



# **Malmstrom Air Force Base, Launch Facility Sampling Results**

**Lt Col Raymond W. Mak  
Command Bioenvironmental Engineer**

**Report Date  
14 November 2024**



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**DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE GLOBAL STRIKE COMMAND**

14 November 2024

MEMORANDUM FOR: AFGSC/A4B  
ATTN: Mr. Daryle Fry

FROM: AFGSC/SGPB  
245 E Davis Ave, Bldg 5341  
Barksdale AFB, LA 71110

SUBJECT: Malmstrom Air Force Base (AFB) Launch Facility Sampling Results

References: (a) American Conference of Governmental Industrial Hygienists, *2023 Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices* (OH: ACGIH, 2023), 19.

(b) American Conference of Governmental Industrial Hygienists, *2001 Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices* (OH: ACGIH, 2001).

(c) William E. Luttrell, Kenneth R. Still, Jeffrey A. Church, and Leslie A. Beyer, *Toxicology Principles for the Industrial Hygienist* (Second Edition) (VA: AIHA, 2019).

(d) Agency for Toxic Substances and Disease Registry, *Polychlorinated Biphenyls ToxFAQs* (GA: ATSDR, 2014).

(e) National Archives, *40 CFR 761.61* (Washington, D.C.: CFR, 2023).

## **1. INTRODUCTION**

At the request of the Air Force Global Strike Commander (AFGSC/CC), the Malmstrom AFB Bioenvironmental Engineering (BE) flight performed air sampling for polychlorinated biphenyls (PCBs) for six (6) Launch Facilities (LFs) and surface swipe sampling for seven (7) LFs at Malmstrom AFB, MT between 21 August to 25 October 2024. Sampling was performed to characterize and document potential occupational and environmental hazards in the LFs. The purpose of this memo is to convey survey results received from two civilian laboratories.

### **A. Survey Personnel:**

(1) Lt Col Brian Shuler, 341st Operational Medical Readiness Squadron (OMRS) BE Flight Commander

- (2) SSgt Brittany Brown, 341st OMRS BE Flight Chief
- (3) 2Lt Alfred Borbe, 341st OMRS BE Director of Operations
- (4) SSgt Nicholas Sundling, 341st OMRS BE Technician
- (5) SrA Elgin Bourne, 341st OMRS BE Technician
- (6) A1C Damien Quick, 341st OMRS BE Technician
- (7) A1C Elias Yu, 341st OMRS BE Technician
- (8) A1C Kellan Hutchison, 341st OMRS BE Technician
- (9) Amn Denisse Guzman Garcia, 341st BE Technician

**B. Personnel Contacted:**

- (1) TSgt Justin Ferguson, 341st Missile Maintenance Squadron, NCOIC Periodic Maintenance Team
- (2) SSgt Shon Jones, 341st Missile Wing Integrated Planning Cell, NCOIC Missile Scheduling

**C. Equipment Used:**

- (1) Scientific Kit Corporation (SKC) AirChek XR5000 Sampling Pumps with Adjustable Low Flow Tube Holder and Constant Pressure Controller for Low Flow
- (2) Bios DryCal DC-Lite Primary Flow Air Sampling Pump Calibrator
- (3) Ancillary equipment including sterile containers and other items to facilitate sample collection and analysis

## **2. BACKGROUND**

Following a March 2023 site visit to address cancer concerns in the missileer community, the United States Air Force School of Aerospace Medicine (USAFSAM) Defense Centers for Public Health-Dayton (DCPH-D) Occupational and Environmental Health Department (OE) performed three rounds of environmental sampling at all Missile Alert Facilities (MAFs) at Malmstrom AFB, MT. The LF sampling plan targeted the identification of PCB present in LFs in accordance with the AFGSC One Time Inspection of PCBs memorandum dated 22 July 2024. The potential health hazards sampled for will be discussed in the health hazard summary in the following section.

The units included in this survey were the 10th, 12th and 490th Missile Squadrons. No less than two (2) LFs per squadron for a minimum total of six (6) LFs per wing. Malmstrom AFB conducted sampling in twelve (12) LFs across three squadrons to include:

- A. Four LFs for the 10th Missile Squadron (A-06, B-07, D-04 and E-10)
- B. Four LFs for the 12th Missile Squadron (F-08, G-02 , G-07 and H-08), and
- C. Four LFs for the 490th Missile Squadron (L-04, M-04, M-08 and N-09)

The intent was to conduct air and swipe sampling in the same LF. However, the air sampling pump became inoperable midway through the air sampling in LF A-06. Additionally, air sampling was conducted in E-10, F-08, G-02, L-04 and M-08, but the sample media were damaged during shipment, preventing the analytical laboratory from analyzing them. Additional air sampling was conducted in B-07, G-07, H-08, M-04 and N-09.

