

OCT 17 2018 *WA*

# Tank 5 Quarterly Release Response Report

## Red Hill Bulk Fuel Storage Facility

JBPHH, Oahu, Hawaii

DOH Facility ID No. 9-102271  
DOH Release ID No. 140010

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## ***Executive Summary***

Navy Region Hawaii (NRH) prepared this Quarterly Release Response Report in accordance with the State of Hawaii Department of Health (DOH) Underground Storage Tank (UST) Technical Guidance Manual (DOH, 2000) and in response to the DOH release response letters dated February 12, 2014 and February 26, 2014 for the Red Hill Bulk Fuel Storage Facility (Facility). The objective of this report is to describe the actions taken by the Navy between July and September 2018 in response to the fuel reportedly released from Tank 5 in January 2014.

Soil vapor and groundwater samples continue to be collected from locations inside the Red Hill tunnel system. Groundwater samples are also collected from locations outside the Red Hill tunnel system. Laboratory analytical results continue to indicate the drinking water at Red Hill is in compliance with all Federal and State regulations and safe for human consumption.

The Navy continues to perform work to ensure the drinking water around the Facility remains safe. Future release response actions include determining the feasibility of alternatives for investigating and remediating releases from the Facility and continuing efforts to monitor and characterize the flow of groundwater around the Facility.



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## **1.0 Introduction**

As required by Hawaii Administrative Rules 11-280.1-65.2, Release Response Reporting, this Quarterly Release Response Report presents the following information:

- 1) All release response actions taken pursuant to subchapter 7 after the last reported date;
- 2) A plan for future release response actions to be taken; and
- 3) Information required pursuant to section 11-280.1-65.1.

This report presents a summary of the release response activities performed from July 1 through September 30, 2018 at the Red Hill Bulk Fuel Storage Facility (hereinafter referred to as “the Facility”) located at Joint Base Pearl Harbor-Hickam (JBPHH), Oahu, Hawaii.

### **1.1 Statement of Purpose**

Release response actions were performed to address a fuel release observed in Tank 5.

### **1.2 Previous Reports**

The following documents were previously submitted to DOH:

- Release confirmation information for Tank 5 as Navy Region Hawaii (NRH) letter 5090 Ser N45/044 dated January 23, 2014
- Initial Release Response Report, enclosed with NRH letter 5090 Ser N45/320 dated April 24, 2014
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/563 dated July 22, 2014
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/929 dated November 10, 2014
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/121 dated January 21, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/322 dated April 20, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/573 dated July 17, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/812 dated October 16, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0411 dated January 13, 2016
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0508 dated April 13, 2016

- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0583 dated July 28, 2016
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0658 dated October 24, 2016
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0422 dated January 27, 2017
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0489 dated April 24, 2017
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0552 dated July 24, 2017
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0627 dated October 23, 2017
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0410 dated January 19, 2018
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0492 dated April 19, 2018
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0553 dated July 18, 2018

## ***2.0 Background***

The following sections provide a description of the site and information on the Facility.

### ***2.1 Site Description***

The Facility is located on federal government land (zoned a mix of F1- Military and Federal and P-1 Restricted Preservation districts) in south-central Oahu, approximately 2.5 miles northeast of Pearl Harbor. It is located on a low ridge on the western edge of the Koolau Mountain Range that divides Halawa Valley from Moanalua Valley. The Facility occupies 144 acres of land and the majority of the ground surface of the site lies at an elevation of approximately 200 to 500 feet above mean sea level (msl) (AECOM Technical Services, Inc., 2018).

The Facility is bordered on the southwest by residential neighborhoods and the United States (U.S.) Coast Guard reservation, on the southeast by residential neighborhoods in Moanalua Valley, and on the northeast by preservation land. The Facility is bordered on the north by Halawa Correctional Facility and Halawa Industrial Park, which includes private businesses and a former bus facility. A quarry is located less than a quarter mile away to the northwest.

### ***2.2 Facility Information***

The Facility contains eighteen (18) active and two (2) inactive bulk fuel field-constructed underground storage tanks (USTs), which are operated by Naval Supply Systems Command

(NAVSUP) Fleet Logistics Center (FLC) Pearl Harbor (formerly Fleet and Industrial Supply Center). The Facility was constructed by the U.S. Government in the early 1940s. Twenty (20) USTs and a series of tunnels were constructed to supply fuel to the Navy. Each UST has a capacity of approximately 12.5 million gallons. The Facility is located approximately 100 feet above the basal aquifer. The USTs currently contain Jet Fuel Propellant No. 5 (JP-5), North Atlantic Treaty Organization (NATO)-grade F-24 jet fuel, or Marine Diesel Fuel (F-76). Tank 5 was used to store Jet Fuel Propellant No. 8 (JP-8).

Four (4) groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, and RHMW05) are located within the lower access tunnel, and one (1) sampling point (RHMW2254-01) is located at Red Hill Shaft. Sampling point RHMW2254-01 is located inside the infiltration gallery of the Department of the Navy (Navy) Supply Well 2254-01.

Nine (9) groundwater monitoring wells (RHMW04, RHMW06, RHMW07, RHMW08, RHMW09, RHMW10, RHMW11, OWDFMW01, and HDMW2253-03) are located outside of the Facility tunnel system. Well OWDFMW01 is located at the former Oily Waste Disposal Facility, near Adit 3, and wells RHMW11 and HDMW2253-03 are located at the Halawa Correctional Facility (outside the Red Hill Facility).

### ***3.0 Groundwater and Soil Vapor Monitoring***

The following sections describe activities that were performed to monitor the groundwater and soil vapor beneath Tank 5 from July 1 through September 30, 2018.

#### ***3.1 Oil/Water Interface Measurements***

The water level was gauged and measured for the presence of light non-aqueous phase liquids (LNAPLs) using an interface meter. The interface meter was lowered into the groundwater monitoring wells located within the lower access tunnel to determine the depth of water to the nearest 0.01 foot, and the existence of any immiscible layers (LNAPL).

Oil/water interface measurements were taken at groundwater monitoring wells RHMW01, RHMW02, RHMW03, and RHMW05 in July 2018. Oil/water interface measurements were taken at groundwater monitoring wells RHMW02 and RHMW03 in August 2018. No measurements were taken at monitoring wells RHMW01 and RHMW05 in August due to the presence of transducers that were installed in the wells for the synoptic water level survey. No LNAPL was observed in July and August 2018.

Following the oil/water interface measurements in August 2018, transducers were installed in monitoring wells RHMW02 and RHMW03 for the synoptic water level survey. No oil/water interface measurements were taken at any of the monitoring wells in September 2018.

A summary of interface measurements from January 2014 through August 2018 is presented in Appendix A.

### **3.2 Soil Vapor Monitoring**

Soil vapor samples were collected and analyzed in the field for volatile organic compound (VOC) concentrations using a photo-ionization detector (PID). Soil vapor monitoring points (SVMPs) were given a SV prefix, followed by the associated tank number, and then the location under the tank: "S" for shallow or front of the UST, "M" for mid depth or middle of the UST, and "D" for deep or outer edge of the UST.

A conservative approach to assess the integrity of the associated tank system is to measure if VOC concentrations exceed 280,000 parts per billion by volume (ppbv) in soil vapor monitoring probes beneath tanks containing jet fuels (JP-5 or F-24), or 14,000 ppbv in soil vapor monitoring probes beneath tanks containing marine diesel fuel (F-76) (TEC, 2010). These values are 50 percent of the calculated vapor concentration from fuel-saturated water.

Soil vapor monitoring was performed at all active and accessible tanks in July, August, and September 2018. Soil vapor VOC concentrations at Tank 5 were below the action level of 280,000 ppbv during all three monitoring events. During the same monitoring events, soil vapor VOC concentrations at all other active and accessible tanks were below the action levels, with no consistent trending.

Soil vapor sampling results from January 2014 through September 2018 are presented in Appendix B.

### **3.3 Groundwater Sampling and Analysis**

Groundwater samples were collected from 13 conventional monitoring locations and 1 multilevel monitoring location within the Red Hill groundwater monitoring network in July 2018. Groundwater samples were collected from sampling point RHMW2254-01 located at Red Hill Shaft, 11 monitoring wells within the Facility boundary (wells RHMW01 through RHMW10 and OWDFMW01), and the Halawa Deep Monitor Well (HDMW2253-03) located outside of the Facility. The multilevel monitoring location, RHMW11, is located outside of the Facility.

A groundwater monitoring report, which summarizes sampling activities and laboratory analytical results, will be submitted under separate cover.

### **3.4 Drinking Water Sampling**

Drinking water samples were collected from the Red Hill Shaft post-treatment regulatory compliance sampling point (360-011, Tap Outside Chlorine Building) on September 18, 2018. Samples were analyzed for Lead, JP-8/F-24, and contaminants listed in the Transition Plan.

U.S. Environmental Protection Agency (EPA) Methods 524.2 (VOCs), 525.2 (SVOCs), 8015B (JP-8/F-24 and TPH-o), and 200.8 (Lead) were used and all analyses were conducted by labs certified by the DOH State Laboratories Division.

Sample test results were not available to be included in this report. The test results will be submitted under separate cover.

#### **4.0 Continued Groundwater and Soil Vapor Monitoring**

Continued monitoring of the groundwater and soil vapor will be conducted as follows:

- Oil/water interface measurements – quarterly
- Soil vapor sampling – monthly
- Groundwater sampling and analysis – quarterly

Monitoring results will be submitted to DOH for each sampling event.

#### **5.0 Continued Drinking Water Sampling**

Drinking water sampling will continue on a quarterly schedule in accordance with the approved Transition Plan. Samples will be taken at the entry point to the distribution system (360-011 Tap Outside Chlorine Building) and analyzed using the following analytical methods:

- VOCs – EPA 524.2
- SVOCs – EPA 525.2
- Gas Chromatography for JP-8/F-24 – EPA 8015
- Lead – EPA 200.8

#### **6.0 Planned Future Release Response Actions**

The Navy and DLA negotiated with the EPA and DOH (the “Regulatory Agencies”) release response actions that will be pursued. Future release response actions include determining the feasibility of alternatives for investigating and remediating releases from the Facility and continuing efforts to monitor and characterize the flow of groundwater around the Facility. A revised Work Plan/Scope of Work that describes the future release response actions was submitted pursuant to the Red Hill Administrative Order on Consent to the Regulatory Agencies in November 2016. Conditional approval was received from the Regulatory Agencies in December 2016.

The following documents were submitted for regulatory review:

- Monitoring Well Installation Work Plan Addendum No. 1 in January 2017
- Sampling and Analysis Plan in January 2017
- Existing Data Summary and Evaluation Report in March 2017
- Groundwater Flow Model Progress Report 01 in April 2017
- Sampling and Analysis Plan, Revision 01 in April 2017
- Data Gap Analysis Report in April 2017
- Monitoring Well Installation Work Plan Addendum No. 2 in August 2017
- Groundwater Flow Model Progress Report 02 in August 2017
- Groundwater Flow Model Progress Report 03 in December 2017
- Sentinel Well Network Development Plan in December 2017
- Risk Based Decision Criteria Development Plan in December 2017

- Technical Memorandum, Testing and Verification of Packer Integrity at RHMW11 in February 2018
- Seismic Profiling to Map Hydrostratigraphy in the Red Hill Area in March 2018
- Groundwater Flow Model Progress Report No. 4 in April 2018
- Conceptual Site Model Report and Groundwater Protection and Evaluation Considerations Report in July 2018
- Groundwater Flow Model Progress Report No. 5 in August 2018

Approval by the Regulatory Agencies of the documents will guide future release response actions.

## **7.0 Public Notifications**

The Navy provided notifications to the public through the following documents:

- Ho'okele Article "Red Hill: Fueling RIMPAC and ensuring global strategic alliances" of July 27, 2018
- Red Hill Update Stakeholder Letter of August 15, 2018
- Press Release "Navy, regulators discuss Red Hill Tank Upgrade Alternatives" of August 21, 2018
- Press Release "Red Hill: Navy to Update State Senate Task Force" of September 25, 2018

A copy of these documents are included in Appendix C.

## **8.0 Conclusions and Recommendations**

Results of groundwater sampling and analysis and drinking water sampling and analysis indicate the release of JP-8 from Tank 5 has not impacted the Red Hill Shaft.

Additional release response actions have been negotiated with the EPA and DOH to protect the drinking water sources near the Facility.

The next quarterly release response report will be submitted in January 2019 and will cover the release response actions completed between October and December 2018.

## **9.0 References**

AECOM Technical Services, Inc., 2018, Final First Quarter 2018 – Quarterly Groundwater Monitoring Report, Red Hill Bulk Fuel Storage Facility, Prepared for Department of the Navy, Naval Facilities Engineering Command, Hawaii, JBPHH, Hawaii, July 2018.

DOH, 2000, Technical Guidance Manual for Underground Storage Tank Closure and Release Response, Environmental Management Division, Solid and Hazardous Waste Branch, Underground Storage Tank Section, March 2000.

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DOH, 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Environmental Management Division, Fall 2017.

DOH, 2013, Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, Office of Hazard Evaluation and Emergency Response, Interim Final, March 2013.

Hawaii Administrative Rules, Title 11, Chapter 280.1, Underground Storage Tanks, July 2015.

TEC, 2007, Final Technical Report, Red Hill Bulk Fuel Storage Facility, Prepared for Department of the Navy, Commander Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii, August 2007.

