8/21/93

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 27th FIGHTER WING (ACC)
CANNON AIR FORCE BASE, NEW MEXICO

ENTERED

RECEIVED
AUG 25 1993

27 CES/CEV
111 Engineers Way
Cannon AFB NM 88103-5136

Ms Barbara Hoditchek
RCRA Permits Manager
New Mexico Environment Department
1190 St Francis Drive
P O Box 26110
Santa Fe NM 87502

RE: Submittal of Draft Permit Application for Melrose Air Force Range (MAFR

Dear Ms Hoditchek,

Cannon AFB is pleased to present the Draft RCRA Permit Application for Melrose AFR. We still have some work to accomplish prior to the final report to ensure all the data is complete and totally accurate. Part of these corrections will depend upon our 31 Aug 93 meeting where we can gain additional feedback from your office and make adjustments accordingly.

We feel confident this draft application is significantly improved over our previous submittal. We greatly appreciate and thank you for the time you and your staff have taken to provide technical support and feedback. If you have any questions, please contact our office at (505) 784-4348. Our point of contact is Capt Greg Walters

Sincerely

Bruce G. Oshita

BRUCE G. OSHITA, GM-13
Chief, Environmental Flight

1 Atch
RCRA Permit Application for
Melrose AFR

Appendix A

Laboratory metal analyses reports

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0101-0
Lab ID: 029131-0001-SA
Matrix: SOIL Sampled: 04 MAY 93 Received: 06 MAY 93
Authorized: 06 MAY 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	10300	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	113	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.60	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	41100	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	8.3	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	7.4	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	8790	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	2440	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	149	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	9.5	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	1920	mg/kg	500	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	21.4	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	20.9	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier Approved By: Dave Roberts

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0102-1
Lab ID: 029131-0002-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 04 MAY 93
Prepared: See Below

Received: 06 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	5330	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	90.0	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.34	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	37900	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	5.2	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	5580	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	2600	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	127	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	5.7	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	1050	mg/kg	500	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY [illegible]
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	17.7	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	12.8	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0103-2
Lab ID: 029131-0003-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 04 MAY 93
Prepared: See Below

Received: 06 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	6970	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	418	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.47	mg/kg	0.40	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	119000	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	5.0	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	4.6	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Iron	6300	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	3210	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	104	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	21.8	mg/kg	8.0	6010	14 MAY 93	18 MAY 93
Potassium	1510	mg/kg	1000	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	40.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	1000	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	400	6010	14 MAY 93	18 MAY 93
Vanadium	20.5	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	16.0	mg/kg	2.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0101-EB
Lab ID: 029131-0004-EB
Matrix: AQUEOUS
Authorized: 06 MAY 93

Sampled: 04 MAY 93
Prepared: See Below

Received: 06 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.010	7041	13 MAY 93	20 MAY 93
Aluminum	ND	mg/L	0.20	6010	13 MAY 93	18 MAY 93
Arsenic	ND	mg/L	0.30	6010	13 MAY 93	18 MAY 93
Barium	ND	mg/L	0.10	6010	13 MAY 93	18 MAY 93
Beryllium	ND	mg/L	0.0020	6010	13 MAY 93	18 MAY 93
Cadmium	ND	mg/L	0.0050	6010	13 MAY 93	18 MAY 93
Calcium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Chromium	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Cobalt	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Copper	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Iron	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Lead	ND	mg/L	0.20	6010	13 MAY 93	18 MAY 93
Magnesium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Manganese	ND	mg/L	0.010	6010	13 MAY 93	18 MAY 93
Molybdenum	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Nickel	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Potassium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Selenium	ND	mg/L	0.0050	7740	13 MAY 93	17 MAY
Silver	ND	mg/L	0.030	6010	13 MAY 93	18 MAY
Sodium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Thallium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Vanadium	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Zinc	0.014	mg/L	0.010	6010	13 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

Enseco
A Coming Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0201-EB
Lab ID: 029131-0005-EB
Matrix: AQUEOUS Sampled: 05 MAY 93 Received: 07 MAY 93
Authorized: 06 MAY 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.010	7041	13 MAY 93	20 MAY 93
Aluminum	ND	mg/L	0.20	6010	13 MAY 93	18 MAY 93
Arsenic	ND	mg/L	0.30	6010	13 MAY 93	18 MAY 93
Barium	ND	mg/L	0.10	6010	13 MAY 93	18 MAY 93
Beryllium	ND	mg/L	0.0020	6010	13 MAY 93	18 MAY 93
Cadmium	ND	mg/L	0.0050	6010	13 MAY 93	18 MAY 93
Calcium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Chromium	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Cobalt	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Copper	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Iron	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Lead	ND	mg/L	0.20	6010	13 MAY 93	18 MAY 93
Magnesium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Manganese	ND	mg/L	0.010	6010	13 MAY 93	18 MAY 93
Molybdenum	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Nickel	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Potassium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Selenium	ND	mg/L	0.0050	7740	13 MAY 93	17 MAY 93
Silver	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Sodium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Thallium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Vanadium	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Zinc	ND	mg/L	0.010	6010	13 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier Approved By: Dave Roberts

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0201-1
Lab ID: 029131-0006-SA
Matrix: SOIL — Sampled: 05 MAY 93 — Received: 07 MAY 93
Authorized: 06 MAY 93 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	2.0	7041	14 MAY 93	17 MAY 93
Aluminum	9620	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	127	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.56	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	48300	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	7.5	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	6.7	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	8390	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	2380	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	154	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	9.4	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	1810	mg/kg	500	6010	14 MAY 93	18 MAY [illegible]
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	20.4	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	20.6	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier — Approved By: Dave Roberts

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0202-3
Lab ID: 029131-0007-SA
Matrix: SOIL Sampled: 05 MAY 93 Received: 07 MAY 93
Authorized: 06 MAY 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	7420	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	120	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.54	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	47600	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	6.3	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	7.3	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	7010	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	2070	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	142	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	8.7	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	1460	mg/kg	500	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	19.2	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	17.9	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier Approved By: Dave Roberts

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0203-1
Lab ID: 029131-0008-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 05 MAY 93
Prepared: See Below

Received: 07 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	4280	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	561	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	ND	mg/kg	0.40	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	115000	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	4.1	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Iron	4770	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	2290	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	749	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	ND	mg/kg	8.0	6010	14 MAY 93	18 MAY 93
Potassium	ND	mg/kg	1000	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	1000	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	400	6010	14 MAY 93	18 MAY 93
Vanadium	18.3	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	11.9	mg/kg	2.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

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A Cuming Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0204-2
Lab ID: 029131-0009-SA
Matrix: SOIL Sampled: 05 MAY 93 Received: 07 MAY 93
Authorized: 06 MAY 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	5320	mg/kg	50.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	50.0	6010	14 MAY 93	18 MAY 93
Barium	415	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	ND	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.5	6010	14 MAY 93	18 MAY 93
Calcium	220000	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	ND	mg/kg	5.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	5.0	6010	14 MAY 93	18 MAY 93
Copper	ND	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Iron	5060	mg/kg	50.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	25.0	6010	14 MAY 93	18 MAY 93
Magnesium	3060	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	193	mg/kg	5.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Nickel	24.0	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Potassium	ND	mg/kg	2500	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	100	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	2500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	1000	6010	14 MAY 93	18 MAY 93
Vanadium	17.6	mg/kg	5.0	6010	14 MAY 93	18 MAY 93
Zinc	14.3	mg/kg	5.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier Approved By: Dave Roberts

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD 0301-EB
Lab ID: 029131-0010-EB
Matrix: AQUEOUS
Authorized: 06 MAY 93

Sampled: 06 MAY 93
Prepared: See Below

Received: 08 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.010	7041	13 MAY 93	20 MAY 93
Aluminum	0.32	mg/L	0.20	6010	13 MAY 93	18 MAY 93
Arsenic	ND	mg/L	0.30	6010	13 MAY 93	18 MAY 93
Barium	ND	mg/L	0.10	6010	13 MAY 93	18 MAY 93
Beryllium	ND	mg/L	0.0020	6010	13 MAY 93	18 MAY 93
Cadmium	ND	mg/L	0.0050	6010	13 MAY 93	18 MAY 93
Calcium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Chromium	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Cobalt	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Copper	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Iron	0.12	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Lead	ND	mg/L	0.20	6010	13 MAY 93	18 MAY 93
Magnesium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Manganese	ND	mg/L	0.010	6010	13 MAY 93	18 MAY 93
Molybdenum	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Nickel	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Potassium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY [illegible]
Selenium	ND	mg/L	0.0050	7740	13 MAY 93	17 MAY
Silver	ND	mg/L	0.030	6010	13 MAY 93	18 MAY 93
Sodium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Thallium	ND	mg/L	5.0	6010	13 MAY 93	18 MAY 93
Vanadium	ND	mg/L	0.040	6010	13 MAY 93	18 MAY 93
Zinc	0.012	mg/L	0.010	6010	13 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

Enseco
A Coming Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0301-0
Lab ID: 029131-0011-SA
Matrix: SOIL Sampled: 06 MAY 93 Received: 08 MAY 93
Authorized: 06 MAY 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	5830	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	91.2	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.49	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	8700	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	6.2	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	5.8	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	6690	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	1870	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	214	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	7.9	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	1590	mg/kg	500	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	13.1	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	18.9	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier Approved By: Dave Roberts

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0304-1
Lab ID: 029131-0012-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 06 MAY 93
Prepared: See Below

Received: 08 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	5420	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	48.2	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.35	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	48500	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	5.1	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	3.3	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	5940	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	2670	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	131	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	6.6	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	1190	mg/kg	500	6010	14 MAY 93	18 MAY
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	16.2	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	13.2	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0305-2
Lab ID: 029131-0013-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 06 MAY 93
Prepared: See Below

Received: 08 MAY 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	14 MAY 93	17 MAY 93
Aluminum	8960	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Arsenic	ND	mg/kg	30.0	6010	14 MAY 93	18 MAY 93
Barium	105	mg/kg	10.0	6010	14 MAY 93	18 MAY 93
Beryllium	0.55	mg/kg	0.20	6010	14 MAY 93	18 MAY 93
Cadmium	ND	mg/kg	2.0	6010	14 MAY 93	18 MAY 93
Calcium	67300	mg/kg	500	6010	14 MAY 93	18 MAY 93
Chromium	7.5	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Cobalt	4.1	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Copper	6.1	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Iron	8570	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Lead	ND	mg/kg	20.0	6010	14 MAY 93	18 MAY 93
Magnesium	4530	mg/kg	500	6010	14 MAY 93	18 MAY 93
Manganese	201	mg/kg	1.0	6010	14 MAY 93	18 MAY 93
Molybdenum	ND	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Nickel	9.4	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Potassium	2020	mg/kg	500	6010	14 MAY 93	18 MAY 93
Selenium	ND	mg/kg	1.0	7740	14 MAY 93	17 MAY 93
Silver	ND	mg/kg	3.0	6010	14 MAY 93	18 MAY 93
Sodium	ND	mg/kg	500	6010	14 MAY 93	18 MAY 93
Thallium	ND	mg/kg	200	6010	14 MAY 93	18 MAY 93
Vanadium	26.6	mg/kg	4.0	6010	14 MAY 93	18 MAY 93
Zinc	22.3	mg/kg	1.0	6010	14 MAY 93	18 MAY 93

ND = Not detected
NA = Not applicable

Reported By: Norma Baier

Approved By: Dave Roberts

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0401-EB
Lab ID: 029569-0001-EB
Matrix: AQUEOUS
Authorized: 08 JUN 93

Sampled: 06 JUN 93
Prepared: See Below

Received: 08 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/L	0.010	7041	17 JUN 93	18 JUN 93
Aluminum	0.25	mg/L	0.20	6010	17 JUN 93	21 JUN 93
Arsenic	ND	mg/L	0.30	6010	17 JUN 93	21 JUN 93
Barium	ND	mg/L	0.10	6010	17 JUN 93	21 JUN 93
Beryllium	ND	mg/L	0.0020	6010	17 JUN 93	21 JUN 93
Cadmium	ND	mg/L	0.0050	6010	17 JUN 93	21 JUN 93
Calcium	ND	mg/L	5.0	6010	17 JUN 93	21 JUN 93
Chromium	ND	mg/L	0.030	6010	17 JUN 93	21 JUN 93
Cobalt	ND	mg/L	0.040	6010	17 JUN 93	21 JUN 93
Copper	ND	mg/L	0.030	6010	17 JUN 93	21 JUN 93
Iron	0.064	mg/L	0.040	6010	17 JUN 93	21 JUN 93
Lead	ND	mg/L	0.20	6010	17 JUN 93	21 JUN 93
Magnesium	ND	mg/L	5.0	6010	17 JUN 93	21 JUN 93
Manganese	ND	mg/L	0.010	6010	17 JUN 93	21 JUN 93
Molybdenum	ND	mg/L	0.040	6010	17 JUN 93	21 JUN 93
Nickel	ND	mg/L	0.040	6010	17 JUN 93	21 JUN 93
Potassium	ND	mg/L	5.0	6010	17 JUN 93	21 JUN
Selenium	ND	mg/L	0.0050	7740	17 JUN 93	18 JUN [illegible]
Silver	ND	mg/L	0.030	6010	17 JUN 93	21 JUN 93
Sodium	ND	mg/L	5.0	6010	17 JUN 93	21 JUN 93
Thallium	ND	mg/L	5.0	6010	17 JUN 93	21 JUN 93
Vanadium	ND	mg/L	0.040	6010	17 JUN 93	21 JUN 93
Zinc	ND	mg/L	0.010	6010	17 JUN 93	21 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0401-0
Lab ID: 029569-0002-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	2.0	7041	15 JUN 93	18 JUN 93
Aluminum	9610	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	98.8	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.64	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	4110	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	8.7	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	4.2	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	8.4	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	8430	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2150	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	229	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	10.4	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	2130	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	17.3	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	21.8	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0402-1
Lab ID: 029569-0003-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	2.0	7041	15 JUN 93	18 JUN 93
Aluminum	7080	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	112	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.47	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	57300	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	5.7	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	6.3	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	6600	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	3450	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	185	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	8.0	mg/kg	4.0	6010	22 JUN 93	23 JUN [illegible]
Potassium	1520	mg/kg	500	6010	22 JUN 93	23 JUN [illegible]
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	27.4	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	17.9	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0501-0
Lab ID: 029569-0004-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 06 JUN 93
Prepared: See Below

Received: 08 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	9550	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	94.7	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.62	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	3030	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	9.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	4.3	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	8.4	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	8650	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	1870	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	225	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	9.6	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1920	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	18.2	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	20.0	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0502-1
Lab ID: 029569-0005-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	5080	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	176	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.35	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	56700	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	4.2	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	4.4	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	4710	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2630	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	143	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	7.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1100	mg/kg	500	6010	22 JUN 93	23 JUN [illegible]
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN [illegible]
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	16.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	13.0	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0601-0
Lab ID: 029569-0006-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	10900	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	119	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.69	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	7830	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	10.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	5.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	8.5	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	9770	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2350	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	249	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	11.4	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	2230	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	20.5	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	23.5	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0602-1
Lab ID: 029569-0007-SA
Matrix: SOIL — Sampled: 07 JUN 93 — Received: 09 JUN 93
Authorized: 08 JUN 93 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	7160	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	127	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	ND	mg/kg	0.40	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	97100	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	4.9	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	4.5	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Iron	5900	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	3140	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	122	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	8.0	mg/kg	8.0	6010	22 JUN 93	23 JUN [illegible]
Potassium	1640	mg/kg	1000	6010	22 JUN 93	23 JUN [illegible]
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 9[illegible]
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	1000	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	400	6010	22 JUN 93	23 JUN 93
Vanadium	18.6	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	31.1	mg/kg	2.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt — Approved By: Sandra Jones

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0701-0
Lab ID: 029569-0008-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: See Below

Received: 09 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	9150	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	110	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.60	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	33600	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	7.3	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	4.3	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	8.5	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	7070	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	1990	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	156	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	9.8	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1640	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	20.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	18.3	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0702-1
Lab ID: 029569-0009-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	10100	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	146	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.67	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	46500	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	7.8	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	4.5	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	9.0	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	8100	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2560	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	193	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	11.2	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	2090	mg/kg	500	6010	22 JUN 93	23 JUN [illegible]
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN [illegible]
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	24.2	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	21.5	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0801-0
Lab ID: 029569-0010-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	9800	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	117	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.62	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	29100	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	7.8	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	4.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	8.7	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	7900	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2130	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	171	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	9.8	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1720	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	20.9	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	23.7	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0802-0
Lab ID: 029569-0011-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: See Below

Received: 09 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	5760	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	211	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.39	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	48000	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	4.9	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	4.5	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	5050	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2680	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	124	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	6.4	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1300	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	15.3	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	13.9	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0803-0
Lab ID: 029569-0012-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	6650	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	73.2	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.45	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	51000	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	5.3	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	4.7	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	5700	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	3230	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	156	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	7.4	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1400	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	22.5	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	16.1	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0901-0
Lab ID: 029569-0013-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: See Below

Received: 09 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	8170	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	110	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.57	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	25200	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	7.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	4.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	9.5	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	7160	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	1980	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	175	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	8.9	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1740	mg/kg	500	6010	22 JUN 93	23 JUN [illegible]
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN [illegible]
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	17.2	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	20.8	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD0902-1
Lab ID: 029569-0014-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	15 JUN 93	18 JUN 93
Aluminum	5320	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	22 JUN 93	23 JUN 93
Barium	142	mg/kg	10.0	6010	22 JUN 93	23 JUN 93
Beryllium	0.38	mg/kg	0.20	6010	22 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	22 JUN 93	23 JUN 93
Calcium	51300	mg/kg	500	6010	22 JUN 93	23 JUN 93
Chromium	4.1	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Copper	4.9	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Iron	4420	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	22 JUN 93	23 JUN 93
Magnesium	2190	mg/kg	500	6010	22 JUN 93	23 JUN 93
Manganese	143	mg/kg	1.0	6010	22 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Nickel	6.7	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Potassium	1230	mg/kg	500	6010	22 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	15 JUN 93	16 JUN 93
Silver	ND	mg/kg	3.0	6010	22 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	22 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	22 JUN 93	23 JUN 93
Vanadium	14.6	mg/kg	4.0	6010	22 JUN 93	23 JUN 93
Zinc	13.2	mg/kg	1.0	6010	22 JUN 93	23 JUN 93

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1001-0
Lab ID: 029614-0001-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	5680	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	176	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.46	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	57500	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	5.0	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	6.6	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	5810	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	1960	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	127	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	7.1	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	1110	mg/kg	500	6010	16 JUN 93	23 JUN 9[illegible]
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN [illegible]
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN 9[illegible]
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	16.6	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	14.6	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1002-1
Lab ID: 029614-0002-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	4520	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	66.5	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.37	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	77700	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	4.0	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	4.1	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	4860	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	2510	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	107	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	5.8	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	1010	mg/kg	500	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN 93
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	20.6	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	11.8	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Coming Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1101-0
Lab ID: 029614-0003-SA
Matrix: SOIL
Authorized: 10 JUN 93

Sampled: 08 JUN 93
Prepared: See Below

Received: 10 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	7460	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	107	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.58	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	16700	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	7.9	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	4.3	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	8.8	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	8210	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	1830	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	194	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	9.0	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	1600	mg/kg	500	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	1.0	7740	16 JUN 93	17 JUN
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	18.8	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	19.0	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1104-1
Lab ID: 029614-0004-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date	
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93	
Aluminum	3580	mg/kg	20.0	6010	16 JUN 93	23 JUN 93	
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93	
Barium	145	mg/kg	10.0	6010	16 JUN 93	23 JUN 93	
Beryllium	0.32	mg/kg	0.20	6010	16 JUN 93	23 JUN 93	
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93	
Calcium	52300	mg/kg	500	6010	16 JUN 93	23 JUN 93	
Chromium	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Copper	3.1	mg/kg	3.0	6010	16 JUN 93	23 JUN 93	
Iron	5210	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93	
Magnesium	1790	mg/kg	500	6010	16 JUN 93	23 JUN 93	
Manganese	158	mg/kg	1.0	6010	16 JUN 93	23 JUN 93	
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Nickel	5.0	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Potassium	663	mg/kg	500	6010	16 JUN 93	23 JUN 93	
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN 93	
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN 93	
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93	
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93	
Vanadium	21.3	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Zinc	20.6	mg/kg	1.0	6010	16 JUN 93	23 JUN 93	B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Coming Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1201-0
Lab ID: 029614-0005-SA
Matrix: SOIL
Authorized: 10 JUN 93

Sampled: 08 JUN 93
Prepared: See Below

Received: 10 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	3300	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	49.5	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.27	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	11200	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	4.2	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	4.6	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	3670	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	855	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	84.8	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	5.3	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	731	mg/kg	500	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN 93
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN [illegible]
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	8.7	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	34.5	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1202-1
Lab ID: 029614-0006-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	4680	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	513	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.43	mg/kg	0.40	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	132000	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	4.3	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Iron	4660	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	2320	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	201	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	ND	mg/kg	8.0	6010	16 JUN 93	23 JUN 93
Potassium	ND	mg/kg	1000	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN 93
Silver	3.1	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Sodium	ND	mg/kg	1000	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	400	6010	16 JUN 93	23 JUN 93
Vanadium	17.0	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	12.7	mg/kg	2.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1301-0
Lab ID: 029614-0007-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	5000	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	141	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.39	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	41100	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	5.1	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	6.7	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	5940	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	1530	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	131	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	6.4	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	995	mg/kg	500	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN 9
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	16.4	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	15.5	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Coming Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1302-1
Lab ID: 029614-0008-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	4200	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	155	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.35	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	77000	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	4.0	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	5.0	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	4590	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	2040	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	365	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	5.9	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	732	mg/kg	500	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN 93
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	20.1	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	12.0	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1401-0
Lab ID: 029614-0009-SA
Matrix: SOIL
Authorized: 10 JUN 93

Sampled: 08 JUN 93
Prepared: See Below

Received: 10 JUN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93
Aluminum	6580	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93
Barium	120	mg/kg	10.0	6010	16 JUN 93	23 JUN 93
Beryllium	0.52	mg/kg	0.20	6010	16 JUN 93	23 JUN 93
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93
Calcium	23800	mg/kg	500	6010	16 JUN 93	23 JUN 93
Chromium	7.2	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Copper	8.1	mg/kg	3.0	6010	16 JUN 93	23 JUN 93
Iron	7070	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93
Magnesium	1860	mg/kg	500	6010	16 JUN 93	23 JUN 93
Manganese	177	mg/kg	1.0	6010	16 JUN 93	23 JUN 93
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Nickel	7.8	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Potassium	1530	mg/kg	500	6010	16 JUN 93	23 JUN 93
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN
Sodium	ND	mg/kg	500	6010	16 JUN 93	23 JUN 93
Thallium	ND	mg/kg	200	6010	16 JUN 93	23 JUN 93
Vanadium	16.8	mg/kg	4.0	6010	16 JUN 93	23 JUN 93
Zinc	18.9	mg/kg	1.0	6010	16 JUN 93	23 JUN 93 B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt

Approved By: Sandra Jones

Enseco
A Corning Company

Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: OB/OD1402-I
Lab ID: 029614-0010-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date	
Antimony	ND	mg/kg	1.0	7041	16 JUN 93	18 JUN 93	
Aluminum	5720	mg/kg	20.0	6010	16 JUN 93	23 JUN 93	
Arsenic	ND	mg/kg	30.0	6010	16 JUN 93	23 JUN 93	
Barium	63.9	mg/kg	10.0	6010	16 JUN 93	23 JUN 93	
Beryllium	0.44	mg/kg	0.40	6010	16 JUN 93	23 JUN 93	
Cadmium	ND	mg/kg	2.0	6010	16 JUN 93	23 JUN 93	
Calcium	101000	mg/kg	500	6010	16 JUN 93	23 JUN 93	
Chromium	4.5	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Cobalt	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Copper	4.1	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Iron	5810	mg/kg	20.0	6010	16 JUN 93	23 JUN 93	
Lead	ND	mg/kg	20.0	6010	16 JUN 93	23 JUN 93	
Magnesium	3030	mg/kg	500	6010	16 JUN 93	23 JUN 93	
Manganese	117	mg/kg	2.0	6010	16 JUN 93	23 JUN 93	
Molybdenum	ND	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Nickel	ND	mg/kg	8.0	6010	16 JUN 93	23 JUN 93	
Potassium	1200	mg/kg	1000	6010	16 JUN 93	23 JUN 93	
Selenium	ND	mg/kg	0.50	7740	16 JUN 93	17 JUN 93	
Silver	ND	mg/kg	3.0	6010	16 JUN 93	23 JUN 93	
Sodium	ND	mg/kg	1000	6010	16 JUN 93	23 JUN 93	
Thallium	ND	mg/kg	400	6010	16 JUN 93	23 JUN 93	
Vanadium	23.5	mg/kg	4.0	6010	16 JUN 93	23 JUN 93	
Zinc	15.0	mg/kg	2.0	6010	16 JUN 93	23 JUN 93	B

Note B : Compound is also detected in the blank.

