

3.0 FIRST CAMP CLAIBORNE DEMOLITION OPERATION

The second sample collection at Camp Claiborne took place on 27 June 1995. The purpose of the activity was to collect samples from the first large scale disposal activity since work had begun on the site. All previous detonations had been the disposal of items found by blowing them in place.

Based on the net explosive weight (NEW) of the items to be destroyed and the initiator charge, calculations using approximate relations from Volume 1 resulted in collection pans placed at 25 and 50 meters from the detonation pit in each of the four cardinal compass directions in order to catch fallout samples from the detonation. Figure 2.1 depicts the location of the collection pans and the locations of the other samples taken. No downwind collection pans were used because there was no discernible wind or wind direction at the time the sample collection pans were set out. Subsequent viewing of the video showed a westerly wind of < 1 meter/sec.

The preparations by UXB for the detonations consisted of digging two trenches, running roughly east-west, with a backhoe. The trenches were 24" wide and 6 feet long. The northern most trench was approximately 30-36 inches deep and the southern one was 12 inches deep. The 20mm projectiles were placed in the trench on a bed of explosives in a single layer and covered with another layer of explosives. The larger items were placed in the trench with a layer of explosives on top. The trenches were backfilled with builders sand, which was mounded to a height of 3-5 feet above the natural level of the surrounding earth (Figure 3.1).

The detonation left a large crater approximately 20 feet in diameter and six feet deep, with a lip of ejecta 1-2 feet high surrounding it. All of the pans had some material to be sampled, ranging from completely filled to a fine dusting. Figure 3.2 - 3.5 depict the collection pans and the fallout in each. Figures 3.2a and 3.2b show the collection pans at 25m and 50m to the north of the crater. Figures 3.3a and 3.3b are the collection pans to the south of the crater. Figures 3.4a and 3.4b are the collection pans to the east of the crater and Figures 3.5a and 3.5b are the collection pans to the west of the crater.

The crater left from the first detonation is shown in Figures 3.6 and 3.7. Figure 3.6 is looking across the crater to the south and Figure 3.7 is looking across the crater to the east. Samples were taken from the bottom of the crater and from the ejecta as shown in Figure 2.1.

No groundwater samples were collected because there was no standing water at the site.

Figures 3.8 through 3.17 show the explosion sequence out to 13 seconds. Figure 3.8 shows a flame front at detonation shooting out toward the east from the shallow

trench which also had the least overburden of sand (Figure 3.1). This flame front is still visible 0.07 seconds later (Figure 3.9), but has disappeared by 0.1 second after the first frame (Figure 3.10).

Tables 3.1, 3.2 and 3.3 summarize the results of laboratory analyses of the post detonation samples. Appendix E contains the original laboratory reports on the assays. RDX showed up in several samples and is most likely from the 3.5 inch rocket which contains Composition B.



**Figure 3.1. Sand Mounded Over Two Trenches
Containing UXO and Initiator Charges. View Looking N-E.**



Figure 3.2(a). Fallout Collection Pan at 25 Meters Due North of Ground Zero



Figure 3.2(b). Fallout Collection Pan at 50 Meters Due North of Ground Zero



Figure 3.3(a). Fallout Collection Pan at 25 Meters Due South of Ground Zero



Figure 3.3(b). Fallout Collection Pan at 50 Meters Due South of Ground Zero



Figure 3.4(a). Fallout Collection Pan at 25 Meters Due East of Ground Zero



Figure 3.4(b). Fallout Collection Pan at 50 Meters Due East of Ground Zero



Figure 3.5(a). Fallout Collection Pan at 25 Meters Due West of Ground Zero



Figure 3.5(b). Fallout Collection Pan at 50 Meters Due West of Ground Zero



Figure 3.6. Crater Looking Generally South



Figure 3.7. Carter Looking East



Figure 3.8 Detonation at $<.02$ Seconds From Initiation Showing Flame Front Spreading on the Ground to the East From the Shallow Pit (Red)



**Figure 3.9 Detonation at $.07$ Seconds From Initiation.
Flame Front Still Apparent Near Right Hand Side of Base (Red)**



Figure 3.10 Detonation at 0.1 Seconds from Initiation



Figure 3.11 Detonation at 0.3 Seconds From Initiation



Figure 3.12 Detonation of 0.67 Seconds From Initiation



Figure 3.13 Detonation at 1.6 Seconds After Initiation



Figure 3.14 Detonation at 3.0 Seconds After Initiation



Figure 3.15 Detonation at 6.2 Seconds After Initiation



Figure 3.16 Detonation at 7.2 Seconds After Initiation



Figure 3.17 Detonation at 13 Seconds After Initiation

TABLE 3.1 POST DETONATION SEMIVOLATILE CONCENTRATIONS FOR CAMP CLAIBORNE

| Compounds (1) | 1630 | 1633 | 1640 | 1643 | 1647 | 1650 | 1655 | 1658 | 1712 | 1715 | 1717 | 1706 | 1708 | 1317 | Trip Blank |
|-----------------------------|---------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|------------|
| | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/L | µg/L | µg/kg | µg/L |
| Bis(2-chloroethyl)ether | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 1,3-Dichlorobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 1,2-Dichlorobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 1,4-Dichlorobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Bis(2-chloroisopropyl)ether | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| N-Nitrosodi-n-propylamine | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Hexachloroethane | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Nitrobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Isophorone | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Bis(2-chloroethoxy)methane | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 1,2,4-Trichlorobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Naphthalene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Hexachlorobutadiene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-Chloronaphthalene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Dimethyl phthalate | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,6-Dinitrotoluene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Acenaphthylene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,4-Dinitrotoluene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Diethyl phthalate | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Benzidine | <660 | <660 | <660 | <660 | <660 | <660 | <660 | <660 | <660 | <660 | <660 | <66 | <33 | <660 | <134 |
| 4-Bromophenyl phenyl ether | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| N-nitrosodimethylamine | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Hexachlorocyclopentadiene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 4-Chlorophenyl phenylether | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Fluorene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Azobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Hexachlorobenzene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Phenanthrene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Anthracene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Dibutyl phthalate | <330(2) | <330(2) | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Fluoranthene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Pyrene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Butylbenzyl phthalate | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 3,3'-Dichlorobenzidine | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |

(1) < N means N is method detection limit and concentration is <N.