### **3. HEALTH HAZARD SUMMARY**

PCBs are synthetic organic chemicals used for a variety of industrial and commercial purposes. They were commonly used in the fluid in electrical components, capacitors, and transformers. PCBs were developed in the 1940's and used through the late 1970's. In the late 1970's, they were banned from manufacturing because of evidence that determined PCBs accumulate in the environment and may be toxic to humans and wildlife. PCBs remain present in electrical components of equipment in the Launch Control Centers (LCCs) and LFs because of their capability to insulate and regulate equipment temperatures (Agency for Toxic Substances and Disease Registry, 2014). 40 Code of Federal Regulations (CFR) 761.61 establishes a standard for PCB spills to be cleaned to ten micrograms per one hundred square centimeters (10  $\mu\text{g}/100\text{ cm}^2$ ) (National Archives, 2023). The EPA classified PCBs as a probable human carcinogen. Many of the cancer concerns from MAF occupants originated with concerns from PCB exposures. Furthermore, PCB stickers across all LCCs and LFs were not standardized and MAF occupants reported past incidences of PCB leaks. Due to LCC and LF equipment containing PCBs, air and swipe samples were collected to test for PCBs.

### **4. METHODOLOGY & ANALYSIS**

This section summarizes sampling plans utilized to ensure proper collection, analysis, and validity of results. National Institute for Occupational Safety and Health (NIOSH) and EPA approved methods were used to develop sampling plans and execute sample analysis. Laboratory analysis was used to run one method for PCB air sampling and one method for PCB swipe sampling. The tables in the appendices of this report contain sample type, location, analyte, result, and applicable standard. A summary of analytical methods and number of samples taken for each method can be found in Table 1. Samples were shipped from Malmstrom AFB to two civilian analytical laboratories to conduct the analysis. Air Force Global Strike Command Bioenvironmental Engineering (AFGSC/SGPB) validated the results as they were received from the laboratories.

#### **4.1 AIR**

Air sampling quantifies the concentration of analytes within the volume sampled. Personal air samples were collected to characterize environmental exposures in the LFs. Local BE used one sampling method to analyze seven PCB analytes in each of the sampled LF. Representative sample for environmental exposures encountered during routine systems maintenance and checks in six (6) LFs.

In addition to the personal air samples collected at each sampled LF, field and media blanks were also analyzed. Media blanks are never exposed to the environment and are used to ensure

there is no contamination of media during the equipment/media manufacturing and handling processes. Field blanks are opened to the environment to assess any initial contamination that may have occurred prior to any tested air that would have flowed through the sample media. Media and field blanks are a standard quality assurance practice in environmental sampling studies.

## 4.2 PCB SWIPES

Swipe sampling was conducted to determine the presence/absence of PCBs. A total of twenty-two (22) swipes were collected in each of seven (7) LFs at locations historically known to contain PCBs (e.g., panels, transformers, & batteries). Surfaces of a ten centimeter by ten-centimeter (100 cm<sup>2</sup>) area were swiped horizontally and vertically within the same location, side to side, up and down. When possible for equipment being swiped, both a surface swipe and ground level or underside swipe was taken to determine the presence/absence of PCB.

**Table 1: Summary of Analytical Methods and Sample Quantity for each Potential Health Hazard**

Potential Health Hazard	Lab (Location)	Analytical Method	Matrix	No. of Samples (per LF)	No. of Samples (per base)
PCBs	Bureau Veritas North America	NIOSH 5503	Air	1	6
PCB Swipe Sampling	Summit (Cuyahoga Falls, OH)	EPA 8082A	Surface	22	154

## 5. RESULTS & DISCUSSION

This section summarizes the findings of all samples collected at Malmstrom AFB. Sample results were received from the laboratories and checked for quality assurance and control. Any results that came back above a standard were immediately communicated and released to AFGSC/A4B. All results for each sampled LF received from the laboratories are documented in the appendices of this report. Each LF's results can be found as its own appendix. Non-Detects (ND) mean the result was below the laboratory's limit of detection (LOD) for that specific method.

### 5.1 PCB SWIPE SAMPLING

Swipe sampling for PCBs were compared to the 40 CFR 761 standard of ten micrograms per one hundred square centimeters (10 µg/100 cm<sup>2</sup>). Thirty (30) swipes in six (6) LFs had detectable surface levels of PCBs. Three (3) LFs revealed in a total of seven (7) locations (LDB Panel and Electrical Surge Arrester), which exceeded limits mandated by 40 CFR 761. These results were expedited to AFGSC/A4B. A full list of all swipe locations at each sampled LF and associated results can be found in Appendix 1 - 12.