TEC, 2008, Final Groundwater Protection Plan, Red Hill Fuel Storage Facility, prepared for Navy Region Hawaii, Pearl Harbor, Hawaii, January 2008, revised December 2009 and August 2014.

TEC, 2010, Final Soil Vapor Sampling Monitoring Analysis Letter Report, February 1, 2010.



***Appendix A***  
***Oil/Water Interface Measurements***  
***January 2014 through August 2018***

Red Hill Oil/Water Interface Measurements January 2014 through August 2018

Date	RHMW01 Elevation = 102.27 ft <sup>1</sup>				RHMW02 Elevation = 104.76 ft <sup>1</sup>				RHMW03 Elevation = 121.06 ft <sup>1</sup>				RHMW05 Elevation = 101.55 ft <sup>1</sup>			
	DTW (TOC)	SWL	LNAPL	LNAPL	DTW (TOC)	SWL	LNAPL	LNAPL	DTW (TOC)	SWL	LNAPL	LNAPL	DTW (TOC)	SWL	LNAPL	LNAPL
15-Jan-14	83.94	18.33	0	0	86.62	18.14	0	0	NT	NT	NT	NT	NT	NT	NT	NT
16-Jan-14	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	83.09	18.46	0	0
22-Jan-14	83.53	18.74	0	0	86.20	18.56	0	0	NT	NT	NT	NT	82.87	18.68	0	0
23-Jan-14	83.58	18.69	0	0	86.24	18.52	0	0	NT	NT	NT	NT	82.94	18.61	0	0
24-Jan-14	83.57	18.70	0	0	86.23	18.53	0	0	NT	NT	NT	NT	82.93	18.62	0	0
27-Jan-14	83.55	18.72	0	0	86.23	18.53	0	0	NT	NT	NT	NT	82.93	18.62	0	0
28-Jan-14	83.56	18.71	0	0	86.25	18.51	0	0	102.52	18.54	0	0	82.94	18.61	0	0
29-Jan-14	83.56	18.71	0	0	86.22	18.54	0	0	NT	NT	NT	NT	82.93	18.62	0	0
30-Jan-14	83.53	18.74	0	0	86.21	18.55	0	0	NT	NT	NT	NT	82.93	18.62	0	0
31-Jan-14	83.53	18.74	0	0	86.19	18.57	0	0	NT	NT	NT	NT	82.88	18.67	0	0
3-Feb-14	83.54	18.73	0	0	86.20	18.56	0	0	NT	NT	NT	NT	82.91	18.64	0	0
4-Feb-14	83.54	18.73	0	0	86.20	18.56	0	0	NT	NT	NT	NT	82.89	18.66	0	0
10-Feb-14	84.49	17.78	0	0	86.16	18.60	0	0	102.47	18.59	0	0	82.83	18.72	0	0
24-Feb-14	83.54	18.73	0	0	86.24	18.52	0	0	102.47	18.59	0	0	82.97	18.58	0	0
4-Mar-14*	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
13-Mar-14*	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
28-Mar-14	83.76	18.51	0	0	86.42	18.34	0	0	102.65	18.41	0	0	83.18	18.37	0	0
7-Apr-14*	83.42	18.85	0	0	86.43	18.33	0	0	NT	NT	NT	NT	83.21	18.34	0	0
21-Apr-14	83.93	18.34	0	0	86.58	18.18	0	0	102.80	18.26	0	0	83.27	18.28	0	0
8-May-14*	84.03	18.24	0	0	86.68	18.08	0	0	NT	NT	NT	NT	83.46	18.09	0	0
22-May-14*	83.81	18.46	0	0	86.47	18.29	0	0	NT	NT	NT	NT	83.15	18.40	0	0
27-May-14	83.91	18.36	0	0	86.60	18.16	0	0	102.85	18.21	0	0	83.31	18.24	0	0
10-Jun-14*	83.93	18.34	0	0	86.55	18.21	0	0	NT	NT	NT	NT	83.34	18.21	0	0
23-Jun-14	84.06	18.21	0	0	86.72	18.04	0	0	103.99	17.07	0	0	83.54	18.01	0	0
21-Jul-14	84.13	18.14	0	0	86.80	17.96	0	0	102.98	18.08	0	0	83.49	18.06	0	0
27-Aug-14	84.01	18.26	0	0	86.65	18.11	0	0	102.87	18.19	0	0	83.04	18.51	0	0
25-Sep-14	84.64	17.63	0	0	87.27	17.49	0	0	103.51	17.55	0	0	84.10	17.45	0	0
28-Oct-14	83.79	18.48	0	0	86.51	18.25	0	0	102.78	18.28	0	0	83.21	18.34	0	0
20-Nov-14	83.87	18.40	0	0	86.56	18.20	0	0	102.78	18.28	0	0	83.35	18.20	0	0
23-Dec-14	83.67	18.60	0	0	86.37	18.39	0	0	102.64	18.42	0	0	83.05	18.50	0	0
28-Jan-15	83.63	18.64	0	0	86.35	18.41	0	0	102.63	18.43	0	0	83.03	18.52	0	0
27-Feb-15	83.68	18.59	0	0	86.28	18.48	0	0	102.52	18.54	0	0	83.06	18.49	0	0
26-Mar-15	83.83	18.44	0	0	86.04	18.72	0	0	102.79	18.27	0	0	83.24	18.31	0	0
21-Apr-15	84.33	17.94	0	0	86.97	17.79	0	0	103.18	17.88	0	0	83.72	17.83	0	0
28-May-15	84.29	17.98	0	0	86.97	17.79	0	0	103.24	17.82	0	0	83.95	17.60	0	0
25-Jun-15	84.58	17.69	0	0	87.28	17.48	0	0	103.57	17.49	0	0	83.75	17.80	0	0
21-Jul-15	84.58	17.69	0	0	87.24	17.52	0	0	103.44	17.62	0	0	83.76	17.79	0	0
27-Aug-15	84.44	17.83	0	0	87.13	17.63	0	0	103.41	17.65	0	0	83.69	17.86	0	0
23-Sep-15	84.26	18.01	0	0	86.91	17.85	0	0	103.21	17.85	0	0	83.63	17.92	0	0
20-Oct-15	84.00	18.27	0	0	86.38	18.38	0	0	103.38	17.68	0	0	Obstructed	NT	NT	NT
18-Nov-15	84.25	18.02	0	0	86.93	17.83	0	0	103.24	17.82	0	0	84.62 <sup>2</sup>	16.93	0	0
17-Dec-15	83.76	18.51	0	0	86.36	18.40	0	0	102.56	18.50	0	0	83.18	18.37	0	0
20-Jan-16	83.31	18.96	0	0	85.97	18.79	0	0	102.21	18.85	0	0	Obstructed	NT	NT	NT
17-Feb-16	83.17	19.10	0	0	85.81	18.95	0	0	102.10	18.96	0	0	Obstructed	NT	NT	NT
15-Mar-16	82.89	19.38	0	0	85.60	19.16	0	0	101.82	19.24	0	0	82.26	19.29	0	0
20-Apr-16	82.97	19.30	0	0	85.63	19.13	0	0	101.91	19.15	0	0	82.31	19.24	0	0
23-May-16	83.14	19.13	0	0	85.81	18.95	0	0	102.03	19.03	0	0	82.50	19.05	0	0
21-Jun-16	83.16	19.11	0	0	85.77	18.99	0	0	103.03	111.03	0	0	82.54	19.01	0	0
20-Jul-16	83.32	18.95	0	0	85.99	18.77	0	0	102.31	18.75	0	0	82.63	18.92	0	0
23-Aug-16	83.27	19.00	0	0	85.96	18.80	0	0	102.20	18.86	0	0	82.63	18.92	0	0
21-Sep-16	83.13	19.14	0	0	85.74	19.02	0	0	102.06	19.00	0	0	82.44	19.11	0	0
19-Oct-16	83.01	19.26	0	0	85.69	19.07	0	0	101.95	19.11	0	0	82.39	19.16	0	0
17-Nov-16	82.92	19.35	0	0	85.56	19.20	0	0	101.82	19.24	0	0	82.24	19.31	0	0
20-Dec-16	82.67	19.60	0	0	85.36	19.40	0	0	101.61	19.45	0	0	82.01	19.54	0	0
31-Jan-17	82.45	19.82	0	0	85.13	19.63	0	0	101.46	19.60	0	0	82.04	19.51	0	0
22-Feb-17	82.37	19.90	0	0	85.01	19.75	0	0	101.31	19.75	0	0	81.72	19.83	0	0
24-Mar-17	82.49	19.78	0	0	85.19	19.57	0	0	101.45	19.61	0	0	81.84	19.71	0	0
20-Apr-17	82.59	19.68	0	0	85.25	19.51	0	0	101.5	19.56	0	0	81.94	19.61	0	0
26-May-17	82.45	19.82	0	0	85.13	19.63	0	0	101.39	19.67	0	0	81.80	19.75	0	0
22-Jun-17	82.94	19.33	0	0	85.59	19.17	0	0	101.89	16.17	0	0	82.30	19.25	0	0
21-Jul-17	83.43	18.84	0	0	86.5	18.26	0	0	Transducer Installed	NT	NT	NT	82.81	18.74	0	0
20-Mar-18	83.56	18.71	0	0	86.24	18.52	0	0	102.55	18.51	0	0	82.89	18.66	0	0
25-Apr-18	83.47	18.80	0	0	86.14	18.62	0	0	102.38	15.68	0	0	82.86	18.69	0	0
22-May-18	83.61	18.66	0	0	86.28	18.47	0	0	102.56	15.68	0	0	82.86	18.69	0	0
20-Jun-18	83.63	18.64	0	0	86.28	18.47	0	0	102.57	18.49	0	0	82.99	18.56	0	0
25-Jul-18	83.55	18.72	0	0	86.33	18.43	0	0	102.58	18.48	0	0	82.90	18.56	0	0
21-Aug-18	Transducer Installed	NT	NT	NT	86.32	18.42	0	0	102.58	18.48	0	0	Transducer Installed	NT	NT	NT

Notes:

1 - Elevations were updated based on the Groundwater Flow Direction/Gradient and Tier 3 Risk Assessment Re-evaluation Letter Report, Red Hill Bulk Fuel Storage Facility, Pearl Harbor, Hawaii, Contract No. N47408-04-D-8514, Task Order 54, dated April 15, 2010.

2 - Dedicated groundwater pump was obstructing the path of the interface meter probe. Depth measured was based on the elevation of water when pump was removed from the monitoring well (RHMW05).

Measurements recorded by Environmental Science International from January 2014 to August 2015, unless otherwise noted.

\* - Measurements recorded by NAVFAC HI.

All units in feet (ft).

