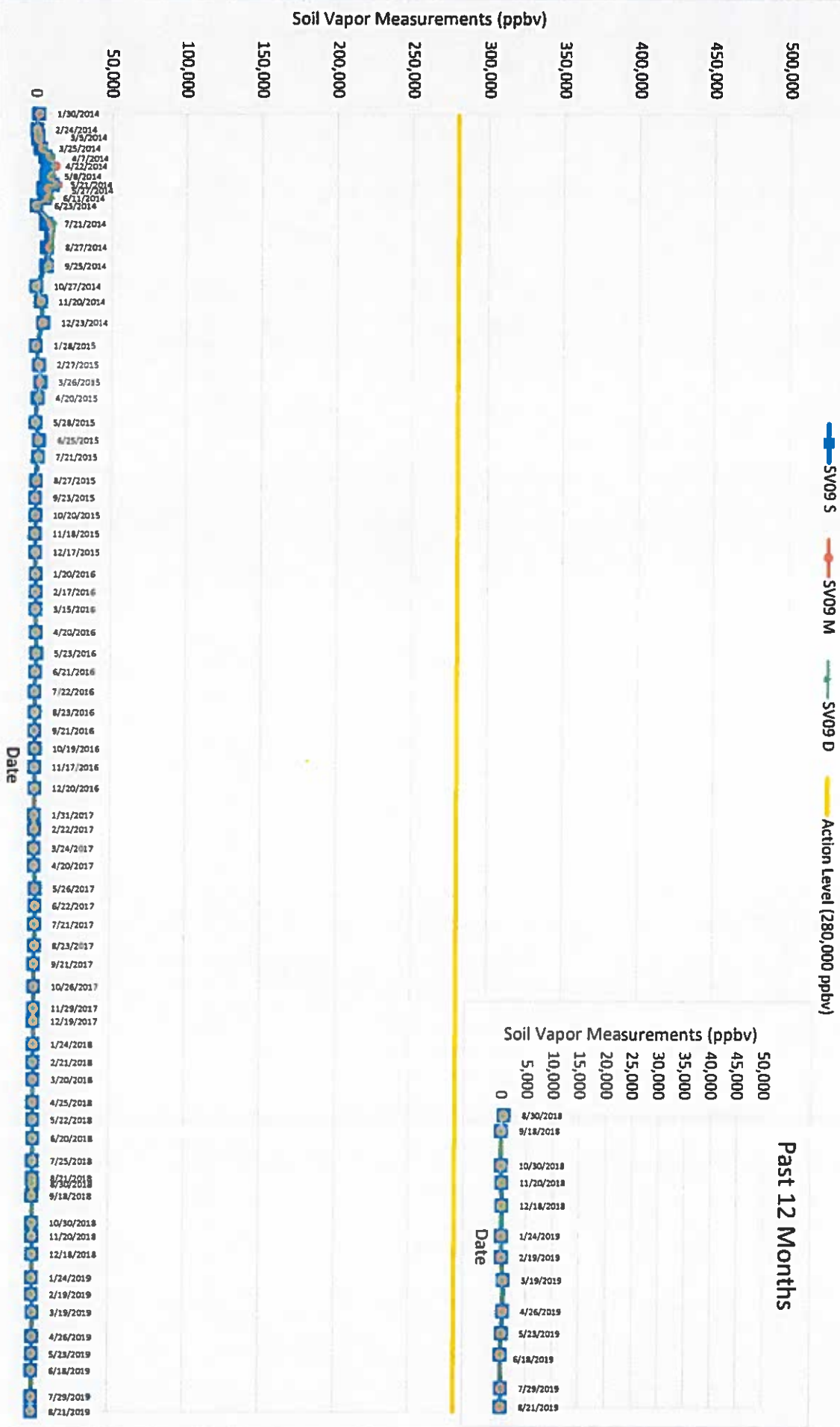


Notes:

ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

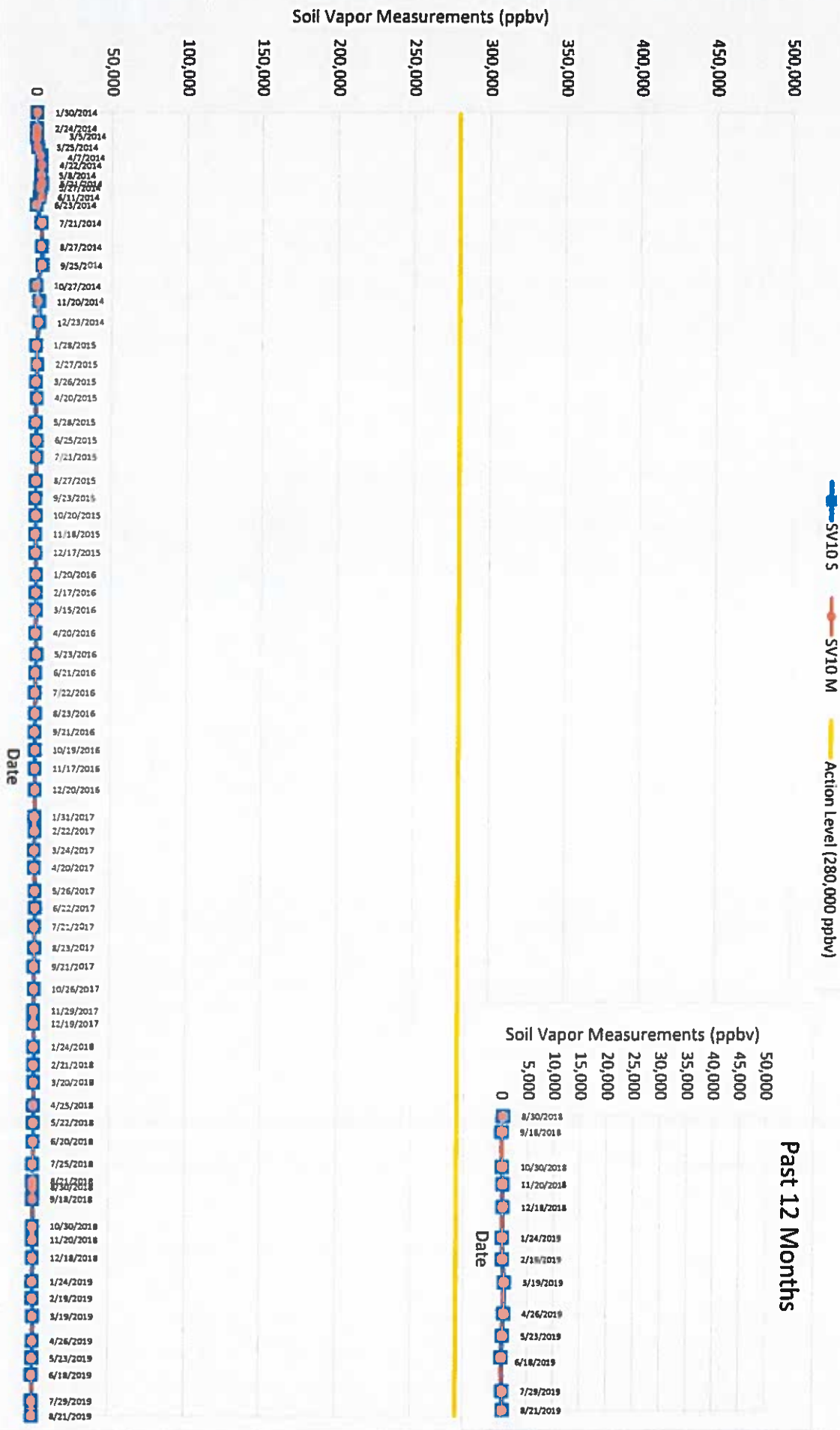
Figure 8
Soil Vapor Measurements - SV09 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