(2) Presence indicated, but less than detection limit.

(3) Tentatively identified and quantitatively estimated.

TABLE 3.1 POST DETONATION SEMIVOLATILE CONCENTRATIONS FOR CAMP CLAIBORNE
(Continued)

| Compounds (1) | 1630 | 1633 | 1640 | 1643 | 1647 | 1650 | 1655 | 1658 | 1712 | 1715 | 1717 | 1706 | 1708 | 1317 | Trip Blank |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|--------|-------|------------|
| | µg/kg | µg/L | µg/L | µg/kg | µg/L |
| Benzo(a)anthracene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <17(2) | <330 | <67 |
| Chrysene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Bis(2-ethylhexyl)phthalate | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Di-n-octyl phthalate | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Benzo(b)fluoranthene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Benzo(k)fluoranthene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Benzo(a)pyrene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Indeno(1,2,3-cd)pyrene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Dibenzo(a,h)anthracene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Benzo(g,h,i)perylene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| N-Nitrosodiphenylamine | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Phenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-Chlorophenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-Nitrophenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,4-Dimethylphenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,4-Dichlorophenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 4-Chloro-3-Methylphenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,4,6-Trichlorophenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,4-Dinitrophenol | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <165 | <84 | <1650 | <335 |
| 4-Nitrophenol | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <165 | <84 | <1650 | <335 |
| 2-Methyl-4,6-Dinitrophenol | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <165 | <84 | <1650 | <335 |
| Pentachlorophenol | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <1650 | <165 | <84 | <1650 | <335 |
| 1-Methylnaphthalene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Acetophenone | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| Diphenylamine | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-Aminonaphthalene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 1-Nitropyrene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,5-Diphenyloxazole | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-Nitronaphthalene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-Methylnaphthalene | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2-&/or 3-Methylphenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 4-Methylphenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |
| 2,4,5-Trichlorophenol | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <330 | <33 | <17 | <330 | <67 |

(1) < N means N is method detection limit and concentration is <N.
(2) Presence indicated, but less than detection limit.
(3) Tentatively identified and quantitatively estimated.

TABLE 3.2 POST DETONATION NITROAROMATICS AND NITRAMINES FOR CAMP CLAIBORNE

| Compound | 1630 | 1633 | 1640 | 1643 | 1647 | 1650 | 1655 | 1658 | 1712 | 1715 | 1717 | 1706 | 1708 | 1317 | Trip Blank |
|-----------|-------|-------|---------------|----------------|----------------|-------|-------|----------------|-------|-------|-------|-----------------|--------|-------|------------|
| | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/kg | µg/L | µg/L | µg/kg | µg/L |
| HMX | <23.7 | <23.7 | <24.9 | <26.1 | <23.7 | <26.1 | <26.1 | <26.1 | <24.9 | <26.1 | <26.1 | <0.058 | <0.050 | <27.5 | — |
| RDX | <36.9 | <36.9 | 102(1) | 56.0(2) | 59.7(3) | <40.6 | <40.6 | 88.5(4) | <38.7 | <40.6 | <40.6 | 0.247(5) | <0.077 | <42.7 | — |
| 1,3,5 TNB | <41.6 | <41.6 | <43.6 | <45.8 | <41.6 | <45.8 | <45.8 | <45.8 | <43.6 | <45.8 | <45.8 | <0.102 | <0.087 | <48.2 | — |
| 1,3 DNB | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| NB | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2,4,6 TNT | <27.4 | <27.4 | <28.7 | <30.1 | <27.4 | <30.1 | <30.1 | <30.1 | <28.7 | <30.1 | <30.1 | <0.067 | <0.057 | <31.7 | — |
| 2 AM DNT | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2,4 DNT | <101 | <101 | <106 | <111 | <101 | <111 | <111 | <111 | <106 | <111 | <111 | <0.247 | <0.211 | <117 | — |
| 2,6 DNT | <73.9 | <73.9 | <77.4 | <81.3 | <73.9 | <81.3 | <81.3 | <81.3 | <77.4 | <81.3 | <81.3 | <0.161 | <0.154 | <85.6 | — |

Key: HMX - Hexahydro-1,3,5-Trinitro-1,3,5-Triazine
RDX - Octahydro-1,3,5,7-Tetranitro-1,3,5,7-Tetrazacine
NB - Nitrobenzene
DNB - Dinitrobenzene
TNB - Trinitrobenzene
TNT - Trinitrotoluene
DNT - Dinitrotoluene
2 AmdNT - 2 Amino-DNT

(1) MDL = 38.7 µg/kg
(2) MDL = 40.6 µg/kg
(3) MDL = 36.9 µg/kg
(4) MDL = 40.6 µg/kg
(5) MDL = 0.090 µg/L