DTW (TOC) - depth to water from top of well casing

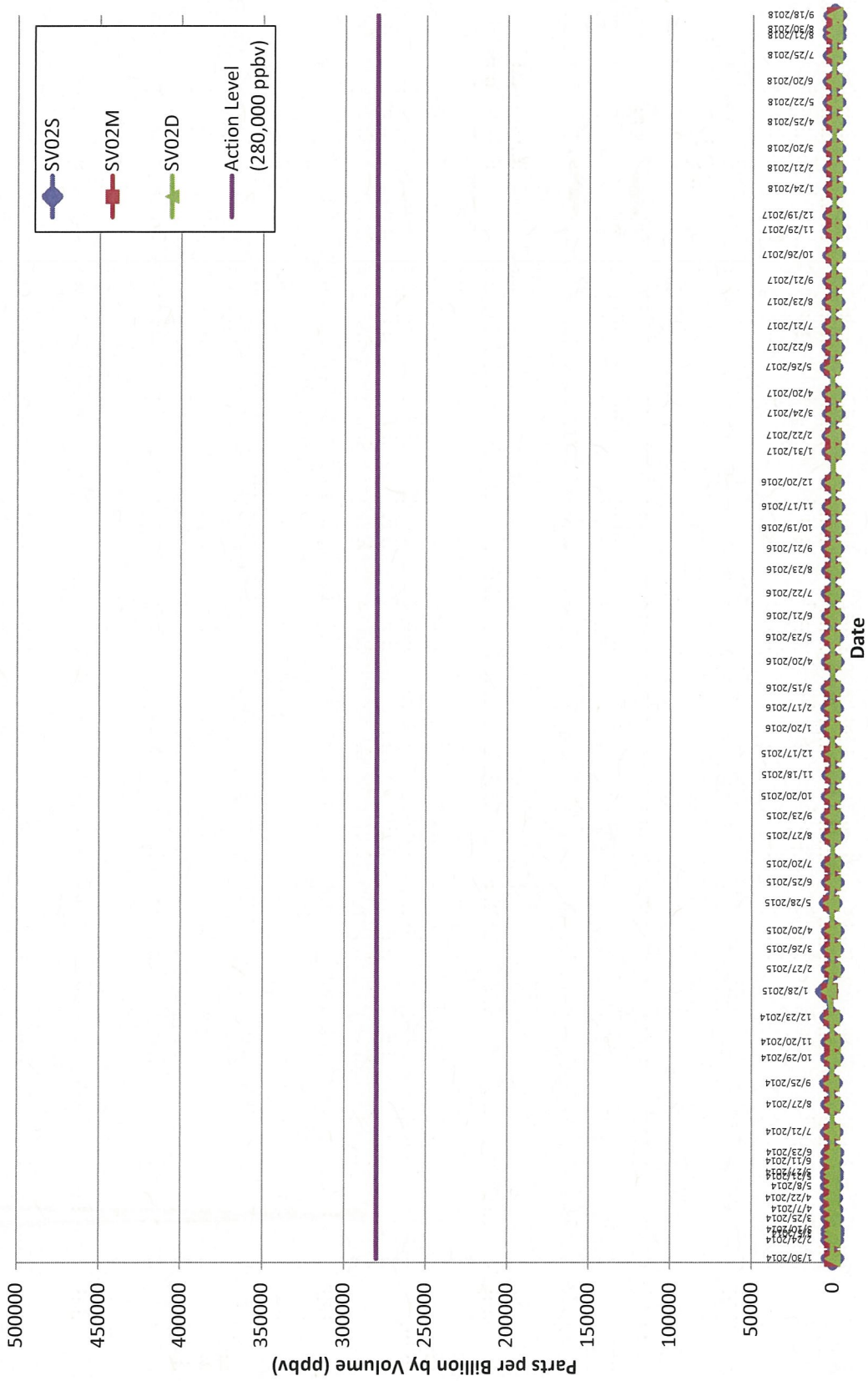
LNAPL - light non-aqueous phase liquid

NT - measurement not taken

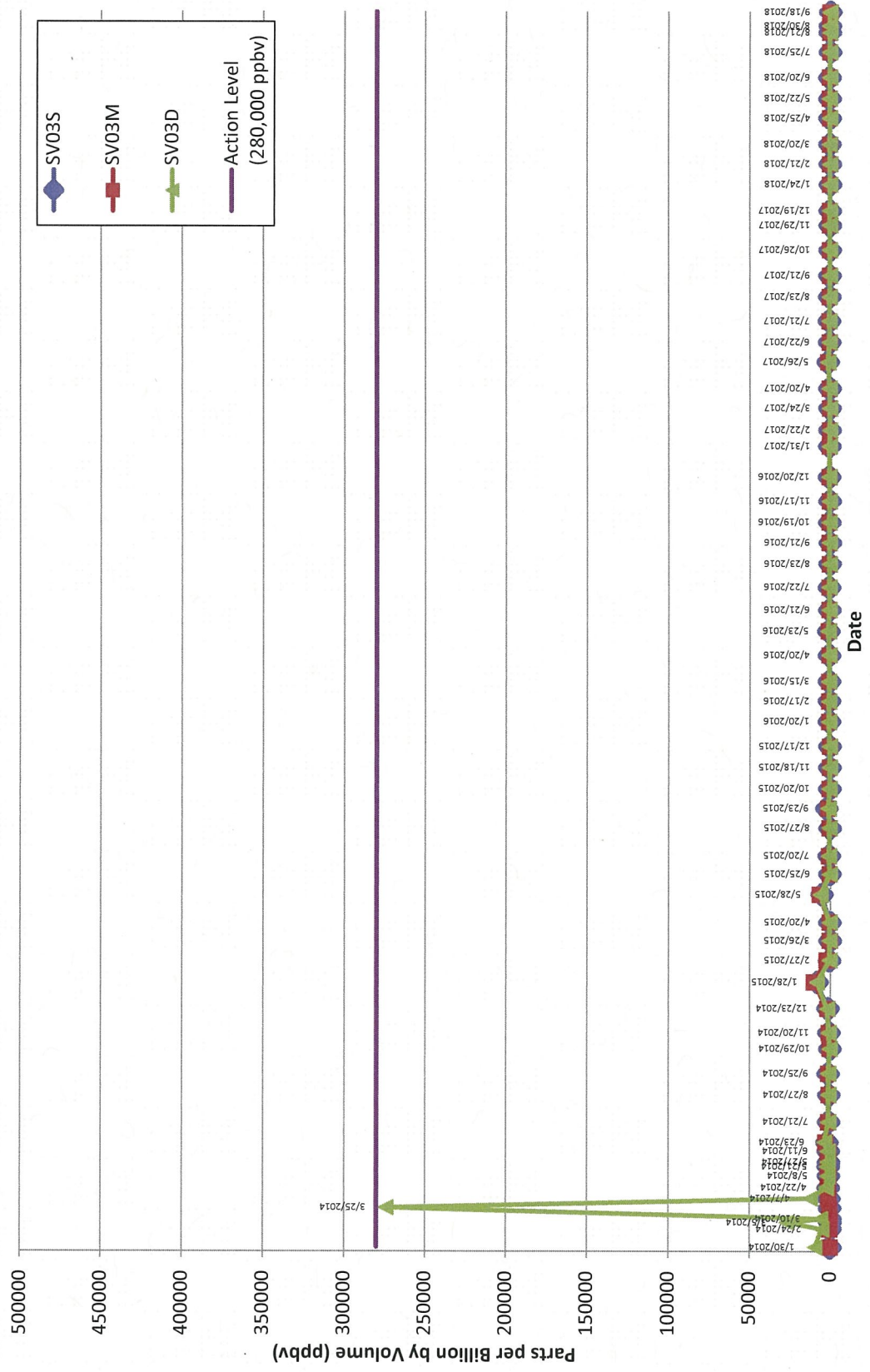
SWL - static water level

***Appendix B***  
***Soil Vapor Sampling Results through September 2018***

**Figure 1**  
**Soil Vapor Measurements**  
**SV02**



**Figure 2**  
**Soil Vapor Measurements**  
**SV03**

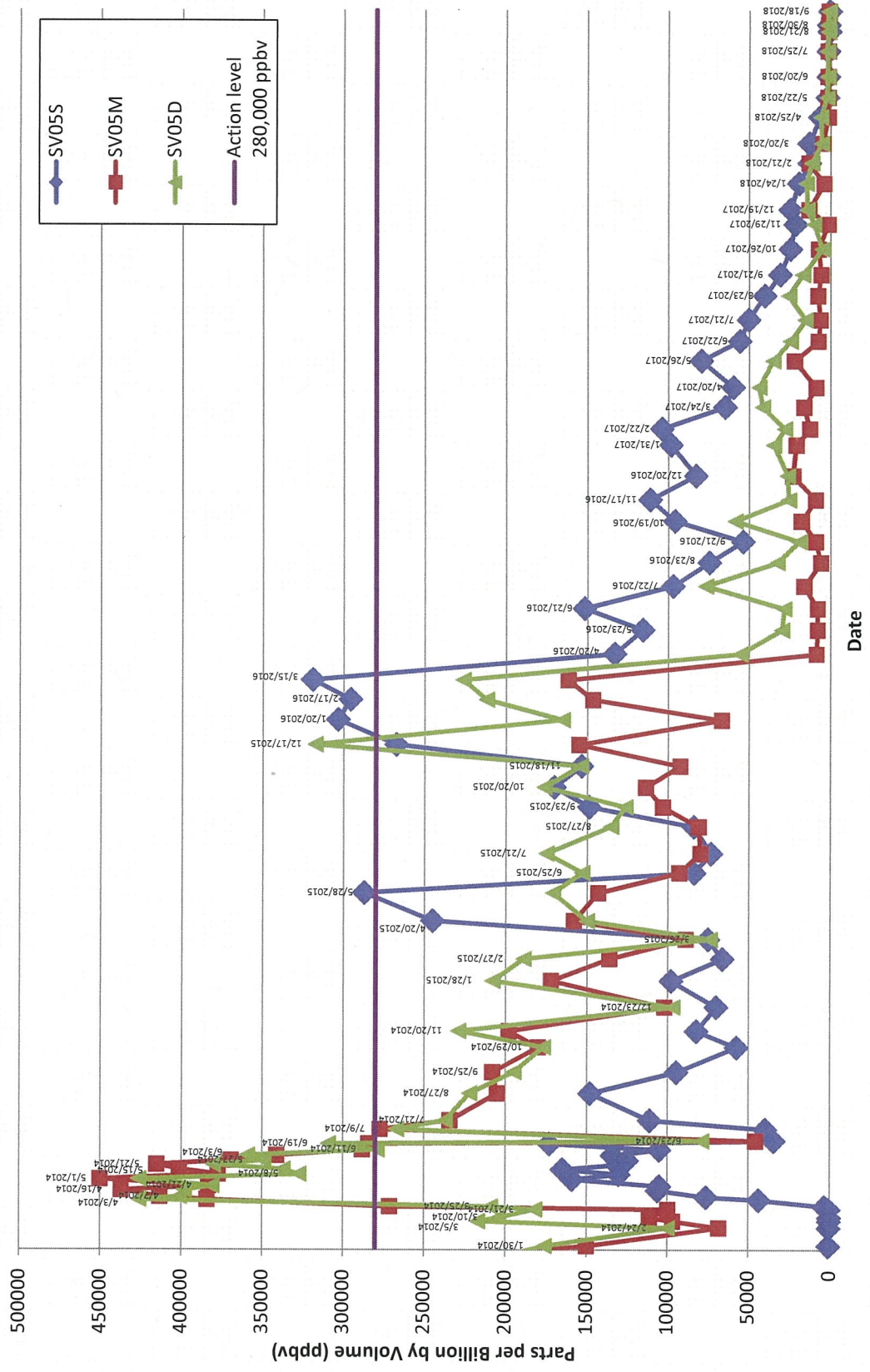




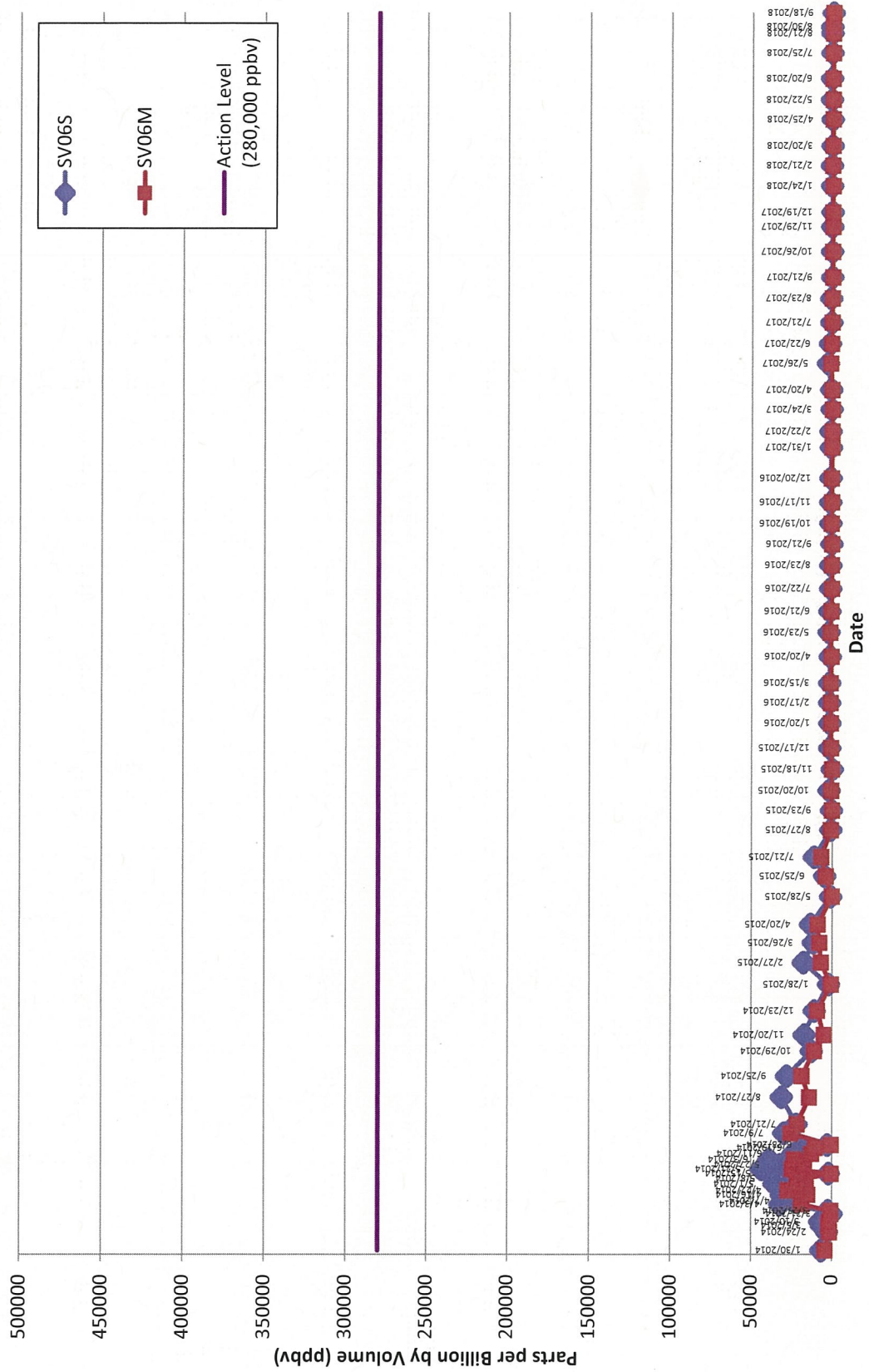
**Figure 3**  
**Soil Vapor Measurements**  
**SV04**



