Lockheed Martin Corporation
6801 Rockledge Drive MP: CCT-246
Bethesda, MD 20817
Telephone (301) 548-2227

October 31, 2017

Mr. James R. Carroll
Program Administrator
Land Restoration Program
Land Management Administration
Maryland Department of the Environment
1800 Washington Boulevard, Suite 625
Baltimore, Maryland 21230

Subject: **Building C Air Sampling due to Recent Flooding**
Sampling and Analysis Summary
Middle River Complex, Middle River, Maryland

Dear Mr. Carroll:

Tetra Tech, Inc. (Tetra Tech) is submitting this letter to summarize the activities that were conducted in response to the flooding and subsequent uplifting and cracking of the floor in Building C basement. On Friday July 14, 2017 at approximately 5:00 p.m., Mr. Justin Tetlow (Middle River Aircraft Systems [MRAS]) contacted Mr. Tony Apanavage (Tetra Tech) by text message stating that with the volume of rain that fell in the Middle River, Maryland area earlier that afternoon, storm water had come up through the floor in Building C basement at column M9 and there was a strong chemical odor. Mr. Tetlow followed with sending a photograph of a vacant room located between columns M9/10 and K9/10 which showed that the floor was lifted up from the water pressure and significant cracking had occurred. Upon receiving these text messages, Mr. Apanavage responded immediately to conduct a site visit to inspect the area. Mr. Tetlow stated that EMCOR (the onsite maintenance contractor) was notified and aware of the site conditions but he was unsure if they had responded yet. See Figure 1 for location of the area.

<u>Initial Site Visit - Friday July 14, 2017</u>

Upon arrival to the site, standing water was observed throughout the northern portion of Building C basement up to 1 inch in depth in various areas. The concrete-walled room between columns M9/10 and K9/10 where the floor lifted up and cracked did not have any water present, however, the floor had significant damage and had been uplifted approximately 1 to 1.5 feet. The room has no windows, and one double door on the eastern side of the room provides access. The attached Photographic Log shows the site conditions including the cracked floor and standing water. No discoloration or sheen was observed on the standing water. During the site visit, a fairly strong odor was detected upon entering the room, however, the odor was not detected outside the room. The odor was chemical in nature, but could not be definitively identified. Present at the site during the visit were six people. One was an employee who works in the nearby printing shop (this area was also flooded with up to 1 inch of standing water), one EMCOR employee, and four people who were conducting general water cleanup activities. Mr. Apanavage reported back to the Lockheed Martin Corporation (Lockheed Martin) and Remedial Technical Operations (RTO) team and stated he would revisit the site on Monday July 17, 2017 to assess the site conditions.

Second Site Visit – Monday July 17, 2017

Upon arrival to the site on Monday July 17, 2017, most of the standing water had either been cleaned up, or had evaporated or seeped into the underlying soil, and only small areas of standing water remained. Mr. Tom Ambrose (EMCOR) and Mr. John Morgan (Lockheed Martin Properties, Inc. [LMCPI]) were also onsite assessing the site conditions. Mr. Ambrose opened up a freight elevator located at column M12 just south of the room between columns M9/10 and K9/10. A sump pump and pipes appeared to have discharged water into the bottom of the elevator shaft/pit. It also appeared that the storm drain under the room (between columns M9/10 and K9/10) may run under the area of the elevator shaft/pit. The distribution, orientation, and function of these subsurface utility features is not known at this time, but is under further investigation by EMCOR. In regards to the chemical odor, another EMCOR staff member stated that the odor was recognizable from his past experience at the site and believed it is a creosote-type smell that would have originated from the old wood block floor that was commonly used in the factory prior to the current concrete floor being installed.

Sample Collection

During a teleconference attended by representatives of Lockheed Martin, RTO and Tetra Tech on Monday July 17, 2017, all parties agreed to collect air samples from inside the room between columns M9/10 and K9/10 and outside the room in surrounding areas. Tetra Tech contacted

TestAmerica Laboratories, Inc. (TestAmerica) and received six Summa canisters the following day on Tuesday July 18, 2017. Mr. Apanavage conducted the air sampling activities between the hours of 9:25am and 5:30pm on July 18, 2017. The location of the vacant room with the cracked floor (sampling area) and six sampling locations are shown on Figure 1.

The following six samples were collected:

IA-BW-C-1	Located inside the room along the back wall (west side) at floor level
IA-CR-C-1	Located in the middle of the room at floor level right above one of the major cracks in the floor
IA-SL-C-1	Located inside the room immediately adjacent to the storm drain lid at floor level
IA-OD-C-1	Located immediately outside the door leading into the room elevated a few feet off the floor (door closed when sampling was initiated but the door was observed open at 5:00 p.m. toward end of sampling period)
IA-OS-C-1	Located outside about 30 feet north of the room elevated a few feet off the floor
IA-ON-C-1	Located outside the room about 30 feet south of the room elevated a few feet off the floor

The Summa canisters were placed on the floor and sampling was conducted between 9:25-9:30 a.m.; the door was closed to isolate the three samplers in the room during the sampling. Upon arrival back to the site at approximately 5:00 p.m., the door was found open. The duration of time during which the door was opened is unknown and is not able to be determined.

