

PHASE I REMEDIAL INVESTIGATION REPORT

LOCKHEED MARTIN TACTICAL DEFENSE SYSTEMS DIVISION (Former Unisys Corp. Site)

Great Neck, New York
NYSDEC Site No.130045

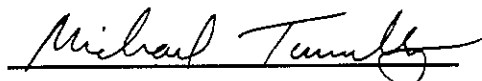
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New York State
Department of Environmental Conservation

On behalf of:
Lockheed Martin Tactical Defense Systems Division of
Lockheed Martin Tactical Systems, Inc.

DECEMBER 1996

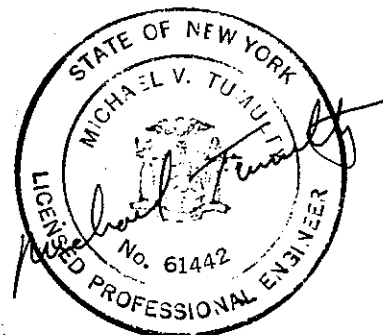
*Certified that the activities described herein have been performed in
accordance with the approved RI/FS Work Plan:*

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6.0 SURFACE-WATER AND SEDIMENT INVESTIGATION (DRAINAGE BASINS)

As part of the RI, surface-water and sediment samples were collected from the three on-site drainage basins to determine if they have been impacted by site activities. The basins receive surface-water runoff from the entire site through a network of on-site storm and roof drains. They are located in the southwestern corner of the site and are shown, along with the sampling locations, on Figure 6-1. The drainage basin samples were collected in accordance with the procedures outlined in the RI/FS Work Plan and all of the sampling locations were surveyed for relative locations by a licensed surveyor.

6.1 Analytical Results

The surface-water and sediment samples were analyzed for VOCs, semi-VOCs, pesticides, PCBs and inorganics. Analytical summaries are presented on Tables 6-1 and 6-2. Validated analytical data including a full list of analytes and detection limits are included in Appendix H.

As shown on Table 6-1, the only organic parameter detected in the water samples was 1,2-DCE which is an estimated value since the compound was detected below the practical quantification limit (PQL). This compound was detected in the samples from the center and west basins at 1 and 2 ug/L, respectively. VOCs, including PCE, TCE, and 1,2-DCE, were detected in the sediment samples from all three basins. The concentrations were relatively low, ranging from 0.001 to 0.016 mg/Kg with most of the detections occurring in samples from the center basin. Semi-VOCs were also detected in sediment samples from all three basins. The detections were evenly distributed between the three basins with concentrations ranging between 0.01 and 60 mg/Kg, the highest of which were detected in samples from the center basin. Many of the reported VOC and semi-VOC concentrations were estimated values because they were either detected below the PQL or other data criteria issues were identified during data validation.

Pesticides and PCBs were also detected in sediment samples from all three basins at relatively low concentrations and, again, most of the reported values were estimates. The highest concentrations detected were 1.4 mg/Kg of the pesticide 4,4-DDD in WB-1 and 4.3 mg/Kg of Aroclor-1254 (PCBs) in CB-3. As with the semi-VOCs, pesticide and PCB detections were relatively evenly distributed between the three basins.

The inorganic results are presented on Table 6-2 and as shown, all of the analyzed parameters were detected in the sediment samples with the exception of beryllium. Many of the detected concentrations were elevated in comparison to some or all of the soil samples collected