ND = Not detected
NA = Not applicable

Reported By: Will Pratt Approved By: Sandra Jones

Mel.
6/23/93

Appendix B

Laboratory explosive analyses reports

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0101-0
Lab ID: 029131-0001-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 04 MAY 93
Prepared: 09 MAY 93

Received: 06 MAY 93
Analyzed: 17 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0102-1
Lab ID: 029131-0002-SA
Matrix: SOIL Sampled: 04 MAY 93 Received: 06 MAY 93
Authorized: 06 MAY 93 Prepared: 09 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0103-2
Lab ID: 029131-0003-SA
Matrix: SOIL Sampled: 04 MAY 93 Received: 06 MAY 93
Authorized: 06 MAY 93 Prepared: 09 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0201-EB
Lab ID: 029131-0005-EB
Matrix: AQUEOUS
Authorized: 06 MAY 93

Sampled: 05 MAY 93
Prepared: 12 MAY 93

Received: 07 MAY 93
Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
Nitrobenzene	ND	ug/L	2.0
2,4-Dinitrotoluene	ND	ug/L	2.0
2,6-Dinitrotoluene	ND	ug/L	2.0
1,3-Dinitrobenzene	ND	ug/L	2.0
1,3,5-Trinitrobenzene	ND	ug/L	2.0
2,4,6-Trinitrotoluene	ND	ug/L	2.0
RDX	ND	ug/L	2.0
HMX	ND	ug/L	2.0
Tetryl	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0201-1
Lab ID: 029131-0006-SA
Matrix: SOIL Sampled: 05 MAY 93 Received: 07 MAY 93
Authorized: 06 MAY 93 Prepared: 11 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0202-3
Lab ID: 029131-0007-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 05 MAY 93
Prepared: 11 MAY 93

Received: 07 MAY 93
Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0203-1
Lab ID: 029131-0008-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 05 MAY 93
Prepared: 11 MAY 93

Received: 07 MAY 93
Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0204-2
Lab ID: 029131-0009-SA
Matrix: SOIL Sampled: 05 MAY 93 Received: 07 MAY 93
Authorized: 06 MAY 93 Prepared: 11 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD 0301-EB
Lab ID: 029131-0010-EB
Matrix: AQUEOUS Sampled: 06 MAY 93 Received: 08 MAY 93
Authorized: 06 MAY 93 Prepared: 12 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
Nitrobenzene	ND	ug/L	2.0
2,4-Dinitrotoluene	ND	ug/L	2.0
2,6-Dinitrotoluene	ND	ug/L	2.0
1,3-Dinitrobenzene	ND	ug/L	2.0
1,3,5-Trinitrobenzene	ND	ug/L	2.0
2,4,6-Trinitrotoluene	ND	ug/L	2.0
RDX	ND	ug/L	2.0
HMX	ND	ug/L	2.0
Tetryl	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0301-0
Lab ID: 029131-0011-SA
Matrix: SOIL
Authorized: 06 MAY 93

Sampled: 06 MAY 93
Prepared: 11 MAY 93

Received: 08 MAY 93
Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0304-1
Lab ID: 029131-0012-SA
Matrix: SOIL Sampled: 06 MAY 93 Received: 08 MAY 93
Authorized: 06 MAY 93 Prepared: 11 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0305-2
Lab ID: 029131-0013-SA
Matrix: SOIL Sampled: 06 MAY 93 Received: 08 MAY 93
Authorized: 06 MAY 93 Prepared: 11 MAY 93 Analyzed: 18 MAY 93

Parameter	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0401-EB
Lab ID: 029965-0001-SA
Matrix: AQUEOUS Sampled: 06 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
Nitrobenzene	ND	ug/L	2.0
2,4-Dinitrotoluene	ND	ug/L	1.0
2,6-Dinitrotoluene	ND	ug/L	1.0
1,3-Dinitrobenzene	ND	ug/L	1.0
1,3,5-Trinitrobenzene	ND	ug/L	2.0
2,4,6-Trinitrotoluene	ND	ug/L	4.0
RDX	ND	ug/L	1.0
HMX	ND	ug/L	1.0
Tetryl	ND	ug/L	5.0
2-Nitrotoluene	ND	ug/L	1.0
3-Nitrotoluene	ND	ug/L	2.0
4-Nitrotoluene	ND	ug/L	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico • Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0401-0
Lab ID: 029965-0002-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0402-1
Lab ID: 029965-0003-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0501-0
Lab ID: 029965-0004-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0502-1
Lab ID: 029965-0005-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0601-0
Lab ID: 029965-0006-SA
Matrix: SOIL
Authorized: 28 JUN 93

Sampled: 07 JUN 93
Prepared: 03 JUL 93

Received: 28 JUN 93
Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0602-1
Lab ID: 029965-0007-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0701-0
Lab ID: 029965-0008-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 21 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0702-1
Lab ID: 029965-0009-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 22 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0801-0
Lab ID: 029965-0010-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 22 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0802-0
Lab ID: 029965-0011-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 22 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0803-1
Lab ID: 029965-0012-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 22 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0901-0
Lab ID: 029965-0013-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 22 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD0902-1
Lab ID: 029965-0014-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 28 JUN 93
Authorized: 28 JUN 93 Prepared: 03 JUL 93 Analyzed: 22 JUL 93

Parameter	Result	Units	Reporting Limit
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

ND = Not detected
NA = Not applicable

Reported By: Philip Tallarico Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0401-EB
Lab ID: 029569-0001-EB
Matrix: AQUEOUS Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: 10 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
Nitrobenzene	ND	ug/L	2.0	T
2,4-Dinitrotoluene	ND	ug/L	2.0	
2,6-Dinitrotoluene	ND	ug/L	2.0	
1,3-Dinitrobenzene	ND	ug/L	2.0	
1,3,5-Trinitrobenzene	ND	ug/L	2.0	
2,4,6-Trinitrotoluene	ND	ug/L	2.0	
RDX	ND	ug/L	2.0	
HMX	ND	ug/L	2.0	
Tetryl	ND	ug/L	2.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0401-0
Lab ID: 029569-0002-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0402-1
Lab ID: 029569-0003-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0501-0
Lab ID: 029569-0004-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0502-1
Lab ID: 029569-0005-SA
Matrix: SOIL Sampled: 06 JUN 93 Received: 08 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: 08/0D0601-0
Lab ID: 029569-0006-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: 11 JUN 93

Received: 09 JUN 93
Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0602-1
Lab ID: 029569-0007-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0701-0
Lab ID: 029569-0008-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: 11 JUN 93

Received: 09 JUN 93
Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0702-1
Lab ID: 029569-0009-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0801-0
Lab ID: 029569-0010-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: 11 JUN 93

Received: 09 JUN 93
Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman , Approved By: Mark Pokorny

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0802-0
Lab ID: 029569-0011-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: 11 JUN 93

Received: 09 JUN 93
Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Coming Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0803-0
Lab ID: 029569-0012-SA
Matrix: SOIL Sampled: 07 JUN 93 Received: 09 JUN 93
Authorized: 08 JUN 93 Prepared: 11 JUN 93 Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0901-0
Lab ID: 029569-0013-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: 11 JUN 93

Received: 09 JUN 93
Analyzed: 17 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives by HPLC

Method HPLC

Client Name: U.S. Geological Survey
Client ID: OB/OD0902-1
Lab ID: 029569-0014-SA
Matrix: SOIL
Authorized: 08 JUN 93

Sampled: 07 JUN 93
Prepared: 11 JUN 93

Received: 09 JUN 93
Analyzed: 18 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	mg/kg	1.0	T
RDX	ND	mg/kg	1.0	
1,3,5-Trinitrobenzene	ND	mg/kg	1.0	
1,3-Dinitrobenzene	ND	mg/kg	1.0	
Nitrobenzene	ND	mg/kg	1.0	
Tetryl	ND	mg/kg	1.0	
2,4,6-Trinitrotoluene	ND	mg/kg	1.0	
2,6-Dinitrotoluene	ND	mg/kg	1.0	
2,4-Dinitrotoluene	ND	mg/kg	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1001-0
Lab ID: 029614-0001-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: 15 JUN 93 Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1002-1
Lab ID: 029614-0002-SA
Matrix: SOIL
Authorized: 10 JUN 93

Sampled: 08 JUN 93
Prepared: 15 JUN 93

Received: 10 JUN 93
Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1101-0
Lab ID: 029614-0003-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: 15 JUN 93 Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1104-1
Lab ID: 029614-0004-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: 15 JUN 93 Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1201-0
Lab ID: 029614-0005-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: 15 JUN 93 Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1202-1
Lab ID: 029614-0006-SA
Matrix: SOIL
Authorized: 10 JUN 93

Sampled: 08 JUN 93
Prepared: 15 JUN 93

Received: 10 JUN 93
Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1302-1
Lab ID: 029614-0008-SA
Matrix: SOIL
Authorized: 10 JUN 93

Sampled: 08 JUN 93
Prepared: 15 JUN 93

Received: 10 JUN 93
Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman

Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1401-0
Lab ID: 029614-0009-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: 15 JUN 93 Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Enseco
A Corning Company

Explosives

Method 8330

Client Name: U.S. Geological Survey
Client ID: OB/OD1402-1
Lab ID: 029614-0010-SA
Matrix: SOIL Sampled: 08 JUN 93 Received: 10 JUN 93
Authorized: 10 JUN 93 Prepared: 15 JUN 93 Analyzed: 24 JUN 93

Parameter	Result	Units	Reporting Limit	
HMX	ND	ug/g	2.0	T
RDX	ND	ug/g	2.0	
1,3,5-Trinitrobenzene	ND	ug/g	1.0	
1,3-Dinitrobenzene	ND	ug/g	1.0	
Nitrobenzene	ND	ug/g	2.0	
Tetryl	ND	ug/g	2.0	
2,4,6-Trinitrotoluene	ND	ug/g	1.0	
2,6-Dinitrotoluene	ND	ug/g	1.0	
2,4-Dinitrotoluene	ND	ug/g	1.0	
2-Nitrotoluene	ND	ug/g	2.0	
3-Nitrotoluene	ND	ug/g	2.0	
4-Nitrotoluene	ND	ug/g	1.0	

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Roland Bruggeman Approved By: Mark Pokorny

Appendix C

Laboratory quality control reports

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029131-0001-SA	SOIL	EXP-USA-S	16 APR 93-6A	09 MAY 93-6A
029131-0002-SA	SOIL	EXP-USA-S	16 APR 93-6A	09 MAY 93-6A
029131-0003-SA	SOIL	EXP-USA-S	16 APR 93-6A	09 MAY 93-6A
029131-0005-EB	AQUEOUS	EXP-USA-A	12 MAY 93-6A	12 MAY 93-6B
029131-0006-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0007-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0008-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0009-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0010-EB	AQUEOUS	EXP-USA-A	12 MAY 93-6A	12 MAY 93-6B
029131-0011-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0011-MS	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0011-SD	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0012-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A
029131-0013-SA	SOIL	EXP-USA-S	16 APR 93-6A	11 MAY 93-6A

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: EXP-USA-S Matrix: SOIL QC Lot: 16 APR 93-6A Concentration Units: mg/kg								
HMX	5.00	6.46	6.52	6.49	130	89-133	0.9	18
RDX	5.00	5.31	5.40	5.36	107	99-121	1.7	14
1,3,5-Trinitrobenzene	5.00	4.03	4.07	4.05	81	70-102	1.0	15
1,3-Dinitrobenzene	5.00	5.01	5.06	5.04	101	82-114	1.0	14
Nitrobenzene	5.00	5.11	5.13	5.12	102	90-114	0.4	14
Tetryl	5.00	3.78	3.73	3.76	75	37-111	1.3	41
2,4,6-Trinitrotoluene	5.00	4.88	4.83	4.86	97	58-100	1.0	16
2,6-Dinitrotoluene	5.00	4.97	5.12	5.04	101	84-123	3.0	15
2,4-Dinitrotoluene	5.00	4.92	4.93	4.92	99	86-108	0.2	14
Category: EXP-USA-A Matrix: AQUEOUS QC Lot: 12 MAY 93-6A Concentration Units: ug/L								
HMX	40.0	34.1	36.4	35.2	88	44-133	6.5	40
RDX	40.0	30.4	33.0	31.7	79	35-128	8.2	41
1,3,5-Trinitrobenzene	40.0	25.7	27.8	26.8	67	33- 99	7.9	42
1,3-Dinitrobenzene	40.0	34.3	36.7	35.5	89	37-113	6.8	44
Nitrobenzene	40.0	32.0	34.4	33.2	83	33-112	7.2	46
Tetryl	40.0	29.9	31.8	30.8	77	20-132	6.2	43
2,4,6-Trinitrotoluene	40.0	30.0	32.3	31.2	78	16-104	7.4	43
2,6-Dinitrotoluene	40.0	30.9	33.1	32.0	80	36-135	6.9	40
2,4-Dinitrotoluene	40.0	30.9	33.2	32.0	80	29-118	7.2	38

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: EXP-USATHAMA-S			
Matrix: SOIL			
QC Lot: 16 APR 93-6A QC Run: 09 MAY 93-6A			
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0
Test: EXP-USATHAMA-A			
Matrix: AQUEOUS			
QC Lot: 12 MAY 93-6A QC Run: 12 MAY 93-6B			
Nitrobenzene	ND	ug/L	2.0
2,4-Dinitrotoluene	ND	ug/L	2.0
2,6-Dinitrotoluene	ND	ug/L	2.0
1,3-Dinitrobenzene	ND	ug/L	2.0
1,3,5-Trinitrobenzene	ND	ug/L	2.0
2,4,6-Trinitrotoluene	ND	ug/L	2.0
RDX	ND	ug/L	2.0
HMX	ND	ug/L	2.0
Tetryl	ND	ug/L	2.0
Test: EXP-USATHAMA-S			
Matrix: SOIL			
QC Lot: 16 APR 93-6A QC Run: 11 MAY 93-6A			
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
4,6-Dinitro-o-toluidine	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: EXP-USATHAMA-S
Matrix: SOIL
QC Lot: 16 APR 93-6A QC Run: 11 MAY 93-6A

Test: EXP-USATHAMA-S
Matrix: SOIL
QC Lot: 16 APR 93-6A QC Run: 11 MAY 93-6A

Analyte	Result	Units	Reporting Limit
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Organics by Chromatography

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	EXP-USATHAMA-S	029131-0011-SD	16 APR 93-6A
MATRIX SPIKE	EXP-USATHAMA-S	029131-0011-MS	16 APR 93-6A

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Organics by Chromatography

Analyte	Sample	Concentration Matrix Spike	Concentration Matrix Spike Dup	Spiked MS	Spiked MSD	%Recovery MS	%Recovery MSD	% RPD
Test: EXP-USATHAMA-S								
Matrix SOIL								
Sample: 029131-0011								
Units: mg/kg								
HMX	ND	5.1	5.3	4.8	5.0	105	106	1
RDX	ND	4.4	4.6	4.8	5.0	90	92	2
1,3,5-Trinitrobenzene	ND	2.8	3.1	4.8	5.0	58	61	5
1,3-Dinitrobenzene	ND	4.9	5.2	4.8	5.0	101	104	3
Nitrobenzene	ND	4.5	4.9	4.8	5.0	93	98	5
Tetryl	ND	1.3	1.4	4.8	5.0	28	28	1
2,4,6-Trinitrotoluene	ND	4.5	4.6	4.8	5.0	92	91	1
2,6-Dinitrotoluene	ND	4.7	4.8	4.8	5.0	97	97	0
2,4-Dinitrotoluene	ND	4.5	4.8	4.8	5.0	94	97	4

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029131-0001-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0001-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0001-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0002-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0002-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0002-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0003-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0003-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0003-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0004-EB	AQUEOUS	ICP-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0004-EB	AQUEOUS	SB-FAA-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0004-EB	AQUEOUS	SE-FAA-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0005-EB	AQUEOUS	ICP-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0005-EB	AQUEOUS	SB-FAA-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0005-EB	AQUEOUS	SE-FAA-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0006-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0006-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0006-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0007-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0007-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0007-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0008-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0008-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0008-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0009-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0009-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0009-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0010-EB	AQUEOUS	ICP-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0010-EB	AQUEOUS	SB-FAA-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0010-EB	AQUEOUS	SE-FAA-AT	13 MAY 93-6P	13 MAY 93-6P
029131-0011-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-MS	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-MS	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-MS	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-SD	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-SD	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0011-SD	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0012-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0012-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0012-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0013-SA	SOIL	ICP-S	14 MAY 93-6G	14 MAY 93-6G
029131-0013-SA	SOIL	SB-FAA-S	14 MAY 93-6G	14 MAY 93-6G
029131-0013-SA	SOIL	SE-FAA-S	14 MAY 93-6G	14 MAY 93-6G

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: ICP-S								
Matrix: SOIL								
QC Lot: 14 MAY 93-6G								
Concentration Units: mg/kg								
Aluminum	10700	10900	10900	10900	102	47-153	0.2	2(
Antimony	55.2	54.8	52.7	53.8	97	18-362	3.8	5(
Arsenic	145	124	130	127	87	59-141	4.3	2(
Barium	503	506	502	504	100	76-124	0.6	2(
Beryllium	129	128	128	128	99	53-131	0.3	2(
Cadmium	154	145	147	146	95	68-132	1.1	2(
Calcium	7390	6950	6990	6970	94	79-121	0.7	2(
Chromium	151	153	154	153	102	66-133	1.0	2(
Cobalt	122	113	114	114	93	70-130	0.7	2(
Copper	162	159	159	159	98	70-132	0.1	2(
Iron	15400	15400	15300	15300	99	66-134	0.7	2(
Lead	148	134	131	133	90	66-135	1.7	2(
Magnesium	3740	3660	3670	3660	98	74-126	0.3	2(
Manganese	423	401	401	401	95	74-125	0.1	2(
Molybdenum	159	153	152	153	96	71-129	0.9	2(
Nickel	166	157	158	157	95	67-133	0.	2(
Potassium	4050	3870	3920	3900	96	68-132	1.	2(
Silver	104	99.7	99.6	99.6	96	76-124	0.1	2(
Sodium	747	650	634	642	86	57-130	2.5	2(
Vanadium	154	148	148	148	96	73-127	0.3	2(
Zinc	530	499	505	502	95	65-135	1.1	2(
Category: SB-FAA-S								
Matrix: SOIL								
QC Lot: 14 MAY 93-6G								
Concentration Units: mg/kg								
Antimony	55.2	67.2	64.0	65.6	119	18-362	4.9	5(
Category: SE-FAA-S								
Matrix: SOIL								
QC Lot: 14 MAY 93-6G								
Concentration Units: mg/kg								
Selenium	143	161	162	162	113	68-132	0.6	2(

Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: ICP-AT Matrix: AQUEOUS QC Lot: 13 MAY 93-6P Concentration Units: mg/L								
Aluminum	2.00	1.75	1.72	1.74	87	75-125	1.5	2(
Antimony	0.500	0.471	0.466	0.469	94	75-125	1.2	2(
Arsenic	0.500	0.430	0.404	0.417	83	75-125	6.3	2(
Barium	2.00	1.75	1.74	1.74	87	75-125	0.6	2(
Beryllium	0.0500	0.0474	0.0472	0.0473	95	75-125	0.5	2(
Cadmium	0.0500	0.0470	0.0473	0.0471	94	75-125	0.6	2(
Calcium	100	99.7	99.2	99.4	99	75-125	0.5	2(
Chromium	0.200	0.181	0.177	0.179	90	75-125	2.2	2(
Cobalt	0.500	0.448	0.434	0.441	88	75-125	3.2	2(
Copper	0.250	0.222	0.212	0.217	87	75-125	4.9	2(
Iron	1.00	0.902	0.909	0.905	91	75-125	0.7	2(
Lead	0.500	0.507	0.490	0.499	100	75-125	3.6	2(
Magnesium	50.0	48.7	48.3	48.5	97	75-125	0.9	2(
Manganese	0.500	0.435	0.422	0.428	86	75-125	3.1	2(
Nickel	0.500	0.462	0.442	0.452	90	75-125	4.5	2(
Potassium	50.0	46.2	45.0	45.6	91	75-125	2.5	2(
Silver	0.050	0.0409	0.0432	0.0421	84	75-125	5.3	2(
Sodium	100	104	103	103	103	75-125	1.2	2(
Vanadium	0.500	0.470	0.469	0.470	94	75-125	0.0	2(
Zinc	0.500	0.465	0.446	0.456	91	75-125	4.3	2(
Category: SB-FAA-AT Matrix: AQUEOUS QC Lot: 13 MAY 93-6P Concentration Units: mg/L								
Antimony	0.500	0.552	0.564	0.558	112	75-125	2.2	2(
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 13 MAY 93-6P Concentration Units: mg/L								
Selenium	0.0300	0.0309	0.0315	0.0312	104	75-125	1.9	2(

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-S			
Matrix: SOIL			
QC Lot: 14 MAY 93-6G QC Run: 14 MAY 93-6G			
Aluminum	ND	mg/kg	20.0
Arsenic	ND	mg/kg	30.0
Barium	ND	mg/kg	10.0
Beryllium	ND	mg/kg	0.20
Cadmium	ND	mg/kg	2.0
Calcium	ND	mg/kg	500
Chromium	ND	mg/kg	4.0
Cobalt	ND	mg/kg	4.0
Copper	ND	mg/kg	3.0
Iron	ND	mg/kg	4.0
Lead	ND	mg/kg	20.0
Magnesium	ND	mg/kg	500
Manganese	ND	mg/kg	1.0
Molybdenum	ND	mg/kg	4.0
Nickel	ND	mg/kg	4.0
Potassium	ND	mg/kg	500
Silver	ND	mg/kg	3.0
Sodium	ND	mg/kg	500
Thallium	ND	mg/kg	200
Vanadium	ND	mg/kg	4.0
Zinc	ND	mg/kg	1.0
Test: SB-FAA-S			
Matrix: SOIL			
QC Lot: 14 MAY 93-6G QC Run: 14 MAY 93-6G			
Antimony	ND	mg/kg	1.0
Test: SE-FAA-S			
Matrix: SOIL			
QC Lot: 14 MAY 93-6G QC Run: 14 MAY 93-6G			
Selenium	ND	mg/kg	0.50

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-AT			
Matrix: AQUEOUS			
QC Lot: 13 MAY 93-6P QC Run: 13 MAY 93-6P			
Aluminum	ND	mg/L	0.20
Arsenic	ND	mg/L	0.30
Barium	ND	mg/L	0.10
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Calcium	ND	mg/L	5.0
Chromium	ND	mg/L	0.030
Cobalt	ND	mg/L	0.040
Copper	ND	mg/L	0.030
Iron	ND	mg/L	0.040
Lead	ND	mg/L	0.20
Magnesium	ND	mg/L	5.0
Manganese	ND	mg/L	0.010
Molybdenum	ND	mg/L	0.040
Nickel	ND	mg/L	0.040
Potassium	ND	mg/L	5.0
Silver	ND	mg/L	0.030
Sodium	ND	mg/L	5.0
Thallium	ND	mg/L	5.0
Vanadium	ND	mg/L	0.040
Zinc	ND	mg/L	0.010
Test: SB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 13 MAY 93-6P QC Run: 13 MAY 93-6P			
Antimony	ND	mg/L	0.010
Test: SE-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 13 MAY 93-6P QC Run: 13 MAY 93-6P			
Selenium	ND	mg/L	0.0050

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Metals Analysis and Preparation

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	ICP-AFIR-S	029131-0011-SD	14 MAY 93-6G
MATRIX SPIKE	ICP-AFIR-S	029131-0011-MS	14 MAY 93-6G
MATRIX SPIKE DUPLICATE	SB-FAA-S	029131-0011-SD	14 MAY 93-6G
MATRIX SPIKE	SB-FAA-S	029131-0011-MS	14 MAY 93-6G
MATRIX SPIKE DUPLICATE	SE-FAA-S	029131-0011-SD	14 MAY 93-6G
MATRIX SPIKE	SE-FAA-S	029131-0011-MS	14 MAY 93-6G

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Metals Analysis and Preparation

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	ICP-AFIR-S	029131-0011-SD	14 MAY 93-6G
MATRIX SPIKE	ICP-AFIR-S	029131-0011-MS	14 MAY 93-6G
MATRIX SPIKE DUPLICATE	SB-FAA-S	029131-0011-SD	14 MAY 93-6G
MATRIX SPIKE	SB-FAA-S	029131-0011-MS	14 MAY 93-6G
MATRIX SPIKE DUPLICATE	SE-FAA-S	029131-0011-SD	14 MAY 93-6G
MATRIX SPIKE	SE-FAA-S	029131-0011-MS	14 MAY 93-6G

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Metals Analysis and Preparation

Analyte	Sample	Concentration Matrix Spike	Matrix Spike Dup	Spiked MS	MSD	%Recovery MS	MSD	% RPD
Test: ICP-AFIR-S								
Matrix SOIL								
Sample: 029131-0011								
Units: mg/kg								
Aluminum	5830	8970	7080	200	200	NC	NC	NC
Arsenic	ND	50.7	44.8	50.0	50.0	101	90	12
Barium	91.2	276	276	200	200	92	93	0
Beryllium	0.49	5.3	5.3	5.0	5.0	96	96	0
Cadmium	ND	4.7	4.8	5.0	5.0	94	96	2
Calcium	8700	19100	18400	10000	10000	104	97	7
Chromium	6.2	26.2	24.4	20.0	20.0	100	91	9
Cobalt	ND	47.8	47.4	50.0	50.0	96	95	1
Copper	5.8	28.2	28.2	25.0	25.0	90	89	0
Iron	6690	8600	7520	100	100	NC	NC	NC
Lead	ND	58.5	53.3	50.0	50.0	117	107	9
Magnesium	1870	7280	6960	5000	5000	108	102	6
Manganese	214	265	271	50.0	50.0	102	114	11
Nickel	7.9	52.9	52.0	50.0	50.0	90	88	2
Potassium	1590	6680	6380	5000	5000	102	96	[illegible]
Silver	ND	4.2	4.3	5.0	5.0	85	86	[illegible]
Sodium	ND	10600	10600	10000	10000	106	106	0
Vanadium	13.1	59.8	60.7	50.0	50.0	93	95	2
Zinc	18.9	67.7	63.5	50.0	50.0	98	89	9
Test: SB-FAA-S								
Matrix SOIL								
Sample: 029131-0011								
Units: mg/kg								
Antimony	ND	23.4	24.1	50.0	50.0	47	48	3
Test: SE-FAA-S								
Matrix SOIL								
Sample: 029131-0011								
Units: mg/kg								
Selenium	ND	1.3	1.2	3.0	3.0	42	41	2

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029965-0001-SA	AQUEOUS	8330-COE-A	16 JUN 93-6A	03 JUL 93-6A
029965-0002-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0003-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0004-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0005-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0006-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0007-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0008-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0009-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0010-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0011-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0012-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0013-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A
029965-0014-SA	SOIL	8330-COE-S	03 JUL 93-6A	03 JUL 93-6A

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DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Category: 8330-COE-A Matrix: AQUEOUS QC Lot: 16 JUN 93-6A Concentration Units: ug/L								
HMX	31.2	21.0	24.0	22.5	72	60-110	13	20
RDX	31.2	22.6	26.0	24.3	78	70-120	14	20
1,3,5-Trinitrobenzene	31.2	21.5	25.7	23.6	76	30-110	18	20
1,3-Dinitrobenzene	31.2	18.9	24.8	21.8	70	60-110	27	20
Nitrobenzene	31.2	10.8	13.8	12.3	39	40-110	24	20
Tetryl	31.2	21.0	24.5	22.8	73	10-110	15	30
2,4,6-Trinitrotoluene	31.2	20.5	24.6	22.6	72	30-110	18	30
2,6-Dinitrotoluene	31.2	18.7	26.3	22.5	72	50-110	34	20
2,4-Dinitrotoluene	31.2	17.0	21.7	19.4	62	50-110	24	20
2-Nitrotoluene	31.2	10.2	13.6	11.9	38	50-110	29	20
3-Nitrotoluene	31.2	10.0	13.1	11.6	37	50-110	27	20
4-Nitrotoluene	31.2	12.2	16.0	14.1	45	50-110	27	20
Category: 8330-COE-S Matrix: SOIL QC Lot: 03 JUL 93-6A Concentration Units: ug/g								
HMX	62.5	51.3	52.6	52.0	83	89-152	2.5	10
RDX	62.5	61.8	63.3	62.6	100	90-132	2.4	10
1,3,5-Trinit.obenzene	62.5	53.3	55.0	54.2	87	80- 94	3.1	13
1,3-Dinitrobenzene	62.5	61.7	63.1	62.4	100	88-114	2.2	10
Nitrobenzene	62.5	56.6	57.8	57.2	92	88-124	2.1	10
Tetryl	62.5	46.5	47.8	47.2	75	75-106	2.8	15
2,4,6-Trinitrotoluene	62.5	51.0	52.7	51.8	83	75- 96	3.3	13
2,6-Dinitrotoluene	62.5	53.3	54.9	54.1	87	87-119	3.0	17
2,4-Dinitrotoluene	62.5	54.9	56.5	55.7	89	85-114	2.9	11
2-Nitrotoluene	62.5	55.7	56.7	56.2	90	86-108	1.8	10
3-Nitrotoluene	62.5	52.9	53.0	53.0	85	89-118	0.2	10
4-Nitrotoluene	62.5	61.0	61.4	61.2	98	90-116	0.6	10

Calculations are performed before rounding to avoid round-off errors in calculated results.