Figure 9
Soil Vapor Measurements - SV10 (JP-5)

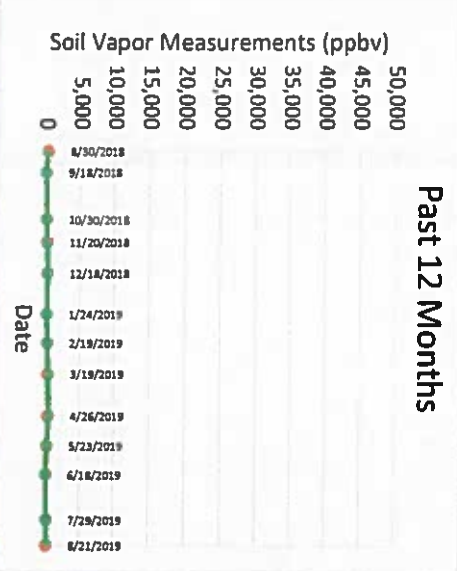
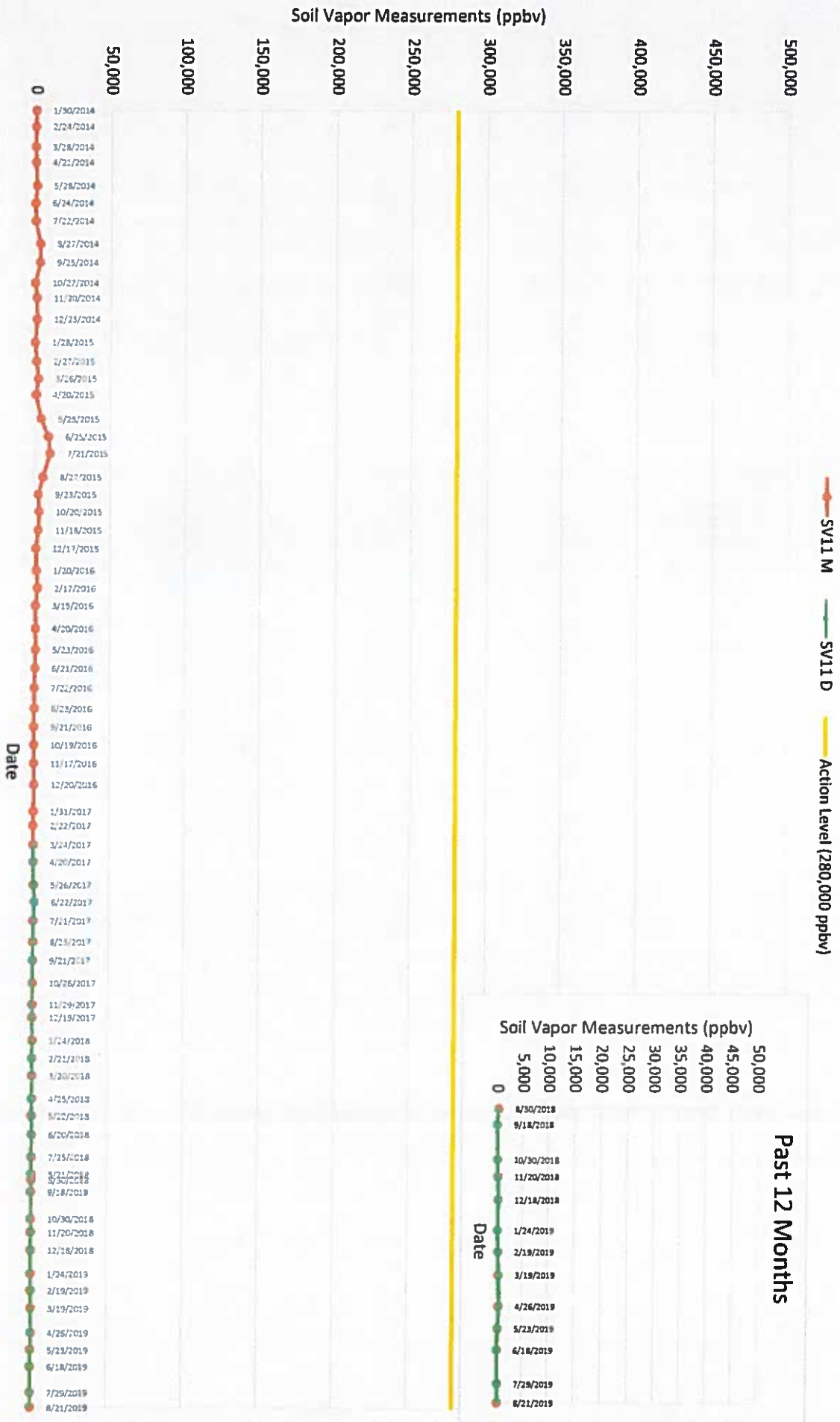