**Figure 4**  
**Soil Vapor Measurements**  
**SV05**

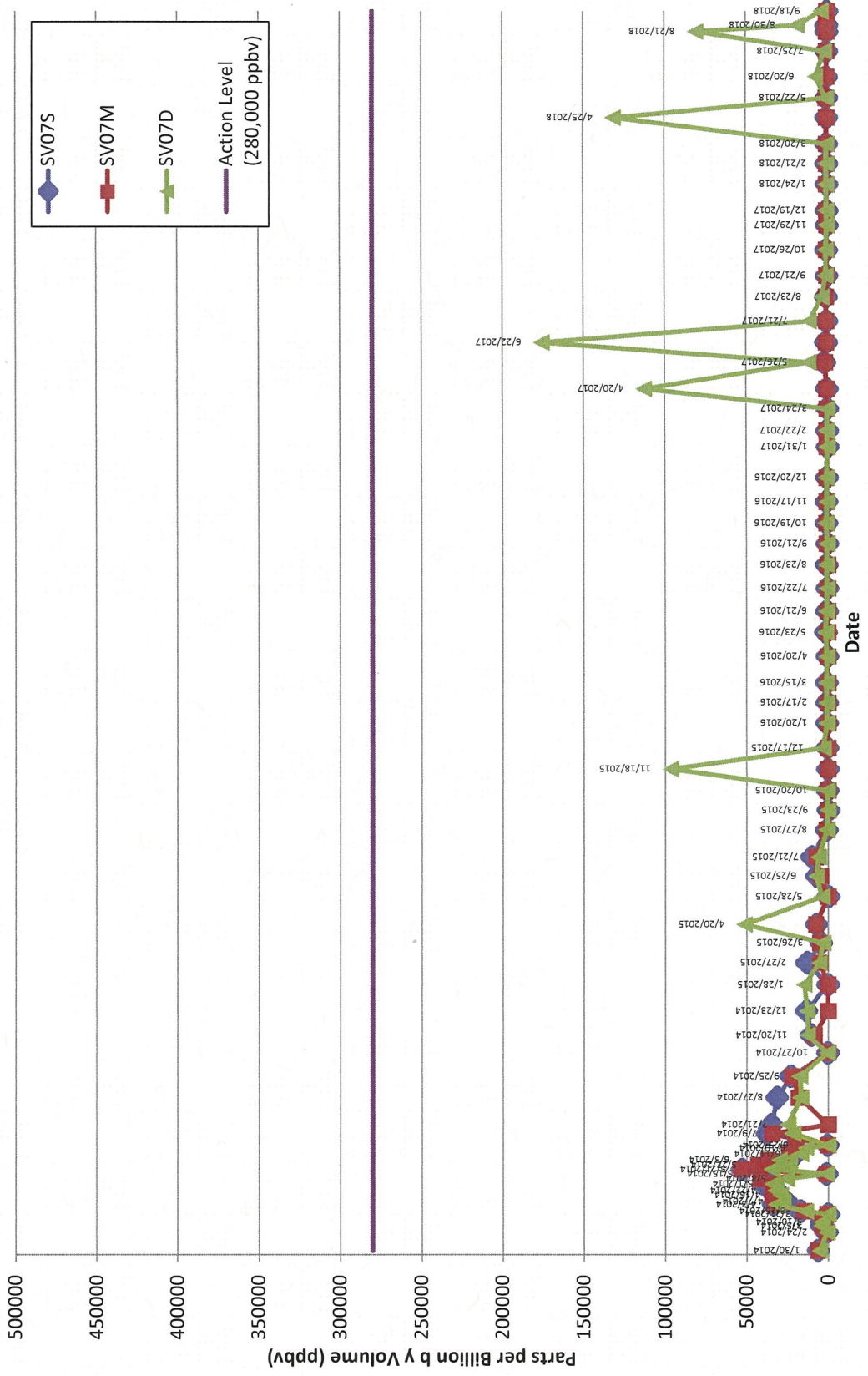


**Figure 5**  
**Soil Vapor Measurements**  
**SV06**

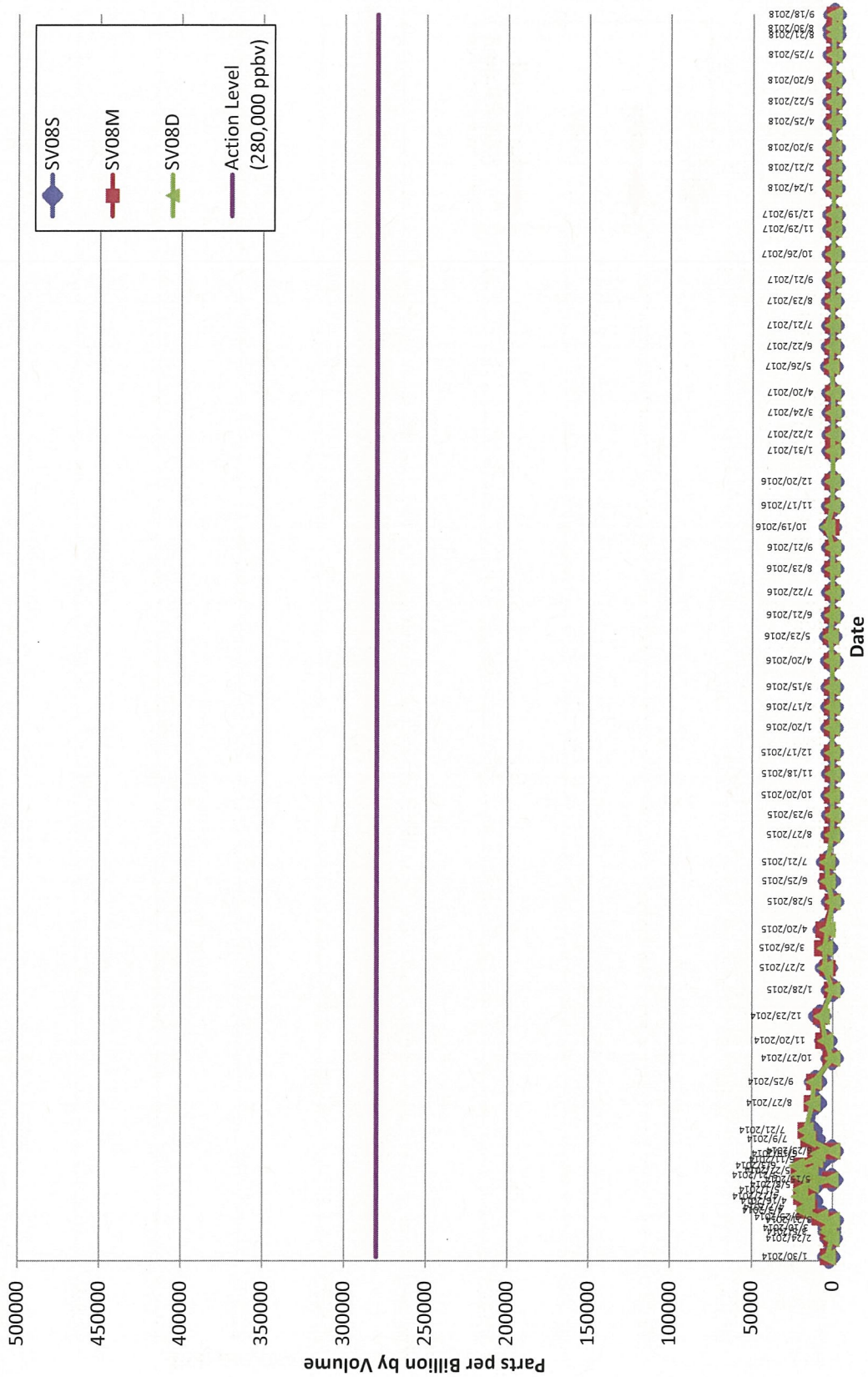




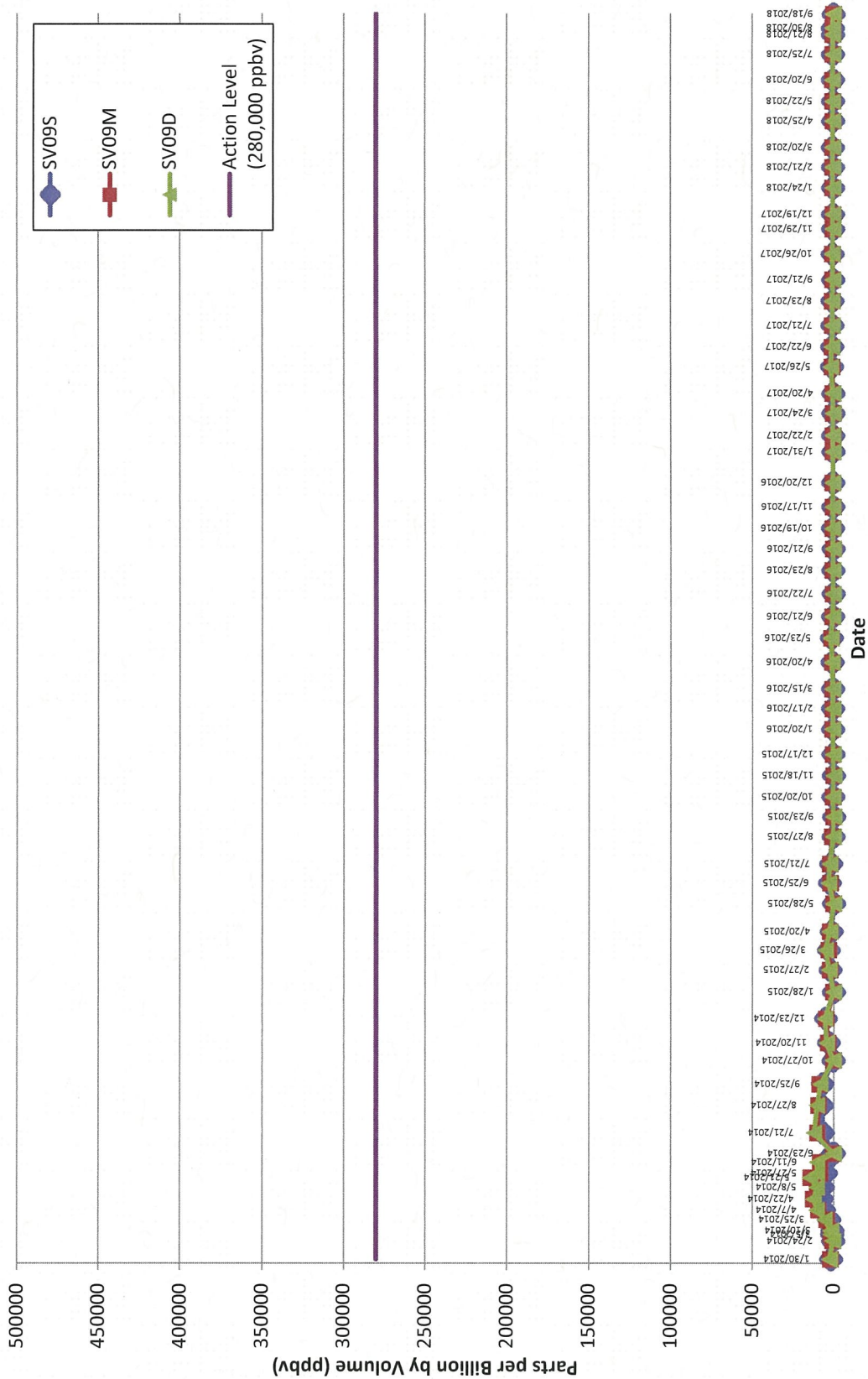
**Figure 6**  
**Soil Vapor Measurements**  
**SV07**