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METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 8330-COE-A			
Matrix: AQUEOUS			
QC Lot: 16 JUN 93-6A QC Run: 03 JUL 93-6A			
Nitrobenzene	ND	ug/L	2.0
2,4-Dinitrotoluene	1.8	ug/L	1.0
2,6-Dinitrotoluene	ND	ug/L	1.0
1,3-Dinitrobenzene	ND	ug/L	1.0
1,3,5-Trinitrobenzene	ND	ug/L	2.0
2,4,6-Trinitrotoluene	ND	ug/L	4.0
RDX	ND	ug/L	1.0
HMX	ND	ug/L	1.0
Tetryl	ND	ug/L	5.0
2-Nitrotoluene	ND	ug/L	1.0
3-Nitrotoluene	ND	ug/L	2.0
4-Nitrotoluene	ND	ug/L	1.0
Test: 8330-COE-S			
Matrix: SOIL			
QC Lot: 03 JUL 93-6A QC Run: 03 JUL 93-6A			
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029569-0001-EB	AQUEOUS	EXP-USA-A	21 MAY 93-6A	10 JUN 93-6A
029569-0002-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0003-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0004-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0005-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0006-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0007-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0008-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0009-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0010-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0011-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0012-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0013-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A
029569-0014-SA	SOIL	EXP-USA-S	02 JUN 93-6A	11 JUN 93-6A

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: EXP-USA-A Matrix: AQUEOUS QC Lot: 21 MAY 93-6A Concentration Units: ug/L								
HMX	40.0	33.5	30.1	31.8	80	44-133	11	40
RDX	40.0	34.7	25.8	30.2	76	35-128	29	41
1,3,5-Trinitrobenzene	40.0	25.7	23.2	24.4	61	33- 99	10	42
1,3-Dinitrobenzene	40.0	33.8	30.5	32.2	80	37-113	10	44
Nitrobenzene	40.0	31.4	27.8	29.6	74	33-112	12	46
Tetryl	40.0	31.7	29.7	30.7	77	20-132	6.5	43
2,4,6-Trinitrotoluene	40.0	32.2	29.8	31.0	78	16-104	7.7	43
2,6-Dinitrotoluene	40.0	33.6	31.2	32.4	81	36-135	7.4	40
2,4-Dinitrotoluene	40.0	31.8	29.1	30.4	76	29-118	8.9	38
Category: EXP-USA-S Matrix: SOIL QC Lot: 02 JUN 93-6A Concentration Units: mg/kg								
HMX	5.00	5.60	5.49	5.54	111	89-133	2.0	18
RDX	5.00	5.07	4.93	5.00	100	99-121	2.8	14
1,3,5-Trinitrobenzene	5.00	4.43	4.37	4.40	88	70-102	1.4	15
1,3-Dinitrobenzene	5.00	5.67	5.67	5.67	113	82-114	0.0	14
Nitrobenzene	5.00	5.58	5.62	5.60	112	90-114	0.7	14
Tetryl	5.00	3.79	3.99	3.89	78	37-111	5.1	41
2,4,6-Trinitrotoluene	5.00	5.40	5.35	5.38	108	58-100	0.9	16
2,6-Dinitrotoluene	5.00	5.36	5.48	5.42	108	84-123	2.2	15
2,4-Dinitrotoluene	5.00	5.13	5.16	5.14	103	86-108	0.6	14

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: EXP-USATHAMA-A			
Matrix: AQUEOUS			
QC Lot: 21 MAY 93-6A QC Run: 10 JUN 93-6A			
Nitrobenzene	ND	ug/L	2.0
2,4-Dinitrotoluene	ND	ug/L	2.0
2,6-Dinitrotoluene	ND	ug/L	2.0
1,3-Dinitrobenzene	ND	ug/L	2.0
1,3,5-Trinitrobenzene	ND	ug/L	2.0
2,4,6-Trinitrotoluene	ND	ug/L	2.0
RDX	ND	ug/L	2.0
HMX	ND	ug/L	2.0
Tetryl	ND	ug/L	2.0
Test: EXP-USATHAMA-S			
Matrix: SOIL			
QC Lot: 02 JUN 93-6A QC Run: 11 JUN 93-6A			
HMX	ND	mg/kg	1.0
RDX	ND	mg/kg	1.0
1,3,5-Trinitrobenzene	ND	mg/kg	1.0
1,3-Dinitrobenzene	ND	mg/kg	1.0
Nitrobenzene	ND	mg/kg	1.0
Tetryl	ND	mg/kg	1.0
2,4,6-Trinitrotoluene	ND	mg/kg	1.0
2,6-Dinitrotoluene	ND	mg/kg	1.0
2,4-Dinitrotoluene	ND	mg/kg	1.0

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029569-0001-EB	AQUEOUS	ICP-AT	17 JUN 93-6A	17 JUN 93-6A
029569-0001-EB	AQUEOUS	SB-FAA-AT	17 JUN 93-6A	17 JUN 93-6A
029569-0001-EB	AQUEOUS	SE-FAA-AT	17 JUN 93-6A	17 JUN 93-6A
029569-0002-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0002-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0002-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0003-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0003-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0003-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0004-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0004-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0004-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0005-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0005-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0005-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0006-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0006-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0006-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0007-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0007-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0007-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0008-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0008-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0008-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0009-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0009-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0009-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0010-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0010-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0010-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0011-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0011-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0011-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0012-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0012-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0012-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0013-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0013-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0013-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0014-SA	SOIL	ICP-S	22 JUN 93-R6	22 JUN 93-R6
029569-0014-SA	SOIL	SB-FAA-S	15 JUN 93-6B	15 JUN 93-6B
029569-0014-SA	SOIL	SE-FAA-S	15 JUN 93-6B	15 JUN 93-6B

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Category: ICP-AT								
Matrix: AQUEOUS								
QC Lot: 17 JUN 93-6A								
Concentration Units: mg/L								
Aluminum	2.00	1.80	1.84	1.82	91	75-125	2.5	20
Antimony	0.500	0.477	0.465	0.471	94	75-125	2.6	20
Arsenic	0.500	0.385	0.426	0.405	81	75-125	10	20
Barium	2.00	1.85	1.90	1.87	94	75-125	2.7	20
Beryllium	0.0500	0.0471	0.0485	0.0478	96	75-125	2.9	20
Cadmium	0.0500	0.0477	0.0474	0.0476	95	75-125	0.6	20
Calcium	100	120	97.8	109	109	75-125	21	20
Chromium	0.200	0.180	0.183	0.182	91	75-125	1.7	20
Cobalt	0.500	0.444	0.458	0.451	90	75-125	3.1	20
Copper	0.250	0.235	0.239	0.237	95	75-125	1.7	20
Iron	1.00	0.939	0.933	0.936	94	75-125	0.7	20
Lead	0.500	0.479	0.469	0.474	95	75-125	2.0	20
Magnesium	50.0	59.2	48.2	53.7	107	75-125	21	20
Manganese	0.500	0.445	0.454	0.449	90	75-125	1.[illegible]	[illegible]0
Nickel	0.500	0.450	0.458	0.454	91	75-125	1.[illegible]	20
Potassium	50.0	59.0	47.0	53.0	106	75-125	23	20
Silver	0.036	0.0373	0.0348	0.0361	100	75-125	6.9	20
Sodium	100	122	99.1	111	111	75-125	21	20
Vanadium	0.500	0.482	0.493	0.488	98	75-125	2.2	20
Zinc	0.500	0.440	0.449	0.444	89	75-125	2.0	20
Category: SB-FAA-AT								
Matrix: AQUEOUS								
QC Lot: 17 JUN 93-6A								
Concentration Units: mg/L								
Antimony	0.500	0.548	0.565	0.556	111	75-125	3.1	20
Category: SE-FAA-AT								
Matrix: AQUEOUS								
QC Lot: 17 JUN 93-6A								
Concentration Units: mg/L								
Selenium	0.0300	0.0300	0.0303	0.0302	101	75-125	1.0	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: ICP-S Matrix: SOIL QC Lot: 22 JUN 93-R6 Concentration Units: mg/kg								
Aluminum	10700	9370	8680	9030	84	47-153	7.6	20
Antimony	55.2	29.4	22.2	25.8	47	18-362	28	50
Arsenic	145	140	134	137	94	59-141	4.7	20
Barium	503	490	471	480	95	76-124	4.0	20
Beryllium	129	127	122	125	97	53-131	4.0	20
Cadmium	154	143	139	141	92	68-132	2.8	20
Calcium	7390	6890	6600	6740	91	79-121	4.2	20
Chromium	151	139	133	136	90	66-133	5.1	20
Cobalt	122	113	110	111	91	70-130	2.8	20
Copper	162	157	151	154	95	70-132	4.0	20
Iron	15400	13800	12900	13300	87	66-134	7.3	20
Lead	148	130	124	127	86	66-135	4.8	20
Magnesium	3740	3330	3180	3250	87	74-126	4.5	20
Manganese	423	388	372	380	90	74-125	4.1	20
Molybdenum	159	146	141	143	90	71-129	3.1	20
Nickel	166	156	149	153	92	67-133	4.4	20
Potassium	4050	3550	3360	3460	85	68-132	5.4	20
Silver	104	99.3	96.0	97.7	94	76-124	3.4	20
Sodium	747	560	454	507	68	57-130	21	20
Vanadium	154	142	136	139	90	73-127	4.1	20
Zinc	530	489	474	481	91	65-135	3.1	20
Category: SB-FAA-S Matrix: SOIL QC Lot: 15 JUN 93-6B Concentration Units: mg/kg								
Antimony	55.2	70.6	74.2	72.4	131	18-362	5.0	50
Category: SE-FAA-S Matrix: SOIL QC Lot: 15 JUN 93-6B Concentration Units: mg/kg								
Selenium	143	147	152	150	105	68-132	3.7	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 93-6A QC Run: 17 JUN 93-6A			
Aluminum	ND	mg/L	0.20
Arsenic	ND	mg/L	0.30
Barium	ND	mg/L	0.10
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Calcium	ND	mg/L	5.0
Chromium	ND	mg/L	0.030
Cobalt	ND	mg/L	0.040
Copper	ND	mg/L	0.030
Iron	ND	mg/L	0.040
Lead	ND	mg/L	0.20
Magnesium	ND	mg/L	5.0
Manganese	ND	mg/L	0.010
Molybdenum	ND	mg/L	0.040
Nickel	ND	mg/L	0.040
Potassium	ND	mg/L	5.0
Silver	ND	mg/L	0.030
Sodium	ND	mg/L	5.0
Thallium	ND	mg/L	5.0
Vanadium	ND	mg/L	0.040
Zinc	ND	mg/L	0.010
Test: SB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 93-6A QC Run: 17 JUN 93-6A			
Antimony	ND	mg/L	0.010
Test: SE-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 17 JUN 93-6A QC Run: 17 JUN 93-6A			
Selenium	ND	mg/L	0.0050

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-S			
Matrix: SOIL			
QC Lot: 22 JUN 93-R6 QC Run: 22 JUN 93-R6			
Aluminum	ND	mg/kg	20.0
Arsenic	ND	mg/kg	30.0
Barium	ND	mg/kg	10.0
Beryllium	ND	mg/kg	0.20
Cadmium	ND	mg/kg	2.0
Calcium	ND	mg/kg	500
Chromium	ND	mg/kg	4.0
Cobalt	ND	mg/kg	4.0
Copper	ND	mg/kg	3.0
Iron	ND	mg/kg	4.0
Lead	ND	mg/kg	20.0
Magnesium	ND	mg/kg	500
Manganese	ND	mg/kg	1.0
Molybdenum	ND	mg/kg	4.0
Nickel	ND	mg/kg	4.0
Potassium	ND	mg/kg	500
Silver	ND	mg/kg	3.0
Sodium	ND	mg/kg	500
Thallium	ND	mg/kg	200
Vanadium	ND	mg/kg	4.0
Zinc	ND	mg/kg	1.0
Test: SB-FAA-S			
Matrix: SOIL			
QC Lot: 15 JUN 93-6B QC Run: 15 JUN 93-6B			
Antimony	ND	mg/kg	1.0
Test: SE-FAA-S			
Matrix: SOIL			
QC Lot: 15 JUN 93-6B QC Run: 15 JUN 93-6B			
Selenium	ND	mg/kg	0.50

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029614-0001-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0002-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0003-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0003-MS	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0003-SD	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0004-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0005-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0006-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0007-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0008-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0009-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A
029614-0010-SA	SOIL	8330-COE-S	15 JUN 93-6A	15 JUN 93-6A

'UPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 8330-COE-S								
Matrix: SOIL								
QC Lot: 15 JUN 93-6A								
Concentration Units: ug/g								
HMX	62.5	63.3	63.0	63.2	101	89-152	0.5	10
RDX	62.5	74.1	73.2	73.6	118	90-132	1.2	10
1,3,5-Trinitrobenzene	62.5	28.6	57.1	42.8	69	80- 94	67	13
1,3-Dinitrobenzene	62.5	70.4	71.7	71.0	114	88-114	1.8	10
Nitrobenzene	62.5	66.5	65.0	65.8	105	88-124	2.3	10
Tetryl	62.5	10.5	23.2	16.8	✓ 27	75-106	75	15
2,4,6-Trinitrotoluene	62.5	64.0	75.3	69.6	✓ 111	75- 96	16	13
2,6-Dinitrotoluene	62.5	68.4	67.5	68.0	109	87-119	1.3	17
2,4-Dinitrotoluene	62.5	66.4	65.5	66.0	106	85-114	1.4	11
2-Nitrotoluene	62.5	67.2	66.8	67.0	107	86-108	0.6	10
3-Nitrotoluene	62.5	62.4	61.9	62.2	99	89-118	0.8	10
4-Nitrotoluene	62.5	71.8	71.4	71.6	115	90-116	0.6	10

,alculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 8330-COE-S			
Matrix: SOIL			
QC Lot: 15 JUN 93-6A QC Run: 15 JUN 93-6A			
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0
Test: 8330-COE-S			
Matrix: SOIL			
QC Lot: 15 JUN 93-6A QC Run: 15 JUN 93-6A			
HMX	ND	ug/g	2.0
RDX	ND	ug/g	2.0
1,3,5-Trinitrobenzene	ND	ug/g	1.0
1,3-Dinitrobenzene	ND	ug/g	1.0
Nitrobenzene	ND	ug/g	2.0
Tetryl	ND	ug/g	2.0
2,4,6-Trinitrotoluene	ND	ug/g	1.0
2,6-Dinitrotoluene	ND	ug/g	1.0
2,4-Dinitrotoluene	ND	ug/g	1.0
2-Nitrotoluene	ND	ug/g	2.0
3-Nitrotoluene	ND	ug/g	2.0
4-Nitrotoluene	ND	ug/g	1.0

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Organics by Chromatography

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	8330-COE-S	029614-0003-SD	15 JUN 93-6A
MATRIX SPIKE	8330-COE-S	029614-0003-MS	15 JUN 93-6A

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Organics by Chromatography

Analyte	Sample	Concentration Matrix Spike	Concentration Matrix Spike Dup	Spiked MS	Spiked MSD	%Recovery MS	%Recovery MSD	% RPD
Test: 8330-COE-S								
Matrix SOIL								
Sample: 029614-0003								
Units: ug/g								
HMX	ND	67	64	62	62	108	103	4
RDX	ND	67	65	62	62	107	104	3
1,3,5-Trinitrobenzene	ND	71	68	62	62	114	109	4
1,3-Dinitrobenzene	ND	77	74	62	62	124	119	4
Nitrobenzene	ND	69	67	62	62	111	108	3
Tetryl	ND	73	70	62	62	117	112	5
2,4,6-Trinitrotoluene	ND	70	68	62	62	113	109	4
2,6-Dinitrotoluene	ND	72	70	62	62	116	112	3
2,4-Dinitrotoluene	ND	71	68	62	62	114	109	5

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029614-0001-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0001-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0001-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0002-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0002-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0002-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-MS	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-MS	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-MS	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-SD	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-SD	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0003-SD	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0004-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0004-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0004-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0005-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0005-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0005-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0006-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0006-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0006-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0007-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0007-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0007-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0008-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0008-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0008-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0009-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0009-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0009-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0010-SA	SOIL	ICP-S	16 JUN 93-6D	16 JUN 93-6D
029614-0010-SA	SOIL	SB-FAA-S	16 JUN 93-6D	16 JUN 93-6D
029614-0010-SA	SOIL	SE-FAA-S	16 JUN 93-6D	16 JUN 93-6D

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: ICP-S								
Matrix: SOIL								
QC Lot: 16 JUN 93-6D								
Concentration Units: mg/kg								
Aluminum	10700	7700	7580	7640	71	47-153	1.5	20
Antimony	55.2	40.9	52.2	46.6	84	18-362	24	50
Arsenic	145	132	127	129	89	59-141	3.8	20
Barium	503	487	475	481	96	76-124	2.6	20
Beryllium	129	127	125	126	98	53-131	2.1	20
Cadmium	154	146	144	145	94	68-132	1.1	20
Calcium	7390	6750	6650	6700	91	79-121	1.5	20
Chromium	151	129	127	128	85	66-133	1.5	20
Cobalt	122	114	112	113	93	70-130	1.6	20
Copper	162	154	151	152	94	70-132	2.2	20
Iron	15400	13000	13200	13100	85	66-134	1.2	20
Lead	148	129	127	128	86	66-135	1.1	20
Magnesium	3740	3100	3060	3080	82	74-126	1.2	20
Manganese	423	382	376	379	90	74-125	1.6	20
Molybdenum	159	148	149	148	93	71-129	0.0	20
Nickel	166	159	156	158	95	67-133	1.[illegible]	20
Potassium	4050	3330	3270	3300	82	68-132	1.[illegible]	20
Silver	104	98.4	96.7	97.6	94	76-124	1.8	20
Sodium	747	505	457	481	64	57-130	10	20
Vanadium	154	140	138	139	90	73-127	1.1	20
Zinc	530	496	490	493	93	65-135	1.2	20
Category: SB-FAA-S								
Matrix: SOIL								
QC Lot: 16 JUN 93-6D								
Concentration Units: mg/kg								
Antimony	55.2	54.0	59.2	56.6	103	18-362	9.2	5[illegible]
Category: SE-FAA-S								
Matrix: SOIL								
QC Lot: 16 JUN 93-6D								
Concentration Units: mg/kg								
Selenium	143	142	146	144	101	68-132	2.6	2

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-S			
Matrix: SOIL			
QC Lot: 16 JUN 93-6D QC Run: 16 JUN 93-6D			
Aluminum	ND	mg/kg	20.0
Arsenic	ND	mg/kg	30.0
Barium	ND	mg/kg	10.0
Beryllium	ND	mg/kg	0.20
Cadmium	ND	mg/kg	2.0
Calcium	ND	mg/kg	500
Chromium	ND	mg/kg	4.0
Cobalt	ND	mg/kg	4.0
Copper	ND	mg/kg	3.0
Iron	ND	mg/kg	4.0
Lead	ND	mg/kg	20.0
Magnesium	ND	mg/kg	500
Manganese	ND	mg/kg	1.0
Molybdenum	ND	mg/kg	4.0
Nickel	ND	mg/kg	4.0
Potassium	ND	mg/kg	500
Silver	ND	mg/kg	3.0
Sodium	ND	mg/kg	500
Thallium	ND	mg/kg	200
Vanadium	ND	mg/kg	4.0
Zinc	2.5	mg/kg	1.0
Test: SB-FAA-S			
Matrix: SOIL			
QC Lot: 16 JUN 93-6D QC Run: 16 JUN 93-6D			
Antimony	ND	mg/kg	1.0
Test: SE-FAA-S			
Matrix: SOIL			
QC Lot: 16 JUN 93-6D QC Run: 16 JUN 93-6D			
Selenium	ND	mg/kg	0.50

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-S			
Matrix: SOIL			
QC Lot: 16 JUN 93-6D QC Run: 16 JUN 93-6D			
Aluminum	ND	mg/kg	20.0
Arsenic	ND	mg/kg	30.0
Barium	ND	mg/kg	10.0
Beryllium	ND	mg/kg	0.20
Cadmium	ND	mg/kg	2.0
Calcium	ND	mg/kg	500
Chromium	ND	mg/kg	4.0
Cobalt	ND	mg/kg	4.0
Copper	ND	mg/kg	3.0
Iron	ND	mg/kg	4.0
Lead	ND	mg/kg	20.0
Magnesium	ND	mg/kg	500
Manganese	ND	mg/kg	1.0
Molybdenum	ND	mg/kg	4.0
Nickel	ND	mg/kg	4.0
Potassium	ND	mg/kg	500
Silver	ND	mg/kg	3.0
Sodium	ND	mg/kg	500
Thallium	ND	mg/kg	200
Vanadium	ND	mg/kg	4.0
Zinc	2.5	mg/kg	1.0
Test: SB-FAA-S			
Matrix: SOIL			
QC Lot: 16 JUN 93-6D QC Run: 16 JUN 93-6D			
Antimony	ND	mg/kg	1.0
Test: SE-FAA-S			
Matrix: SOIL			
QC Lot: 16 JUN 93-6D QC Run: 16 JUN 93-6D			
Selenium	ND	mg/kg	0.50

MATRIX SPECIFIC QC
ASSIGNMENT REPORT
Metals Analysis and Preparation

QC SAMPLE TYPE	TEST	LABORATORY SAMPLE NUMBER	QC LOT
MATRIX SPIKE DUPLICATE	ICP-AFIR-S	029614-0003-SD	16 JUN 93-6D
MATRIX SPIKE	ICP-AFIR-S	029614-0003-MS	16 JUN 93-6D
MATRIX SPIKE DUPLICATE	SB-FAA-S	029614-0003-SD	16 JUN 93-6D
MATRIX SPIKE	SB-FAA-S	029614-0003-MS	16 JUN 93-6D
MATRIX SPIKE DUPLICATE	SE-FAA-S	029614-0003-SD	16 JUN 93-6D
MATRIX SPIKE	SE-FAA-S	029614-0003-MS	16 JUN 93-6D

MATRIX SPIKE / MATRIX SPIKE DUPLICATE REPORT
Metals Analysis and Preparation

Analyte	Sample	Concentration Matrix Spike	Matrix Spike Dup	Spiked MS	MSD	%Recovery MS	MSD	% RPD
Test: ICP-AFIR-S Matrix SOIL Sample: 029614-0003 Units: mg/kg								
Aluminum	7460	7460	7820	200	200	NC	NC	NC
Barium	107	281	281	200	200	87	87	0
Beryllium	0.58	5.2	5.2	5.0	5.0	92	92	0
Cadmium	ND	4.9	4.4	5.0	5.0	98	88	12
Calcium	16700	26400	25900	10000	10000	97	92	5
Chromium	7.9	24.0	25.0	20.0	20.0	81	86	6
Cobalt	4.3	46.0	46.5	50.0	50.0	84	85	1
Copper	8.8	29.9	30.2	25.0	25.0	84	86	1
Iron	8210	7440	8380	100	100	NC	NC	NC
Lead	ND	50.7	50.3	50.0	50.0	101	101	1
Magnesium	1830	6110	6230	5000	5000	86	88	3
Manganese	194	228	233	50.0	50.0	68	77	12
Nickel	9.0	50.4	50.8	50.0	50.0	83	84	1
Potassium	1600	5810	5940	5000	5000	84	87	3
Silver	ND	3.9	3.7	5.0	5.0	77	75	3
Sodium	ND	8790	8890	10000	10000	88	89	
Vanadium	18.8	61.0	63.0	50.0	50.0	84	88	
Zinc	19.0	59.1	60.4	50.0	50.0	80	83	3
Test: S3-FAA-S Matrix SOIL Sample: 029614-0003 Units: mg/kg								
Antimony	ND	20.6	29.4	50.0	50.0	41	59	35
Test: SE-FAA-S Matrix SOIL Sample: 029614-0003 Units: mg/kg								
Selenium	ND	2.2	1.8	3.0	3.0	73	60	19

ND = Not detected
NC = Not calculated, calculation not applicable

All calculations are performed before rounding to avoid round-off errors in calculated results.

MELROSE AIR FORCE RANGE

BASELINE CHARACTERIZATION SAMPLING AND ANALYSIS PLAN

PREPARED BY:

27 CES/CEV
CANNON AFB, NM
22 Feb 94

1. INTRODUCTION

The purpose of this sampling and analysis plan (SAP) is to provide baseline site characterization data for the Melrose Air Force Range (MAFR) Open Detonation (OD) Unit to compliment the data gathered from previous studies. The baseline data will be used to support the Resource Conservation and Recovery Act (RCRA) Subpart X Permit Application for MAFR, an ancillary part of Cannon Air Force Base (CAFB), New Mexico. Environmental baseline data is necessary to determine if previous demilitarization activities at the OD area have affected ambient soils and to identify contaminated areas for further study and/or remedial action.

This plan explains the rationale for how and why samples are collected and explains the spatial relationships for sample collection. This plan is based upon historical knowledge of MAFR operations, United States Air Force (USAF) OD operations, existing environmental conditions, previous studies conducted to determine contamination of OD units ("Bang Box" studies by Johnson, 1991 & 1993, and USGS Baseline Study 1993). Where applicable, the procedures and quality assurance/quality control (QA/QC) techniques in EPA's November 1986 *Test Methods for Evaluating Solid Waste* have been used to prepare this SAP.

2. SITE DESCRIPTION

The OD unit is within the boundaries of MAFR in Roosevelt County, New Mexico, approximately 25 miles southwest of Cannon AFB. The location of MAFR and the exact location of the OD unit are shown in Section B of the Part B permit application. The area within which the OD unit is located consists of a 700-ft circular area which is regularly cleared of vegetation and debris. Encircling this cleared area is an earthen berm used to prevent run-on and run-off of storm water. The environmental conditions, including geology, hydrogeology, topography and drainage features, and climate at MAFR are described in Section B of the Part B RCRA permit application.

3. SAMPLING APPROACH AND RATIONALE

3.1 RATIONALE

Melrose AFR has never been used for the research and development of nuclear, chemical warfare, or other exotic warfare type weapons. The only munitions delivered or disposed of at MAFR have been conventional live and training munitions. Therefore, the emphasis of the sampling and analysis should search only for those constituents present in these wastes. This philosophy supports the analytical methods described in Section 3.3 and Table 4. Any further investigations should be addressed during closure of the unit and only if appropriate at that time. This is also supported by studies conducted on OD units to determine contamination and air toxic release often referred to as the "Bang Box" studies (Johnson 1991 & 1993).

Previous OD operations were conducted using 10-12 feet wide trenches dug to a depth of 6-8 feet. Munitions were then detonated in these trenches. After the detonation trench was cleared of scrap metal, the trenches were backfilled. Earlier baseline studies adequately addressed surface soil contamination, but did not properly address the potential contamination located at a depth consistent with old trenches. Research information indicates all of the previous OD trenches were constructed within 50 feet of the center of the OD unit. Therefore, the primary focus of this study is to search for contamination at a depth of 6-15 feet within 50 feet of the center of the OD unit.

The number of boreholes is based upon the Remedial Action Cost Engineering and Requirements (RACER) System calculations using the site

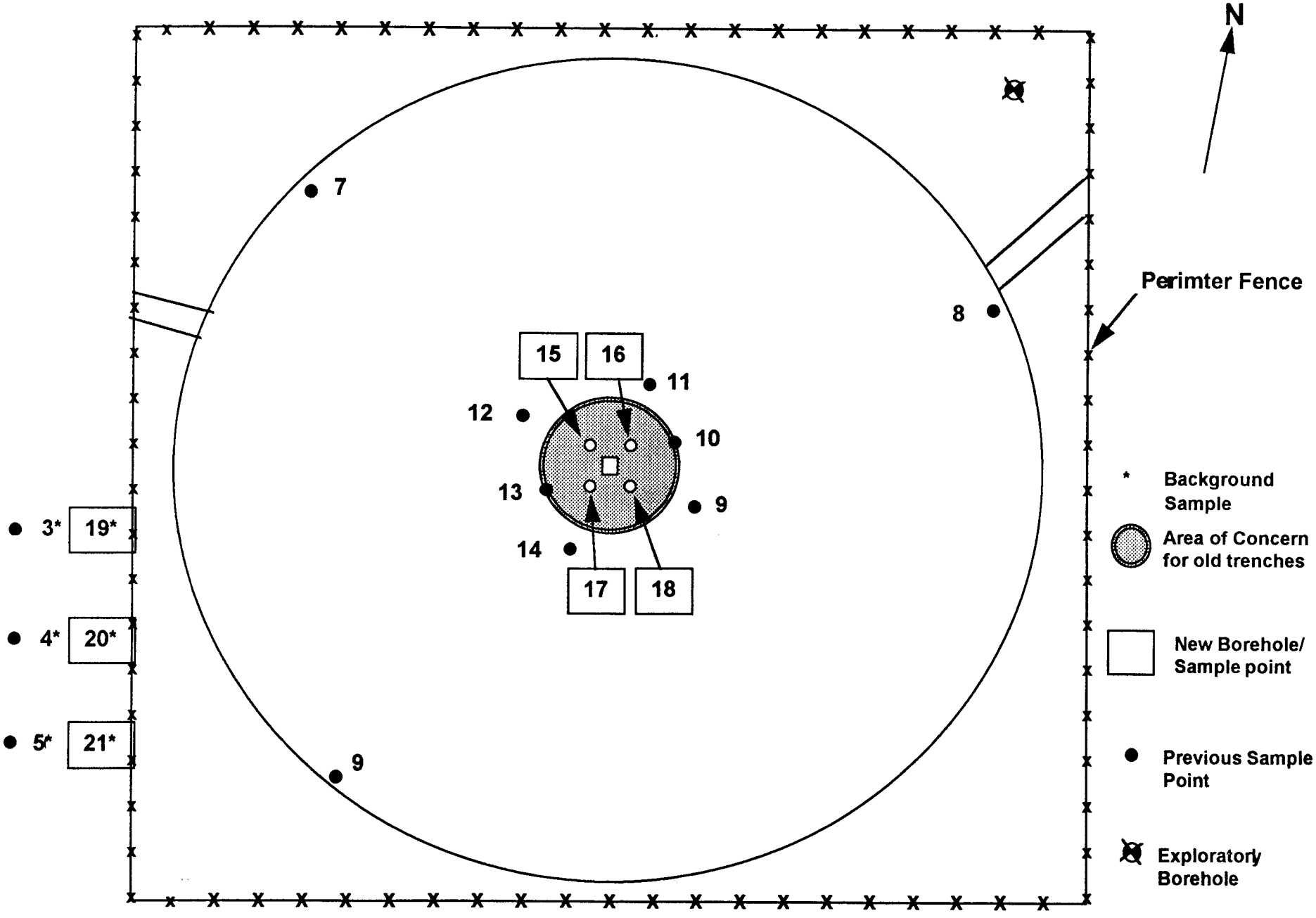

Figure 1 Baseline Characterization Sample Locations

^Denotes Previous Background samples
*Denotes Samples from this Round of Sampling

Table 1
VERTICAL SAMPLE LOCATIONS

BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH	CORRESPONDING USGS NUMBER	REMARKS
1	1	0-1'	OB/OD0101	
1	2	5'	OB/OD0102	
1	3	10'	OB/OD0103	
2		0-1'	OB/OD0201	
2		5'	OB/OD0202	
2		5'	OB/OD0203	
2		10'	OB/OD0204	
3^		0-1'	OB/OD0301	Previous Background Sample
3^		5'	OB/OD0302	Previous Background Sample
3^		10'	OBOD0303	Previous Background Sample
4^		0-1'	OB/OD0401	Previous Background Sample
4^		5'	OB/OD0402	Previous Background Sample
5^		0-1'	OB/OD0501	Previous Background Sample
5^		5'	OB/OD0502	Previous Background Sample
6		0-1'	OB/OD0601	
6		5'	OB/OD0602	
7		0-1'	OB/OD0701	
7		5'	OB/OD0702	
8		0-1'	OB/OD0801	
8		0-1'	OB/OD0802	
8		5'	OB/OD0803	
9		0-1'	OB/OD0901	
9		5'	OB/OD0902	
10		0-1'	OB/OD1001	
10		5'	OB/OD1002	
11		0-1'	OB/OD1101	
11		5'	OB/OD1102	
12		0-1'	OB/OD1201	
12		5'	OB/OD1202	
13		0-1'	OB/OD1301	
13		5'	OB/OD1302	
14		0-1'	OB/OD1401	
14		5'	OB/OD1402	
15*		0-1'		
15*		5'		
15*		10'		
15*		15'		
16*		0-1'		
16*		5'		
16*		10'		
16*		15'		
17*		0-1'		
17*		5'		
17*		10'		
17*		15'		
18*		0-1'		
18*		5'		
18*		10'		
18*		15'		
19*		15'		Additional Background Sample
20*		10'		Additional Background Sample
20*		15'		Additional Background Sample
21*		10'		Additional Background Sample
21*		15'		Additional Background Sample

^Denotes Previous Background Sample
*Denotes Sample from this Round of Sampling

specific conditions and potential contaminants. RACER is the standard for USAF and US Army Corps of Engineers in determining site characterization parameters. A description of the baseline RACER parameters used to establish this study are contained in Appendix 1 to this plan. The RACER calculations were based upon investigating the entire fenced area (approximately 12 acres) of the OD facility. The RACER estimate requirements to characterize the entire area of the OD facility were 5 subsurface soil boreholes, and 4 surface soil samples. The primary focus of this additional baseline characterization is to search the old trench area (only the 50 radius circle around center of OD unit). This is the basis for downward adjustment of sample numbers from 5 boreholes to 4 boreholes.