The Summa canisters were sent under proper chain-of-custody procedures on the evening of July 18, 2017 (same day as sampling) to TestAmerica for TO-15 laboratory analysis. The sample data were requested on an expedited 3-day turnaround time.

<u>Laboratory Analysis</u>

Table 1 presents a summary of the preliminary analytical data screened against Industrial Air Screening Levels from United States Environmental Protection Agency (USEPA) Regional Screening Levels for Chemical Contaminants at Superfund Sites (June 2017) and the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs). The data included in the table is preliminary and, at the time this report was prepared, was undergoing third party validation. There were no exceedances of the risk-based screening criteria for any chemical detected. Trichloroethene (TCE) or other chlorinated compounds such as tetrachloroethene, *cis*- or *trans*-1,2-dichloroethenes, or vinyl chloride were not detected in any of the six samples.

Historically, wood-block shop flooring has been treated with creosote or coal tar products. Based upon the observed creosote-type odor, naphthalene was expected to be present; however, naphthalene was detected in only two samples (IA-BW-C-1 and IA-SL-C-1) at low concentrations (2.7 micrograms per meters cubed ($\mu g/m^3$) and 2.4 $\mu g/m^3$, respectively).

Benzene, toluene, xylenes, and ethylbenzene (BTEX) compounds and trimethylbenzene compounds are often associated with oil, creosote, and coal tar. Oil could have also been used to preserve the wood-block flooring at the site, and all BTEX components were detected during sampling. Total xylenes were detected in all six samples at concentrations ranging from 15*J* $\mu g/m^3$ to 32 $\mu g/m^3$, and toluene was detected in five of six samples at concentrations ranging from 9.9 $\mu g/m^3$ to 17 $\mu g/m^3$. Ethylbenzene was also detected in all six samples at a maximum concentration of 6.5 $\mu g/m^3$. Similarly, 1,2,4-trimethylbenzene was detected in five samples and 1,3,5-trimethylbenene was detected in three samples. Other compounds possibly present in coal tar such as polycyclic aromatic hydrocarbons were not included in the analytical list used for indoor air monitoring at the facility.

This document is being submitted for information only. Please let me know if you have any questions. My office phone is (301) 548-2227.

Sincerely,

Lynnette Drake
Remediation Project Lead, Environmental Remediation

Enclosures: Figure 1, Table 1, and Photographic Log

cc: (via email without enclosure)
Gary Schold, MDE
Mark Mank, MDE
Tom Blackman, Lockheed Martin
Christine Kline, Lockheed Martin
Norman Varney, Lockheed Martin
Michael Martin, Tetra Tech
Cannon Silver, CDM Smith

cc: (via mail with CD enclosure)
Jann Richardson, Lockheed Martin

cc: (via RMFT)
Justin Tetlow, MRAS
Scott Heinlein, LMCPI

cc: (via mail with enclosure)
Tom Green, LMCPI
Mike Musheno, LMCPI
Terry Miller, Lockheed Martin MST
Christopher Keller, Lockheed Martin

FIGURES

TABLES

Table 1
Analytical Summary
Building C Basement Flooding Air Sampling
Middle River Complex
Middle River, Maryland