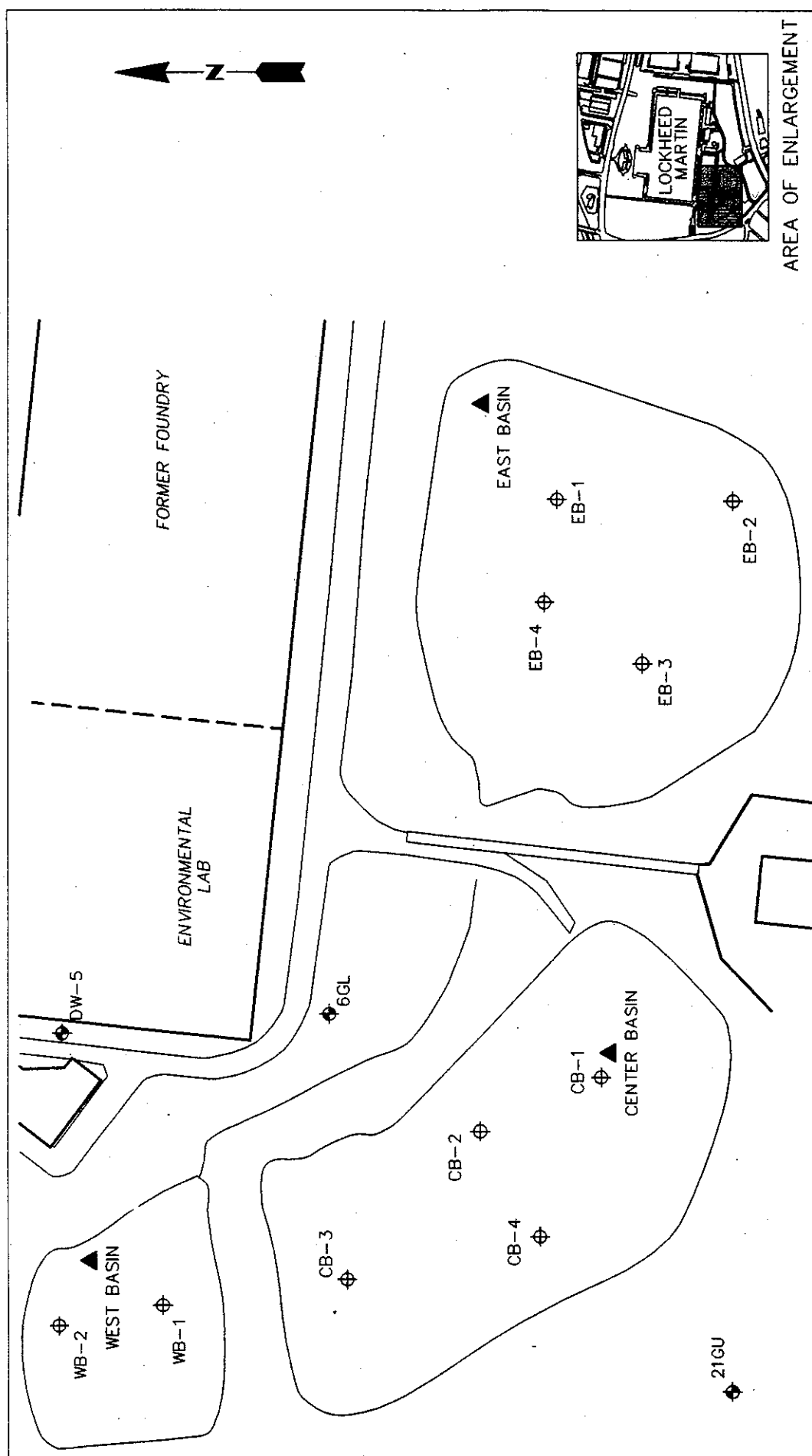
from the former dry wells as part of the RI and the basin samples collected in 1988 (see Section 2.4.5). While the distribution of elevated concentrations within the basins themselves varied, the distribution between the three basins was fairly even. Fewer inorganic compounds were detected in the water samples and the detected concentrations were several orders of magnitude lower than those detected in the sediment samples. In addition, the compounds detected tended to be present in samples from all three basins at similar concentrations, again indicating an even distribution. The exceptions to this pattern were aluminum and barium which were not detected in all three surface-water samples.

6.2 Summary of Results

The results of the drainage basin sampling showed the presence of low levels of VOCs, semi-VOCs, pesticides and PCBs in the sediment samples. In contrast, the only organic parameter detected in the surface-water samples was 1,2-DCE, at a maximum concentration of 2 ug/L. Many of the inorganic parameters analyzed were detected in both the sediment and surface-water samples with the concentrations and number of detections being greatest in the sediment samples, as expected. Another noticeable pattern is the fairly even distribution of detections and concentrations between the three basins, which is not surprising considering that they are interconnected and receive runoff from the same sources.

These results are not inconsistent with the nature and purpose of the drainage basins which is to collect storm-water runoff from surrounding parking lots, walkways, rooftops and unpaved areas and allow it to drain to the underlying sediments. Many of the compounds detected in the drainage basin samples are leached from the surrounding pervious and impervious surfaces or transported on sediments and deposited in the basins. As runoff collects in the basins, sediments picked up enroute settle to the bottom and become part of a natural filter which removes impurities from the water as it drains through the bottom of the basin. Over time, these impurities concentrate in the bottom sediments as is evident by the results presented above. Studies of drainage basins on Long Island show that the compounds detected in these samples are not uncommon (KU, 1986).

As a result, while the drainage basins appear to have been impacted by site activities, the impact is consistent with the nature and purpose of the basins and does not appear to be a contributing factor to the on-site groundwater problem.