Four additional subsurface borings (Boreholes #15-#18) are to be studied under this SAP. All of the borings are located within 50 feet of the center of the OD unit. Samples will be collected at 0, 5, 10, and 15 ft intervals. Additional background samples (Borehole #19-#21) will be taken near the previous background locations. Background samples will collected at depths to compliment previous samples (i.e. deeper than in the previous study). Background sampling will be conducted at a distance sufficiently separate from previous OD activities such that contamination at the sampling locations will not have occurred. Table 1 summarizes vertical locations of all samples. Boring locations for the additional borings are indicated by a box in Figure 1.

3.2 INTEGRATION WITH PREVIOUS STUDIES

Vertical and horizontal sample locations from previous baseline surveys are located in Figure 1 with analytical results summarized in Tables 2 and 3. Upon review of the 1993 USGS Baseline Study, NMED found the study did not properly address potential contamination associated with the old OD trenches. Therefore, this additional baseline study will be used to compliment existing data.

The previous study consisted of 33 samples, of which, 7 were for background. These samples were analyzed for RCRA metals (EPA Method 6010) and explosives (EPA Method 8330). The samples were located as depicted in Figure 1 (horizontal locations) and Table 1 (vertical locations. This sampling plan will compliment the previous study by further examining for contamination associated with old OD trenches and by providing additional sample locations, additional analytes, better QA/QC, and additional background sampling.

Together, the proposed and previous studies will allow a complete evaluation of existing contamination at the OD facility. Should any new information/contamination be detected in this episode of baseline characterization, additional sampling may be warranted.

Table 2
Previous Study Sample Results
METALS

BOREHOLE #	DEPTH OF SAMPLE	Antimony	Aluminum	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	NICKEL	Potasium	Selenium	Solver	Sodium	Tallium	Vanadium	Zinc
1	0-1'	ND	10300	ND	113	0.6	ND	41100	8.3	ND	7.4	8790	ND	2440	149	ND	9.5	1920	ND	ND	ND	ND	21.4	20.9
1	5'	ND	5330	ND	90	0.34	ND	37900	5.2	ND	ND	5580	ND	2600	127	ND	5.7	1050	ND	ND	ND	ND	17.1	12.8
1	10	ND	6970	ND	418	0.47	ND	119000	5	ND	4.6	6300	ND	3210	104	ND	21.8	1510	ND	ND	ND	ND	20.5	16
2	0-1'	ND	9620	ND	127	0.56	ND	48300	7.5	ND	6.7	8390	ND	2380	154	ND	9.4	1810	ND	ND	ND	ND	20.4	20.6
2	5'	ND	7420	ND	120	0.54	ND	47600	6.3	ND	7.3	7010	ND	2070	142	ND	8.7	1460	ND	ND	ND	ND	19.2	17.9
2	5'	ND	4280	ND	561	ND	ND	115000	ND	ND	4.1	4770	ND	2290	749	ND	ND	ND	ND	ND	ND	ND	18.3	11.9
2	10'	ND	5320	ND	415	ND	ND	220000	ND	ND	ND	5060	ND	3060	193	ND	24	ND	ND	ND	ND	ND	17.6	14.3
3	0-1'	ND	5830	ND	91.2	0.49	ND	8700	6.2	ND	5.8	6690	ND	1870	214	ND	7.9	1590	ND	ND	ND	ND	13.1	18.9
3	5'	ND	5420	ND	48.2	0.35	ND	48500	5.1	ND	3.3	5940	ND	2670	131	ND	6.6	1190	ND	ND	ND	ND	16.2	13.2
3	10'	ND	8960	ND	105	0.55	ND	67300	7.5	4.1	6.1	8570	ND	4530	201	ND	9.4	2020	ND	ND	ND	ND	26.6	22.3
4	0-1'	ND	9610	ND	98.8	0.64	ND	4110	8.7	4.2	8.4	8430	ND	2150	229	ND	10.4	2130	ND	ND	ND	ND	17.3	21.8
4	5'	ND	7080	ND	112	0.47	ND	57300	5.7	ND	6.3	6600	ND	3450	185	ND	8	1520	ND	ND	ND	ND	27.4	17.9
5	0-1'	ND	9550	ND	94.7	0.62	ND	3030	9.1	4.3	8.4	8650	ND	1870	225	ND	9.6	1920	ND	ND	ND	ND	18.2	20
5	5'	ND	5080	ND	176	0.35	ND	56700	4.2	ND	4.4	4710	ND	2630	143	ND	7.1	1100	ND	ND	ND	ND	16.1	13
6	0-1'	ND	10900	ND	119	0.69	ND	7830	10.1	5.1	8.5	9770	ND	2350	249	ND	11.4	2230	ND	ND	ND	ND	20.5	23.5
6	5'	ND	7160	ND	127	ND	ND	97100	4.9	ND	4.5	5900	ND	3140	122	ND	8	1640	ND	ND	ND	ND	18.6	31.1
7	0-1'	ND	9150	ND	110	0.6	ND	33600	7.3	4.3	8.5	7070	ND	1990	156	ND	9.8	1640	ND	ND	ND	ND	20.1	18.3
7	5'	ND	10100	ND	146	0.67	ND	46500	7.8	4.5	9	8100	ND	2560	193	ND	11.2	2090	ND	ND	ND	ND	24.2	21.5
8	0-1'	ND	9800	ND	117	0.62	ND	29100	7.8	4.1	8.7	7900	ND	2130	171	ND	9.8	1720	ND	ND	ND	ND	20.9	23.7
8	0-1'	ND	5760	ND	211	0.39	ND	48000	4.9	ND	4.5	5050	ND	2680	124	ND	6.4	1300	ND	ND	ND	ND	15.3	13.9
8	5'	ND	6650	ND	73.2	0.45	ND	51000	5.3	ND	4.7	5700	ND	3230	156	ND	7.4	1400	ND	ND	ND	ND	22.5	16.1
9	0-1'	ND	8170	ND	110	0.57	ND	25200	7.1	4.1	9.5	7160	ND	1980	175	ND	8.9	1740	ND	ND	ND	ND	17.2	20.8
9	5'	ND	5320	ND	142	0.38	ND	51300	4.1	ND	4.9	4420	ND	2190	143	ND	6.7	1230	ND	ND	ND	ND	14.6	13.2
10	0-1'	ND	5680	ND	176	0.46	ND	57500	5	ND	6.6	5810	ND	1960	127	ND	7.1	1110	ND	ND	ND	ND	16.6	14.6
10	5'	ND	4520	ND	66.5	0.37	ND	77700	4	ND	4.1	4860	ND	2510	107	ND	5.8	1010	ND	ND	ND	ND	20.6	11.8
11	0-1'	ND	7460	ND	107	0.58	ND	16700	7.9	4.3	8.8	8210	ND	1830	194	ND	9	1600	ND	ND	ND	ND	18.8	19
11	5'	ND	3580	ND	145	0.32	ND	52300	ND	ND	3.1	5210	ND	1790	158	ND	5	663	ND	ND	ND	ND	21.3	20.6
12	0-1'	ND	3300	ND	49.5	0.27	ND	11200	4.2	ND	4.6	3670	ND	855	84.8	ND	5.3	731	ND	ND	ND	ND	8.7	34.5
12	5'	ND	4680	ND	513	0.43	ND	132000	ND	ND	4.3	4660	ND	2320	201	ND	ND	ND	ND	3.1	ND	ND	17	12.7
13	0-1'	ND	5000	ND	141	0.39	ND	41100	5.1	ND	6.7	5940	ND	1530	131	ND	6.4	995	ND	ND	ND	ND	16.4	15.5
13	5'	ND	4200	ND	155	0.35	ND	77000	ND	4	5	4590	ND	2040	365	ND	5.9	732	ND	ND	ND	ND	20.1	12
14	0-1'	ND	6580	ND	120	0.52	ND	23800	7.2	ND	8.1	7070	ND	1860	177	ND	7.8	1530	ND	ND	ND	ND	16.8	18.9
14	5'	ND	5720	ND	63.9	0.44	ND	101000	4.5	ND	4.1	5810	ND	3030	117	ND	ND	1200	ND	ND	ND	ND	23.5	15

Table 3
Previous Study Sampling Results
EXPLOSIVE COMPOUNDS
(EPA 8330)

BOREHOLE #	DEPTH OF SAMPLE	HMX	RDX	1,3,5 TRINITROBENZENE	1,3-DINITROBENZENE	NITROBENZENE	TETRYL	4,6-DINITROBENZENE	2,4,6-TRINITROTOLUENE	2,6-DINITROTOLUENE	2,4-DINITROTOLUENE
1	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2	10'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3	10'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14	0-1'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14	5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4
Baseline Sampling Analytes

COMPOUND GROUP	COMPOUND	EPA METHOD
METALS		6010
	Antimony	6010
	Aluminum	6010
	Arsenic	6010
	Barium	6010
	Beryllium	6010
	Cadmium	6010
	Calcium	6010
	Chromium	6010
	Cobalt	6010
	Copper	6010
	Iron	6010
	Lead	6010
	Magnesium	6010
	Manganese	6010
	Molybdenum	6010
	Nickel	6010
	Potassium	6010
	Selenium	6010
	Silver	6010
	Sodium	6010
	Thallium	6010
	Vanadium	6010
	Zinc	6010
	Mercury	7471
Gross Alpha and Beta		9310
Sulfides		9031
SemiVOCs		8260/8270
Soil Moisture		ASTM D 2216
Explosive Compounds		8330
	HMX	8330
	RDX	8330
	1,3,5-Trinitrobenzene	8330
	1,3,5-Dinitrobenzene	8330
	Nitrobenzene	8330
	Tetryl	8330
	2,4,6-Trinitrotoluene	8330
	2,6-Dinitrotoluene	8330
	2,4-Dinitrontoluene	8330
	2-Nitrotoluene	8330
	3-Nitrotoluene	8330
	4-Nitrotoluene	8330

3.3 ANALYSIS RATIONALE

In previous studies, samples have been analyzed for Metals (EPA Method 6010) and Explosives (EPA Method 8330). This was sufficient to characterize surface soils because all volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) would not be present. The explosive episode would vaporize all VOCs The potential for SVOCs to be present in the soil after nearly one year since the last detonation episode is low. Thermal destruction and natural degradation processes are two reasons SVOCs would not be present after one year. However, since the basis for this study is to characterize the old OD trenches, SVOCs will be added to the analyte listing (See Table 1).

Previously NMED has requested an analysis of the entire list of compounds in HWMR Appendix VIII type of analysis spectrum. Many of these constituents can be ruled out because of the process knowledge and munitions involved in detonation. As discussed above we can rule out VOCs because they become vaporized during the detonation episode and the Bang Box Study (Johnson 1991 and 1993). No Polychlorinated Biphenols are present in the munitions treated at the range, nor have any waste oils or fluids potentially containing PCBs been used. Pesticides and herbicides are not treated at the OD unit. Although Gross Alpha and Beta measurements are on the list of analytes, no munitions or weapons associated with nuclear compound have ever been treated or utilized on Melrose AFR.

Based upon this rationale, samples will be analyzed for a modified Appendix VIII list. These analytes are listed in Table 4

SECTION 4: SAMPLING PROCEDURES AND METHODOLOGY

4.1 SAMPLE LOCATION:

Sample locations will be those depicted with squares in Figure 1. The vertical extent of sampling, ranging from the upper 6 inches to a depth of 15 feet, is presented for each sample location in Table 2. These sample locations should sufficiently identify any contamination in subsurface soils.

4.2 QUALITY CONTROL SAMPLES:

This section addresses requirements for field QC samples. Field QC is monitored by a variety of QC samples taken with sufficient frequency to verify the quality of field samples. Field rinsates will be collected during each sampling

event to ensure decontamination procedures in the field are adequate to prevent carryover of contamination from one sampling area to the next. Field rinsate blanks shall be collected by rinsing cleaned equipment with American Society for Testing and Materials (ASTM) Type II water and collecting the runoff as a sample. Field duplicates (samples taken at the same sampling location) will be collected during each sampling event. These duplicates are used to ensure that the sampling procedure is reproducible and that the sample is representative of the location. One duplicate sample will be taken for every ten baseline samples collected. For each mobilization of sampling (daily) one equipment blank sample will be collected.

4.4 SAMPLING PROCEDURES

Required sampling equipment includes a soil auger for excavation, 100 - 500-mL glass vials, plastic caps, small stainless steel or Teflon-lined trowel, small stainless steel or Teflon-lined spatulas/scoops/spoons, and gummed labels for sample identification. Sampling procedures will be performed in accordance with ASTM D 1452, "Standard Practice for Soil Investigation and Sampling by Auger Borings," where applicable. Sampling procedures for the three sampling areas are as follows:

4.5 CONTAMINATION CONTROL

Sampling tools and equipment will be protected from contamination sources before sampling and decontaminated before and between sampling points. Sample containers should also be protected from contamination sources. Sampling personnel will wear chemical-resistant gloves when handling the sampling equipment and samples. Gloves will be decontaminated or disposed of between samples.

To prevent cross contamination, sampling equipment will be subject to decontamination procedures following sample collection at each location. Sampling equipment will be decontaminated in a decontamination zone by being:

- brush-scrubbed in tap water and Liquinox detergent wash in a tub to remove any soil from the equipment;
- rinsed in tap water in a separate tub;
- rinsed in deionized water;
- rinsed in isopropanol rinse;
- air-dried in an area upwind of the decontamination process; and
- stored for future sampling after being wrapped in aluminum foil (shiny side out).

4.6 HEALTH AND SAFETY PROCEDURES

Personnel performing sampling activities will utilize personal protective equipment such as rubber gloves, boots, aprons, and eye protection, if deemed necessary. Personnel will not be permitted to conduct any sampling until they have been cleared by the range contractor and EOD personnel. Sampling personnel will be properly trained in hazardous waste sampling, and will have appropriate medical monitoring and certification. Sampling personnel will also be briefed by Cannon AFB on the hazards of sampling explosive compounds.

5. SAMPLING HANDLING AND CHAIN OF CUSTODY

Chain Of Custody (COC) procedures will be followed to track possession of the samples from the time the samples are collected until the analytical data from the samples are received and recorded. For all soil samples, procedures will begin once sampling is complete. A sample will be considered under custody if it is:

- in the possession of the sampling team;
- in view of the sampling team; or
- transferred to a secure area.

An area is considered secure only when it is locked and access is controlled. The sampling team leader is responsible for custody of the collected samples in the field until they have been properly transferred to the shipping coordinator, who is responsible for sample custody until the samples are properly packaged, documented, and released to a courier or directly to the analytical laboratory. A COC record such as the one shown in Fig. 2 will be used for the sampling effort.

5.1 SAMPLE CONTAINER AND PRESERVATION REQUIREMENTS

The following arrangements will be made ahead of time for the selected laboratory to conform to the following special requirements:

- Method 6010 Elemental Metals: Refrigerate the samples at 4°C until analysis.
- Method 7471 Mercury: Refrigerate the samples at 4°C until analysis.
- Method 8330 Explosive Residues: If soil samples are wet, they should be air dried at room temperature or colder. Refrigerate the samples at 4°C until analysis.
- Method 8260/8270 Semi-Volatile Organic Compounds: Refrigerate the samples at 4°C until analysis.

Table 5 summarizes the container, preservative, and holding time requirements for the samples to be collected.

Table 5.
SUMMARY OF SAMPLE CONTAINER, PRESERVATIVE, AND HOLDING TIME REQUIREMENTS.

SW 846 Method	Analyte	Container	Preservative	Holding time
6010	elemental metals	600-ml wide-mouthed glass or plastic jar	none, cool, 4°C	14 days to extraction 26 months after extraction
7471	mercury	400-ml wide-mouthed glass or plastic jar	none, cool, 4°C	14 days to extraction 28 days after extraction
8330	explosive residues	60-ml wide-mouthed amber glass jar with Teflon-lined cap	none, cool, 4°C	14 days to extraction 40 days after extraction
8260/ 8270	semi-volatile organics	60-ml wide-mouthed amber glass jar with Teflon-lined cap	none, cool, 4°C	14 days to extraction 40 days after extraction

5.2 PACKAGING AND TRANSPORTATION

At the end of each sampling day, samples will be packaged in shipping containers with ice packs. The samples will be carefully packaged so that they will not break during shipping. Each shipping container will be sealed with a custody seal and shipped to the analytical laboratory by an overnight delivery service.

6. DOCUMENTATION OF ACTIVITIES

6.1 SAMPLE CODING

Labels for sample containers will be uniquely coded to identify the individual composite sample's location, the treatment unit, and date. Examples of a sample code is listed below.

· OD1401 - Sample collected from borehole #14 at interval 1 (0-1')

6.2 SAMPLE IDENTIFICATION

The samples collected will be identified by a tag or other means (e.g., tape) along with the following information:

- Collector name,
- Sample code,
- Place of collection (facility and location),
- Date sample taken, and
- Time sample taken.

Any other information deemed necessary will also be added to the tag.

6.3 FIELD LOGBOOKS

Bound, water-resistant field logbooks and waterproof black ink pens will be used to document the methodology, procedures, and events pertaining to sample and data acquisition. The logbooks will be considered formal documents representing a complete and organized record of all field activities. The entries will include, but not be limited to the following:

- personnel present;
- name of sampler(s)
- date and time of every recording;
- work location;
- description of work and treatment process;
- purpose of sampling;
- environmental conditions (previous 24 hr and present weather conditions, amount and date of last precipitation, and any other conditions or activities that would affect samples);
- soil sample descriptions;
- description and location of area sampled;
- sample numbers;
- field QC data;
- other important notes on field activities, conditions, or problems; and initials/signature of person entering data.

Entries made in the logbook should be of sufficient detail to reconstruct the taking of a sample by the reading of the entries and information recorded in it. No erasures or deletion marks are permitted. If a mistake is made in a logbook, it is corrected by placing a line through the error and rewritten in the note section.

7. LABORATORY ANALYSIS

7.1 LABORATORY

Design and execution of the testing program will be coordinated with an analytical chemist with experience in contaminated soil testing. The laboratory report will state the following in distinguishable print:

- dates of sampling and testing,
- sample descriptions and numbers,
- name and address of the laboratory performing the tests,
- name and qualifications of the person performing the test,
- test method used for all tests,
- detection limits achieved, and
- name and model number of major instruments used.

EPA SW-846 and American Standard for Testing Materials (ASTM) address all procedures proposed in this SAP. Extracts will be analyzed using Method 7471 for mercury and Method 6010 for elemental metals. The Method of Standard Addition will be performed for each metal on one of the submitted samples per sampling event. The laboratory will be required to achieve the required or estimated detection limits as specified in EPA SW-846. If equivalent methods are used, this must be justified in advance. Approval for any equivalent methods employed by the laboratory will be at the discretion of Cannon AFB and NMED.

7.2 Quality Assurance/Quality Control (QA/QC)

For all tests, the samples will be spiked with known quantities of the hazardous constituent and spike concentration and percent recovery reported. The surrogate spike recoveries will be reported for all organic tests. Results from method blanks on the samples will be submitted. Blanks will not be subtracted. The method of how the reported lower detectable limit was determined must also be reported. To ensure that the established data quality objectives (DQOs) can be attained, the level of analytical quality achieved will be at least Level III. One set of samples (samples collected in any one day or one sample package) per year will undergo the more rigorous QA/QC to ensure data of Level IV data quality. The laboratory will report data equivalent to Contract Laboratory Program (CLP) Routine Analytical Services deliverables. Data will be sufficiently documented to allow personnel to review and evaluate data quality.

7.3 SAMPLING DATA QUALITY OBJECTIVES (DQOs)

DQOs are quantitative and qualitative statements specified to ensure that data of known and appropriate quality are obtained during sampling. The overall objective of sampling is to provide an accurate, precise, and representative confirmation that the OD unit treatment process is not contaminating surrounding soils above RCRA action or background levels. DQOs will be followed in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC). The PARCC parameters indicate data quality. The procedures described in this section are designed to obtain PARCC, for each sampling and analytical method and analysis.

7.3.1 Precision

Precision is a measure or estimate of the reproducibility of measurements under a given set of conditions. Specifically, precision is a qualitative measure of the variability of a group of measurements compared to their average value. A simple measure of precision is the standard deviation. The methods and protocols found in the most recent version of EPA SW-846 will be used by the laboratory performing the sample analyses.

The overall precision of measurement data is a mixture of sampling and analytical factors. The objective for precision in the chosen laboratory for certain samples is to equal the precision demonstrated for the CLP methods on similar samples. Laboratories commonly determine precision from duplicate samples; thus, precision is usually expressed as relative percent difference (RPD). The calculation for RPD is:
where V1 and V2 are the reported concentrations for each duplicate sample.

7.3.2 Accuracy

Accuracy is the ability to obtain a true value. The accuracy of an entire measurement system indicates any bias that exists; this is generally difficult to measure through the entire data collection process, since there are potentially many sources of error. These include the sampling process, field and laboratory cross contamination, preservation, handling, sample matrix, sample preparation, and analytical techniques. Sampling accuracy can be assessed by evaluating the results of field blanks; and analytical accuracy, through use of known and unknown QC samples and matrix spiked samples.

Laboratory accuracy is checked by adding a known amount of surrogate compounds to a sample and ensuring that amount is recovered in the analysis.

Surrogate compounds are compounds unlikely to be found in actual samples. This addition of a compound(s) is referred to as spiking, and the samples are referred to as spikes. The objective for accuracy in the chosen laboratory for certain samples is to equal the accuracy demonstrated for the CLP methods on similar samples being analyzed for similar concentrations of contaminants. Laboratory accuracy is expressed as percent recovery (PR), calculated by:

where So is the background value obtained by analyzing the sample (before the spike is added), Sa is the concentration of the spike added to the sample, and Ss is the value obtained by analyzing the sample after the spike has been added.

7.4 SAMPLE RETURN OR DISPOSAL

Unless directed otherwise by Cannon AFB, the laboratory will dispose of all soil samples following analysis. The laboratory will provide certification that its facilities qualify for the exemption in 40 Code of Federal Regulations (CFR) 261.4(d), which excludes waste samples from many hazardous waste management requirements. In addition, all laboratories will provide the base with an explanation of the disposal practices employed with respect to sample residual.

8. REFERENCES

New Mexico Environment Department, Hazardous and Radioactive Materials Bureau. "Notice of Deficiency Comments for Melrose Air Force Range RCRA Operating Permit." December 22, 1992, Santa Fe, New Mexico.

Snedecor, G.W. and Cochran, W.G. *Statistical Methods*, 6th Edition, Sect. 4.14

U.S. Environmental Protection Agency (EPA) November 1986. *Test Methods for Evaluating Solid Waste,* SW-846, 3rd Edition, Office of Solid Waste and Emergency Response, Washington, D.C.

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U.S. Environmental Protection Agency (EPA) November 1986. *Test Methods for Evaluating Solid Waste,* SW-846, 3rd Edition, Office of Solid Waste and Emergency Response, Washington, D.C.

APPENDIX E1-1
GEOLOGY AND ANALYTICAL RESULTS FOR SOILS AT THE OPEN BURN/OPEN DETONATION THERMAL TREATMENT FACILITY

United States Air Force

Environmental Restoration Program

GEOLOGY AND ANALYTICAL RESULTS FOR SOILS AT THE OPEN BURN/OPEN DETONATION THERMAL TREATMENT FACILITY

Melrose Air Force Range
New Mexico

August 1993

RCRA SUBPART X PART B APPLICATION
OPEN BURN/OPEN DETONATION THERMAL TREATMENT FACILITY
MELROSE AIR FORCE RANGE, NEW MEXICO

August 1993

GEOLOGY AND ANALYTICAL RESULTS FOR SOILS AT THE OPEN BURN/OPEN DETONATION THERMAL TREATMENT FACILITY, MELROSE AIR FORCE RANGE, NEW MEXICO

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NOTICE

This report has been prepared for Cannon Air Force Base by the U.S. Geological Survey, Water Resources Division, New Mexico District, for the purpose of providing technical information for completion of their Resource Conservation Recovery Act (RCRA) Subpart X Part B operating permit at Melrose Air Force Range. Because the report relates to actual or possible releases of potentially hazardous substances, its release prior to an Air Force final decision on remedial action may be in the public's interest. The limited objectives of this report and the ongoing nature of the baseline study for the permit application, along with the evolving knowledge of site conditions and chemical effects on the environment and health, must be considered when evaluating this report because subsequent facts may become known that may make this report premature or inaccurate. Acceptance of this report in performance of the contract under which it is prepared does not mean that the Air Force adopts the conclusions, recommendations, or other views expressed herein, which are those of the contractor only and do not necessarily reflect the official position of the United States Air Force.

PREFACE

The purpose of this investigation is to determine the site geology and the possible contamination of soils in or immediately adjacent to the Open Burn/Open Detonation Thermal Treatment Facility on the Melrose Air Force Range, New Mexico, where contaminants may have been released from the operation of the Open Burn/Open Detonation Thermal Treatment Facility.

Project Chief of this investigation is Jerry Larson. Technical support is provided by employees of the New Mexico District of the U.S. Geological Survey, Water Resources Division. Text and illustrations were prepared by the Publications Unit of the New Mexico District. Chemical analyses were performed by Rocky Mountain Analytical Laboratory, a division of Enseco, Arvada, Colorado. Drilling was performed by the U.S. Geological Survey.

Appreciation is extended to the base points of contact--Captain Gregory Walters and Ms. Vera Wood, Environmental Management, Cannon Air Force Base. The assistance and cooperation of all involved in the investigation at Melrose Air Force Range are greatly appreciated.

This work was performed between April and July 1993. Captain Gregory Walters, Environmental Manager, Cannon Air Force Base, is the Technical Project Manager for this investigation.

Approved:

Russell K. Livingston
District Chief, New Mexico
U.S. Geological Survey

Captain Gregory Walters
Technical Project Manager
Cannon AFB, New Mexico

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1.0 INTRODUCTION

1.1 Description of the Melrose Air Force Range Subpart X Part B Permit Application

The U.S. Force (USAF), in performing its primary mission of defense of the United States, has frequently engaged in operations that deal with toxic and hazardous materials. Cannon Air Force Base has applied for an RCRA Subpart X Part B Permit to treat reactive material in expended ordnance. This baseline study will identify the constituents of past toxic and hazardous materials burned or detonated at the Open Burn/Open Detonation site in order to control hazards to public health and the environment. The Department of Defense (DOD) issued Defense Environmental Quality Program Policy MemorandUM (DEQPPM) 80-6 in June 1980, which mandated that hazardous waste material sites on DOD installations be identified. The USAF implemented DEQPPM 80-6 in December 1980. The current policy is contained in DEQPPM 81-5, dated December 11, 1981, and was implemented by U.S. Air Force Message 211807Z in January 1982.