Notes:

ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

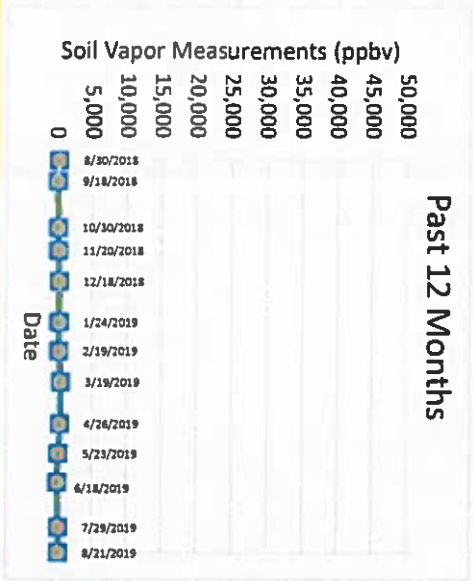
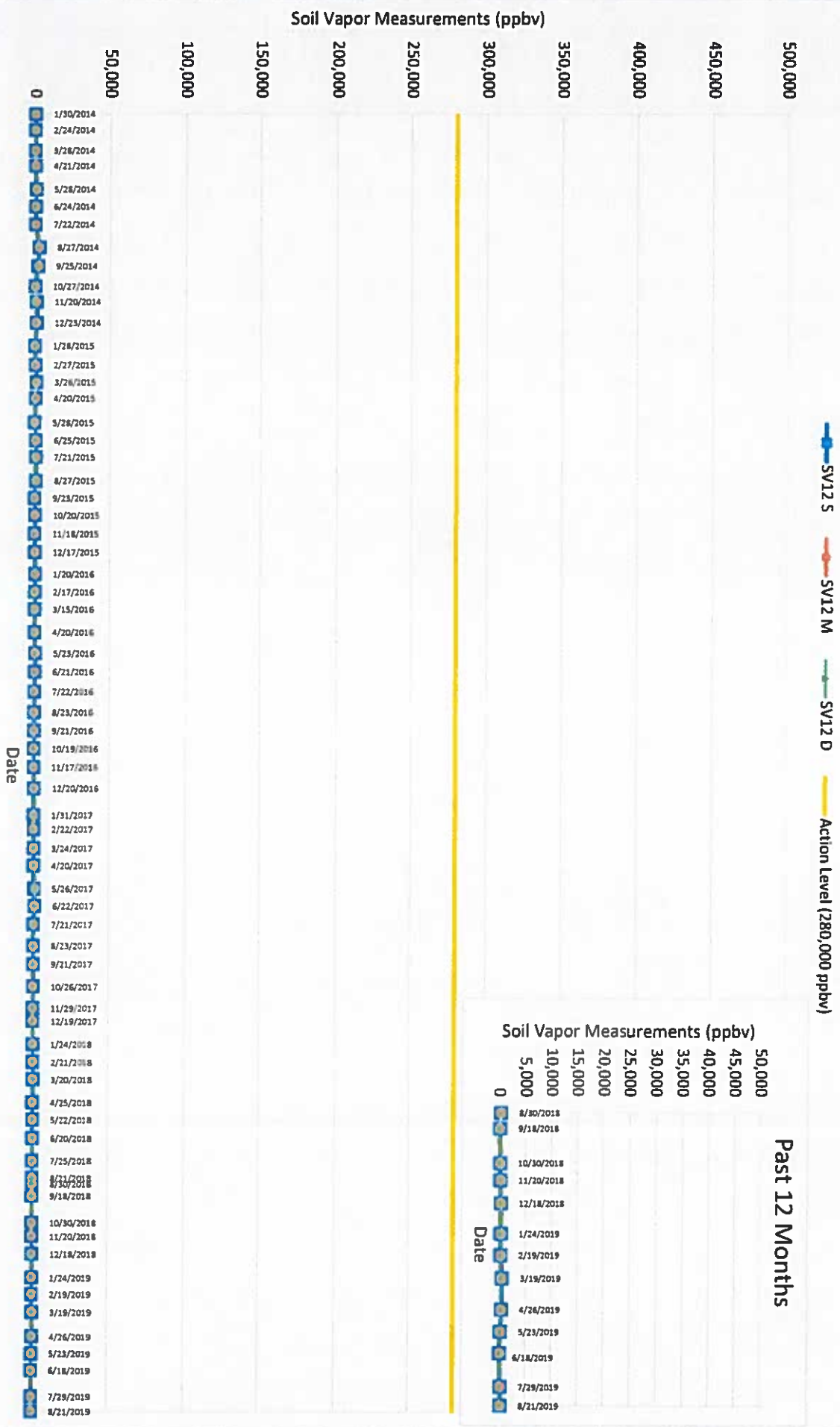
Figure 10
Soil Vapor Measurements - SV11 (JP-5)



Notes:
 ppbv: Parts Per Billion by Volume
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
 F-76: Marine Diesel, Fuel Number 76