## 5.2 AIR SAMPLING

All PCB air sampling in the sampled LF were below laboratory limits of detection. No trace amounts of chemicals were found on any Malmstrom media and field blanks; therefore, these results are considered valid. A full list of results can be found in Appendix 1 - 12.

## 6. CONCLUSIONS

The results presented in this report are a part of a MAJCOM initiative at Malmstrom, Minot and F.E. Warren AFBs to determine the presence/absence of PCBs in LFs. If you have any questions, comments, or concerns, please contact SMSgt Taurie McCurdy, DSN at DSN 781-1597, [taurie.mccurdy@us.af.mil](mailto:taurie.mccurdy@us.af.mil) or me at DSN 781-5635, [raymond.mak@us.af.mil](mailto:raymond.mak@us.af.mil).

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**Appendix 1: LF Alpha (A-06) Results, Sampled on 17 September 2024**

**Table 1A: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (µg/100 cm<sup>2</sup>)</b>	<b>Standard (40 CFR Part 761) (µg/100 cm<sup>2</sup>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	Not Detected	<10
5. LDB Panel - Underside	Total PCBs	8.67	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	Not Detected	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	Not Detected	<10
8. Battery Charger - Surface	Total PCBs	Not Detected	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	Not Detected	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	2.14	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	2.40	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	2.26	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	1.54	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10



**Appendix 2: LF Bravo (B-07) Results, Sampled on 16 October 2024**

**Table 1B: Air Sampling Results – PCBs**

<b>Analyte</b>	<b>LF Result (mg/m<sup>3</sup>)</b>
Aroclor 1016	<0.0024
Aroclor 1221	<0.0024
Aroclor 1232	<0.0024
Aroclor 1242	<0.0024
Aroclor 1248	<0.0024
Aroclor 1254	<0.0024
Aroclor 1260	<0.0024

**Appendix 3: LF Delta (D-04) Results, Sampled on 21 August 2024**

**Table 1C: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (µg/100 cm<sup>2</sup>)</b>	<b>Standard (40 CFR Part 761) (µg/100 cm<sup>2</sup>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	Not Detected	<10
5. LDB Panel - Underside	Total PCBs	Not Detected	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	Not Detected	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	Not Detected	<10
8. Battery Charger - Surface	Total PCBs	Not Detected	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	Not Detected	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	Not Detected	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	Not Detected	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	Not Detected	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	Not Detected	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10

**Table 2C: Air Sampling Results – PCBs**

Analyte	LF Result (mg/m <sup>3</sup> )
Aroclor 1016	<0.0023
Aroclor 1221	<0.0023
Aroclor 1232	<0.0023
Aroclor 1242	<0.0023
Aroclor 1248	<0.0023
Aroclor 1254	<0.0023
Aroclor 1260	<0.0023

**Appendix 4: LF Echo (E-10) Results, Sampled on 20 September 2024**

**Table 1D: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (µg/100 cm<sup>2</sup>)</b>	<b>Standard (40 CFR Part 761) (µg/100 cm<sup>2</sup>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	Not Detected	<10
5. LDB Panel - Underside	Total PCBs	1.37	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	Not Detected	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	Not Detected	<10
8. Battery Charger - Surface	Total PCBs	1.04	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	Not Detected	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	Not Detected	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	1.91	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	Not Detected	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	Not Detected	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10

**Appendix 5: LF Foxtrot (F-08) Results, Sampled on 23 September 2024**

**Table 1E: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (µg/100 cm<sup>2</sup>)</b>	<b>Standard (40 CFR Part 761) (µg/100 cm<sup>2</sup>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	Not Detected	<10
5. LDB Panel - Underside	Total PCBs	1.47	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	Not Detected	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	Not Detected	<10
8. Battery Charger - Surface	Total PCBs	Not Detected	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	Not Detected	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	Not Detected	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	Not Detected	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	Not Detected	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	Not Detected	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10

**Appendix 6: LF Golf (G-02) Results, Sampled on 25 September 2024**

**Table 1F: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (<math>\mu\text{g}/100\text{ cm}^2</math>)</b>	<b>Standard (40 CFR Part 761) (<math>\mu\text{g}/100\text{ cm}^2</math>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	1.11	<10
5. LDB Panel - Underside	Total PCBs	79.5	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	Not Detected	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	Not Detected	<10
8. Battery Charger - Surface	Total PCBs	Not Detected	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	Not Detected	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	2.06	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	4.48	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	11.3	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	3.10	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10