DOD policy is to identify and evaluate suspected problems associated with past hazardous contamination, to control hazardous contamination, and to control hazards to the public health and welfare. The baseline study will be conducted in accordance with the basis for response actions on USAF installations under the provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the Superfund Amendment and Reauthorization Act (SARA) of 1986, the Resource Conservation and Recovery Act (RCRA) of 1976, the Hazardous and Solid Waste Amendments (HSWA) of 1984, and Executive Order 12316.

The current study of the Open Burn/Open Detonation Thermal Treatment Facility (hereafter referred to as OB/OD) on Melrose Air Force Range (MAFR) is a baseline RCRA investigation.

1.2 History of Past Work at the Installation

1.2.1 Previous investigative activities and documentation

No previous investigations have been performed at this installation. An Environmental Impact Statement was completed on October 17, 1989, by Science Applications International Corporation (SAIC) for the MAFR.

1.3 Installation Description

MAFR is located approximately 10 miles southwest of Melrose and approximately 30 miles west-southwest of Clovis in east-central New Mexico (fig. 1.3.1). The Range consists of 77,120 acres in Roosevelt County, New Mexico. The Air Force has 15,680 acres of restrictive easement of the total acreage, which can be used for cattle grazing or gas/oil exploration or extraction. Some crops are grown in the northern sections of the Range but the primary use is for cattle grazing. A Range support facility near the center of the Range houses a fire station, maintenance area, TV camera station for monitoring ordnance practices, and other support facilities (fig. 1.3.2). The basic mission of MAFR is to support bombing and air-to-ground gunnery training missions by Air Force, Air Force Reserve, Air National Guard, Navy, and Marine units. The Range consists of a composite day/night simulated special and conventional weapon delivery range and a day/night tactical range.

1.4 Description of Study Area

The OB/OD is located approximately 1.2 miles south of the Range support facility as shown on figure 1.3.2. The site is an approximately 700-foot-diameter circular area with a burn pit in the center (fig. 1.4.1). The burn pit is used infrequently and consists of burning material with the aid of unused diesel fuel. Surrounding the burn pit is a 200-foot area used for detonations. Detonations are performed by digging trenches and exploding the ordnance within the trench.

1.4.1 Project objectives

In this project, the Geological Survey will investigate the OB/OD on MAFR to determine site geology and possible hazardous materials in the soil.

The objective of this effort is to conduct a facility investigation of the OB/OD on MAFR and to identify and characterize past releases that may have occurred. Information presently available concerning site use, history, and type of waste is minimal. This investigation will collect data to determine the type of wastes and extent of contamination at the site. This site is remote and few people (receptors) are near the sites who would come in contact with airborne contaminants released from the sites. The receptors of most concern are people working on the base who come in contact with surface water or ground water from supply wells or residents of the area who could come in contact with ground water or surface water that has moved off the base. The pathways for contaminant release are air, dust, surface water, and ground water. Because no perennial streams are on base, contaminants in surface water would be transported during the rare times when runoff results from precipitation. The pathway of greatest potential if contaminants are released is ground water. Ground water on base is generally deep, so an important consideration in this study is to determine if contamination is moving through the unsaturated zone toward the ground water.

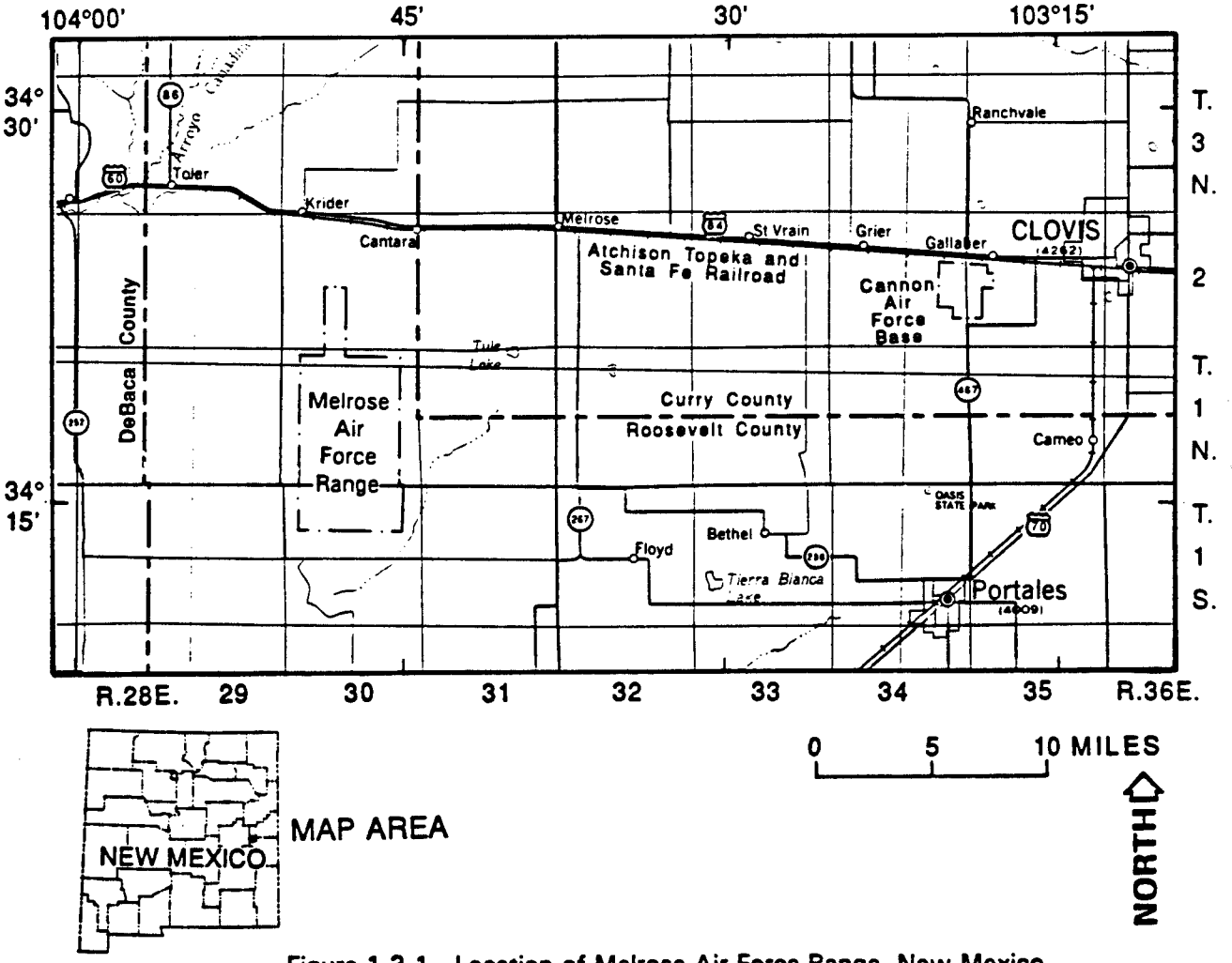


Figure 1.3.1.--Location of Melrose Air Force Range, New Mexico.

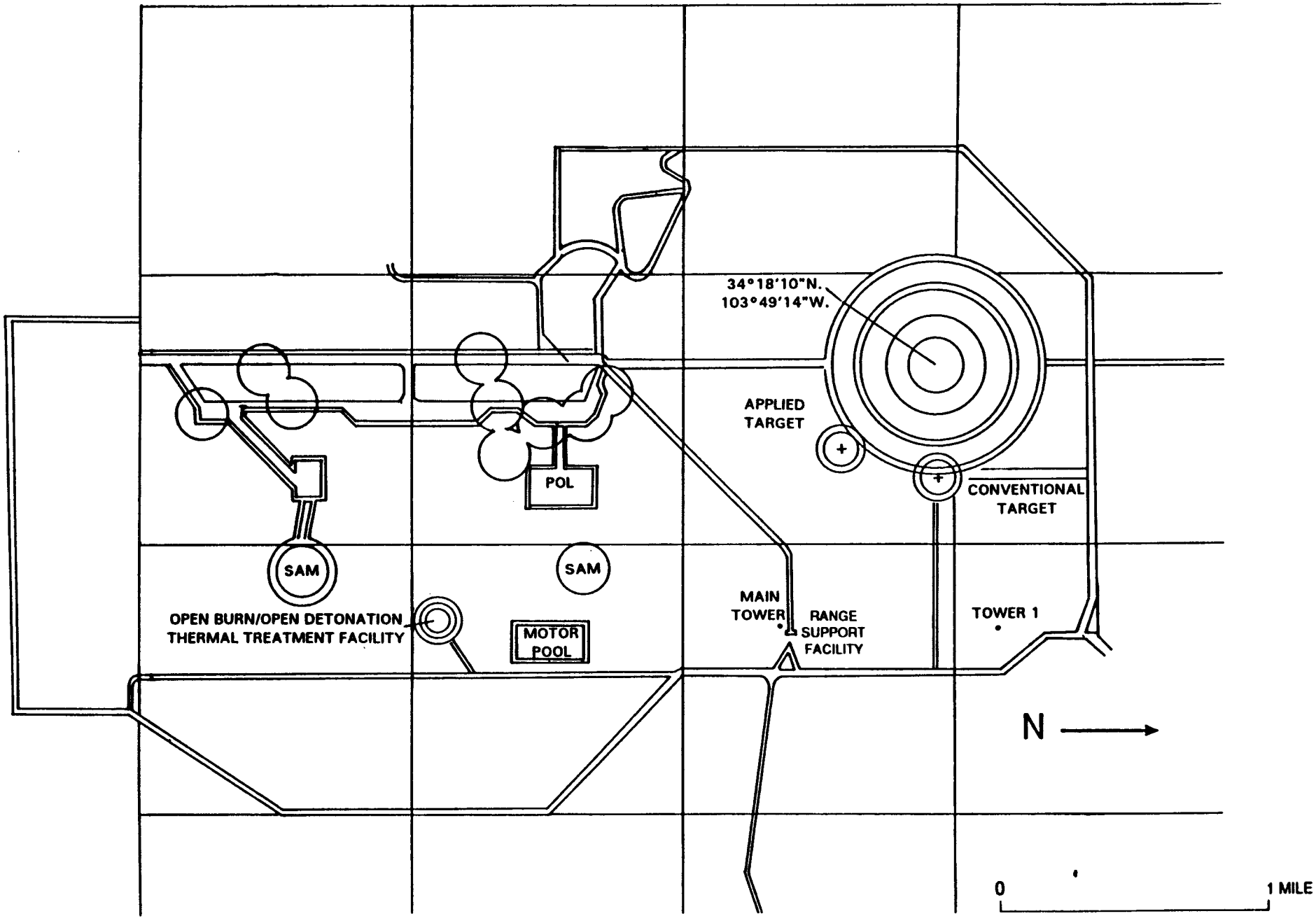


Figure 1.3.2.- ...ilities on Melrose Air Force Range.

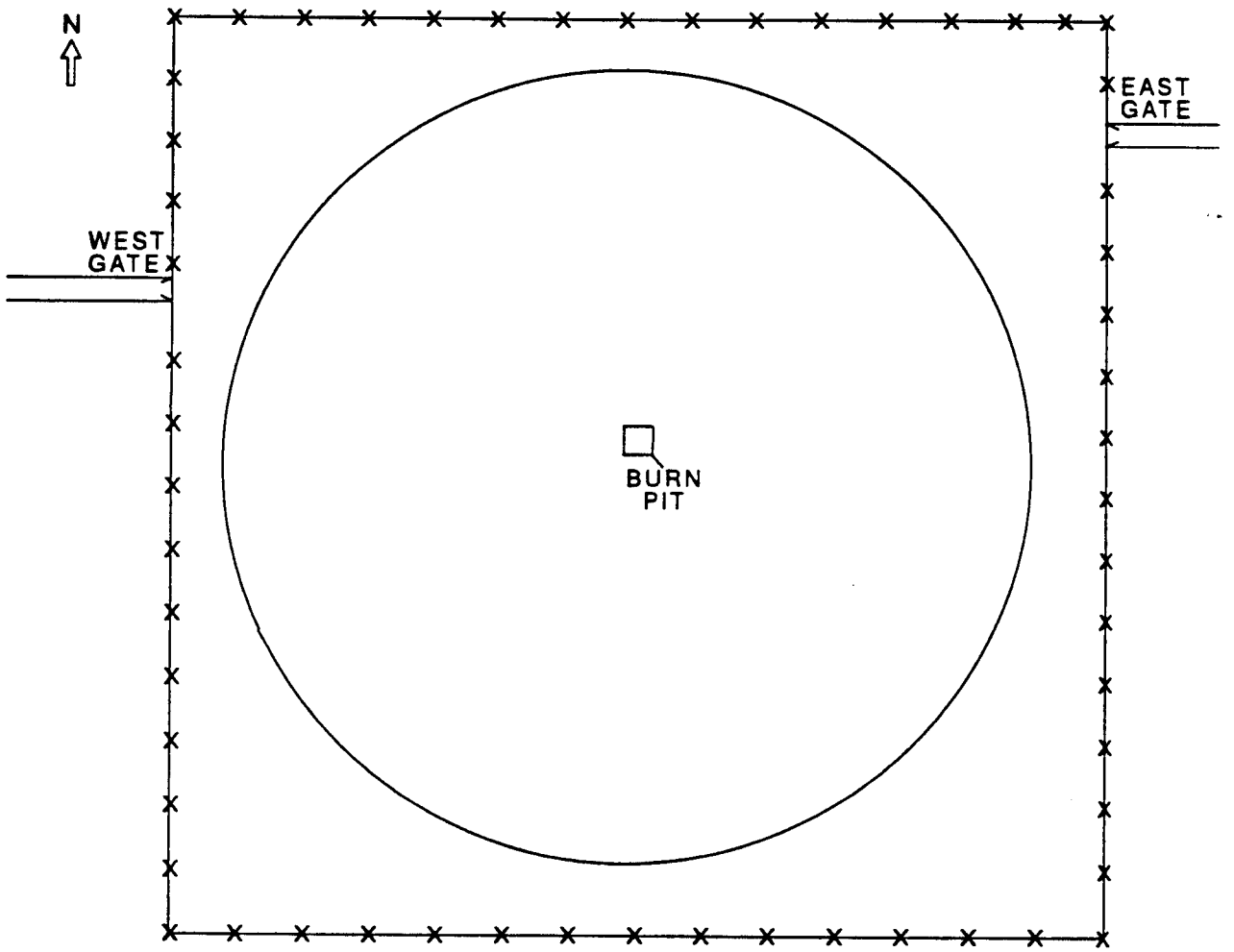


Figure 1.4.1.--Configuration of Open Burn/Open Detonation Thermal Treatment Facility.

2.0 SUMMARY OF EXISTING INFORMATION

2.1 Installation Environmental Setting

A summary of the available information on the environmental setting of MAFR is discussed in the following sections. This includes the geographic setting, geology, soils, ground water, surface water, climate, biology, and demographics.

2.1.1 Geographic setting

MAFR is located in the High Plains section of the Great Plains physiographic province. The region is essentially a plateau, bounded on the north by the Canadian River and on the east and west by prominent escarpments rising as much as 300 or more feet above the lower lands.

The surface of the plains is flat throughout much of the area and gently undulating in the remainder. An exception to the flat surface is the Portales Valley, which is the drainage for much of MAFR. This valley is as much as 30 miles wide and drains eastward-southeastward into Texas. The drainage on MAFR is predominantly to the northeast toward the Portales Valley. Altitudes range from about 4,620 feet on the mesa at the southwest edge of the Range to 4,218 feet at the northeast corner of the Range.

2.1.2 Geology

MAFR lies on the western edge of the Ogallala Formation and is defined as a stratigraphic unit of Pliocene age. The Ogallala in the MAFR area includes valley-fill deposits of Quaternary age which consist of clay, silt, fine- to coarse-grained sand, gravel, and caliche. Lithology varies within short distances, both vertically and horizontally, and individual beds or lenses are not continuous over wide areas.

Most of the Ogallala is unconsolidated, although near the top and locally within the formation the sediments have been cemented, chiefly by calcium carbonate, to form beds of caliche. The degree of cementation varies greatly from well cemented to partially cemented. The caliche occurs in single or multiple layers in the uppermost part of the formation throughout the area.

The Ogallala Formation overlies an erosional surface incised into Triassic rocks on the MAFR. The slope of the Triassic rocks is to the east-southeast.

2.1.3 Soils

Surface soils, as described by Ross and Bailey (1967), constitute generally the first 5 feet of unconsolidated material below land surface. The soils on MAFR are generally of the Amarillo-Clovis loams and Amarillo-Clovis fine sandy loams association, and the soils on OB/OD are further subdivided into Olton loan. Olton loam consists of about 4 inches of brown to dark-brown loam that has strong granular structure and is noncalcareous. The subsoil is noncalcareous clay loam. It is about 24 inches thick and has a subangular blocky structure. The subsoil overlies a strongly calcareous layer that is 18 to 20 inches thick, light reddish brown in color, and massive. Olton loam is characterized by moderate runoff and slow interval drainage. Puddling is common following a hard rain and wind erosion is a slight or moderate hazard.

2.1.4 Ground water

The principal source of ground water on MAFR is the underlying Ogallala aquifer. The Quaternary alluvium of the Portales Valley is considered part of the Ogallala aquifer. Ground water in the Ogallala is unconfined and contained in the pore spaces of the unconsolidated or partially consolidated sediments. The saturated thickness of Ogallala aquifer material is estimated to be less than 100 feet on the Range due to its proximity to the western edge of the aquifer.

Depth to water varies from 41 feet below land surface along the Canada del Tule on the southeast corner of the Range to 128 feet along the east-central Range boundary. Ground water on the Range flows in a northeasterly direction toward the Portales Valley.

2.1.5 Surface water

MAFR has no perennial surface water. During intense precipitation, water flows in the normally dry stream channels and over land. Lakes were present during pluvial periods of the Pleistocene, but declining water tables during the Holocene led to the drying up of these lakes. Presently, ephemeral lakes form in playa basins after heavy rainfall.

2.1.6 Climate

The climate of MAFR is semiarid. Average annual rainfall recorded at Cannon AFB is 15.2 inches, most of which falls during the summer months as thundershowers. Monthly averages vary from 0.4 inches in the winter months to 2.5 and 2.7 inches in July and August, respectively. Maximum monthly rainfall is 11.4 inches in July and maximum daily rainfall is 4.8 inches. Annual snowfall for this region is 10 to 13 inches and the record snowfall is 19 inches.

Average monthly temperatures range from the mid-30's in January to the upper 70's in July. Occasional days of temperature more than 100 degrees occur in the summer; the highest recorded temperature is 106 degrees. Minimum temperatures range from the low 20's in January to the mid-60's in July; the lowest recorded temperature is 11 degrees.

Winds on the MAFR are often gusty and can average 19 miles per hour (mph) or greater. The prevailing surface wind direction is west. These west winds blow primarily from October to May. During the remainder of the year, winds tend to be from the south. Monthly wind averages range from 6 to 10 mph; the maximum recorded wind gust is 84 mph.

2.1.7 Biology

The vegetation of MAFR is classified as grassland. Grassland is dominated by various grasses but may also contain low shrubs. No fishing streams or lakes are on the Range and wildlife is sparse. Burrowing rodents are the most common form of wildlife. Several species of endangered wildlife may exist within the area, but have not been sighted on the Range. These include the southern bald eagle, the American peregrine falcon, and black-footed ferret.

2.1.8 Demographics

No major population centers are near MAFR. The nearest community is Melrose, which is about 10 miles north of the Range. Clovis and Portales are about 30 miles east of the Range. The nearest inhabitants are about 4.5 miles east of MAFR on the road into the Range.

2.2 Site-Specific Environment Setting

To design a technically sound investigation of the presence or absence of contaminant release from the OB/OD, a conceptual model of contaminant movement from the site was developed. This conceptual model was developed using available information on the nature of the site, stratigraphy, and hydrology of the MAFR area, and pertinent literature on the movement of contaminants in the unsaturated zone.

The OB/OD on MAFR overlies the Holocene alluvium and the Ogallala Formation. The Holocene alluvium generally consists of a thin veneer (less than 50 feet thick) of clay, sand, and gravel on top of the Ogallala.

The lithology of the Holocene alluvium and Ogallala Formation varies considerably in short vertical distances. Lithology ranges from clay to gravel and cobbles. Caliche or buried soil zones are penetrated at several locations at various depths. Many of these caliche zones contain considerable amounts of calcareous cemented sediments, and in some cases root casts were evident. The relatively large changes in dominant grain size and sorting in small vertical distances indicate that the vertical and lateral permeabilities of the alluvium and Ogallala vary considerably in small vertical distances. The dominant grain size of the sediments on the Range also may considerably vary laterally in short distances. No detailed geologic mapping has been done on the Range.

2.2.1 Open Burn/Open Detonation Thermal Treatment Facility

The OB/OD site is located in the south-central part of MAFR in section 27, Township 1 North, Range 30 East. The site is about 1 mile south of the main observation tower and command post for the Range.

Pathways for contaminants include air, dust, surface water, and ground water. Air pathways may result from contaminants that have a large volatility or have been blown into the air during detonations. Dust pathways can result from winds that erode surface materials that may be contaminated. Surface-water pathways are likely only during precipitation from storms that result in runoff over and through the site and eastward. Ground-water pathways may result from migration of contamination through the unsaturated zone to ground water. Receptors include site workers and base employees who work on or near the site.

The focus of the investigation at OB/OD was to determine the site geology and possible contamination in the unsaturated zone at the site. During Mary 4-6, 1993, the upper unsaturated zone was investigated using 20-foot soil borings and surface sampling. Two 20-foot borings were located within the detonation area as shown on figure 2.2.1.1. One additional 20-foot boring was drilled 200 feet west of the outer perimeter of the site to determine background. The rationale for the location chosen for the background sample was the predominantly westerly wind and the eastward-dipping alluvial sediments at this location, which provided an updip and upwind location for background samples. The 20-foot borings were sampled at 0, 5, and 10 feet for metals and explosive residue.

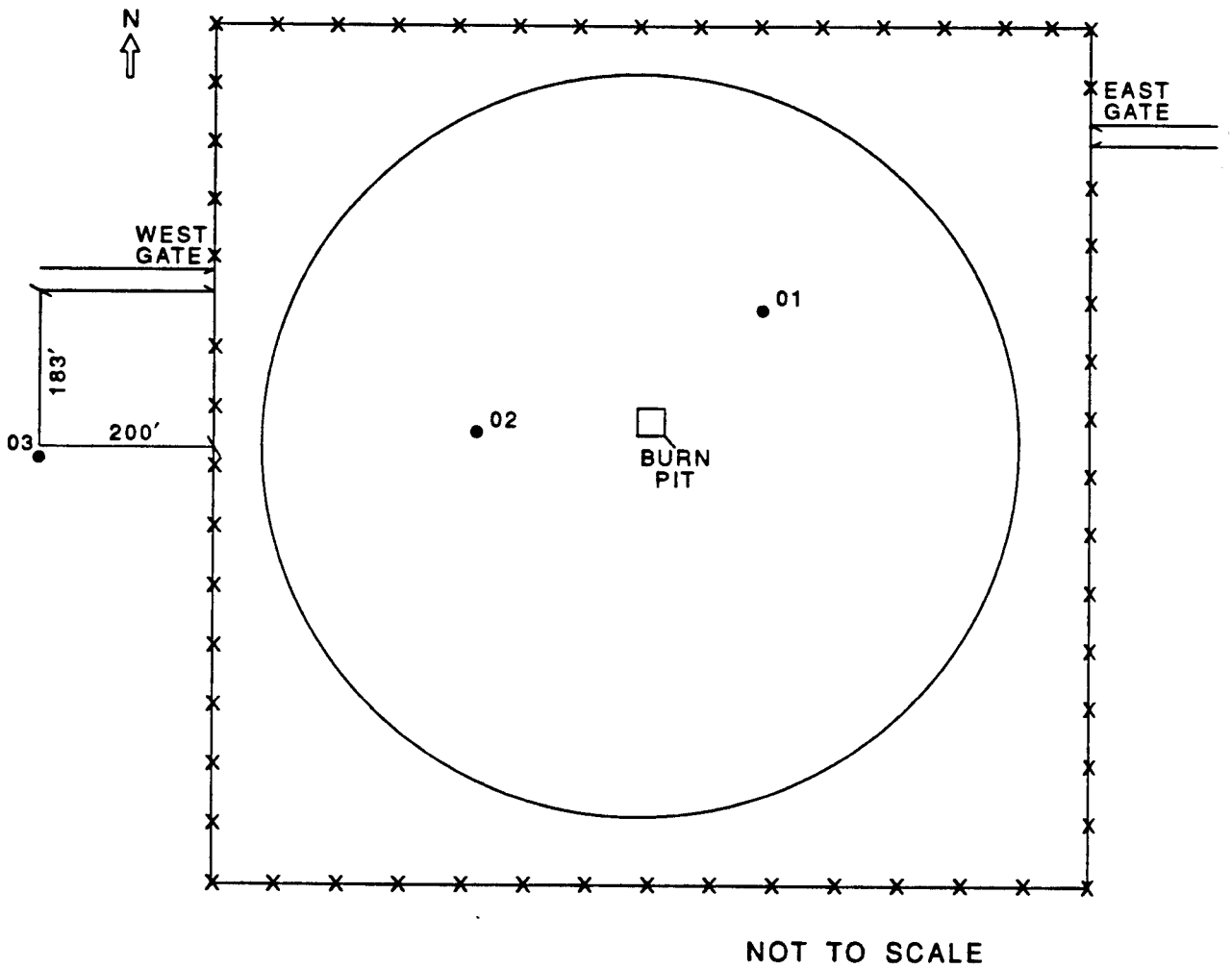
To better define the near-surface geology, borings were continuously cored to a maximum of 20 feet. These cores were selected on the basis of providing a good cross-sectional look at the site.

During June 3-8, 1993, two deep holes were drilled to further define the geology at depth and to locate water-yielding zones. The first hole was drilled to 180 feet and sealed and the second hole was cored to 120 feet and completed as a monitoring well. In addition, 11 shallow soil borings were drilled to collect additional soil samples at depths of 0 and 5 feet. The locations of the soil borings and the monitoring well are shown in figure 2.2.1.2.

2.2.2 Site geology

The 20-foot cores discussed above provided a good geologic description at the OB/OD site. The background hole (OB/OD-03) was cored to 16 feet. Drilling was halted due to very hard drilling–presumably caliche.