SAMPLE_ID	Industrial Air Screening Level	OSHA PEL	IA-BW-C-1	IA-CR-C-1	IA-OD-C-1	IA-ON-C-1	IA-OS-C-1	IA-SL-C-1
LAB ID			140-8740-1	140-8740-2	140-8740-4	140-8740-6	140-8740-5	140-8740-3
SAMPLE DATE	(µg/m^3)	(µg/m^3)	07/18/2017	07/18/2017	07/18/2017	07/18/2017	07/18/2017	07/18/2017
OV-M3 (µG/M^3)								
1,1,1-TRICHLOROETHANE	22,000	1,900,000	0.33 U	1.5 U	0.33 U	0.33 U	0.33 U	0.41 U
1,1,2-TRICHLOROETHANE	0.88	45,000	0.57 U	2.6 U	0.57 U	0.57 U	0.57 U	0.72 U
1,1-DICHLOROETHANE	77	400,000	0.2 U	0.92 U	0.2 U	0.2 U	0.2 U	0.25 U
1,1-DICHLOROETHENE	880	--	0.28 U	1.3 U	0.28 U	0.28 U	0.28 U	0.35 U
1,2,3-TRIMETHYLBENZENE	260	123,000[N]	1.3 J	3.8 U	0.84 U	0.84 U	1.1 J	1 U
1,2,4-TRICHLOROBENZENE	8.8	40,000[N]	1.4 U	6.6 U	1.4 U	1.4 U	1.4 U	1.8 U
1,2,4-TRIMETHYLBENZENE	260	123,000[N]	2.5	2.8 U	1.6 J	2.1	2.9	2.1 J
1,2-DICHLOROETHANE	4.7	400,000	0.38 U	1.7 U	0.38 U	0.38 U	0.38 U	0.48 U
1,3,5-TRIMETHYLBENZENE	260	123,000	0.98 J	2.9 U	0.64 U	0.62 J	0.92 J	0.8 U
BENZENE	16	319	0.46 J	1.7 U	0.37 U	0.37 J	0.37 U	0.46 U
CARBON TETRACHLORIDE	20	62,900	1.5 J	2.1 U	0.54 J	0.58 J	0.48 J	1.6 J
CHLORODIFLUOROMETHANE	220,000	3,590,000[A]	24	30	23	30	19	30
CHLOROFORM	5.3	240,000	0.43 J B	1.7 U	0.37 U	0.37 U	0.37 U	0.5 J B
CIS-1,2-DICHLOROETHENE	--	790,000	0.48 U	2.2 U	0.48 U	0.48 U	0.48 U	0.59 U
DICHLORODIFLUOROMETHANE	440	4,950,000	2.7	3 U	2.7	3	2.5	2.7
ETHYLBENZENE	49	435,000	6.5	2.9 J	4.8	4.8	4.7	5
METHYL TERT-BUTYL ETHER	470	180,000[A]	1.2 U	5.6 U	1.2 U	1.2 U	1.2 U	1.5 U
METHYLENE CHLORIDE	2600	87,000	8.1	20	7.3	8.7	6.6	11
NAPHTHALENE	3.6	50,000	2.7	4.8 U	1 U	1 U	1 U	2.4
TETRACHLOROETHENE	180	678,000	0.54 U	2.5 U	0.54 U	0.54 U	0.54 U	0.68 U
TOLUENE	22,000	754,000	10	10 U	12	17	12	9.9
TOTAL XYLENES	440	435,000	32	15 J	23	24	25	26
TRANS-1,2-DICHLOROETHENE	--	790,000	0.4 U	1.8 U	0.4 U	0.4 U	0.4 U	0.5 U
TRICHLOROETHENE	8.8	537,000	0.38 U	1.7 U	0.38 U	0.38 U	0.38 U	0.47 U
VINYL CHLORIDE	28	21,560	0.37 U	1.7 U	0.37 U	0.37 U	0.37 U	0.46 U

-- = not available

J = estimated value

JB = estimated value and detected in associated method blank

U = not detected

Industrial Air Screening Levels from USEPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, June 2017

ca =carcinogenic screening values based on 1×10^{-5} carcinogenic risk

nc = noncarcinogenic screening values based on noncarcinogenic hazard quotient = 1

OSHA PEL = Occupational Safety and Health Administration Pemissible Exposure Limit

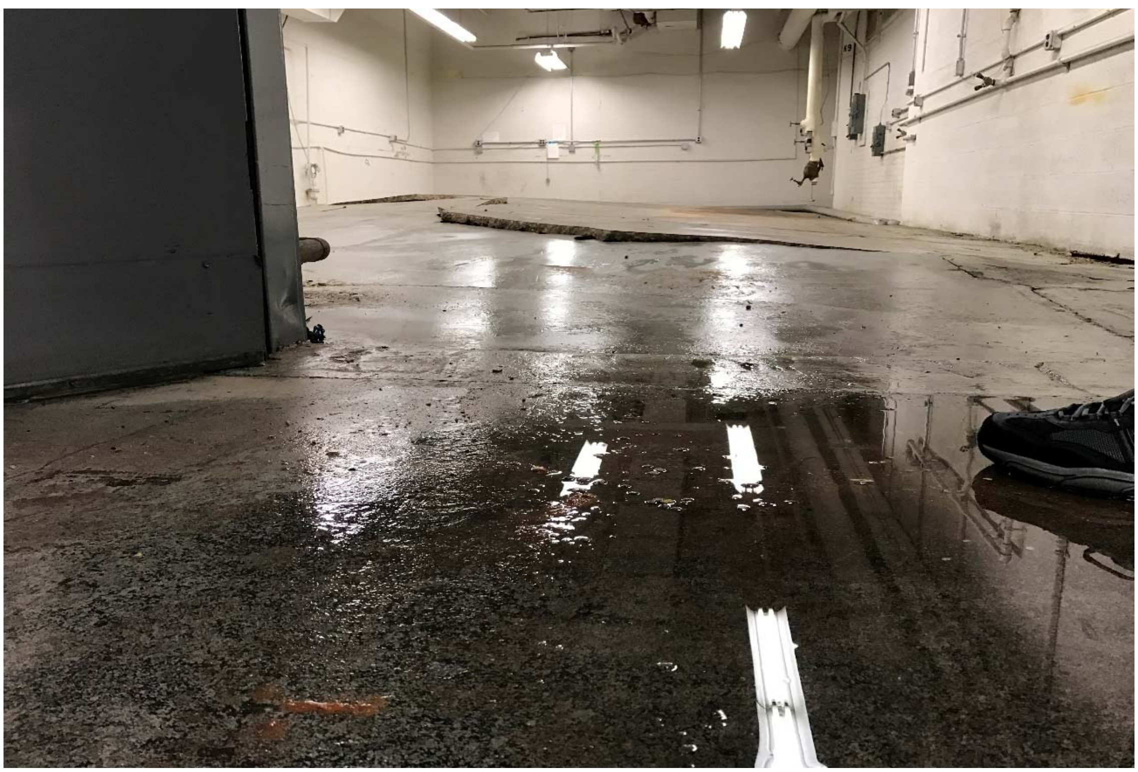
USEPA = United States Environmental Protection Agency