LOCKHEED MARTIN GREAT NECK, NEW YORK FACILITY

AREA OF ENLARGEMENT

LEGEND

- ⊕ SEDIMENT SAMPLE LOCATION
- ▲ CENTER BASIN
- ⊕ WATER SAMPLE LOCATION
- ⊕ GROUND-WATER MONITOR WELL

SURFACE-WATER AND SEDIMENT SAMPLING LOCATIONS (DRAINAGE BASINS)		PREPARED BY:	
DATE	REVISED		
		LEGGETTE, BRASHEARS & GRAHAM, INC.	
		Professional Ground-Water and Environmental Services	
		72 Danbury Road	
		Wilton, CT 06897	
		(203) 762-1207	
		DATE:	2/27/95
		FIGURE:	6-1

FORMER FOUNDRY

ENVIRONMENTAL LAB

DW-5

6GL

21GU

EAST BASIN

WB-2

WB-1

CB-3

CB-2

CB-4

CB-1

CENTER BASIN

EB-4

EB-3

EB-2

EB-1

0 100

SCALE IN FEET

TABLE 6-1
(continued)

LOCKHEED MARTIN
GREAT NECK, NEW YORK

Surface-Water and Sediment Quality Summary (Drainage Basins) -
Volatiles, Semi-Volatiles, Pesticides/PCB's

(Detected compounds only - See Appendix I for full analyte list and detection limits)

Compound	SEDIMENT SAMPLES										WATER SAMPLES		
	EB-1	EB-2	EB-3	EB-4	CB-1	CB-2	CB-3	CB-4	WB-1	WB-2	Center Basin	West Basin	East Basin
Volatiles	Milligrams per kilogram										Micrograms per liter		
Chrysene	3.8	9.0	1.1	0.08 J	8.1 J	2.6 J	31	1.8	13	6.2	ND	ND	ND
bis(2-Ethylhexyl) phthalate	2.0 JB	3.9	ND	ND	ND	ND	ND	ND	7.3 B	4.9	ND	ND	ND
Benzo(b)fluoranthene	5.2	0.76 J	2.0 J	0.074 J	7.8 J	2.4 J	23	1.1 J	14	5.1	ND	ND	ND
Benzo(k)fluoranthene	4.3	1.1 J	ND	0.054 J	5.7 J	2.5 J	33	1.2 J	8.2	16	ND	ND	ND
Benzo(a)pyrene	3.8	8.1	0.89 J	0.047 J	5.5 J	2.0 J	28	1.1 J	10	5.5	ND	ND	ND
Indeno(1,2,3-cd)pyrene	1.8 J	3.0 J	0.32 J	0.028 J	3.1 J	1.1 J	16 J	ND	3.5 J	ND	ND	ND	ND
Dibenzo(a,h)anthracene	0.36 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.32 J	ND	0.16 J	ND	1.2 J	0.51 J	ND	ND	ND	1.1 J	ND	ND	ND
Pesticides/PCB's													
4,4-DDE	0.026 J	0.067 J	ND	0.00032 J	0.08 J	0.37 J	0.12 J	0.011 J	0.22 J	0.15 J	ND	ND	ND
4,4-DDD	0.068 J	0.14 J	0.019 J	ND	0.32 J	0.22	0.92 J	0.078	1.4	0.91	ND	ND	ND
4,4'-DDT	0.016 J	0.034	0.006 J	ND	0.044 J	0.014 J	0.047 J	0.0093 J	0.058 J	0.035 J	ND	ND	ND
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
gamma-Chlordane	0.011 J	0.023 J	0.0016 J	ND	0.035 J	0.013 J	0.055 J	0.004 J	0.046 J	0.037 J	ND	ND	ND
Aroclor - 1242	0.12 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1248	ND	0.89	0.073	ND	1.4	0.29 J	2.4 J	ND	ND	1.4	ND	ND	ND
Aroclor - 1254	0.33	0.94	0.087	ND	1.5	0.53	4.3	0.19	1.7 J	1.3	ND	ND	ND
Aroclor - 1260	ND	ND	ND	ND	ND	0.25 J	ND	0.1 J	ND	ND	ND	ND	ND

ND Not detected.

J Value is estimated - Compound either detected below practical quantitation limit or other limitations were identified during data validation.

B Compound detected in either field blank, trip blank, and/or laboratory blank.

table1.95/UNISYS

TABLE 6-1
LOCKHEED MARTIN
GREAT NECK, NEW YORK

Surface-Water and Sediment Quality Summary (Drainage Basins) -
Volatiles, Semi-Volatiles, Pesticides/PCB's

(Detected compounds only - See Appendix I for full analyte list and detection limits)