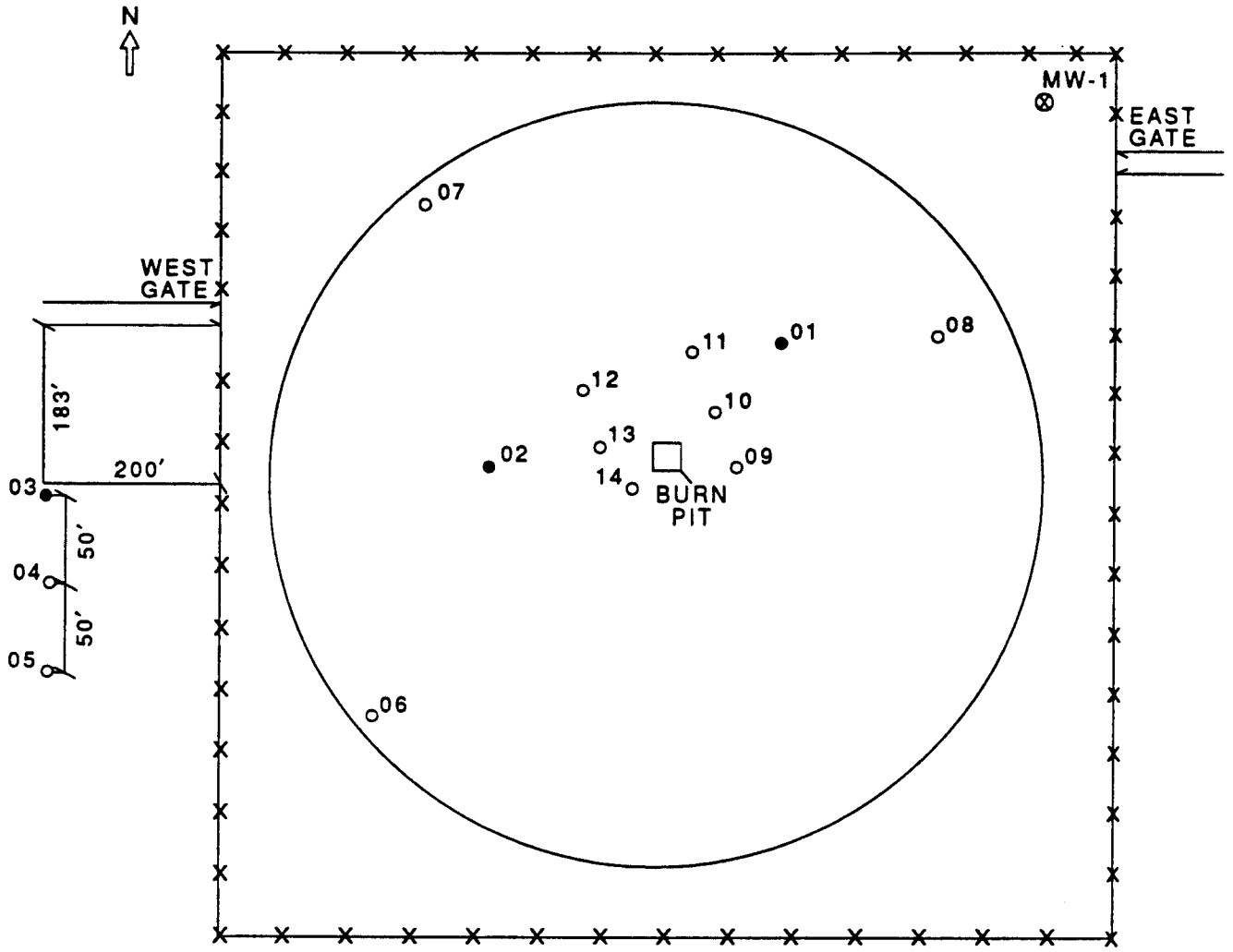
In general, the top 20 feet at the OB/OD consists predominantly of silt and minor amounts of sand, clay, and gravel. Caliche and calcification layers are scattered throughout the section. The predominant change observed between the holes is a distinctively lighter color of sediments within the impact area compared to those of the background site. The color change is attributed to the mixing of soil material during trenching operations and to the effects of exploding the ordnance. Tables 2.2.2.1, 2.2.2.2, and 2.2.2.3 are descriptions of the materials penetrated in core holes OB/OD-01, 02, and 03, respectively.



EXPLANATION

● BOREHOLE--20 feet deep

Figure 2.2.1.1.--Location of the May 4-6, 1993, soil borings on the Open Burn/Open Detonation Thermal Treatment Facility.



NOT TO SCALE

EXPLANATION

● BORE HOLE--20 feet deep

o BORE HOLE-- 5 feet deep

⊗ MONITORING WELL

Figure 2.2.1.2.--Location of soil borings and monitoring well at the Open Burn/Open Detonation Thermal Treatment Facility.

Table 2.2.2.1.--Lithologic log of core from hole OB/OD-01 Melrose Air Force Range, NM

Depth interval below land surface (feet)	Lithologic description
1	
	1' - 2' Recovery 11". Very compacted silt (cemented). Munsell color chart; silt is grayish orange pink (5 YR 7/2). A few thin layers of calcification. Root tubes throughout this interval.
2	
3	2' - 4' Recovery 22". Very similar to above interval. Still grayish orange pink (5 YR 7/2). The layers or more of a banding of the calcification has slightly increased, but not yet turned to caliche. No sand or gravel.
4	
5	4' - 6' Recovery 20". Interval is still cemented silt with some very fine sand. Slight color change, light brown (5 YR 6/4). Thin bands of caliche. Also a few small bands of a darker fine sandy silt, moderate brown (5 YR 4/4). Still root tubes throughout.
6	
7	6' - 8' Recovery 23". Light-brown (5 YR 6/4) compacted silt with some very fine sand, small amount of bands of caliche. No moderate-brown bands. Still root tubes.
8	
9	8' - 10' Recovery 22". Still has light-brown (5 YR 6/4) compacted silt with some very fine sand. However, there are more caliche layers. The silt and caliche seem to be pressed together in layers, breaking apart in layers. Root tubes.
10	
11	10' - 12' Recovery 20". Interval is basically the same as the previous sample. A slight change in color, light brown (5 YR 5/6). Slight increase in quantity of very fine sands. There are also a few pieces of small dark gray-black gravel, 1-2 mm. Root tubes.
12	
13	12'- 14' Recovery 23". Same as above; decrease in the compacted layers, more loosely packed. More fine sand. Caliche is now more of a calcification with more nodules rather than layers.
14	
15	14'- 16' Recovery 23". Has become more cemented silt. Most of this interval (14.7'-16') has a color change, grayish orange pink (5 YR 7/2). Less fine sand and more banding of the calcification. Almost no small gravel. Root tubes.
16	
17	16' - 18' Recovery 19". Same as above (14.7'-16').
18	
19	18' - 20' Recovery 24". Layered cemented silt. No small gravel. Very small percentage of fine sand. Color varies. Area with more calcification is grayish orange pink (5 YR 7/2); less calcification is light brown (5 YR 6/4). Still root tubes.
20	

Table 2.2.2.2.--Lithologic log of core from hole OB/OD-02 Melrose Air Force Range, NM

Depth interval below land surface (feet)	Lithologic description
0 - 2′	Recovery 22". Very compacted silt. Light brown in color (5 YR 5/6) (Munsell color chart). Diameter of acetate sample tube is 28 mm. Numerous layers of caliche material, as large as the full diameter of tube. Numerous nodules of caliche throughout interval. Small amount of limestone gravel, as large as 5 mm--angular in shape. Root zones throughout core.
2′ - 4′	Recovery 22". Basically same as above. Compacted dry silt. Slight change in color, light brown (5 YR 6/4). No hard caliche layers but several irregularly banded or spotted lighter colored--probably some calcification. Root tubes throughout interval. Traces of small, gray or darker, subangular to angular gravel.
4′ - 8′	Most of material is compacted light-brown silt similar to above, but now has a large amount of poorly sorted gravel (quartz, feldspar, limestone). Gravel is generally subrounded to subangular (many angular fractured pieces). Sizes range up to diameter of sampling tube (28 mm) and probably much larger. Large amount of caliche and other lesser degrees of calcification.
8′ - 12′	Similar to previous interval only now lighter in color, grayish-orange-pink (5 YR 7/2). Much less gravel than previous interval. Overall more compacted and calcified than before (several very "tight" zones).
12′ - 15′	Tightly compacted light-brown silt with many light-colored calcified zones; slightly more gravel than previous interval (gravel is generally smaller, down to sand size). No white bands of caliche.
15′ - 20′	Compacted brown silt, light-brown (5 YR 5/6), slightly darker than before. A lot of fine sand with some coarse sand to fine gravel. Several caliche nodules, but no large caliche layers. Noticed a dime-sized piece of shrapnel in sample. No root tubes.
20′ - 22′	Upper 1.3′ of this interval is still compacted light-brown silt with fine sand. The lower 0.7′ is a mixture of light-brown silt with coarse dark-gray and black sand with small limestone gravel as large as large as 5 mm. Also a hard caliche layer 0.1′ thick at 21.8′.

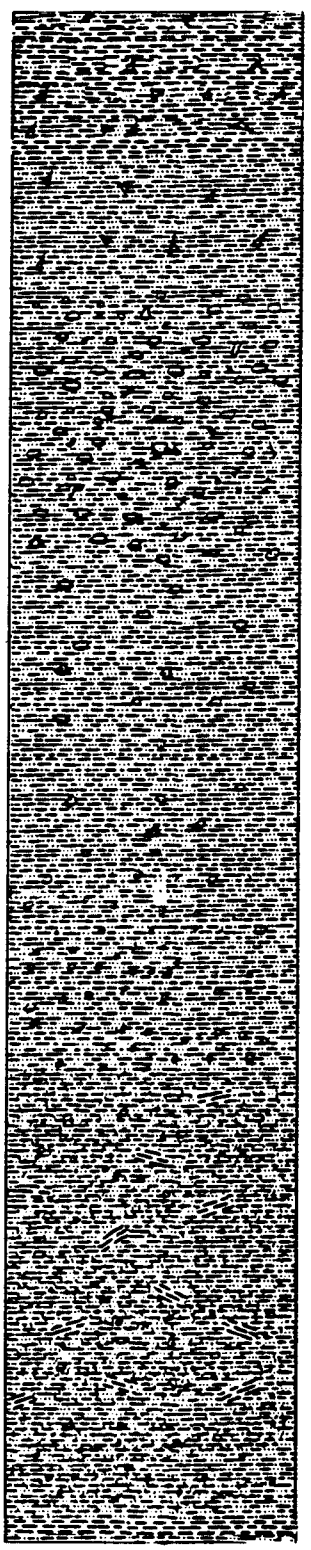


Table 2.2.2.3.--Lithologic log of core from hole OB/OD-03 Melrose Air Force Range, NM

Depth interval below land surface (feet)	Lithologic description
0	
	0′ - 1′ Moderate-brown (5 YR 4/4) silt, lightly compacted with some fine sand and trace of small gravel (limestone and quartz), subrounded to subangular. Plant roots throughout.
1	
	1′ - 2′ Light-brown (5 YR 6/4) moderately compacted silt, about 10% randomly "speckled" with white nodules or small bands of caliche. Some fine sand, no gravel. Root zones throughout.
2	
3	2′ - 4′ Moderate orange-pink (5 YR 8/4) silt with some fine- to very fine-grained sand. About 30% is white banded but very few separate nodules. Root tubes throughout. No gravel.
4	
5	
	4′ - 7′ Light-brown (5 YR 6/4) silt with some very fine- to fine-grained sand. Moderately compacted with small amount of white nodules (calcification) and irregular light-colored bands. Small number of small limestone nodules. Root tubes throughout (no gravel).
6	
7	
8	7′- 9′ Light-brown silt and very fine sand similar to previous interval, only a half-shade darker in color, probably due to decrease overall in calcification. Still a few white calcite nodules. Traces of very hard sandstone. Root tubes throughout. No gravel.
9	
10	
	9′ - 12′ Light-brown silt and fine-grained sand as above (somewhere between 5 YR 6/4 and 5 YR 8/4). Slight increase in small calcite nodules and lighter irregularly shaped zones. Slight trace of small gravel, mostly limestone, some quartz (quartz is well rounded.) Root tubes.
11	
12	
13	12′- 14′ Light-brown (5 YR 6/4) silt and very fine-grained sand similar to previous intervals. Slightly more compaction than before. Only trace of small calcite nodules and lighter colored irregularly shaped zones. No gravel, small amount of pale-brown (5 YR 5/2) clay at about 13 feet. Root tubes throughout.
14	
15	14′- 16′ Light-brown silt and very fine-grained sand, similar to previous interval, only has small color variations (lighter/darker) throughout interval. Small amount of white calcite nodules. Trace of gravel (mostly subrounded to subangular limestone fragments - generally very small). Root tubes throughout.
16	

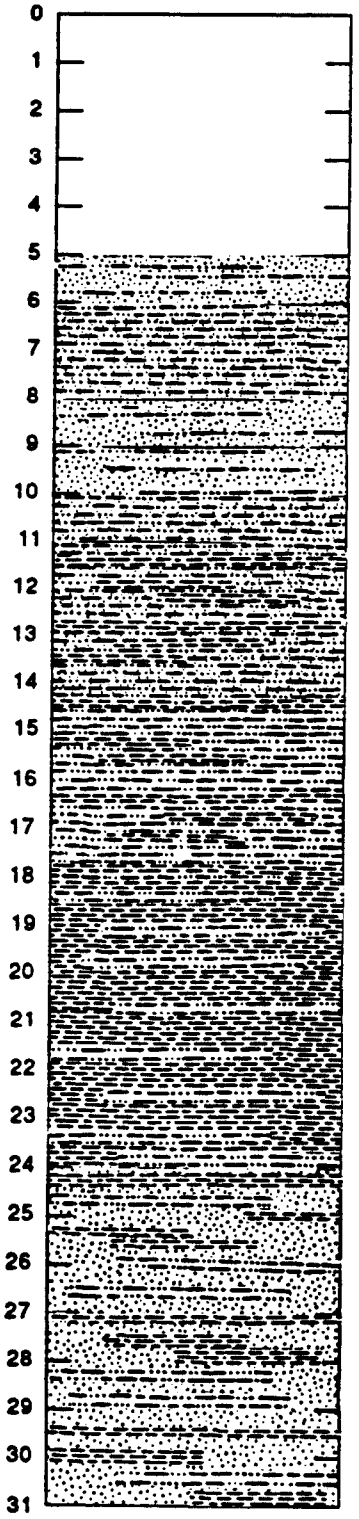
During June 3-7, 1993, two exploratory holes were drilled in the northeast corner of the OB/OD. The first hole was drilled with air to a maximum depth of 180 feet. The purpose of this hole was to reach the Ogallala aquifer if possible and to determine the presence of any perched water zones. The Ogallala aquifer was not reached but a small perched zone was penetrated at a depth of 94 to 100 feet. The first hole was plugged with bentonite. A second hole was drilled using the mud-rotary method. This second hole was continuously cored to a depth of 120 feet and completed as a monitoring well. Table 2.2.2.4 is a description of the materials penetrated in the cored hole, hereafter referred to as MW-1. Figure 2.2.2.1 is a well-completion diagram showing the construction features of MW-1.

The lithology of MW-1 shows similar material in the upper 20 feet as found in other holes. The material becomes coarser below 25 feet with sand and pebble material. Below 57 feet, most of the material is cemented and has very little carbonate material compared to the upper section. This lower section is assumed to be the Ogallala Formation.

2.2.3 Analytical results and comparison to action levels

Soil samples were collected during two time frames for this project. The first samples were collected while coring the 20-foot holes OB/OD-01, 02, and 03. Samples were collected from these holes at depths of 0, 5, and 10 feet and analyzed for explosives by the High Pressure Liquid Chromatography (HPLC) method, SW6010 metals, antimony (furnace method), and selenium (furnace method). No explosives residue was found in any of the samples. The only metal analyzed that exceeded the RCRA action levels was beryllium. Table 2.2.3.1 is a listing of beryllium values obtained from the first sampling of OB/OD. Analytical lab sheets for metals analysis are found in Appendix A, analytical lab sheets for explosives analysis are found in Appendix B, and all Quality Control (QC) results are found in Appendix C.

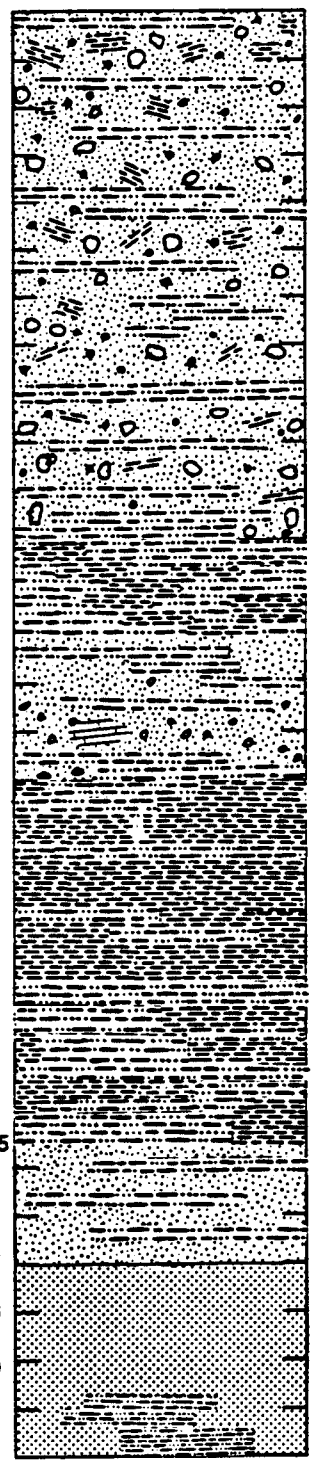
Table 2.2.2.4.--Lithologic log of monitoring well MW-1 Melrose Air Force Range, NM



Depth interval below land surface (feet)	Lithologic description
0 - 5′	No samples retained.
5′ - 6′	(Cuttings) Sandy silt with clay and caliche nodules; sand very fine to medium grained; light brown (5 YR 5/6); strong reaction with HCl; caliche nodules 60%, ≤ 20 mm.
6′ - 7′	(Cuttings) Silty sand with caliche and minor pebbles; sand very fine to fine-grained, pebbles <5%, <10 mm, subangular; pebbles limestone, sandstone, quartz; light brown (5 YR 5/6), strong reaction with HCl; caliche occurs as matrix and nodules < 10 mm.
7′ - 8′	(Cuttings) Silty sand with caliche and minor pebbles; sand very fine to fine grained; pebbles <5%, <10 mm, subangular; pebbles limestone, sandstone, quartz; light brown (5 YR 5/6), strong reaction with HCl; caliche occurs as matrix and nodules <10 mm.
8′ - 9′	(Cuttings) Sandy silt with clay; sand very fine to fine grained; moderate brown (10 YR 4/6), strong reaction with HCl.
9′ - 10′	(Cuttings) Sandy silt with clay; sand very fine to fine grained; light brown (5 YR 5/6), strong reaction with HCl.
10′ - 11′	(Cuttings) Silty sand with clay; sand very fine to fine grained; with 5% medium grained; moderate reddish brown (10 YR 4/6); strong reaction with HCl.
11′ - 18′	Clayey silt with sand; sand very fine to fine grained to medium grained; in lower portion, arkosic; light brown (5 YR 5/6); moderately compacted; weakly cemented with $CaCO_3$, strong reaction with HCl; fairly abrupt basal contact.
18′ - 24′	Silty clay, similar to previous interval. Contains 0.5- to 1-mm-diameter root holes and 1 mm flakes of irridescent bluish-black Mn-oxide? (weakly magnetic).
24′ - 31′	Sand with silt and clay; sand very fine to fine grained in upper portion; very fine to medium grained in lower portion, sand-quartz; moderate yellowish brown (10 YR 5/4), moderately compacted, weakly cemented with $CaCO_3$, strong reaction with HCl; contains root holes and Mn flakes in upper portion; basal contact consists of a 40-mm (?) silty limestone lens; hard, difficult to break with hammer.

Table 2.2.2.4.--Lithologic log of monitoring well MW-1 Melrose Air Force Range, NM--Continued

Depth interval below land surface (feet)	Lithologic description
31 - 42	
42 - 44	
44 - 47	
47 - 54.5	
54.5 - 57	
57 - 61	



31′ - 42′ Sand with silt and minor silty clay clumps and also pebbles with cobbles; sand very fine to medium grained; pebbles 25%, 15 to 60 mm, subangular to subrounded; cobble 100 mm (terminated by coring), subangular; pebbles and cobble limestone; light brown (5 YR 5/6), clumps moderately/firmly compacted; strong reaction with HCl.

42′ - 44′ Clayey silt with sand; sand very fine grained, arkosic; light brown (5 YR 5/6), contains root holes and Mn flakes moderately compacted, moderately to strongly cemented with $CaCO_3$, strong reaction with HCl.

44′ - 47′ Silty sand grading downward to silty sand with pebbles, sand very fine to fine-grained with <1% coarser whole pebbles, pebbles <2%, subangular to rounded, mostly <8 mm with few to 12 mm, scattered, except at basal contact; sand-quartz, pebbles-quartz, chert, limonite; reddish brown, moderately compacted, minor root holes, moderately to strongly cemented with $CaCO_3$, strong reaction with HCl; abrupt basal contact includes 30-mm limestone ($CaCO_3$) blob with regular horizontal and irregular near horizontal laminae, also dendritic.

TOP OF ROCK

47′ - 54.5′ Silty clay and clayey silt, moderate-reddish-brown (10 YR 4/5); moderately/strongly compacted, moderately to strongly cemented with $CaCO_3$, strong reaction with HCl, upper portion contains $CaCO_3$-rich blobs, also major clayey blobs, greenish gray (5 GY 6/1), with moderate/strong reaction with HCl in lower portion of interval.

54.5′ - 57′ Silty sand; sand very fine grained, well sorted, moderate reddish brown (10 YR 4/5), moderately laminated <1 mm moderately compacted, strongly cemented, no reaction to moderate/strong reaction with HCl where calcareous; gradual basal contact.

TOP OF SOUND ROCK

57′ - 61′ Sandstone with siltstone in lower central portion; sand very fine grained, clayey in lower portion, well sorted, micaceous in upper portion; moderate brown (5 YR 4/4), poorly to well laminated <1 mm to 3 mm; moderately hard, readily scratches with knife, no reaction with HCl.

Table 2.2.2.4.--Lithologic log of monitoring well MW-1 Melrose Air Force Range, NM--Continued

Depth interval below land surface (feet)	Lithologic description
61 - 70.5	Sandstone, very fine to fine-grained, upper and lower 1′ pale-greenish-yellow (10 YR 8/2), otherwise grayish-brown (5 YR 3/2), massive to laminated, moderately cemented, scratches with knife, no reaction with HCl.
70	Mudstone/shale, poorly defined 0.1-0.2′ zone, irregular, moderate-brown (5 YR 4/4).
70.5 - 71	Siltstone, shaley; micaceous, moderate brown (5 YR 4/4), poor fissility, no reaction with HCl.
71 - 77	Sandstone, very fine to fine-grained; arkose; grayish brown (5 YR 3/2), massive to laminated; poorly cemented, scratches with fingernail when wetted; no reaction with HCl, blebby basal contact.
77 - 77.5	Shale, silty and sandy; sand very fine grained, arkosic, moderate brown (5 YR 4/4), poor fissility, irregular near-horizontal fracture in upper portion and 15 degrees (from horizontal) planar slicken-sided surface are Fe stained; no reaction with HCl.
77.5 - 82	Sandstone; very fine to fine or medium grained in lower central portion; grayish brown (5 YR 3/2); massive to laminated, weakly cemented, scratches with fingernail when wetted; no reaction with HCl.
82 - 85.2	Mudstone/shale; moderate brown (5 YR 4/4); irregular, near-horizontal weak fissility; weak reaction with HCl; basal contact is abrupt 50 degrees near-planar slicken-side with Fe stains.
85.2 - 85.5	Mudstone with volcanic ash (?), contains 10 to 20% silt and very fine to fine-grained sandstone, including glassy material; greenish gray (5 GY 6/1); poorly cemented, easily scratched when wetted; weak reaction with HCl; basal contact is abrupt and irregular.
85.5 - 95	Mudstone and shale; greenish gray (5 GY 6/1); poor to moderately developed fissility, dissolves in water, few scattered slicken-sides and minor near-vertical hairline fractures are Fe stained; weak reaction with HCl.

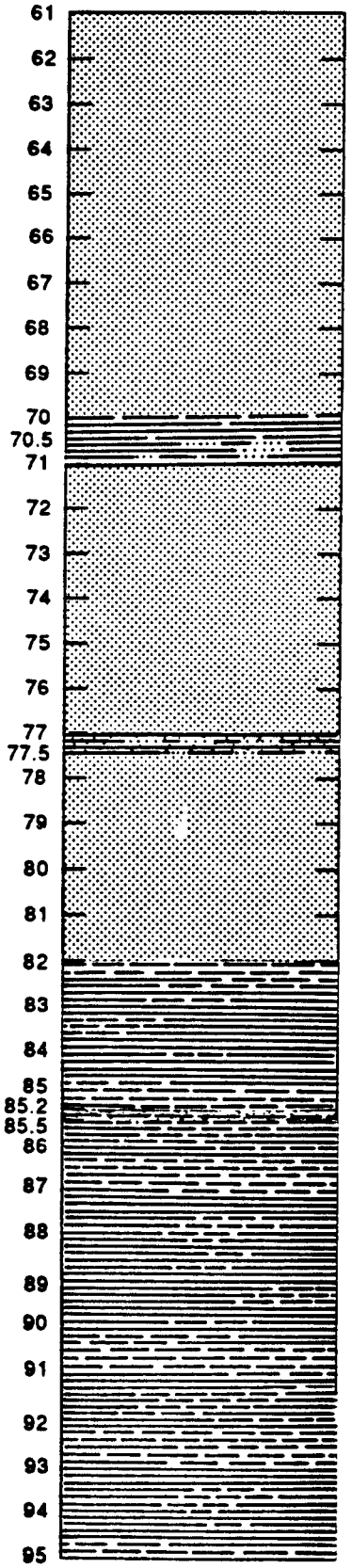


Table 2.2.2.4.--Lithologic log of monitoring well MW-1 Melrose Air Force Base, NM--Continued

Depth interval below land surface (feet)	Lithologic description
95 - 105	95′ - 105′ Sandstone, very fine to fine- or medium-grained; greenish gray (5 GY 6/1); 97- to 100′-zone recovered crumbly (reported to be water bearing), small pieces easily crushed when wetted, no to weak reaction with HCl.
105 - 107	105′ - 107′ Mudstone, greenish-gray (5 GY 6/1).
107 - 119	107′ - 119′ Mudstone, very silty, and siltstone, moderate-brown (5 YR 4/4), soft, easily scratched with knife, very weak reaction with HCl.
119 - 120.2	119′ - 120.2′ Sandstone, very fine to fine-grained; grayish green (5 GY 6/1) to grayish brown (5 YR 3/2); massive, moderately hard, scratches with knife.
120.2 - 125	120.2′ - 125′ (Cuttings) Shale, silty; moderate brown (5 YR 4/4) and greenish gray (5 GY 6/1); no reaction with HCl.

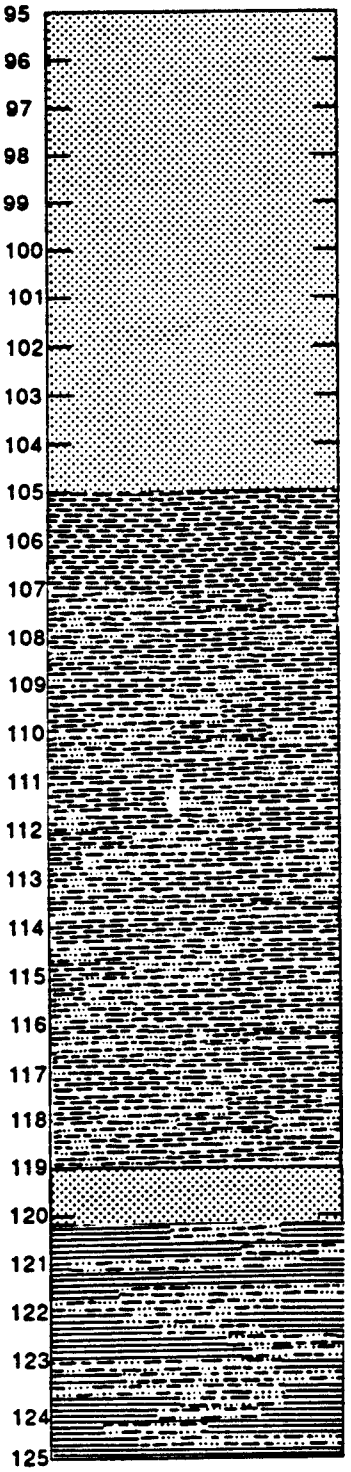


Table 2.2.2.4.--Lithologic log of monitoring well MW-1 Melrose Air Force Range, NM--Continued

Depth interval below land surface (feet)	Lithologic description
125–155	
125′ - 150′	(Cuttings) Shale, silty; moderate brown (5 YR 4/4) and greenish gray (5 GY 6/1); no reaction with HCl.
150′ - 155′	(Cuttings) Mudstone/shale; brownish-gray (5 YR 4/1), cuttings difficult to break with fingernail when dry, dissolves when wetted, no reaction with HCl.