**Figure 7**  
**Soil Vapor Measurements**  
**SV08**

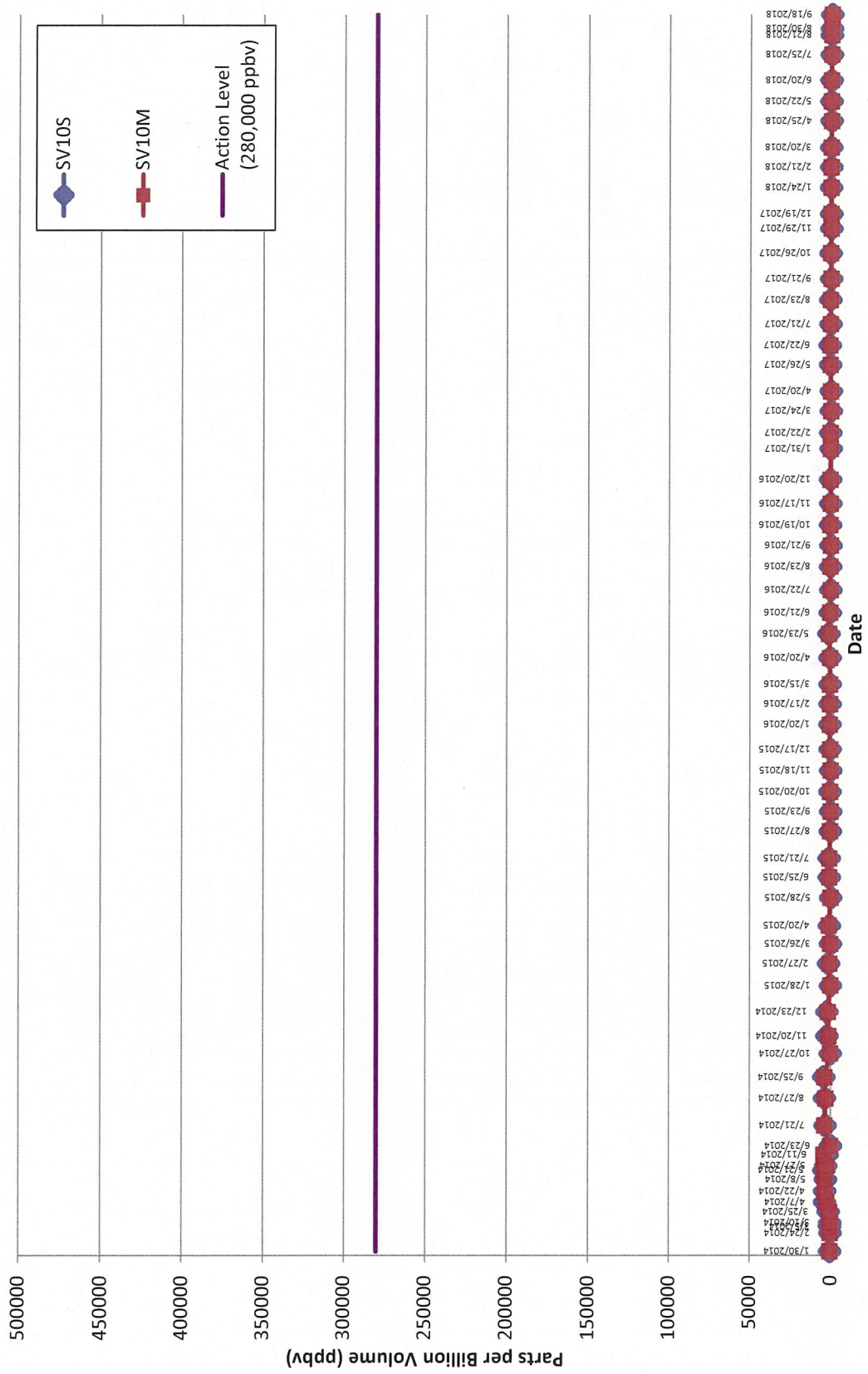


**Figure 8**  
**Soil Vapor Measurements**  
**SV09**

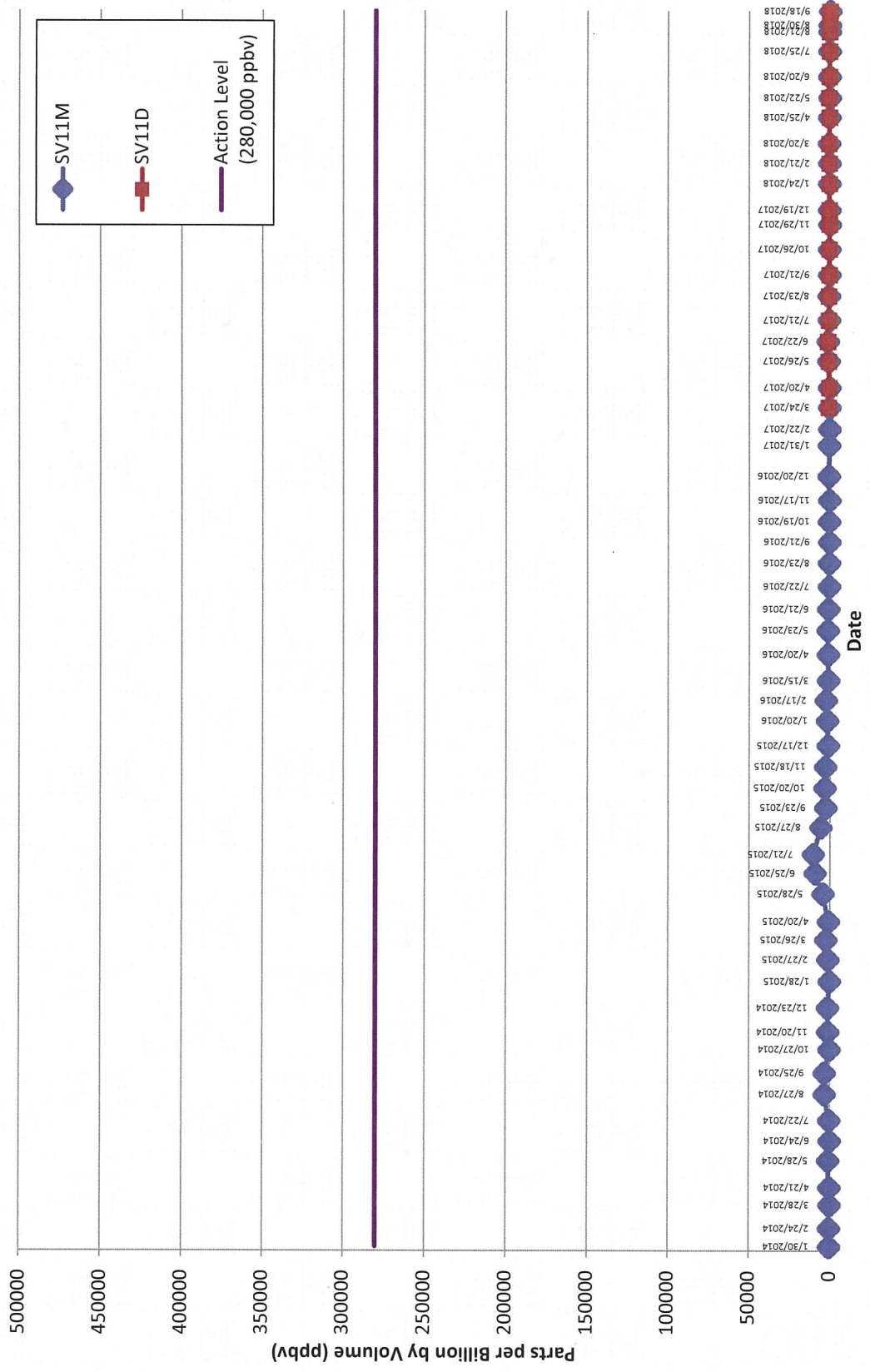




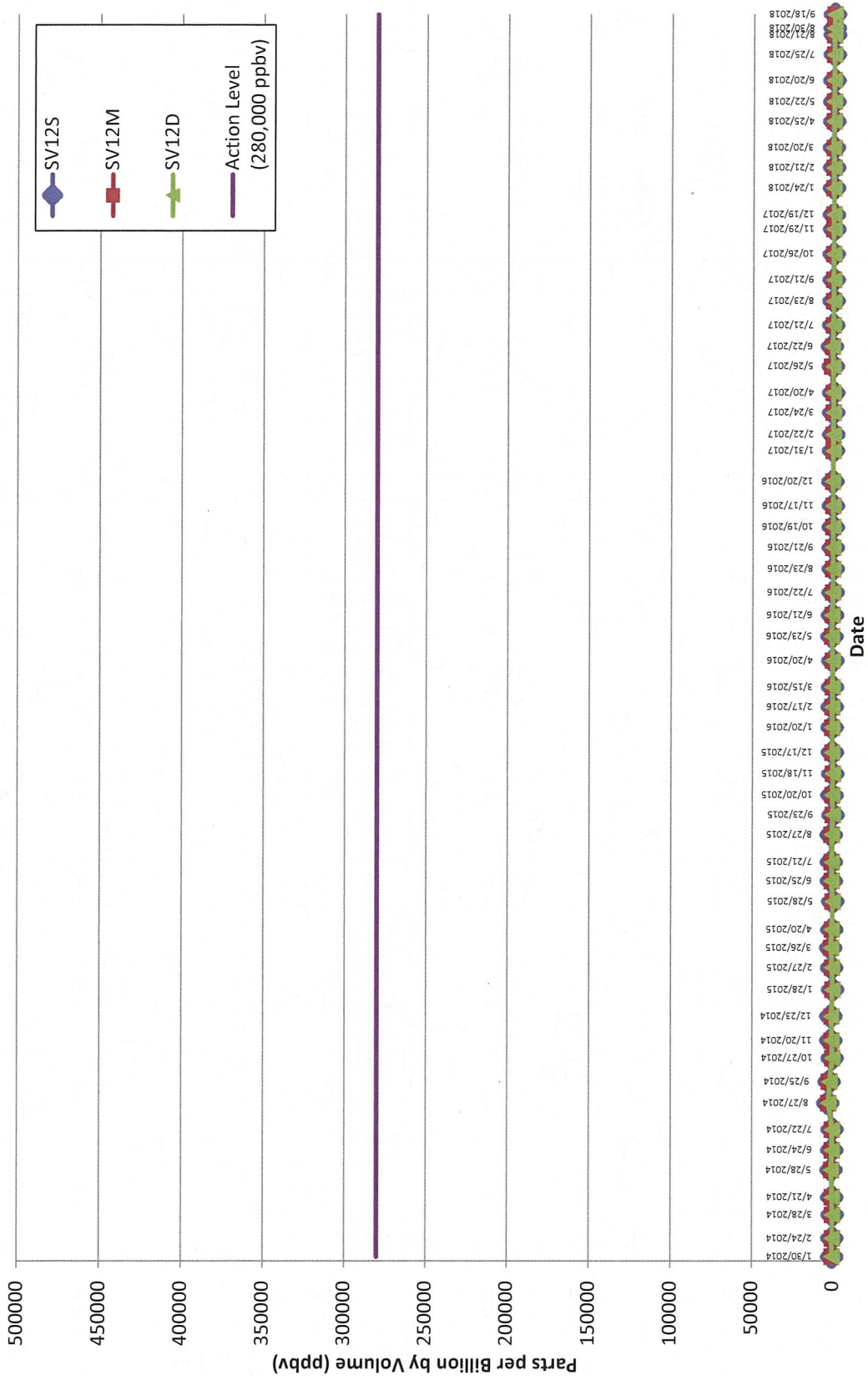
**Figure 9**  
**Soil Vapor Measurements**  
**SV10**



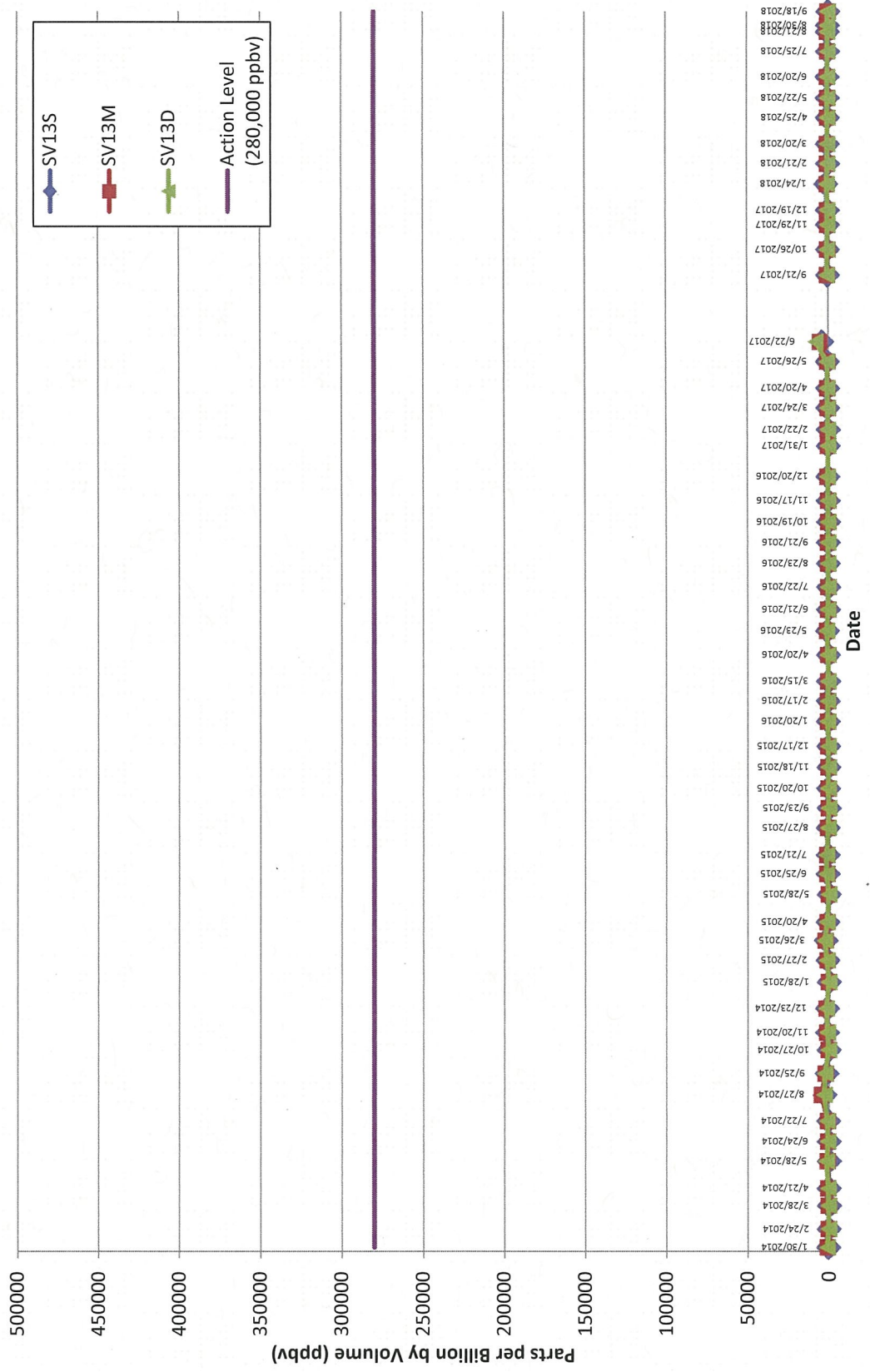
**Figure 10**  
**Soil Vapor Measurements**  
**SV11**