Compound	SEDIMENT SAMPLES										WATER SAMPLES		
	EB-1	EB-2	EB-3	EB-4	CB-1	CB-2	CB-3	CB-4	WB-1	WB-2	Center Basin	West Basin	East Basin
Volatiles	Milligrams per kilogram										Micrograms per liter		
Carbon Disulfide	ND	0.002 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	0.003 J	ND	ND	ND	ND	1 J	2 J	ND
Trichloroethene	ND	ND	ND	ND	ND	0.005 J	0.002 J	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	0.003 J	0.004 J	0.003 J	0.016	0.010 J	0.004 J	0.008 J	0.004 J	ND	ND	ND
Toluene	ND	0.004 J	0.002 J	ND	ND	0.003 J	0.002 J	ND	ND	0.001 J	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	0.001 J	ND	ND	ND	ND	ND	ND	ND	ND
Semi-Volatiles													
1,2-Dichlorobenzene	0.16 J	ND	ND	ND	ND	ND	4.2 J	ND	ND	ND	ND	ND	ND
Naphthalene	0.15 J	0.47 J	0.032 J	ND	ND	ND	1.4 J	ND	0.43 J	0.17 J	ND	ND	ND
2-Methylnaphthalene	0.11 J	0.26 J	0.039 J	ND	ND	ND	ND	ND	ND	0.15 J	ND	ND	ND
Acenaphthylene	0.25 J	0.48 J	0.16 J	ND	ND	0.14 J	ND	0.10 J	0.28 J	0.37 J	ND	ND	ND
Acenaphthene	0.31 J	0.57 J	0.024 J	ND	0.76 J	0.21 J	4.9 J	0.071 J	1.6 J	0.60 J	ND	ND	ND
Dibenzofuran	0.15 J	0.32 J	0.022 J	ND	ND	ND	2.1 J	ND	0.73 J	0.29 J	ND	ND	ND
Fluorene	0.44 J	0.84 J	0.028 J	ND	0.81 J	0.22 J	4.6 J	ND	1.6 J	0.73 J	ND	ND	ND
Phenanthrene	3.2	6.3	0.62	0.048 J	9.7 J	2.8 J	38	1.5 J	12	4.7	ND	ND	ND
Anthracene	0.75 J	1.7 J	0.13 J	0.01 J	1.5 J	0.57 J	9.3 J	0.26 J	3.4 J	1.3 J	ND	ND	ND
Carbazole	0.54 J	1.4 J	0.12 J	ND	2.8 J	0.70 J	7.8 J	0.18 J	3.0 J	1.1 J	ND	ND	ND
Di-n-butylphthalate	ND	ND	ND	1.2 B	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	6.4	18	1.0	0.13 J	16	5.0	60	4.1	26	12	ND	ND	ND
Pyrene	4.7 J	12	1.9 J	0.13 J	11 J	3.6 J	48 J	3.3 J	22	7.3 B	ND	ND	ND
Benzo(a)anthracene	3.2	ND	0.46	0.049 J	5.4 J	1.7 J	31	ND	11	ND	ND	ND	ND

TABLE 6-2
LOCKHEED MARTIN
GREAT NECK, NEW YORK

Surface-Water and Sediment Quality Summary (Drainage Basins) - Inorganics

(See Appendix I for detection limits)

Compound	SEDIMENT SAMPLES						
	EB-1	EB-2	EB-3	EB-4	CB-1	CB-2	CB-3
	Milligrams per kilogram						
Aluminum	5,470	13,300	8,270	4,030	18,500	5,140	7,570
Antimony	ND	ND	5.5 J	ND	ND	ND	ND
Arsenic	5	21.3	4.2	0.72	18.6	2.7	4.8
Barium	43.1 J	108 J	53.6 J	35.7 J	118 J	35.1 J	52.1 J
Beryllium	ND	ND	ND	ND	ND	ND	ND
Cadmium	2.9	13.1	1.1	ND	12.7	1.7	2
Calcium	2,700	4,890	1,180	677	7,230	1,690	2,230
Chromium	50.5 J	153 J	42.5 J	14.1 J	171 J	60 J	106 J
Cobalt	6.9	15.3	8.3	5.7	13.4	4.8	5.3
Copper	717	2,700	265	33.7	2,860	793	1,600
Iron	10,700	23,900	15,300	9,210	25,900	8,330	12,300
Lead	433	1,650	84.2	12.8	1,470	489	667
Magnesium	2,470	4,610	2,440	1,690	6,510	1,630	2,500
Manganese	64.7	116	160	78.8	163	61.5	78.4
Mercury	0.38 J	3.1 J	0.23 J	ND	2.3 J	1.4 J	1.4 J
Nickel	48.7	119	31.1	13.6	90.6	30.1	38.8
Potassium	737	1,000	479	1,350	1,040	330	579
Selenium	0.69 J	6 J	ND	ND	3.1 J	0.86 J	0.58 J
Silver	245 J	626 J	26.8 J	2.4 J	402 J	207 J	248 J
Sodium	123	345	107	65.1	1,440	106	129
Thallium	0.32	ND	ND	ND	ND	ND	ND
Vanadium	110	256	44.9	18.1	190	54.7	74.3
Zinc	467 J	1,770 J	312 J	39.6 J	1,730 J	343 J	539 J
Cyanide	ND	ND	ND	ND	29.2	ND	20.6