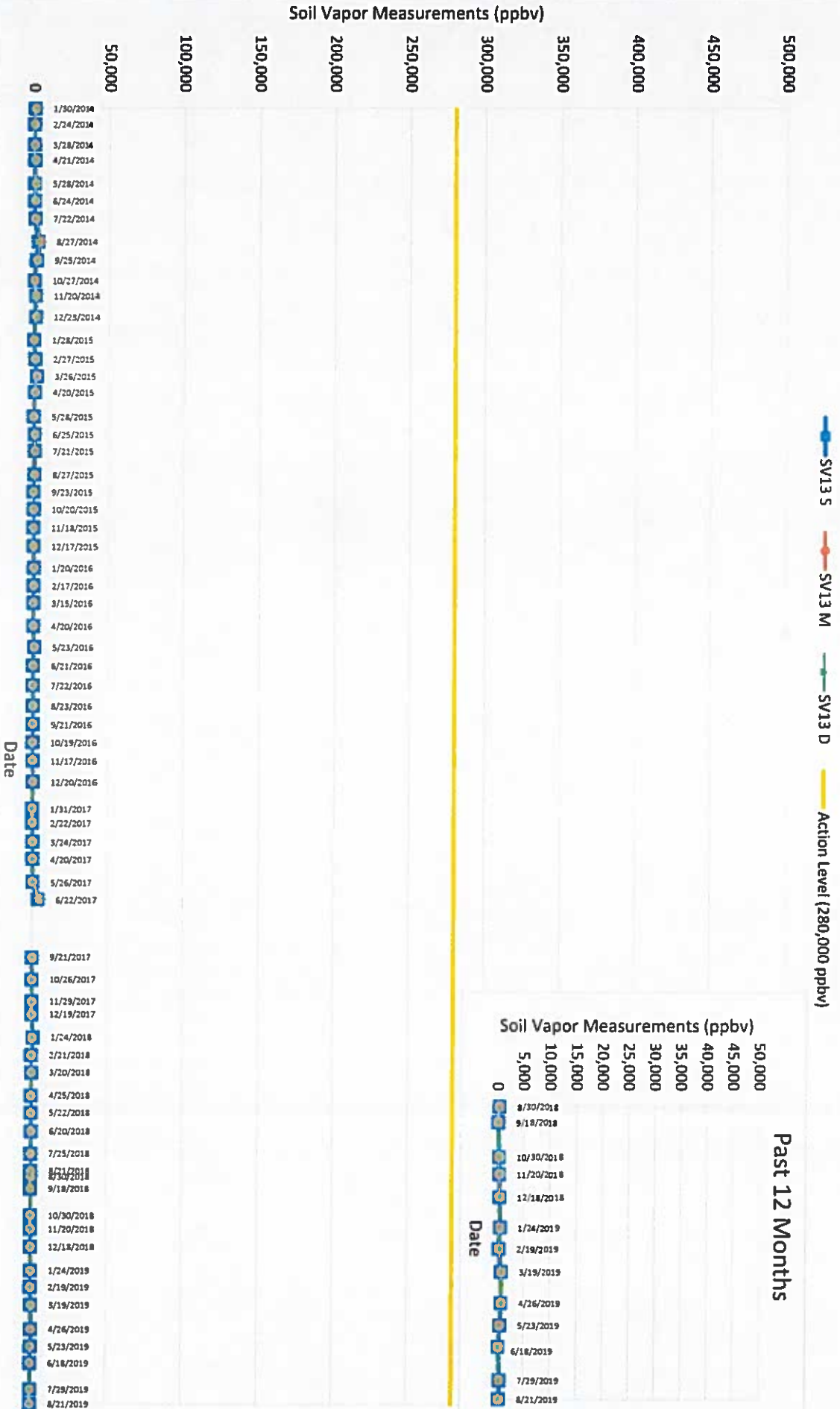
Figure 11
Soil Vapor Measurements - SV12 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

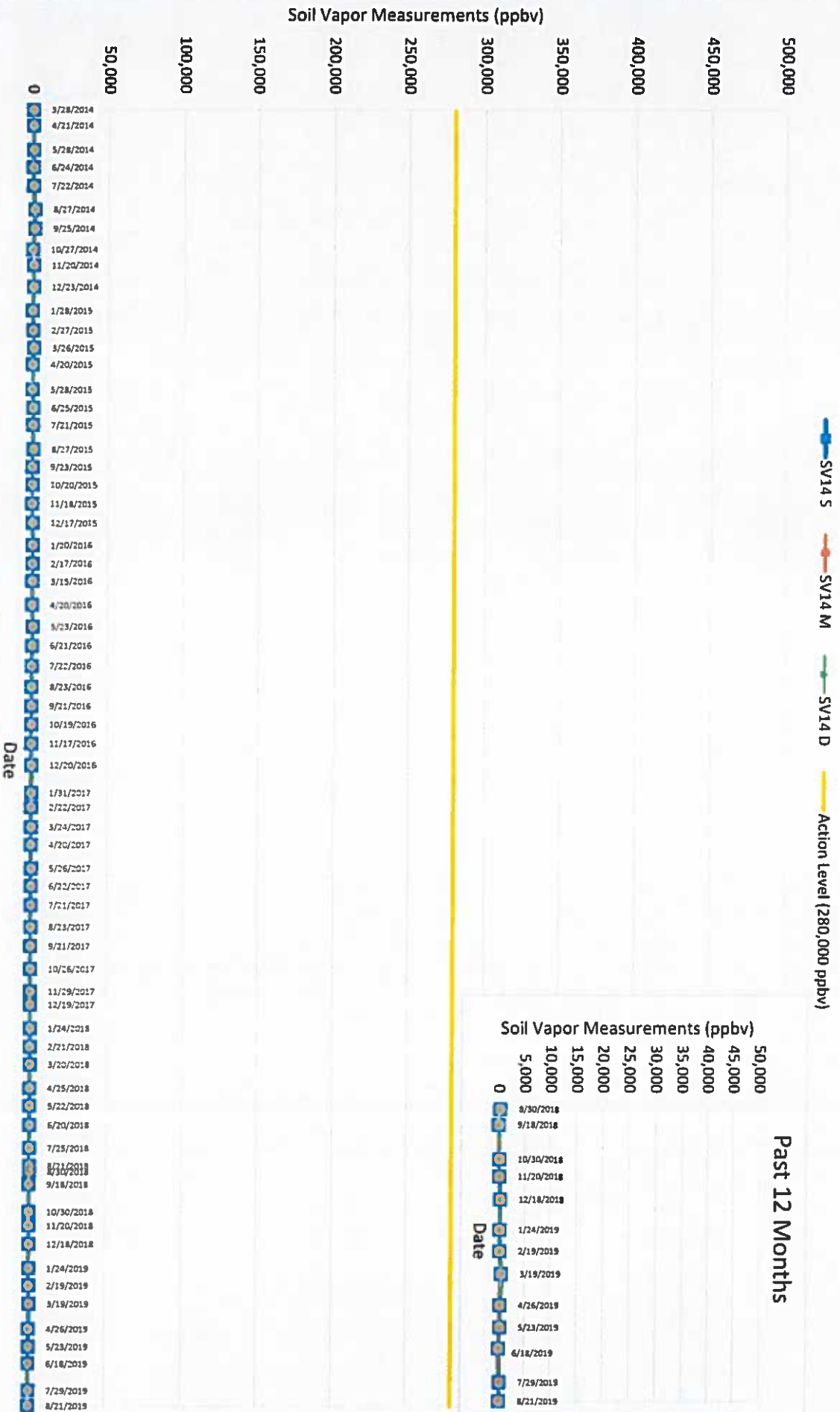
Figure 12
Soil Vapor Measurements - SV13 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