Table 2.2.2.4.--Lithologic log of monitoring well MW-1 Melrose Air Force Range, NM--Concluded

Depth interval below land surface (feet)	Lithologic description
155	
156	
157	
158	
159	
160	
161	155′ - 165′ (Cuttings) Shale and silty shale; greenish gray (5 GY 6/1), cuttings difficult to break with fingernail when dry, dissolves when wetted, no reaction with HCl.
162	
163	
164	
165	
166	
167	
168	
169	
170	
171	
172	165′ - 180′ (Cuttings) Sandstone with siltstone and shale, very fine to fine-grained, greenish-gray (5 GY 4/1), small pieces easily crushed with fingers when wetted (except for well-indurated shale); no reaction with HCl.
173	
174	
175	
176	
177	
178	
179	
180	

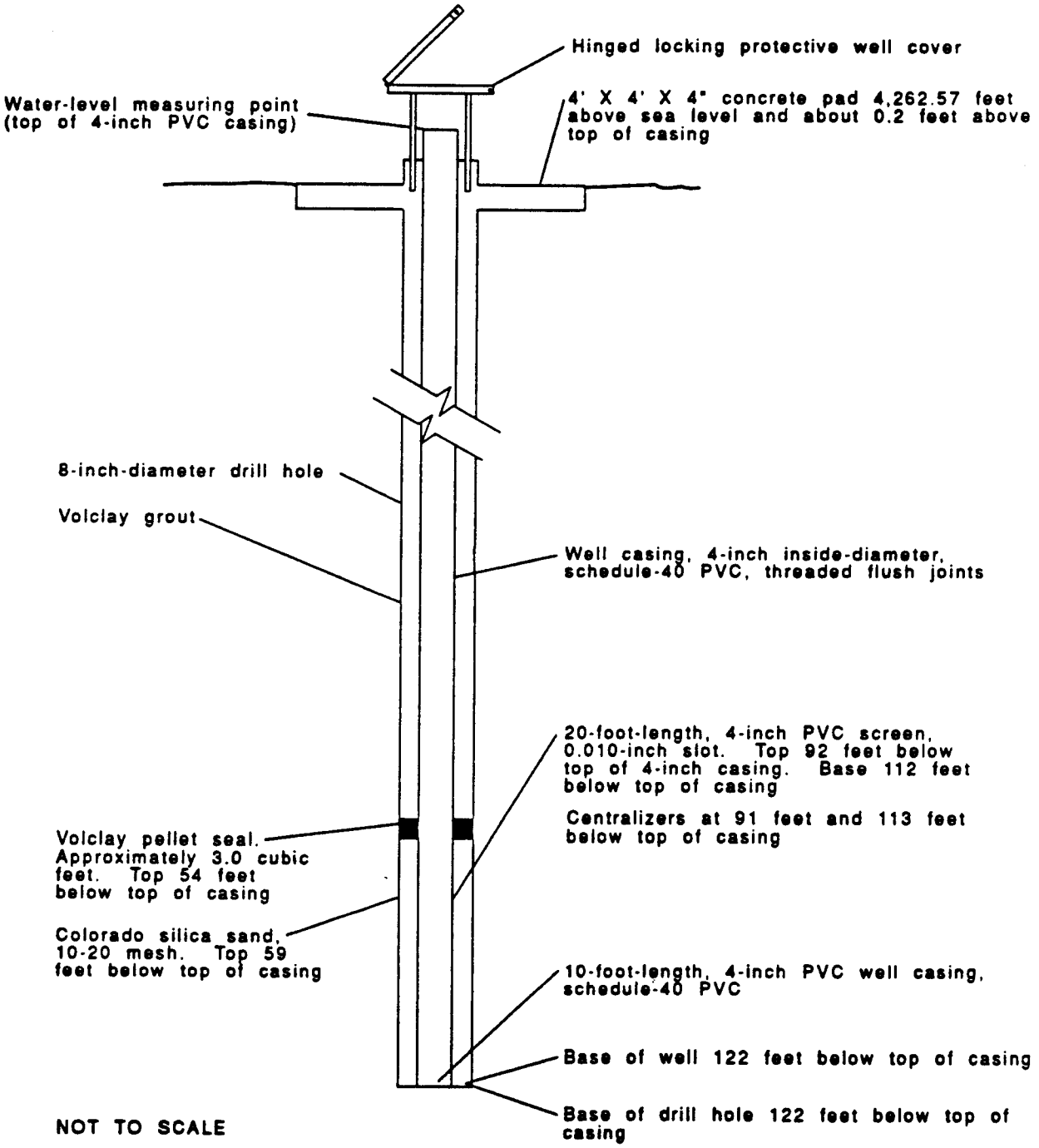


Figure 2.2.2.1.--Well-completion diagram for monitoring well 1MW-1. Drilled and completed by U.S. Geological Survey, Coal Branch, Denver, Colo. Started 06-03-93. Completed 06-07-93. Well drilled using mud-rotary method and Wyoming sodium bentonite drilling fluid.

Table 2.2.3.1.--Beryllium values obtained from holes OB/OD-01, 02, and 03 Melrose Air Force Range, New Mexico

Well and sample number	Depth (feet)	RCRA action level (mg/kg)	Reporting level (mg/kg)	Beryllium concentration (mg/kg)
OB/OD0101	0-1	0.2	0.20	0.60
OB/OD0102	5	0.2	0.20	0.34
OB/OD0103	10	0.2	0.40	0.47
OB/OD0201	0-1	0.2	0.20	0.56
OB/OD0202	5	0.2	0.20	0.54 (duplicate)
OB/OD0203	5	0.2	0.40	Not detected
OB/OD0204	10	0.2	1.00	Not detected
OB/OD0301	0-1	0.2	0.20	0.49
OB/OD0304	5	0.2	0.20	0.35
OB/OD0305	10	0.2	0.20	0.55

The second series of soil samples were taken June 6-8, 1993. The samples were collected at depths of 0 and 5 feet from three boreholes west of the OB/OD for background, three boreholes around the perimeter of the bermed area, and eight boreholes around the center of the site. Figure 2.2.1.2 shows the location of the additional sampling sites. Sampling protocol for metals was the same as that for the previous sampling. At the request of the New Mexico Environment Department (NMED), explosives analysis was done by Method SW 8330. No explosives residue was reported in any analyses. Beryllium was found at levels above the RCRA action levels. Table 2.2.3.2 is a listing of beryllium values from this second series of soil sampling. Analytical lab sheets for metals analyses are found in Appendix A, analytical lab sheets for explosives analyses are found in Appendix B, and all Quality Control (QC) results are found in Appendix C.

Table 2.2.3.2.–Beryllium values obtained from holes OB/OD-04 through OB/OD-14 Melrose Air Force Range, New Mexico

Well and sample number	Depth (feet)	RCRA action level (mg/kg)	Reporting level (mg/kg)	Beryllium concentration (mg/kg)
OB/OD0401	0-1	0.20	0.20	0.64
OB/OD0402	5	0.20	0.20	0.47
OB/OD0501	0-1	0.20	0.20	0.62
OB/OD0502	5	0.20	0.20	0.35
OB/OD0601	0-1	0.20	0.20	0.69
OB/OD0602	5	0.20	0.20	Not detected
OB/OD0701	0-1	0.20	0.20	0.60
OB/OD0702	5	0.20	0.20	0.67
OB/OD0801	0-1	0.20	0.20	0.62
OB/OD0802	0-1	0.20	0.20	0.39 (duplicate)
OB/OD0803	5	0.20	0.20	0.45
OB/OD0901	0-1	0.20	0.20	0.57
OB/OD0902	5	0.20	0.20	0.38
OB/OD1001	0-1	0.20	0.20	0.46
OB/OD1002	5	0.20	0.20	0.37
OB/OD1101	0-1	0.20	0.20	0.58
OB/OD1104	5	0.20	0.20	0.32
OB/OD1201	0-1	0.20	0.20	0.27
OB/OD1202	5	0.20	0.20	0.43
OB/OD1301	0-1	0.20	0.20	0.39
OB/OD1302	5	0.20	0.20	0.35
OB/OD1401	0-1	0.20	0.20	0.52
OB/OD1402	5	0.20	0.20	0.44

2.2.4 Summary and conclusions

During May 4 through June 8, 1993, 14 shallow soil borings and two exploratory holes were drilled on or near the OB/OD on MAFR. Three of the shallow soil borings were continuously cored to depths of nearly 20 feet to characterize the subsurface geology and analytical content. These borings were analyzed for metals and explosives at depths of 0, 5, and 10 feet. Eleven shallow soil borings were drilled to collect additional soil samples at depths of 0 and 5 feet. Two exploratory holes were drilled in the northeast corner of the OB/OD. The first well was drilled with air to 180 feet to determine the location of water zones. This hole was then plugged with Bentonite. The second well was drilled using the mud-rotary method and continuously cored to a depth of 120 feet and completed as a monitoring well across a perched water zone from 94 to 100 feet.

The geology of the site is mostly silt and very fine sand in the upper 25 feet that becomes slightly coarser to a depth of 27 to 57 feet. Below 57 feet the core hole material becomes cemented and noncalcareous, indicating the top of the Ogallala Formation.

Analytical results of the soil sampling showed no explosives residue in the soils. The only metal exceeding action levels was beryllium. Beryllium values were high in background samples and are naturally high throughout much of New Mexico. The action levels for beryllium is 0.20 milligram per kilogram. Values obtained from the OB/OD site ranged from nondetected to 0.69 milligram per kilogram.

APPENDIX F
PROCEDURES TO PREVENT HAZARDS

Revised

Spill Prevention and Response Plan

Plan 106

Melrose Air Force Range, New Mexico

February 1994

Prepared for
27 CES/CEV
Cannon Air Force Base, NM 88103

Prepared by
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Melrose AFR Plan 106
SECURITY INSTRUCTIONS

1. The long title of this document is Spill Prevention and Response (SPR) Plan. The title is unclassified.

2. This document is unclassified and requires no special handling or control measures.

3. As this plan is unclassified, it does not come within the scope of directives governing the protection of information affecting national security as specified in Air Force Directives in the 205 series.

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5. Tasked organizations are authorized to extract and reproduce those portions of this document essential in the accomplishment of necessary planning and in the preparation of supporting documents.

Melrose AFR Plan 106
RECORD OF CHANGES AND ANNUAL REVIEW

RECORD OF CHANGES:

CHANGE NUMBER	DATE	DATE OF ENTRY	SIGNATURE AND ORG. OF INDIVIDUAL POSTING ENTRY

RECORD OF REVIEW:

REVIEWED BY	ORGANIZATION	DATE REVIEWED	REMARKS

Melrose AFR Plan 106
PLAN SUMMARY

1. Purpose. This plan provides guidance and assigns responsibility for the prevention and proper response to spills of oils, sewage, or hazardous substances. This plan was prepared and formatted in accordance with Air Force Engineering and Services Center's Guidance Manual for Preparation of Spill Prevention and Response Plans. This plan outlines the procedures for the Melrose AFR to comply with federal, state, and local environmental laws and regulations.

2. Conditions of Execution.

   a. This plan will be effective for execution upon discovery of an oil or hazardous substance spill.

   b. The plan will be executed in accordance with Chapter 3, "Plan Execution," for the general procedures and Annex I for site-specific situations.

3. Operations to be Conducted.

   a. Forces Assigned. Melrose AFR- and/or Cannon AFB-assigned personnel.

   b. Supporting Plans/Orders

      (1) This plan may be implemented in conjunction with Cannon AFB Operations Plan 355-1, Cannon AFB Disaster Preparedness Operations Plan.

      (2) Agencies handling oils, sewage or hazardous substances will develop a checklist for initial notification in accordance with Phase I, Spill Discovery and Initial Notification.

      (3) Key Assumption. Required personnel will be available.

      (4) Operational Constraints. Federal, state, and local laws and regulations on the handling of oil, sewage, and hazardous substances.

      (5) Command Relationships. 27 SPTG/CEV is the Office of Primary Responsibility (OPR) for the plan and will request support through the Environmental Protection Committee.

      (6) Logistic Appraisal. This plan is logistically feasible.

      (7) Personnel Appraisal. This plan is supportable with current resources.

LIST OF ACRONYMS

ACC	Air Combat Command
AFB	Air Force Base
AFESC	Air Force Engineering Service Center
AFR	Air Force Range
BCE	Melrose AFR Civil Engineer
CE	Civil Engineering
CECC	Civil Engineering Control Center
CECT	Civil Engineering Cleanup Team
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEV	27th Civil Engineering Squadron/Environmental Management Flight
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
CHRIS	Chemical Hazardous Response Information System
CRT	Cleanup and Recovery Team
CWA	Clean Water Act
DCCP	Disaster Casualty Control Plan
DCG	Disaster Control Group
DoD	U.S. Department of Defense
DRMO	Defense Reutilization and Marketing Office
DSN	Defense Switching Network
EOD	Explosive Ordnance Detachment
EPA	Environmental Protection Agency
EPC	Environmental Protection Committee
ETIS	Environmental Technical Information System
HAZMAT	Hazardous Materials
HMIS	Hazardous Material Information System
HQ	Headquarters
HW	Hazardous Wastes
IRP	Installation Restoration Program
MSDS	Material Safety Data Sheet
NMED	New Mexico Environmental Department
NOSC	National On-Scene Coordinator
NRC	National Response Center
NSN	National Stock Number
OEHL	Occupational and Environmental Health Laboratory
OHMTADS	Oil and Hazardous Materials Technical Assistance Database System
OHSPC	Oil and Hazardous Substance Pollution Contingency
OPLAN	Operations Plan
OPR	Office of Primary Responsibility

LIST OF ACRONYMS - Continued

OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
POL	Petroleum, Oil, and Lubricants
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
RRT	Regional Response Team
SPR	Spill Prevention and Response
SPTG	Support Group
UOCP	Used Oil Collection Point
USAF	United States Air Force
USCG	United States Coast Guard

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Melrose AFR Plan 106
Quick Reference Table

This table should be used as a quick reference listing when responding to a spill. The first response should be to determine the substance spilled and whether it is hazardous. This listing contains the most common hazardous substances and their associated National Stock Numbers (NSNs) used at Melrose Air Force Range (AFR) and the reportable quantity of that substance.

Quick Reference Chemical Listing

Substance	RQ
Aboveground Storage Tank, Leaking	1 lb
Antifreeze (Hazardous)	5000 lb
Diesel Fuel	25 gal
Engine Oil	25 gal
Gasoline	25 gal
Hydrazine	any amount
Hydraulic fluid	1 lb
JP-4	25 gal
Lubricant oils	25 gal
Listed Hazardous Substances (Listing in Section I)	Varies
Paint Waste - Thinners	100 lb
Sulfuric Acid	100 lb
Synthetic Oils	25 gal
Used Paint Rags	100 lb

CHAPTER 1 - BACKGROUND

1.1 PURPOSE

This Spill Prevention and Response (SPR) Plan is intended to fulfill the requirements of an Oil and Hazardous Substance Pollution Contingency (OHSPC) Plan and the hazardous waste spill prevention and response requirements. The Contingency Plan portion of the document specifies procedures to be followed when responding to releases, accidents, and spills involving oils, sewage, or hazardous substances. These include spill detection, reporting, containment, cleanup, and disposal procedures. The plan should be implemented in conjunction with the Cannon Air Force Base (AFB) Disaster Preparedness OPLAN, 355-1, if circumstances warrant implementation of the OPLAN. Also included within this document are general procedures for training programs and procedures for plan reviews and updates. The SPR Plan is supported by several vital annexes that provide the specific information associated with the facilities found on Cannon AFB.

1.2 AUTHORITY

This plan was developed in accordance with applicable legislation/regulations. The major federal oil and hazardous substances spill prevention and response legislation and regulations are as follows:

Clean Water Act (CWA), PL 92-500, 33 USC 1251 as amended by PL 95-217 and PL 95-576. Effective date 1977. The CWA authorizes the President to issue regulations establishing procedures, methods, equipment, and other requirements to prevent discharges of oil and hazardous substances from onshore and offshore facilities, and to contain such discharges.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), PL 96-510, 42 USC 9601. Effective date 11 December 1980. CERCLA provides for spill reporting, liability compensation, cleanup, and emergency response for hazardous substances (excluding oil) released into the environment and the cleanup of inactive disposal sites.

Resource Conservation and Recovery Act (RCRA), PL 94-580, 42 USC 6901. Effective date 21 October 1976. Subtitle C of the Solid Waste Disposal Act, as amended by RCRA, directs the Environmental Protection Agency to promulgate regulations establishing a federal hazardous waste management system.

33 Code of Federal Regulations (CFR) Part 153, Control of Pollution by Oil and Hazardous Substances, Discharge Removal. Effective date 26 April 1976. Requires the notification of the Duty Officer, National Response Center, U.S. Coast Guard (USCG) of the discharge of oil or a hazardous substance from a facility in violation of section 311(b)(3 of the CQA).

40 CFR Part 110, Environmental Protection Agency Regulations on Discharge of Oil. Effective date 11 November 1976. Defines a reportable spill of oil.

40 CFR Part 117, Determination of Reportable Quantities for Hazardous Substances. Effective date 28 September 1979. Defines reportable spill quantities for substances designated under section 311 of the CWA and requires notification of the National Response Center in the event of a reportable spill.

40 CFR Part 151, Hazardous Substance Pollution Prevention for Facilities Subject to Permitting Requirements. Proposed regulation 1 September 1978. Requires the preparation and implementation of a Spill Prevention Control and Countermeasures plan to prevent discharge of CWA Section 311 hazardous substances by any facility subject to permitting requirements under the National Pollutant Discharge Elimination System.

40 CFR Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Effective date 19 May 1980. Established requirements under Section 3004 of RCRA for owners and operators of facilities that treat, store, and dispose of hazardous waste. Requirements include preparedness and prevention of hazards, contingency planning, emergency procedures, manifests, recordkeeping, reporting, security, inspection of facilities, and personnel training.

40 CFR Part 300, National Oil and Hazardous Substance Pollution Contingency Plan. effective date 16 July 1982. Provides for coordinated federal action to try to prevent discharges of oil and hazardous substances, and to protect the environment from damage when discharges occur. The plan also requires federal local contingency plans for federal installations and promotes federal-state coordination.

1.3 APPLICABLE DEFINITIONS

Cleanup and Recovery Team (CRT) -- A team of predesignated individuals at Melrose Air Force Range (AFR) and stationed at Cannon AFB, trained and equipped to specifically clean up spills. The CRT is currently composed of members of the Cannon AFB Civil Engineering Squadron.

Environment -- Means the navigable waters, water of the contiguous zone, and any other surface water, groundwater, drinking water supply, land surface, and subsurface strate, or ambient air under the jurisdiction of the United States.

Hazardous Material -- Any material which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may pose a substantial hazard of any release to the environment.

Hazardous Material Response Team -- A team of predesignated individuals at each AFB and AFR, trained and equipped to execute operations for the response, control, and containment of hazardous substance spills.

Hazardous Substance -- Hazardous material or hazardous waste designated as hazardous under Section 101(14) of CERCLA. A comprehensive list of CERCLA regulated hazardous waste that may be present at Melrose AFR is presented on the Quick Reference Chemical Listing on page iv of the SPR Plan.

Hazardous Waste - Any solid, semisolid, or contained gaseous material designated as waste for disposal as defined or identified in 40 CFR Part 261.

Release/Spill -- Synonymous terms as defined by section 101(22) of CERCLA, relating to the intentional or accidental loss, including any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of a hazardous substance into the environment. It includes the release of any material of any size, nature, and quantity that:

(1) Occurs in or endangers critical water areas;
(2) Generates public interests;
(3) Becomes the focus of an enforcement action; or
(4) In any way poses a real or potential threat to public health or welfare, of the environment.

Reportable Quantity -- The quantity designated for each of 699 hazardous substances in 40 CFR 302, under the provisions of section 102 of the CERCLA. These spill quantities are for any 24-hour period and include spills on land and in air in addition to spills in the water.

Spills typically may occur in the work place and are cleaned up without a threat to the environment, public health, and property.

Response Personnel -- Those predesignated personnel charged with being knowledgeable of the nature of hazardous material present in their work places and storage areas. These personnel will also be knowledgeable on spill containment and the cleanup of operational type spills, site layout (e.g., material locations and spill equipment), and use of the site plan.

CHAPTER 2 - RESPONSE ORGANIZATIONS

2.1 GENERAL SPILL RESPONSE ACTIVITIES

The Cannon AFB On-Scene Coordinator (OSC) has available all base resources in determining and performing response actions in the event of an oil or hazardous substance spill. Deployment of personnel and resources will be activated only if called by the OSC, the OSC's representatives on-scene, or the Base Commanding Officer. For spills beyond the capabilities of Melrose AFR and Cannon AFB, additional emergency services can be obtained from the state of New Mexico or contractors or through the U.S. Environmental Protection Agency (EPA) Regional Response Team (RRT).

2.2 BASE SPILL RESPONSE CENTER

The Cannon AFB Fire Department receives all initial spill reports from Melrose AFR. The Fire Department operates 24-hr/day and alerts/activates the Melrose AFR SPR Plan. The Fire Department also notifies the Base Command Post, who in turn passes the report up the chain of command.

2.3 ORGANIZATIONAL FUNCTIONS

Spill response organizations consist of representatives from various squadrons and basewide functions.

2.3.1 Environmental Protection Committee

The Base Environmental Protection Committee is responsible for reviewing the SPR Plan before its promulgation by the Installation Commander and before finalization of any

modifications occurring during the annual review and update of the plan. The committee will develop pollution abatement policy guidance, monitor implementation of this plan and other pollution abatement directives, and ensure that supporting procedures by responsible commanders are published.

2.3.2 On-Scene Coordinator (OSC)

The OSC is the individual assigned the responsibility for directing and coordinating all spill response actions for U.S. Air Force (USAF) spills (see Executive Order 12316). The OSC will have the authority to use the expertise and resources of the HAZMAT Team and Disaster Control Group (DCG) in determining and performing response actions. It is also the responsibility of the OSC to ensure that training programs regarding spill response activities are routinely conducted. The OSC will ensure only certified and trained personnel perform spill containment, recovery, cleanup, disposal, and restoration activities.

The primary OSC for spills of oil and hazardous substances at Melrose AFR will be the Commander, 27 Support Group (27 SPTG/CC). 27 SPTG/CC may appoint someone as OSC according to OPLAN 355-1. The alternate OSC will assume full responsibility in the absence of the primary OSC.

2.3.3 Disaster Control Group (DCG)

Members notified by the DCG (under the responsibility of the 27 FW Command Post) are tasked to respond to all spills when requested by the OSC and to provide services for spill containment, recovery, cleanup, disposal, and restoration activities as directed by the OSC.

The personnel on the DCG and their designated responsibilities are discussed below.

2.3.3.1 Commander 27 SPTG

The Commander 27 SPTG will:

(1) Act as primary OSC responsible for directing and coordinating all spill response actions.

(2) Implement Cannon AFB OPLAN 355-1, if deemed necessary.

(3) Properly report and document oil or hazardous substance spills. Authorize and coordinate with higher headquarters all required notifications and requests for assistance to federal (outside the USAF), state, or local agencies and the news media.

(4) Appoint first alternate OSC according to OPLAN 355-1 Chain of Command.

2.3.3.2 Base Civil Engineer

The Base Civil Engineer (BCE) (27 SPTG/CE) will:

(1) Provide Environmental personnel to furnish technical expertise relative to pollution control techniques.

(2) Within his capability, provide personnel, transportation and equipment for containment, cleanup, and restoration of landscape due to spills of oils and hazardous substances that exceed the capability of the Base agency responsible for the spill.

(3) Notify the Commander 27 SPTG of personnel and equipment requirements that exceed Base capability.

(4) Ensure that adequate types and quantities of spill response and protective equipment, sandbags, absorbent material, cleanup equipment, etc., are stocked as designated in this plan, and that such gear is properly inspected, operated, and maintained.

(5) Provide suitable inventory and storage for chemical agents, absorbent materials, and equipment not otherwise specified to be furnished by other units employed in combating pollution.

2.3.3.3 Base Fire Chief

The Base Fire Chief (27 SPTG/CEF) will:

(1) Act as the OSC until the Commander 27 SPTG or designee arrives at the spill scene.

(2) Direct Fire Department to record all spill reports received from the Emergency Call Line (911) on a designated telephone log.

(3) Immediately respond to spills as necessary to protect life and property with due regard for the environment.

(4) Direct emergency dispatch operator to notify Base Hospital if injuries are reported.

(5) Provide technical assistance to the OSC concerning response to and handling of combustible or flammable substances.

(6) Direct emergency dispatch operator to notify the Environmental Flight on spill occurrences, if necessary.

(7) Measure explosive concentrations and determine if an explosive hazard exists. This information will be provided to the OSC for use in establishing the cordon.

(8) Provide trained personnel, transportation, and equipment for containment of spills of hazardous chemicals where special protection equipment is required (i.e., self-contained breathing systems, corrosive resistant clothing, etc.) This team shall be called the Fire Department HAZMAT Team (HAZMAT Team). Training of the HAZMAT Team members shall include the 24-Hour HAZMAT First Responder course.

(9) Maintain a current list of all members of the HAZMAT Team along with their duty telephone numbers as well as nonduty telephone numbers.

(10) Contact the HAZMAT Team members and inform them to assemble at a designated area as soon as possible.

(11) Evaluate and identify the spill area and determine whether health hazards have been eliminated.

(12) Direct emergency dispatch operator to notify Security Police of spill occurrence if evacuation is required.

(13) Notify the Chief of Operations when the Civil Engineering Cleanup Team (CECT) is needed for containment and cleanup.

(14) Fully equip, train, and maintain HAZMAT Team members to provide initial control, emergency rescue, and hazard mitigation at the scene of a hazardous spill.

2.3.3.4 Chief, Environmental Management

The Chief, Environmental Management (27 SPTG/CEV) and assigned staff will:

(1) Respond to all spill emergency calls. Provide technical and scientific support to the OSC in environmental pollution matters during all oil or hazardous substance incidents.

(2) Advise the OSC as to the need to, or in his/her absence, activate specific members of the HAZMAT Team and the CECT.

(3) Determine the adequacy of the ultimate cleanup effort and advise the OSC of any additional cleanup requirements.

(4) Represent the commanding officer in matters of coordination between Melrose AFR and federal/state agencies exercising jurisdiction in environmental pollution control.

(5) Ensure proper containerization and disposal of all hazardous wastes resulting from the spill.

(6) Maintain official records and photographs documenting the extent of the spill and all contaminants, cleanup and recovery actions taken, and procedures used.

(7) Report to the scene of the spill immediately upon notification, as ordered by the OSC.

(8) Provide technical expertise on severity of spill, containment, and remediation.

(9) Assess environmental impact.

(10) Notify the state of New Mexico, the New Mexico Emergency Response Center (through the New Mexico State Police and in accordance with Chapter 3 and OPLAN 355-1), the National Response Center (NRC), and Air Combat Command (ACC) of reportable spills. Submit pollution incident reports.

(11) Ensure proper cleanup and disposal of contaminated materials.

(12) Notify Base Bioenvironmental Engineer of spill and materials that require testing.

2.3.3.5 Bioenvironmental Engineer

The Bioenvironmental Engineer (27 MG/SPB) will:

(1) Upon notification of a spill, and at the direction of the OSC, sample and test the affected waterways to monitor the extent and degree of pollution caused by the spill, if any.

(2) Provide the technical assistance and advice to the OSC and the hospital with respect to the health hazards associated with oils and hazardous substances.

(3) Perform confirmation sampling after cleanup activities to ensure that hazardous constituents have been removed.

2.3.3.6 Readiness Officer

The Readiness Officer (27 SPTG/CEAD) will

(1) Ensure that the Cannon AFB Disaster Preparedness OPLAN 355-1 is coordinated with the SPR Plan in the event of a hazardous substance spill requiring the implementation of the Disaster Preparedness OPLAN 355-1.

2.3.3.7 Chief, Security Police

The Chief of Security Police (27 FW/SP) will:

(1) Immediately mobilize his or her organization to an actual or potential oil, sewage or hazardous substance spill, to isolate the spill area and control traffic when and where necessary as directed by the OSC.

(2) Ensure that while individuals in the security force are on normal patrols, they are continuously aware of oil and hazardous substance spills and report all areas that appear to be suspect.

2.3.3.8 Liquids Fuels Maintenance Technician

The Liquid Fuels Maintenance Technician will:

(1) Report to the scene, at the request of the OSC, to measure explosive vapor concentrations and determine where explosion hazards exist. This information will be provided to the OSC for use in establishing the cordon.

2.3.3.9 Staff Judge Advocate

The Staff Judge Advocate will:

(1) Respond to all oil and hazardous substance pollution spills, at the request of the OSC, to ensure that information, records, and samples adequate for legal purposes are obtained and safeguarded for future use.

(2) Advise the OSC on the legal aspects of spill response when parties other than the USAF are responsible for the spill.

(3) Obtain necessary permission from land owners to investigate and clean up spills.

2.3.3.10 Public Affairs Officer

The Public Affairs Officer will:

(1) Respond to all oil or hazardous substance spills when requested by the OSC.

(2) Keep abreast of all Melrose AFR actions during a spill and prepare to provide prompt and accurate news releases on the nature of the discharge and the steps being taken to correct the problem. This policy must be followed to obtain understanding from the public, ensure cooperation from all interested parties, and check the spread of misinformation.

(3) Coordinate all news media releases involving actions with the Wing Commander.

(4) If the Regional Response Team News Office is activated, coordinate all news releases with them. If a Regional Response Team News Office is not activated, the EPA's Public Information Office can be contacted (404-881-3004) if deemed appropriate.