**Appendix 7: LF Golf (G-07) Results, Sampled on 25 October 2024**

**Table 1G: Air Sampling Results – PCBs**

<b>Analyte</b>	<b>LF Result (mg/m<sup>3</sup>)</b>
Aroclor 1016	<0.0052
Aroclor 1221	<0.0052
Aroclor 1232	<0.0052
Aroclor 1242	<0.0052
Aroclor 1248	<0.0052
Aroclor 1254	<0.0052
Aroclor 1260	<0.0052

**Appendix 8: LF Hotel (H-08) Results, Sampled on 24 October 2024**

**Table 1H: Air Sampling Results – PCBs**

<b>Analyte</b>	<b>LF Result (mg/m<sup>3</sup>)</b>
Aroclor 1016	<0.0081
Aroclor 1221	<0.0081
Aroclor 1232	<0.0081
Aroclor 1242	<0.0081
Aroclor 1248	<0.0081
Aroclor 1254	<0.0081
Aroclor 1260	<0.0081



**Appendix 9: LF Lima (L-04) Results, Sampled on 20 September 2024**

**Table 11: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (µg/100 cm<sup>2</sup>)</b>	<b>Standard (40 CFR Part 761) (µg/100 cm<sup>2</sup>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	1.39	<10
5. LDB Panel - Underside	Total PCBs	3.35	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	1.13	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	1.07	<10
8. Battery Charger - Surface	Total PCBs	Not Detected	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	4.02	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	90.9	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	32.5	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	91.9	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	8.95	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10

**Appendix 10: LF Mike (M-04) Results, Sampled on 18 October 2024**

**Table 1J: Air Sampling Results – PCBs**

<b>Analyte</b>	<b>LF Result (mg/m<sup>3</sup>)</b>
Aroclor 1016	<0.0025
Aroclor 1221	<0.0025
Aroclor 1232	<0.0025
Aroclor 1242	<0.0025
Aroclor 1248	<0.0025
Aroclor 1254	<0.0025
Aroclor 1260	<0.0025

**Appendix 11: LF Mike (M-08) Results, Sampled on 24 September 2024**

**Table 1K: PCB Swipe Sampling**

<b>Location</b>	<b>Analyte</b>	<b>Result (µg/100 cm<sup>2</sup>)</b>	<b>Standard (40 CFR Part 761) (µg/100 cm<sup>2</sup>)</b>
1. PLPA Panel – Surface or Underside	Total PCBs	Not Detected	<10
2. Cable Air Dryer - Surface	Total PCBs	Not Detected	<10
3. Telephone Set Repeater - Surface	Total PCBs	Not Detected	<10
4. LDB Panel (Open)	Total PCBs	2.34	<10
5. LDB Panel - Underside	Total PCBs	387	<10
6. Receiver/Transmitter Alarm Set Drawer (475A1)	Total PCBs	Not Detected	<10
7. Battery Charger-Alarm Set Group - Surface	Total PCBs	Not Detected	<10
8. Battery Charger - Surface	Total PCBs	Not Detected	<10
9. Battery Charger Handles	Total PCBs	Not Detected	<10
10. LF Access System SDCA - Surface	Total PCBs	Not Detected	<10
11. LF Access System MDC - Surface	Total PCBs	Not Detected	<10
12. G & C Liquid Cooler (Chiller) - Surface	Total PCBs	Not Detected	<10
13. Control Monitor (403A6) - Surface	Total PCBs	Not Detected	<10
14. Power Supply (403A7) - Surface	Total PCBs	Not Detected	<10
15. Power Supply Group (406) (PSDU) - Surface	Total PCBs	Not Detected	<10
16. AC Power 400 CY Panel (406) - Surface	Total PCBs	Not Detected	<10
17. Power Supply A4 (406A4)	Total PCBs	Not Detected	<10
18. Electrical Surge Arrester – Left side Top Surface (484)	Total PCBs	6.54	<10
19. Electrical Surge Arrester – Left side Bottom Surface (484)	Total PCBs	2.59	<10
20. Electrical Surge Arrester – Right side Top Surface (483)	Total PCBs	15.8	<10
21. Electrical Surge Arrester – Left side Bottom Surface (483)	Total PCBs	1.94	<10
22. Launch Tube Heater Panel (LTH)-Inside Bottom Surface	Total PCBs	Not Detected	<10

**Appendix 12: LF November (N-09) Results, Sampled on 18 October 2024**

**Table 1L: Air Sampling Results – PCBs**

<b>Analyte</b>	<b>LF Result (mg/m<sup>3</sup>)</b>
Aroclor 1016	<0.0021
Aroclor 1221	<0.0021
Aroclor 1232	<0.0021
Aroclor 1242	<0.0021
Aroclor 1248	<0.0021
Aroclor 1254	<0.0021
Aroclor 1260	<0.0021