**Figure 11**  
**Soil Vapor Measurements**  
**SV12**

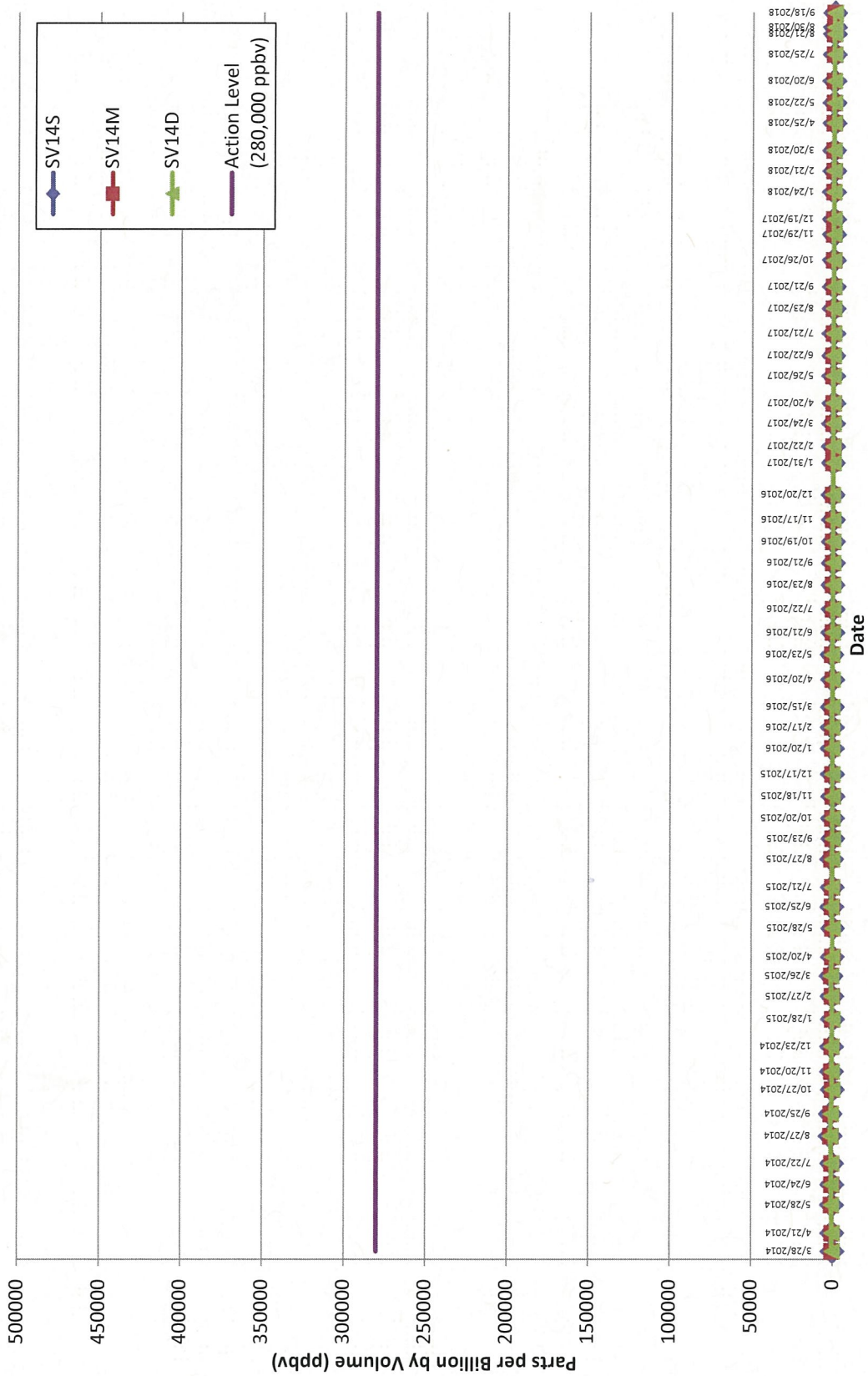


**Figure 12**  
**Soil Vapor Measurements**  
**SV13**



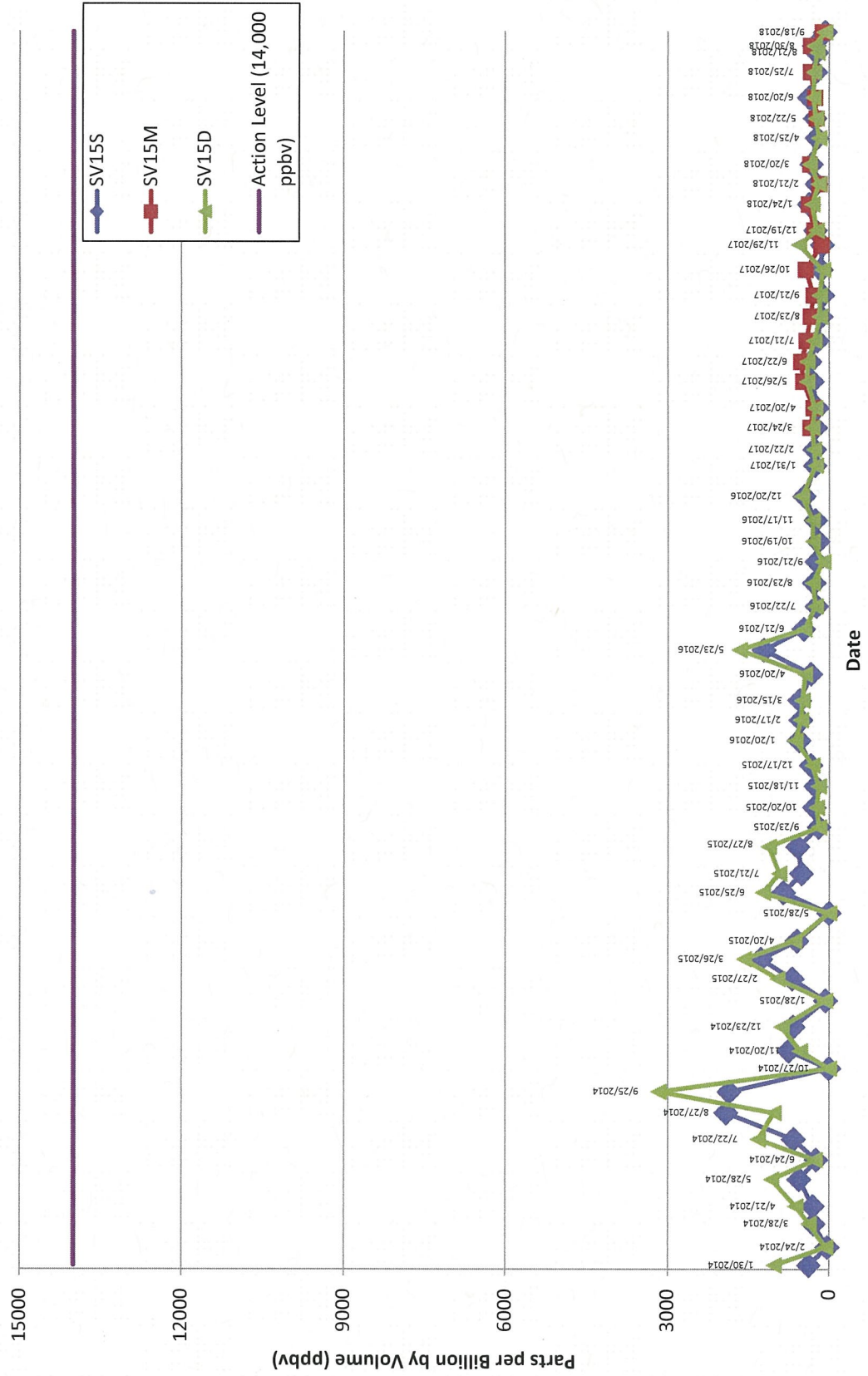


**Figure 13**  
**Soil Vapor Measurements**  
**SV14**

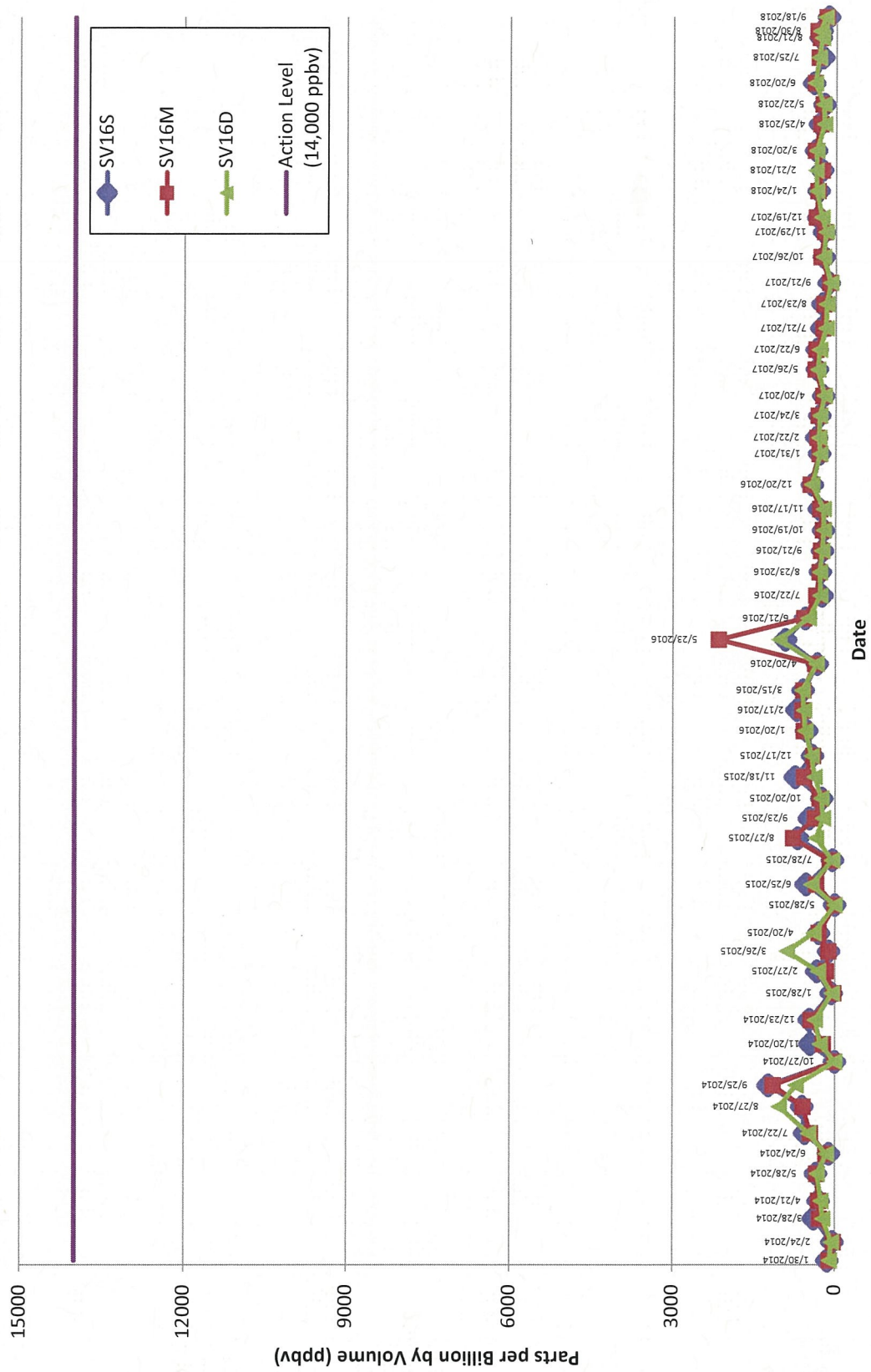




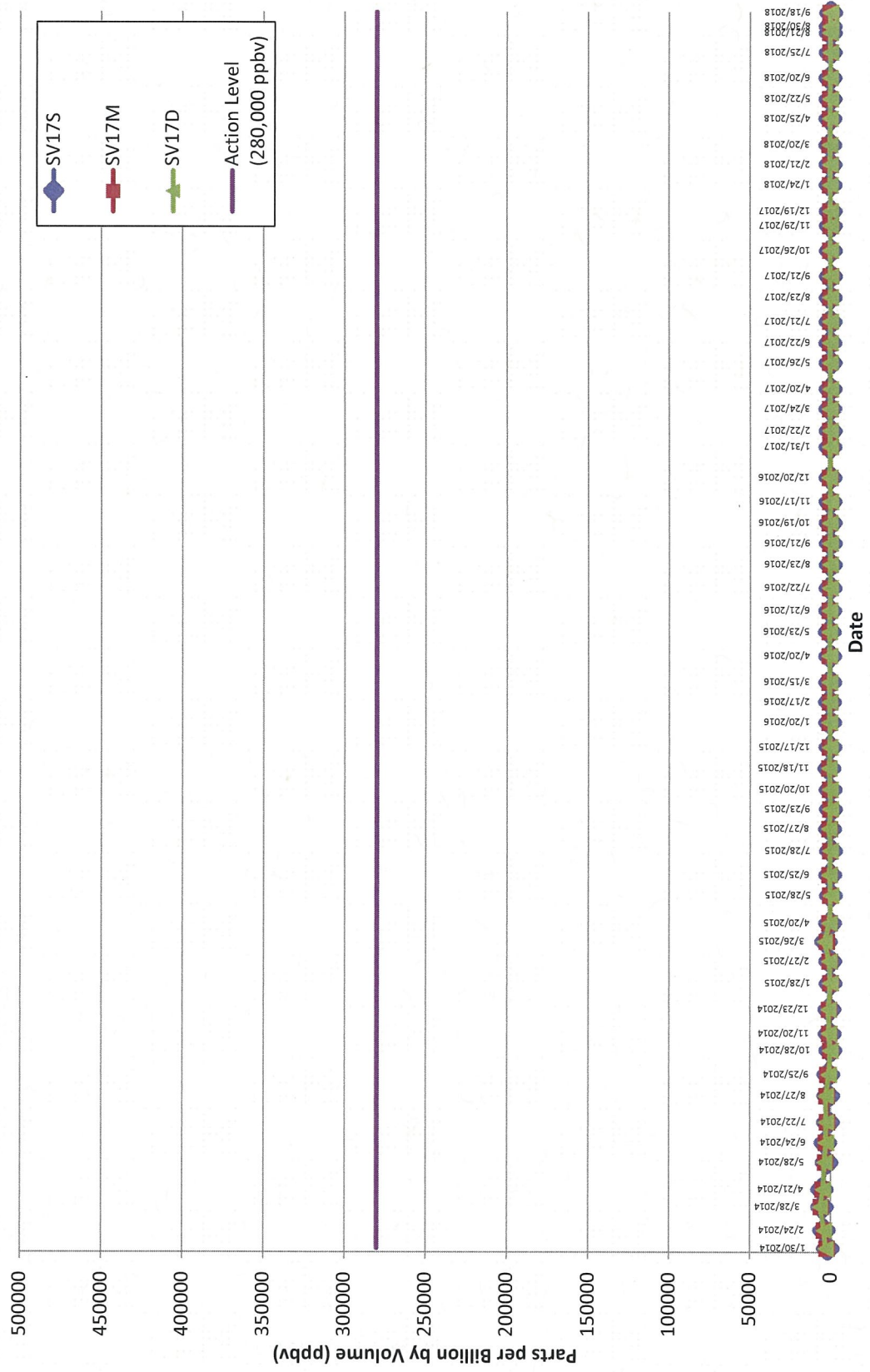
**Figure 14**  
**Soil Vapor Measurements**  
**SV15**