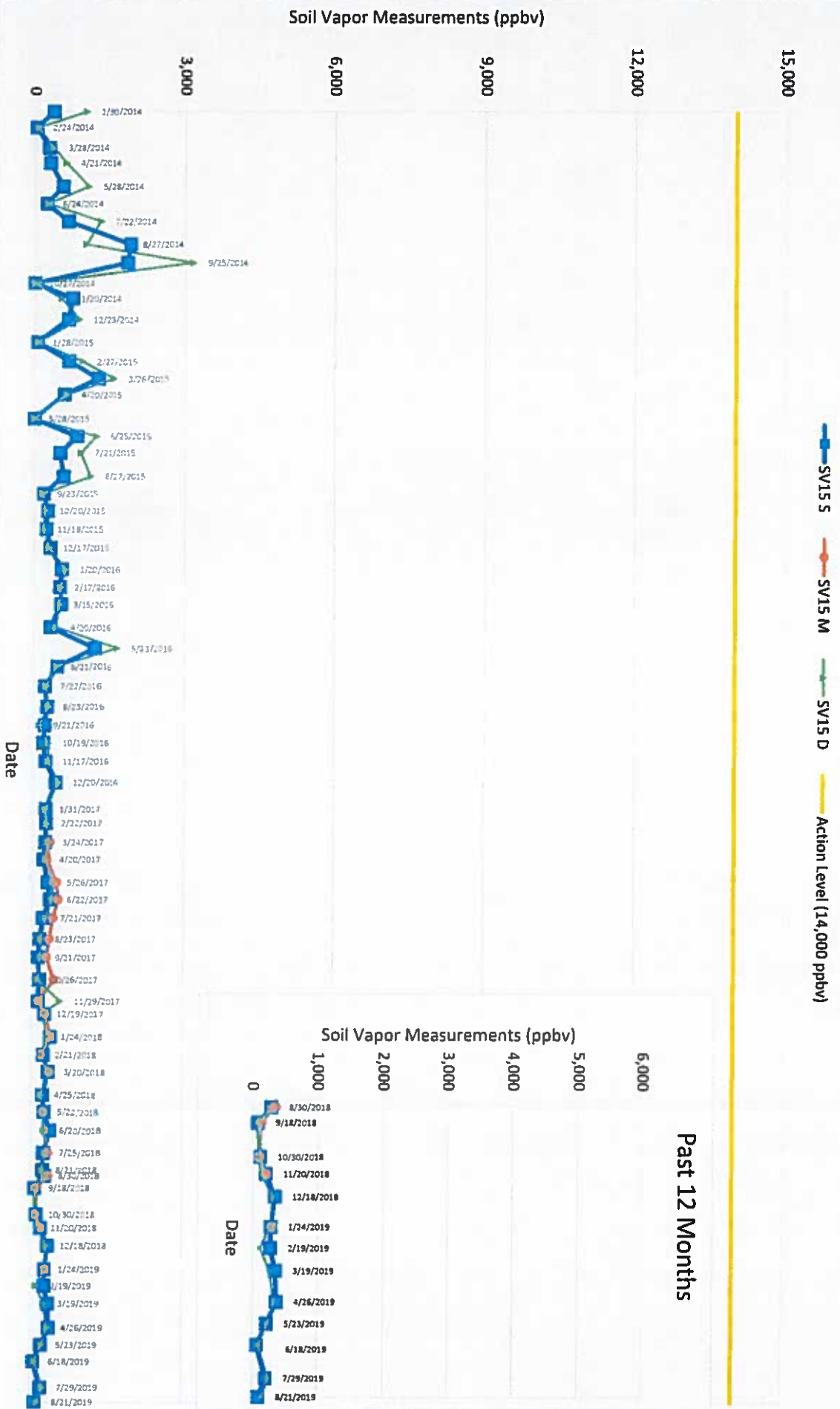
Figure 13
Soil Vapor Measurements - SV14 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