A = American Council of Governmental Industrial Hygenists Theshold Limit Value

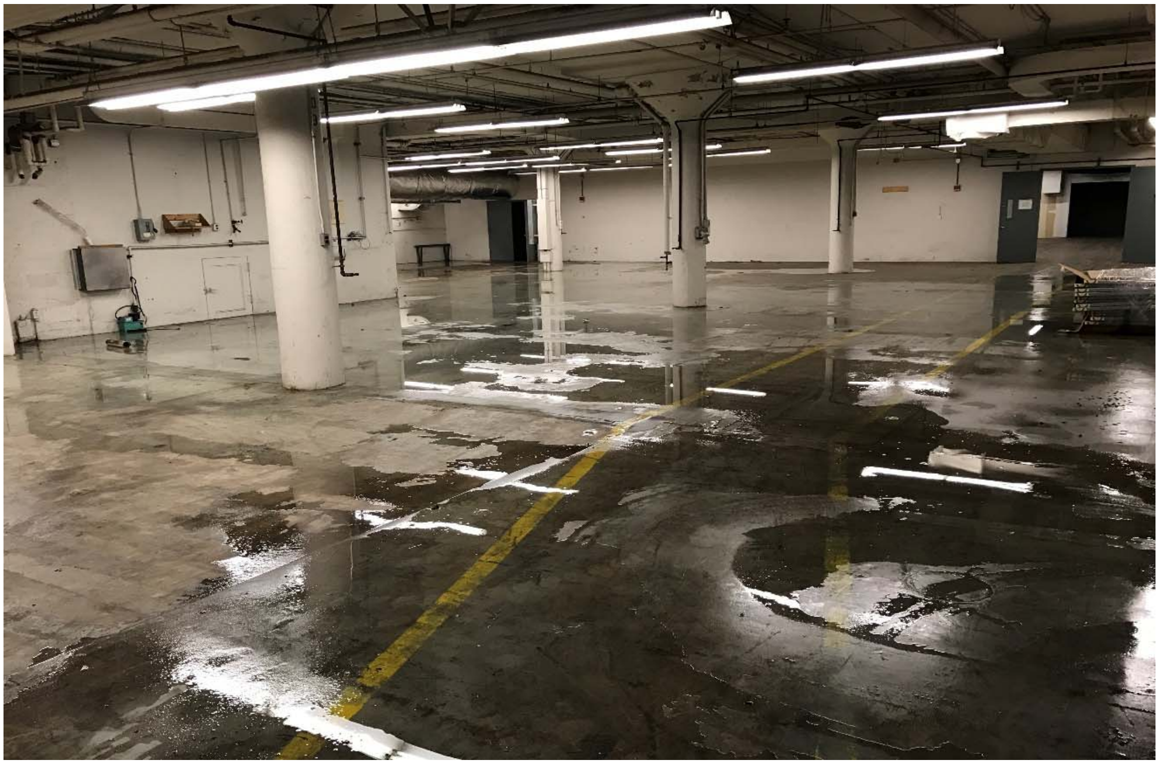
N = National Institute for Occupational Safety and Health Recommended Exposure Limit

PHOTOGRAPHIC LOG

Vacant room between columns M9/10 and K9/10 showing cracked floor



Ground level view of vacant room showing uplift of floor



Flooding in northern portion of Building C basement

Flooding down hallway in northern portion of Building C basement

Flooding in northern portion of Building C basement