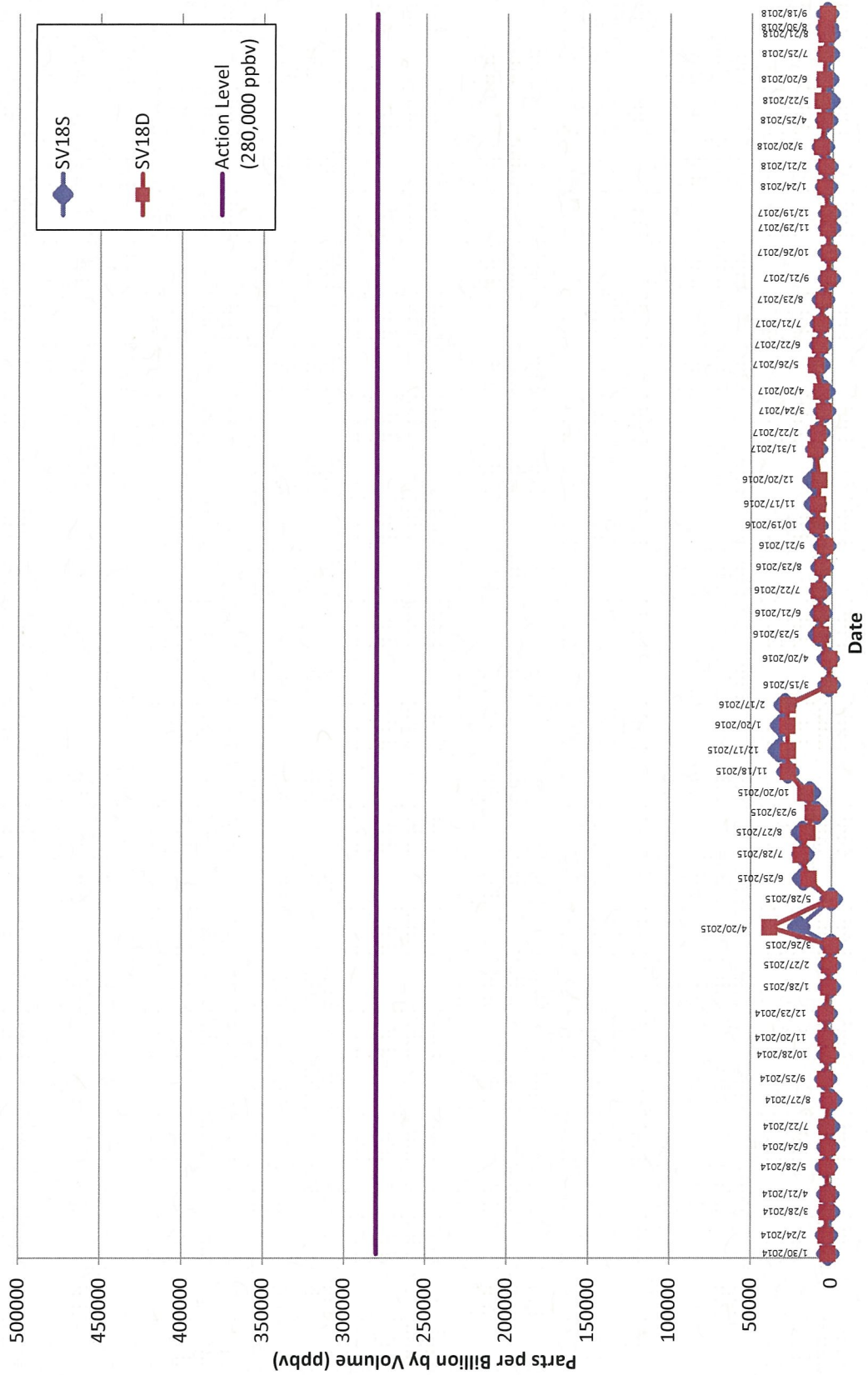
**Figure 15**  
**Soil Vapor Measurements**  
**SV16**



**Figure 16**  
**Soil Vapor Measurements**  
**SV17**

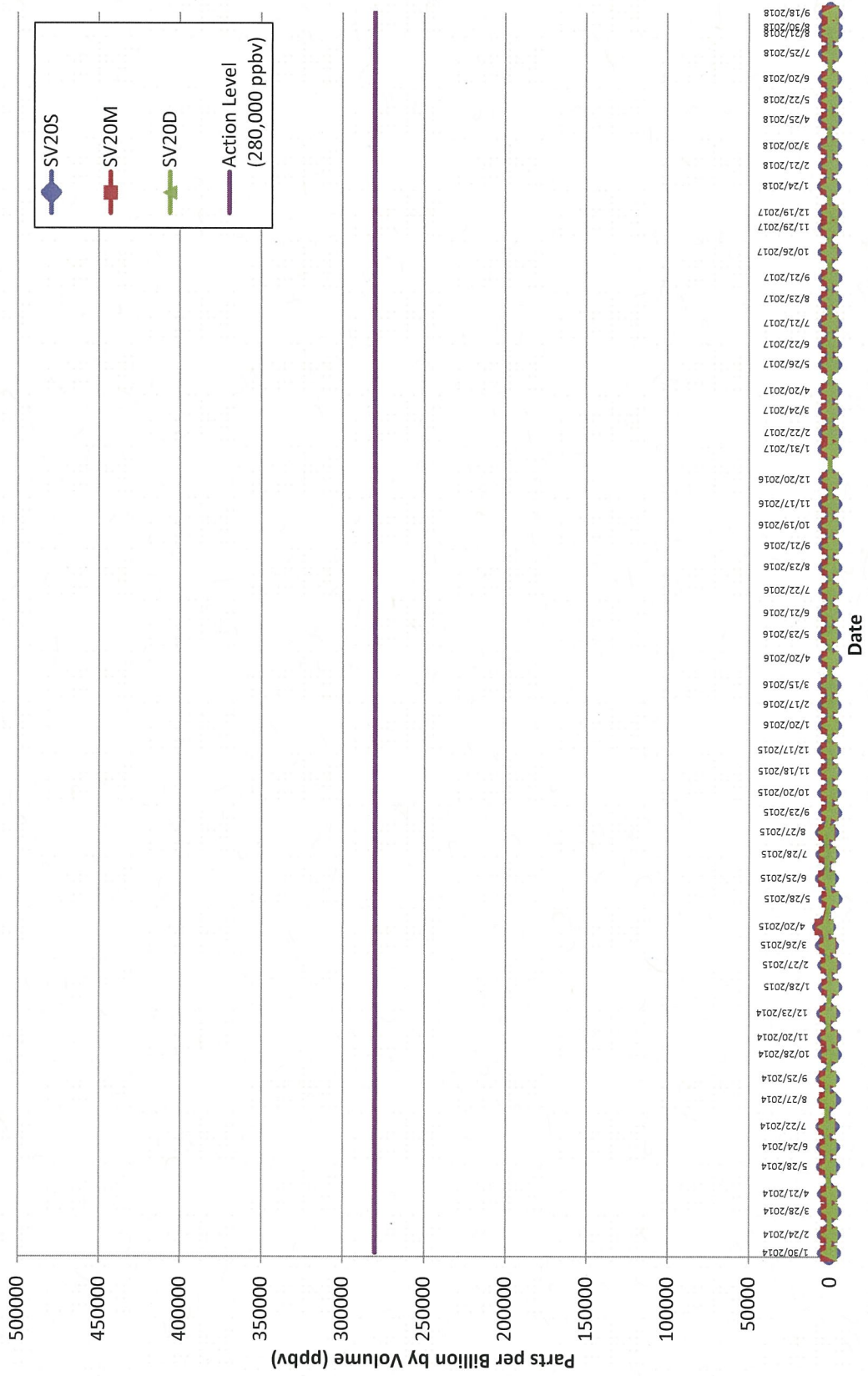


**Figure 17**  
**Soil Vapor Measurements**  
**SV18**





**Figure 18**  
**Soil Vapor Measurements**  
**SV20**

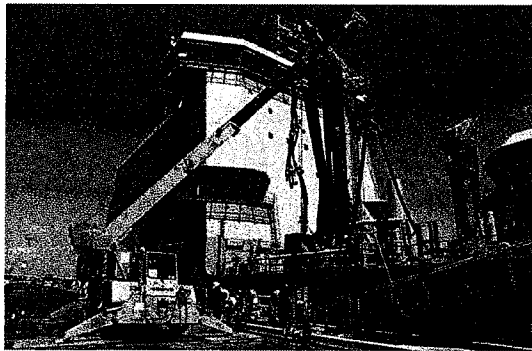


*Appendix C*  
*Public Notifications*

# **WHO'OKELE** <sup>"Navigator"</sup> FOR THE NAVY AND AIR FORCE TEAM IN HAWAII

## **Red Hill: Fueling RIMPAC and ensuring global strategic alliances**

Jul 27, 2018



NAVSUP FLC Pearl Harbor personnel hoist fuel hoses to rig to a coalition oiler in preparation for a fuel transfer during RIMPAC 2018.

**Story and photo by Shannon Haney**  
*NAVSUP FLC Pearl Harbor Public Affairs*

The Red Hill Bulk Fuel Storage Facility has issued over 19 million gallons of fuel to U.S. and foreign ships and aircraft participating in the Rim of the Pacific (RIMPAC) exercise.

Red Hill, operated by Navy Supply Systems Command (NAVSUP) Fleet Logistics Center (FLC) Pearl Harbor's Fuel Department, consists of 20 tanks, each able to store 12 million gallons of fuel.

RIMPAC's theme is "Capable, Adaptive, Partners." With 'Capable' being an important part of the theme of this exercise, it is clear that Red Hill and the fuel it delivers is one of the most important factors of RIMPAC 2018.

"Red Hill enables fleet readiness and is a key component of operations in the Pacific," said Lt. Cmdr. Blake Whittle, fuel department director. "We are capable of fueling three fleet replenishment oilers simultaneously via pier connection to conduct quick turnarounds to get the vessels back underway to conduct replenishments-at-sea (RASs)."

The RASs allow the surface ships participating in RIMPAC 2018 to maintain the proper amount of fuel and supplies so the ships can continue the exercise without pulling into port for logistical needs.

A gravity-fed distribution system delivers fuel from the Red Hill Bulk Fuel Storage Facility tanks to Pearl Harbor, 3.5 miles away. The facility can operate manually, requiring no connection to the Internet or outside power source.

"Red Hill is reliable and delivers fuel quickly, three times faster than comparable facilities," Whittle said. "It is also two times faster than refueling from a barge or truck. The faster the fueling evolution progresses, the less likely a mishap will occur."

Red Hill fuel is used by each of the military services in Hawaii, including the U.S. Coast Guard, which frequently conducts rescue missions in Hawaiian waters. Along with the Hawaii Air National Guard, which is also fueled by Red Hill, the Coast Guard assisted in relief and reconnaissance efforts in Kauai and the Big Island of Hawaii in recent months.

"The Red Hill fuel facility is considered essential for providing the fuel necessary to defend our nation, safeguard our national interests and support humanitarian missions," Whittle said.

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## DEPARTMENT OF THE NAVY

COMMANDER  
NAVY REGION HAWAII  
850 TICONDEROGA ST STE 110  
JBP HH HI 96860-5101

August 15, 2018

Aloha, Stakeholder,

This is the Navy's tenth and my third stakeholder letter to the community to share news from Navy Region Hawaii. This letter also coincides with completion of my first year of service as the Regional Commander. As I have shared with everyone I have met over the last year, my number one priority remains the warfighting readiness of our infrastructure and the force protection of that infrastructure. That most certainly includes the Red Hill Bulk Fuel Storage Facility.