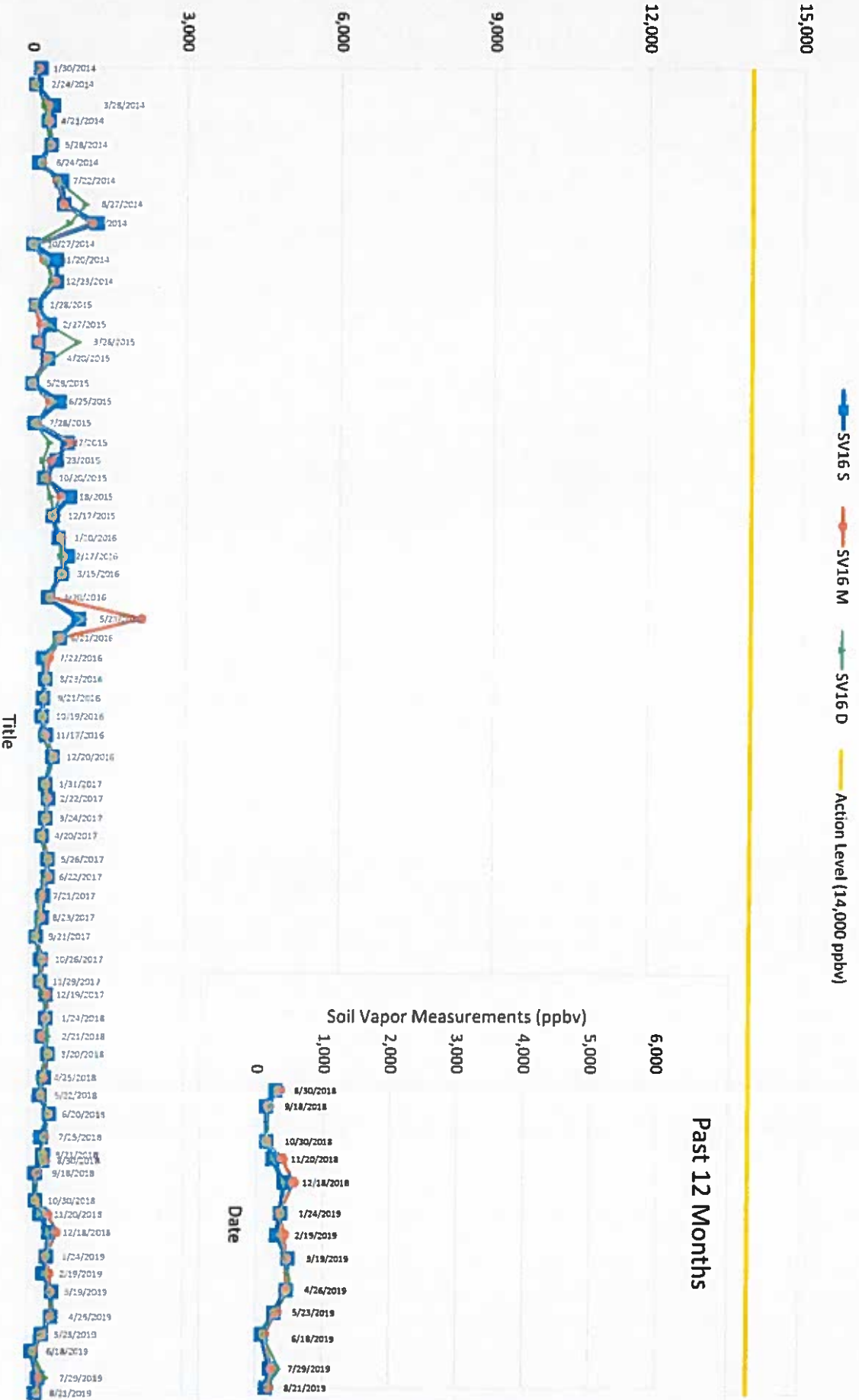
Figure 14
Soil Vapor Measurements - SV15 (F-76)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

Figure 15
Soil Vapor Measurements - SV16 (F-76)

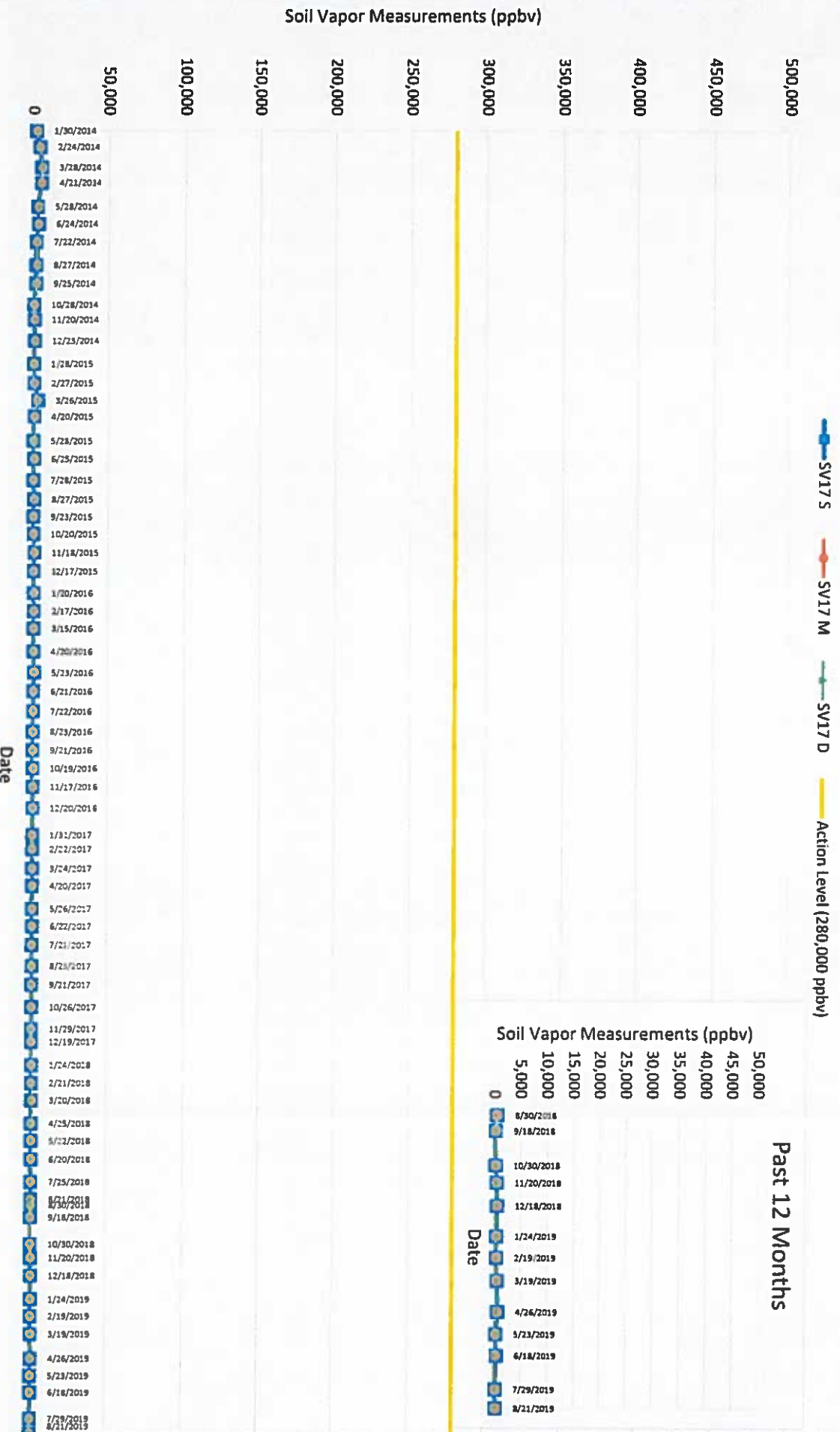


Notes:

ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

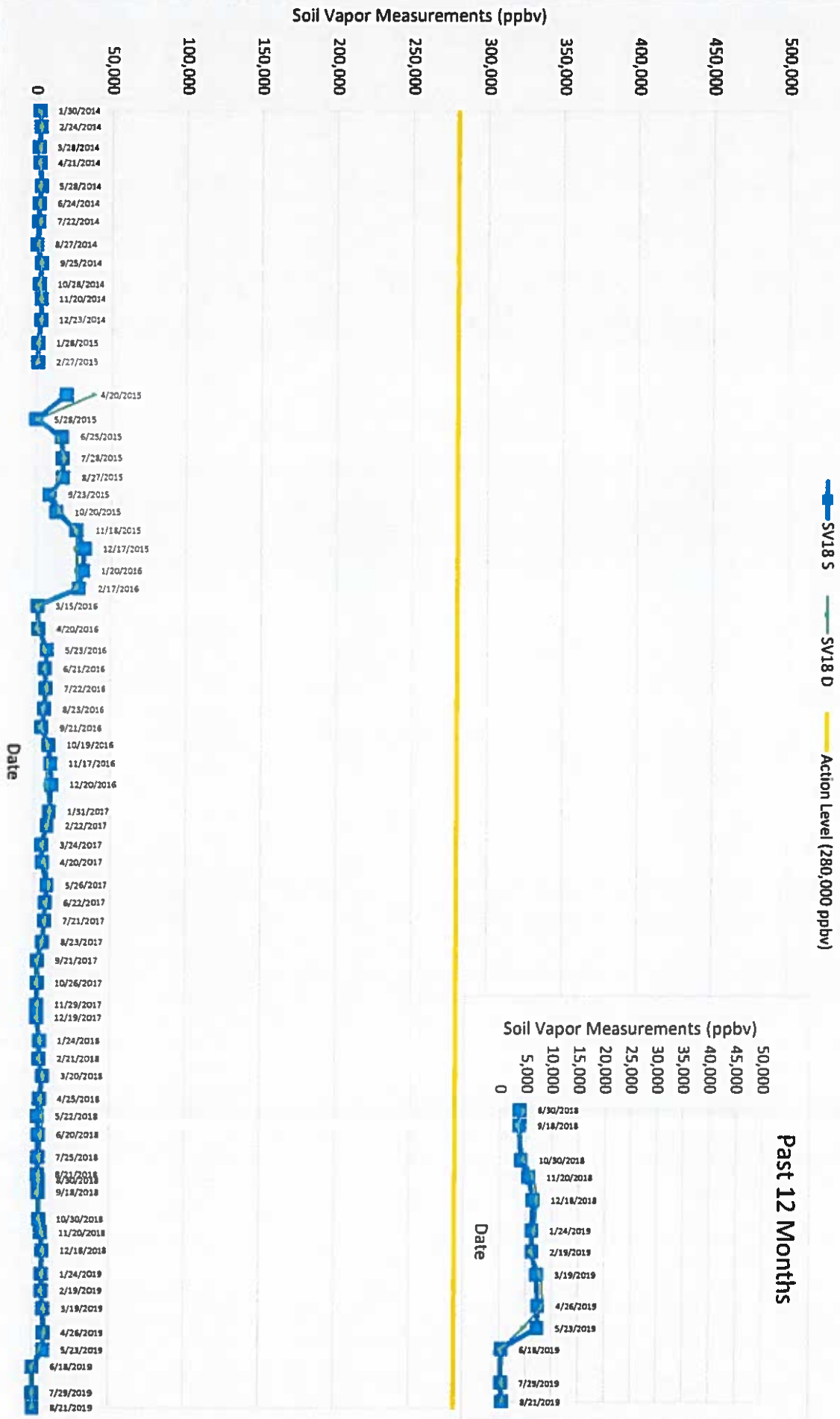
Figure 16
Soil Vapor Measurements - SV17 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

Figure 17
Soil Vapor Measurements - SV18 (JP-5)