**Navy Leadership and Red Hill.** I assure you Red Hill has the attention of our leaders both in Hawaii and in Washington, D.C. Commander, U.S. Pacific Fleet, Admiral Chris Aquilino, toured Red Hill shortly after his change of command in May, and then he personally led our Secretary of the Navy, the Honorable Richard Spencer, on a tour of the facility just last month. This is all in advance of Secretary Spencer providing testimony to the House Armed Services Committee in 2019 on the future funding of Red Hill upgrades. Leadership, on and off island, understands the national strategic importance of Red Hill and the absolute necessity of protecting public health by keeping our drinking water safe.

**Red Hill Engagement.** In addition to meeting with many neighborhood boards this year, we also hosted an open forum in March where we publicly presented the possible Red Hill upgrades for the first time. Both regulators, the Environmental Protection Agency (EPA) and Hawaii Department of Health (DOH), were in attendance as were other members of the public to include many from the Sierra Club. Open and professional dialogue is an important aspect of my command and this particularly applies to Red Hill. In March, I also toured several Hawaii State Legislators through Red Hill and provided testimony to two House Committees. I was very pleased that the Governor's office championed an additional engagement meeting on Red Hill to include both the Board of Water Supply and the Sierra Club. At all of these engagements, I took the opportunity to talk about not only the strategic importance of Red Hill but our commitment to ensure we never spill another drop of fuel. Most importantly, these engagements, like the one at the Governor's office, allow stakeholders the opportunity to speak with each other, not just to each other. That's the spirit of Aloha.

**Our Approach to the Tank Upgrade Alternative (TUA) Decision.** On May 21 of this year, the EPA and DOH approved our TUA report. In accordance with the Administrative Order on Consent, that required I brief both regulators within 60 days on our TUA selection and proposed way forward. On July 20, I had phone calls with both the EPA and DOH to discuss our proposal. As you would expect, our preferred TUA option and proposed way forward was coordinated with numerous senior military staffs to include U.S. Pacific Fleet, U.S. Indo-Pacific Command, Defense Logistics Agency (DLA), Navy Installations Command and the Navy Staff, and both the Secretary of the Navy and the Secretary of Defense staffs. As I opened with in this letter, Red Hill has the attention of our leaders both in Hawaii and Washington D.C.

My phone calls to the EPA and DOH were just the first step, though. This week actually began a series of face-to-face meetings in Hawaii amongst the Navy, the regulators, and many



other stakeholders such as the U.S. Geological Service and the Board of Water Supply. This series of meetings could take up to several months, but once complete, the Navy and DLA will have 60 days to submit a formal TUA recommendation report for regulatory agency approval.

**The Proposed TUA Way Forward.** At this time, the Navy and DLA will:

- Continue with sustainment/maintenance of the existing tanks in accordance with current procedures as the Navy's initial best available practicable technology (BAPT) decision submittal.
- Propose a pilot for regulatory approval of application of an interior epoxy coating to one tank to determine feasibility of this unproven coating method.
- Fund an upgrade to the leak detection system.

As part of this way forward, there are proactive actions being taken by Indo-Pacific Command, the Joint Chiefs of Staff, and the Institute for Defense Analyses to revalidate the fuel requirement and fuel logistics laydown in the Indo-Pacific Command Area of Responsibility under the new National Defense Strategy. The fuel requirement validation and logistics laydown analyses could certainly impact the long-term plan for Red Hill. Moving forward, these studies will help shape future, more informed BAPT decisions by stakeholders, recognizing that changes in fuel requirements may require exploration of other alternatives and should feed into the first five-year review of BAPT.

**Background on the Proposed TUA Way Forward.** The Red Hill fuel tanks were superbly designed and constructed to ensure long-service life. A Tank Tightness Test for each tank is conducted annually in accordance with federal and state regulations utilizing the Mass Technology Corporation's Mass Technology Precision Mass Measurement System. Since we started tank tightness testing in 2008, the tanks have never failed. Further, in 2016 the EPA used industry subject matter experts to conduct a baseline evaluation of the systems, management practices, and inspection and safety procedures, at Red Hill with respect to 10 industry and federal standards, including those of the American Petroleum Institute, the American Society for Nondestructive Testing, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Society for Testing and Materials, and the National Fire Protection Association. The evaluation team found that the systems, inspection technologies/methods, safety procedures, and management practices in place at Red Hill meet or exceed best practices for petroleum terminals and bulk fuel storage facilities. Moreover, new equipment and technology continue to increase inspection fidelity.

Red Hill's ground water protection plan additionally provides a multi-pronged approach to safeguarding Hawaii's aquifer and drinking water. Specifically,

- **Soil Vapor Testing.** Samples are collected monthly beneath all tanks and analyzed in the field for volatile organic compound concentrations using a photo-ionization detector.
- **Quarterly Groundwater Sampling.** Samples are drawn from monitoring wells located inside and outside the Red Hill lower access tunnel.
- **Water Interface Testing.** Oil/water interface measurements are taken monthly at four monitoring wells; the water level at each well is gauged and measured for the presence of light non-aqueous phase liquids using an interface meter.

Red Hill's upgraded control system also far exceeds industry standards. The control room is staffed 24/7 by thoroughly trained and qualified professionals and includes state-of-the-art control and surveillance systems. Each tank's online fuel inventory accounting system continuously measures tank level fidelity down to 1/16 of an inch. A new and even more precise system is scheduled for installation in 2019.

The bottom line is that Red Hill has one of the most advanced leak detection systems, comprehensive monitoring networks, a robust emergency response plan, and well trained operators—all to ensure safe drinking water. The same drinking water my family and I drink continues to be safe and in compliance with all federal and state standards.

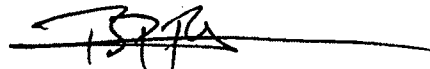
Lastly, it is remarkably important to remember that the 2014 fuel release is the only reportable fuel release to the environment from Red Hill since establishment of underground storage tank regulations in 1988 – 30 years ago. Further, the 2014 release from Tank Five was solely the result of human error, and not indicative of failing tanks. The Navy has worked with EPA and DOH under the Administrative Order on Consent to improve our procedures and add more controls to limit the potential for future human error.

**Red Hill and Hawaii.** In addition to providing fuel for our Navy and Air Force, Red Hill also provides fuel to other services and agencies, including the U.S. Coast Guard and Hawaii National Guard. Red Hill fuel was particularly vital in recent months to support relief efforts on Kauai after the April floods and on the Big Island in response to Kilauea's volcanic eruption, as well as supporting the Navy's Pacific Partnership mission across the central and southeast Pacific.

As always, if you would like more technical information about our progress, please contact my Red Hill Program Director/Project Coordinator, Mark Manfredi, at (808) 473-4148. Mark and his team can provide detailed technical briefings to interested groups, including neighborhood boards. I also invite everyone to visit our Red Hill website at [www.cnic.navy.mil/redhill](http://www.cnic.navy.mil/redhill) to see the dialogue – along with water quality information, photos, video, and copies of previous stakeholder letters and press releases. We will continue to keep the community informed of the facts and progress at Red Hill.

We remain committed to protecting our environment and drinking water while at the same time maintaining Red Hill as part of our critical infrastructure, both in the event of conflict and in vital support to all of our islands and humanitarian missions.

Very Respectfully,



B. P. FORT  
Rear Admiral, U. S. Navy



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**FOR IMMEDIATE RELEASE**

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**CNRH Public Affairs after hours: 808-371-5189**

**AUG. 21, 2018**  
**Release # 18-029**

## **Navy, regulators discuss Red Hill Tank Upgrade Alternatives**

(JOINT BASE PEARL HARBOR-HICKAM) – Rear Adm. Brian Fort, Commander, Navy Region Hawaii and Naval Surface Group Middle Pacific, issued the Navy’s tenth “stakeholder letter” as part of an ongoing initiative to provide transparency to the public. The letter offers pre-decisional information on the Navy’s intention regarding the Tank Upgrade Alternative (TUA), which is being discussed with the State of Hawaii Department of Health (DOH) and the Environmental Protection Agency (EPA).

“The EPA and DOH approved our TUA report in May of this year and, in accordance with the Administrative Order on Consent (AOC), we are now in the TUA Decision Meetings with the EPA and DOH,” said Fort. “I assure you Red Hill has the attention of our leaders both in Hawaii and in Washington, DC. Commander, Pacific Fleet, Admiral Chris Aquilino toured Red Hill shortly after his change of command in May, and then he personally led our Secretary of the Navy, the Honorable Richard Spencer, on a tour of the facility just last month.”

“In addition to meeting with many neighborhood boards this year, we also hosted an open forum in March where we publically presented the possible Red Hill upgrades for the first time,” said Fort. “Both regulators, the EPA and DOH, were in attendance, as were other members of the public to include many from the Sierra Club. Open and professional dialogue is an important aspect of my command of Navy Region Hawaii and this particularly applies to Red Hill,” Fort added.

“I was very pleased that the Governor’s office championed an additional engagement meeting on Red Hill to include both the Board of Water Supply and the Sierra Club. At all of these engagements, I took the opportunity to not only talk about the strategic importance of Red Hill, but also our commitment to ensure we never spill another drop of fuel,” said Fort. “Most importantly, these engagements, like the one at the Governor’s office, allow stakeholders the opportunity to speak with each other, not just to each other. That’s the spirit of Aloha,” Fort added.

The Navy and Defense Logistics Agency (DLA) will continue with sustainment/maintenance of the existing tanks in accordance with current procedures as the Navy’s initial best available practicable technology decision submittal. Plans also include a proposed pilot project for regulatory approval of application of an interior epoxy coating to one tank to determine feasibility of this unproven coating method, and funding a new upgrade to the leak detection system.

The Navy continues to address with engineers and regulators the feasibility and concerns regarding each of the alternatives, and expressed its ongoing commitment to protecting the environment. "The bottom line is that the same drinking water my family and I drink continues to be safe and in compliance with all federal and state standards," Fort said.

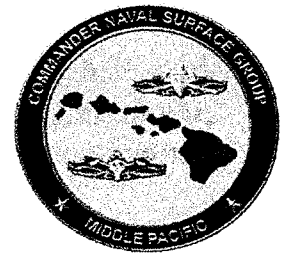
Fort concluded, "We remain committed to protecting our environment and drinking water while at the same time maintaining Red Hill as part of critical infrastructure, both in the event of conflict and in vital support to all of our islands and humanitarian missions."

A copy of the stakeholder letter with pre-decisional information is available on our website at: [www.cnic.navy.mil/redhill](http://www.cnic.navy.mil/redhill).

\* Editor's note: At the request of the State, this update brief was rescheduled to Nov. 1.



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For Immediate Release  
Kathy Isobe: 808-473-0662  
Duty cell: (808) 371-5189

Sept. 25, 2018  
Release # 18-036

Link to Red Hill B-Roll: <https://www.dvidshub.net/video/628960/red-hill-bulk-fuel-storage-facility>

## Red Hill: Navy to Update State Senate Task Force

(JOINT BASE PEARL HARBOR-HICKAM) – The Navy plans to present the latest information about Red Hill improvements and upgrades to elected officials and regulators at the annual state Senate task force meeting Oct. 3.\*

In June, the Navy initiated a study to validate its methods of assessing and testing its tanks. Contrary to some reporting, the study is ongoing and has not been completed. Results are expected in late October.

Steel liner samples – “coupons” – were taken from one inactive tank and were selected after collaborative discussion between the Navy and regulators, Environmental Protection Agency and Hawaii Department of Health, under the Administrative Order on Consent (AOC) process.

“The coupons were chosen to evaluate our non-destructive examination scanning process,” said Lt. Cmdr. Blake Whittle, Fuels Director at Fleet Logistics Center Pearl Harbor. “Ensuring tank integrity is the top priority and key to the exhaustive review approach we’ve agreed to.”

After the AOC was signed in 2015 the Navy and Defense Logistics Agency spent \$45.3M to identify the best alternative to improve the facility while conducting scientific studies on groundwater to include increasing the number of monitoring

sites. This is in addition to the roughly \$260M spent by the Navy and DLA since 2006 to maintain and modernize the Red Hill facilities and conduct environmental testing to protect the drinking water.

Rear Adm. Brian Fort, commander, Navy Region Hawaii and Naval Surface Group Middle Pacific, said studies, workshops and reports are part of the Navy's continuing efforts to inform the public and invest in the integrity of the Red Hill facility.

"We have not and will not rush to judgment or conclusions, and we will continue to keep the drinking water safe, no matter what," Fort said. "There is much more work to do in studying, analyzing and then implementing all the right initiatives at Red Hill."

The facility's clean, inspect, and repair maintenance program is certified by the American Petroleum Institute. The program is built on a process of continuous improvement, and provides an enduring framework to validate tank and system integrity. Engineers and subject matter experts committed to making informed decisions are wary of conclusions based on incomplete information.

"We must understand every potential action, reaction and consequence of our decisions, but this is also a good time to recognize how much progress we have made and continue to make," Fort said.

"We're eager to present the science, facts and evidence behind our decision-making process," Fort noted. "For more general information from the Navy about Red Hill, I invite you to visit our website: [www.cnmc.navy.mil/redhill](http://www.cnmc.navy.mil/redhill) <<http://www.cnmc.navy.mil/redhill>>. Regulators confirm our drinking water continues to be safe to drink and the Red Hill tanks are not leaking," Fort said.

Red Hill is considered a national strategic asset, which is vital to the nation's defense. Fuel from Red Hill is used by each of the military services, including the U.S. Coast Guard as well as the Hawaii National Guard.