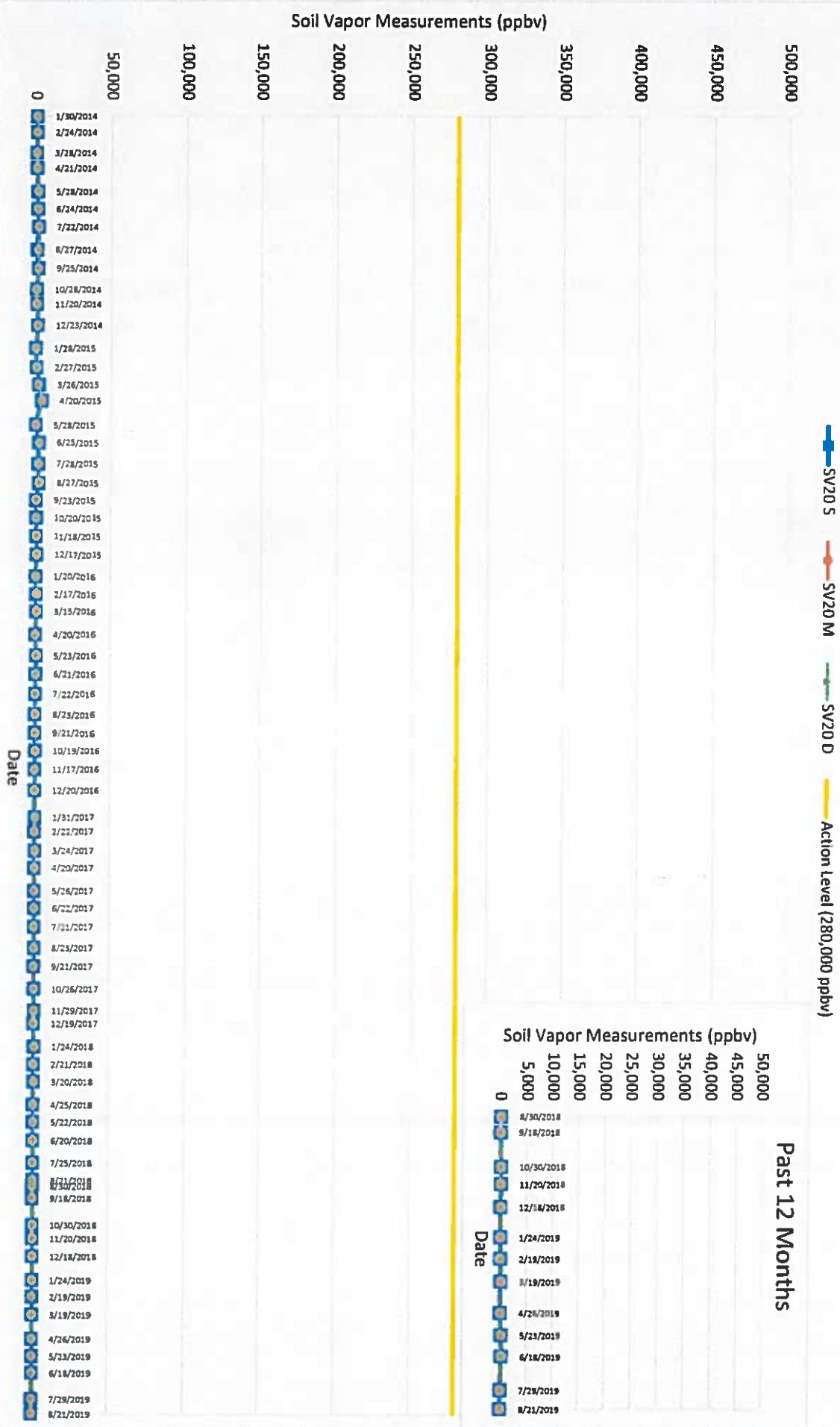


Notes:

ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

Figure 18
Soil Vapor Measurements - SV20 (JP-5)



Notes:
ppbv: Parts Per Billion by Volume
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5
F-76: Marine Diesel, Fuel Number 76

04 Oct 2019

From: Deputy Director, Fuel Department, NAVSUP FLC Pearl Harbor, HI
To: Environmental Department, NAVFAC Pearl Harbor, HI

Subj: NAVSUP FLC PEARL HARBOR CAUSATIVE RESEARCH REPORT IRT RED HILL
SOIL VAPOR MONITORING REPORT FOR AUGUST 2019

Ref: (a) Red Hill Bulk Fuel Storage Facility Groundwater Protection Plan
(b) Red Hill Soil Vapor Monitoring Report for Round 137, dtd 27 August 2019

1. Ref (a) requires NAVSUP FLCPH investigate possible fuel leaks. Refs (b) reported the following soil vapor monitoring results at the Red Hill Fuel Storage Facility:

- Slight increase trends at tank 2-4, 7, 10-12 and 16

2. FLCPH causative research and findings:

a. Reviewed all AFHE Unscheduled Fuel Movement (UFM) Alarm Summaries and UFM Reports. The following UFM's were recorded between sampling events 136 and 137 during the period of 29 Jul 2019 – 21 Aug 2019:

03 Aug – RH09: A high and then a low UFM alarm occurred. Dispatched Rover to tank and all were conditions normal. Tank was top gauged and inventory had not changed since last report. Investigative actions confirmed no release of fuel from the tank occurred. Opened Trouble ticket # 4234776 to determine cause of erroneous alarms.

06 Aug - RH 20: 03 Aug – RH09: A high UFM alarm occurred. Dispatched Rover to tank and all were conditions normal. Tank was top gauged and inventory had not changed since last report. Investigative actions confirmed no release of fuel from the tank occurred. Opened Trouble ticket # 422589 to determine cause of erroneous alarms.

08 Aug - RH 16: A Low UFM alarm occurred during evolution. Maintenance verified that system set points were not updating. Investigative actions confirmed no release of fuel from the tank occurred.

08 Aug - RH 03: A Low UFM alarm occurred. Dispatched Rover to tank and all were conditions normal. Tank was top gauged and inventory had not changed since last report. Investigative actions confirmed no release of fuel from the tank occurred. Opened Trouble ticket # 4227687 to determine cause of erroneous alarms

20 Aug - RH 20: A Low UFM Alarm occurred while maintenance technician was trouble shooting the system. Confirmed no release of fuel from the tank occurred.

Reviewed Red Hill Inventory Trend Analysis Reports for August 2019; reports did not reveal evidence of a loss of fuel in any Red Hill tank.

ENCLOSURE(2)

**Subj: NAVSUP FLC PEARL HARBOR CAUSATIVE RESEARCH REPORT IRT RED HILL
SOIL VAPOR MONITORING REPORT FOR JULY 2019**

- b. Red Hill maintenance and repair contractors did not report any factors that could have influenced increase in trends.
 - c. Inspection of the area surrounding all Red Hill tanks did not show evidence of a fuel leak or evidence that fuel was spilled in the area.
 - d. All active tanks have passed tank tightness testing within the required periodicity.
4. There is no evidence of a leaking tank in the Red Hill Complex or evidence of a spill that may have contributed to elevated soil vapor VOC levels in the area of elevated VOC concentrations.

FLOYD.JOHN.LEWIS.106
4149357

Digitally signed by FLOYD.JOHN.LEWIS.106 49357
DN: c=US, o=U.S. Government, ou=DoD, ou=PR,
ou=USNA, cn=FLOYD JOHN LEWIS, Serial 49357
Date: 2019.10.04 16:13:59 -0500

JOHN FLOYD