(5) Prepare and direct a public awareness program to inform all personnel assigned to Melrose AFR (military, civilian, and contractor) about spill prevention programs as well as spill discovery and notification responsibilities and procedures.

2.3.3.11 Safety Officer

The Safety Officer will:

(1) Provide technical assistance to the OSC with respect to the safety of personnel.

2.3.3.12 Base Hospital Commander

The Base Hospital Commander (27 MG/CC) will:

(1) Ensure that medical personnel and ambulance(s) are dispatched to the site of the spill as directed.

(2) Ensure that emergency treatment is rendered and injured personnel are removed to the Base Hospital for treatment.

(3) Ensure that current and follow-up information on injured personnel is provided to the OSC as soon as possible.

(4) Ensure that hospital staff are familiar with health effects of hazardous substances present at Melrose AFR.

(5) Implement, if required, the 27 Medical Group Disaster Casualty Control Plan (DCCP) to ensure prompt admittance of the injured for treatment (this includes strict control measures to prevent risks of hazards to hospital personnel and the public).

2.3.3.13 Transportation Officer

The Transportation Officer will:

(1) Provide OSC with transportation as required for spill response personnel and equipment.

2.3.3.14 Weather Officer

The Base Weather Officer will:

(1) Ensure that the OSC is provided with up-to-date weather information as requested.

(2) Assist in calculating direction and downwind concentration of airborne contaminants.

2.3.3.15 Chief, Communications Squadron

The Chief, Communications Squadron (27 SPTG/CS) will:

(1) Ensure that a photographer documents with photographs, as directed by the OSC, the extent of the spill as well as the containment, countermeasures, and restoration procedures used.

2.3.3.16 Comptroller

The Comptroller will:

(1) Assign job numbers to identify resources on materials and labor due to oil or hazardous substance spills.

(2) Accumulate costs and report to the Wing Commander the value of resources expended.

(3) Initiate action to recover funds as appropriate.

2.3.4 Hazardous Materials Response Team (HAZMAT Team)

Trained personnel will remain on 24-hour alert at the Base Fire Department. The HAZMAT Team will work under the direction of the Base Fire Chief and in coordination with the OSC. The necessary equipment will be on hand for the HAZMAT Team to perform the following tasks in the event of an emergency:

(1) Serve as the first responder (if directed by the Fire Chief) to any spill where the amount of material spilled exceeds the Reportable Quantity (RQ).

(2) Provide emergency rescue of endangered personnel while protecting others from existing hazards.

(3) Establish a cordon around affected areas with controlled access/egress.

(4) Control, mitigate, or otherwise contain spill material to prevent loss of life and property and prevent degradation of the environment.

(5) Coordinate with outside spill response agencies and emergency personnel if OPLAN 355-1 is implemented.

The HAZMAT response effort requires the total cooperation of all organizations to handle the incident. The HAZMAT team is built around functional roles, or elements, with one or more persons assigned. Specific checklists covering each of the following functional elements shall be developed to handle incidents involving both facility and transportation, specific chemicals, and generic responses. Each of the functional elements is defined below.

The Hazard Group Supervisor will:

(1) Assist the OSC with the overall scene management and directly supervise the HAZMAT team, and

(2) Keep the OSC fully advised of technical or specific information relative to the spill incident at hand.

The Information Management Monitor will:

(1) Assemble and analyze all technical reference material, incident data, and other resources to include interviews with Bioenvironmental Engineering personnel and other technical specialists, and

(2) Make recommendations to the HAZMAT Supervisor concerning evacuation criteria, personal protective equipment and clothing, and mitigation procedures.

This is one of the first positions that will be filled during an incident, and requires one to three persons depending on the complexity of the incident.

The Safety and Health Monitor will:

(1) Monitor the safety and health of all personnel within the hazard area (hot and warm zones),

(2) Consult with the Bioenvironmental Engineering personnel and other technical specialists on the safety and health aspects of the incident,

(3) Have the authority to alter, suspend, or terminate activities that pose an imminent danger condition or are immediately dangerous to life or health,

(4) Remain in constant contact with the Hazard Supervisor and maintain a log of exposure times for each person in the hot zone, and

(5) Be knowledgeable in the operations being used and trained in the emergency handling of hazardous materials.

This position usually requires one to two persons depending on the complexity or geographical size of the incident.

The Entry Personnel Element will:

(1) Perform the physical reconnaissance of the problem area, if safely possible. They will document and report the presence of potential life hazards and environmental factors,

(2) Assist in plan formulation for control actions,

(3) Don proper protective equipment and gear and enter the hot zone to perform product control. All personnel in the hot zone must work in pairs. There must be backup personnel on standby to perform assistance or rescue of personnel in the hot zone wearing appropriate level of protective equipment, and

(4) Ensure that emergency medical services personnel are available with transport capabilities.

The element requires a minimum of four to six persons.

The Decontamination Element will:

(1) Determine the proper decontamination procedures and setup the decontamination zone site before anyone enters the hot zone,

(2) Coordinate all decontamination activities with the Hazard Group Supervisor, the Safety and Health Monitor, and the Information Management Monitor, and

(3) Perform decontamination procedures on all persons leaving the hot zone. Decontamination personnel shall wear personal protective equipment appropriate to the incident.

The element requires a minimum of four to six persons.

The Resources Management Element will:

(1) Control all tools, protective clothing,and equipment used during the incident,

(2) Be responsible for all members of the HAZMAT team not specifically assigned to other functional areas,

(3) Document the use of all expendable items, and

(4) Assist the Entry Element in donning an doffing their protective equipment and clothing.

This element requires a minimum of four to six persons depending on the complexity and/or geographic size of the incident.

2.3.5 Civil Engineering Cleanup Team (CECT)

The CECT will be staffed by the Civil Engineering Squadron and shall be under the control of the Base Civil Engineer. The CECT shall:

(1) Be staffed, trained, and equipped to handle oil and hazardous substance spills that may be encountered at Cannon AFB. Hazardous substance spills include nitrogen tetroxide and hydrazine.

(2) Respond to all Cannon-related spill emergency calls on and off base as requested by the OSC.

(3) Clean up the spills to satisfy all federal, state, and local requirements.

(4) Conduct bimonthly training sessions to prepare the Civil Engineering Cleanup Team members for oil and hazardous substance spills that may be encountered.

(5) Be placed on a recall roster to permit after-hours cleanup of oil and hazardous substance spills.

2.3.6 Tasked Commanders and Staff Agency Chiefs

It is the responsibility of tasked commanders and staff agency chiefs to publish such procedures that are necessary for implementing this plan and ensure that adequate training is

conducted and environmental protection/pollution abatement procedures are implemented in their areas of responsibility. They will designate additional project officers and monitors as required to ensure an effective program and continually inspect the work areas under their control to ensure that effective pollution abatement procedures are followed. They will also ensure that Site-Specific Contingency Plans developed for their particular areas are posted in prominent locations at potential spill sites.

2.3.7 Individuals Assigned, Attached to, or Working at Melrose AFR

Each individual assigned to, attached to, or working at Melrose AFR is tasked to report any spill of oil or hazardous substance to the Base Fire Department and to take every reasonable precaution to prevent the spillage of oil or hazardous substances. In addition, all contractors performing services will be notified prior to the initiation of the contract of their responsibilities to take every reasonable precaution to prevent the spillage of oil or hazardous substances and to report any spills of this nature to the Base Fire Department.

CHAPTER 3 - PLAN EXECUTION

3.1 GENERAL PROCEDURES

The Oil and Hazardous Substance Contingency Plan for Cannon AFB designates the procedures to be followed in the event of releases, accidents, and spills involving oils, sewage or hazardous substances and the organizations, personnel, and equipment responsible for carrying out the response functions.

The OSC is the individual assigned the authority for directing and coordinating all spill response actions. The OSC will have the authority to use the expertise and resources of the HAZMAT Response Team and personnel associated with the Primary Crash Network. Only the OSC or his/her designee can activate the HAZMAT Team. The activation of the HAZMAT Team and the Disaster Control Group (DCG) is effected to provide a coordinated response to contain, control, recover, and restore the environment from all spills. Annex IV summarizes all Base telephone numbers used for contacting these organizations. Off-duty telephone numbers are maintained by the primary and alternate OSCs, the Fire Department, and the Civil Engineering Service Call Desk. Annex IV also summarizes all off-base response organizations along with the telephone numbers used for contacting those organizations. The responsibilities of the OSC and personnel assigned to the HAZMAT Team and DCG regarding contingency planning are outlined in Chapter 2.

Due to the diversity of materials stored at Melrose AFR and the variable severity of the hazards presented in the event of a spill, the response actions will vary. General procedures should be reviewed and, if necessary, updated before adopting courses of action in a particular situation. Site-Specific Contingency Plans exists for each facility at Melrose AFR; these are referred to in Chapter 4 for use in the event of a release. The execution of the SPR Plan is divided into four phases:

- Phase I - Spill Discovery and Initial Notification,
- Phase II - Response Actions,
- Phase III - Short-Term Site Restoration, and
- Phase IV- Long-Term Site Restoration.

It should be noted that this plan deals primarily with solid and liquid pollutants.

3.2 PHASE I - INITIAL NOTIFICATION AND RESPONSE

Phase I designates the initial spill response procedures to be followed by any individual discovering a spill or potential spill of oil, sewage or hazardous substances. The person(s) discovering a spill is responsible for providing initial defensive actions without undue risk of personal injury. Figure 3-1 presents a flow chart for visualization of the notification and response processes. The initial notification will vary depending on the amount of material spilled.

(1) The party discovering the spill will immediately call the Fire Department at 911 to notify emergency personnel:

(a) When notifying the Fire Department of the spill occurrence, the following information should be provided if it is known or can reasonably be determined.

- Name of individual reporting spill.
- Location of spill, including street address.
- Number of injured personnel and nature of injuries (if applicable).
- Type of substance spilled.

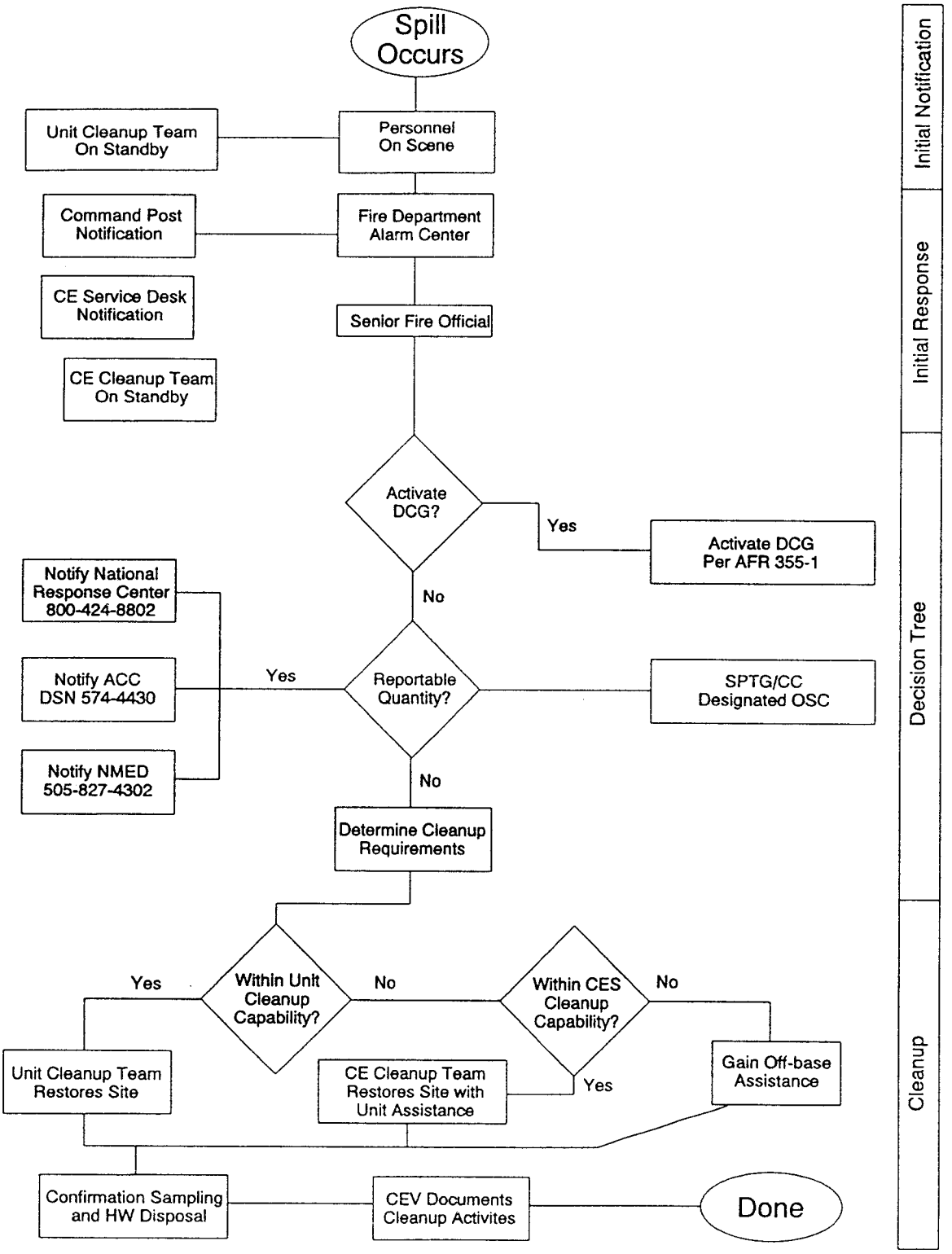


Figure 3-1. Decision Matrix

- Amount spilled (estimated).
- Rate material currently spilling (estimated).
- Time spill occurred (estimated).
- Extent spill has traveled.
- Any additional pertinent information (i.e., other potential hazards).

(b) After notifying the fire department, implement the following actions as necessary upon discovery of a spill. The order of the actions will depend on existing conditions.

- Initiate evacuation, if necessary.
- Notify Base Hospital (via ext. 4-911) for injuries.
- Check causes and stop the source of spill, when possible, without undue risk of personal injury; use of on-site spill containment equipment and materials may be necessary.
- Restrict access to spill scene to authorized personnel.
- Restrict all sources of ignition when flammable substances are involved.
- Report to OSC upon arrival.

(c) Base personnel other than Fire Department personnel receiving reports of spills shall aid in channeling the report to the Fire Department, who will respond as outlined.

(2) The Fire Department will:

(a) Immediately respond as necessary to protect life and property with due regard for the environment.

(b) Record spill reports on a Spill Report/Response Form (Annex I), designed to record the information listed in paragraph (1)b in this section along with the time of the report.

(c) Notify the Fire Chief and Environmental Flight (or Base Civil Engineer if Environmental Flight cannot be contacted) as well as the Base Hospital if injuries are reported. The Fire Chief will notify the Command Post, who will execute notification through the DCG. The Fire Chief will serve as the OSC until relieved by the Base Civil Engineer or the Base Commander. This designation is vital for success of the spill response. The current duty telephone numbers for these personnel are listed in Annex III.

(d) Activate the HAZMAT Team to establish cordon, contain migration, and rescue the injured.

(e) Notify the Chief of Operations or Deputy Chief of Operations when the cleanup team is needed.

(3) The Base Environmental Flight or Civil Engineer will:

(a) Respond with available personnel, equipment and materials, if requested by appropriate authority and approved by the OSC.

(b) Advise the cleanup team on cleanup procedures and proper disposal methods.

(4) The Command Post will:

(a) Maintain a current list of all members of the DCG including their duty telephone numbers (Annex III) as well as nonduty telephone numbers. A backup copy of this list will be posted at the Fire Department dispatch desk, which receives all CE Service Call Desk calls during nonduty hours.

(b) Activate the DCG members designated by the OSC and inform them to assemble within 15 minutes at a specified location.

3.3 PHASE II - FOLLOW-ON RESPONSE

(1) Spill Containment and Control:

To be written by Cannon AFB Fire Department

(2) Spill Response Actions: The OSC or his designee will direct and coordinate all spill response actions. The actions under the responsibility of the OSC are:

(a) Activate or authorize action from appropriate members of the HAZMAT Team based on information obtained during initial notification or information provided by the Environmental Flight and immediately investigate the reported spill.

(b) Determine the source, type, extent, approximate quantity, and cause of the spill and institute appropriate action to stop the source of spill, if the spill is still occurring.

(c) Evaluate the magnitude and severity of the threat to public health, welfare, and natural resources. Material Safety Data Sheets are on file with Bioenvironmental Engineering and should be maintained at each facility.

(d) Take appropriate safety precautions to protect response personnel and any additional personnel located in proximity to the probable spill route (in accordance with OPLAN 355-1). The Security Police Squadron (27 SPS) will be used to initiate evacuation procedures and establish traffic control points and entry control points as determined by the OSC.

(e) Institute spill containment procedures. In accomplishing this task, the OSC should refer to the following sources of information either contained in this document or kept on file:

- Chapter 4 for the Melrose AFR Site-Specific Contingency Plan.

- Material Safety Data Sheets which are on file with Bioenvironmental Engineering. The HMIS database can also be utilized.

- Annex II for spill response equipment inventories and locations of equipment.

- Annex V for a map to assist in the determination of probable spill routes and access to the spill sites.

(f) Determine the party responsible for the spill.

- If the USAF is the responsible party, spill cleanup actions will be the responsibility of the facility where the spill occurred.

- If someone other than the USAF is the responsible party, the responsible party should be informed of the spill and their response action evaluated by the Base OSC.

(g) Direct the Environmental Flight to contact HQ ACC/CEV by telecon (DSN 574-3553) if uncertain of the spill classification. For spills occurring after normal duty hours or on weekends, the ACC/CE alert duty officer should be contacted through the ACC Command Post (DSN 574-2224/2225).

(h) Determine whether a "Reportable Spill" has occurred. Annex IV includes "Reportable Spill" criteria for the substances identified on the Base as potential "Reportable Spill" substances.

(i) Telephonic and message notification of other federal and state agencies must be made promptly by the Environmental Flight representative following telecon notification of reportable spill to HQ ACC/CEV. These agencies are listed in Annex IV.

(j) Direct the Base Bioenvironmental Engineer to take samples to determine the chemical nature, pollutant concentration, and extent of the spill as required for response actions and documentation.

(k) Advise Base Public Affairs of the size and nature of the spill and response actions.

(l) Initiate cleanup actions. Pollutants will be collected to the maximum extent possible.

- Reusable or reclaimable JP-4 will be stored in tanks for proper disposition. All other oils and hazardous substances will be disposed of through DRMO in accordance with Cannon AFB Operations Plan 18-4, Management of Recoverable and Unusable Liquid Petroleum Products, or Cannon AFB Hazardous Waste Management Operations Plan, as appropriate.

- Absorbent and similar material will be placed in 55-gal drums, labeled, turned in to the DRMO (by the organization causing the spill) and stored there, if necessary, until eventual disposal in accordance with federal, state, and local environmental laws and regulations.

- Hazardous pollutants will be collected in polyethylene-lined drums (see 49 CFR 178.133) or other approved drums, as specified by 49 CFR 172.101 or 102; labeled; turned in to DRMO (by the organization causing the spill); and stored there, if necessary, until eventual disposal in accordance with DoD and RCRA regulations.

(m) Develop corrective action plans to ensure that spills or similar spills do not occur again.

(n) On completion of cleanup operations, a "final" report will be submitted to HQ ACC/CEV, with information copies to HQ USAF/CEV and NMED; within 15 days of a spill of hazardous waste requiring the implementation of the SPR Plan, such a report will be submitted to the Regional Administrator of EPA. Both regulatory agency reports and internal USAF reports should contain all of the information listed in Annex IV.

3.4 PHASE III - SHORT-TERM SITE RESTORATION

Phase III site restoration occurs when: (1) the spill has been deemed a "Reportable Quantity"; (2) the release has been mitigated, flow of spill material has ceased, and migration pathways have been closed; and (3) the event is no longer an imminent threat to humans or the environment.

Cleanup and disposal will then be the responsibility of the CECT under the authority of the OSC in coordination with the Base Civil Engineer and the Chief, Environmental Management. The cleanup method used will depend on the characteristics of the spilled material, size of spill, location of spill, character of the area, and potential impacts.

If it is decided to clean up the spill with on-base resources, the OSC will instruct the CECT to assemble and move to the Control Site. Cleanup personnel shall use proper protective equipment at all times during cleanup operations.

The CECT shall:

(1) Treat the spill, if safe and feasible, to mitigate hazards;

(2) Clean all contaminated surfaces of the spilled material. Water, detergents and/or solvents can be used to remove residual spill material from asphalt, and other hard, impermeable surfaces;

(3) Collect spill residue, other contaminated material, and all nonreusable cleanup materials, including disposable clothing, sorbents, brushes, rags, brooms, and containers. Package material in U.S. Department of Transportation-approved containers. Mark and label container in

accordance with Department of Transportation and EPA requirements, as appropriate;

(4) Thoroughly decontaminate and inspect all reusable protective clothing and equipment before it is returned to their proper storage location; and

(5) Ventilate indoor areas.

If it is decided that cleanup is beyond the capabilities of the CECT, the OSC shall activate any other appropriate on-base resources to aid in clean-up or coordinate any required additional assistance with the Wing Commander. If cleanup is done by an outside contractor or agency, the OSC shall maintain on-scene command and support cleanup as needed until relieved by higher authority, if necessary.

3.5 PHASE IV - LONG-TERM SITE RESTORATION

Phase IV may require an extended time period to complete. This phase includes spill site restoration where hazardous chemicals have contaminated large quantities of earth or groundwater or where surface water is contaminated. Phase IV actions will prevent further contamination, restore contaminated earth and water, and permit productive use of the spill site. These restoration activities are administrated and contracted out to a service contractor through the Environmental Flight Installation Restoration Program (IRP) section.

3.6 NOTIFICATION PROCEDURES

3.6.1 Initial Notification Checklist

The Initial Notification Checklist, provided in Annex I, should be used when notifying the Fire Department at Ext. 4-911 of a reportable spill. The minimum information that should be provided, as outlined in the checklist, is as follows:

a. Name/rank of individual reporting the spill.
b. Location of spill, including street address.
c. Description of injuries.
d. Name of spilled substance.
e. Amount of substance spilled.
f. Rate of spill (if spill is still occurring).
g. Time of spill.
h. Distance spill has traveled/spread.
i. Other pertinent information.

The completed form should be delivered to 27 SPTG/CEV within two working days after the incident.

3.6.2 Procedures for Notifying HQ ACC

HQ ACC/CEVCM is responsible for environmental oversight at Melrose AFR. It also provides advice and staff assistance in all areas of environmental protection including spill

response matters. HQ ACC/CEVCM is located at Langley AFB, VA and can be contacted in the following manner:

DSN	574-3553
Commercial	(804) 764-3553

3.6.3 Procedures for Notifying Regulatory Agencies

Submit a pollution report within 60 days of a "major" oil spill or when requested by the National Response Team and the Regional Response Team [40 CFR 300.56]; within 60 days of a 1,000-gal oil spill or two reportable oil spills in 12 months to the Regional Administrator of EPA [40 CFR 112.4]; within 60 days of a reportable spill of CWA Section 311 substances to the Regional EPA Enforcement Division Director and the appropriate state agency [proposed 40 CFR 151.4]; and within 15 days of a spill of a hazardous waste that requires the implementation of the SPR Plan to the Regional Administrator of EPA [40 CFR 264.56, 265.56]. The reports must be in narrative form for regulatory reports and as prescribed in Air Force Rule 19-8 for USAF Reports. The reports must contain the following information [40 CFR 300.56, 264.56, 265.56, Air Force Regulation 19-8 Paragraph 6, Figure 1]:

- Name, owner, and address of installation.
- Name and telephone number of OSC.
- Incident report (initial, second, third, final).
- Date and time of incident.
- Time of official spill notification to the National Response Center and other regional and state officials.
- Location of incident and the nature of the terrain at the location to include surface and subsurface drainage characteristics and relationships to water

bodies (estimate extent of area affected, such as miles of stream or acres of lake).

- Weather conditions and how they affected response action.
- Cause of incident.
- Type and estimated amount (barrels, gallons, pounds) of pollutant and the official size classification for oil spills (minor, medium, major).
- Actual damage and/or potential threat to human life, to property (private, state, or federal), and to plant or animal life.
- Corrective action taken to eliminate pollution source.
- Corrective action taken to remove pollutant.
- Assistance required (federal, state, private contractors).
- Estimated completion date of remedial actions and anticipated effectiveness.
- Estimated quantity and disposition of spill material and contaminated soil and water.
- Description of any problems encountered during implementation of the SPR Plan and an explanation of how the SPR Plan was, or will be, modified to prevent the recurrence of the spill event.
- Anticipated or actual reaction by the news media and public to the incident. Specify potential for liability (for internal USAF reports only).
- Whether all emergency equipment used in a spill response has been decontaminated. Response equipment must be decontaminated and ready for use before the areas of a facility affected by a spill can be put back into service [40 CFR 264.56, 265.56].
- A copy of this SPR Plan if one is requested.

3.6.4 Off-Base Contact Notification Procedures

Various off-base entities can be used for information and assistance during a spill event. A complete discussion of off-base resources is discussed in Section IV.

3.6.5 Activation of Disaster Control Group (DCG)

The DCG must operate in concert with the OSC to ensure that spill response and disaster response activities are coordinated when the DCG is activated. It is the responsibility of Commander 27 SPTG, acting as OSC, to implement Cannon OPLAN 355-1, if deemed necessary.

CHAPTER 4 - CONTINGENCY PLAN

4.1 IMMEDIATE SPILL EMERGENCY ACTION PLAN

WARNING: Predesignated personnel at Cannon AFB have been specifically tasked, trained, and equipped to respond to all hazardous substance spills. Unauthorized individuals shall never undertake the response to or investigation of any actual or suspected hazardous spill.

IN CASE OF AN OIL OR HAZARDOUS SUBSTANCE SPILL

- Initiate evacuation, if necessary.
- Notify Base Hospital (via ext. 911) for injuries.
- Notify 911 immediately. Be prepared to provide the information outlined below (Spill Response Checklist).
- Check causes and stop the source of the spill without undue risk of personal injury; use of on-site spill containment equipment and materials may be necessary.
- Make spill scene "OFF LIMITS" to unauthorized personnel.
- Restrict all sources of ignition.
- Report to OSC upon arrival.
- When notifying the fire department of the spill, the following information should be provided:
  - Name of individual reporting the spill;
  - Location of spill;
  - Number of injured personnel, types of injuries;
  - Type of substance spill;
  - Rate material is currently spilling (estimated);
  - Time that spill occurred (estimated);

— Extent spill has traveled; and

— Any additional, pertinent information.

4.2 GENERAL FACILITY INFORMATION

Melrose AFR is approximately 40 miles west of Cannon AFB in Roosevelt County, New Mexico. The primary function of the range is to provide support facilities for USAF aircraft to practice conventional and nuclear bombing and strafing techniques. The primary wastes generated by the range are diesel fuel, used engine oil, and waste paints.

The facility has been in operation since 1965 and is attached to Operations Group. The facility consists of the following structures:

- Operations Center
- Fire Department Annex
- Aboveground Storage Tanks for Fuels
- Open Detonation Thermal Treatment Unit

Personnel at this facility are military and civilian and work the following shifts:

Shift	Area Supervisor	Extension	Military	Civilian
Days	Range Manager	4-2571	1	7

4.3 POTENTIAL SPILL ROUTES

Spills within the buildings will be contained inside. If a spill occurs in the compound, the spill will migrate into the ground and will have to be cleaned up accordingly.

4.3.1 Fire Safety Plan

(1) Building Construction: Metal frame on concrete foundation. Steel roof.

(2) Evacuation: In the event of a fire or potential fire/explosion, all personnel in any building within 500 feet in all directions will be evacuated. Toxic/flammable vapors or fumes being carried downwind may endanger personnel in building in all directions. Notify the Fire Department immediately to alert local authorities.

(3) Containment Measures:

- Minor spills occurring inside the building should be confined with absorbents. Material should be picked up and containerized, if possible. The spill area should be cleaned up using absorbent materials.

- Major spills should be contained by absorbent materials and cleaned up by the CECT.

- Releases involving the thermal treatment unit will be handled in accordance with the operating procedures outlined in the RCRA Permit

for Open Detonation Activities at Melrose AFR, Section G - Contingency Plan.

(4) Utilities: The building is heated using natural gas. Primary lighting is provided through overhead florescent bulbs. There are lights located at each exit from the facility.

4.4 FIRE AND SPILL EQUIPMENT

Fire extinguisher are located throughout the facility. The following spill response equipment and materials are stored at the range:

Quantity	Description
13	Halon 1211, 28 pound, Model GH-17F fire extinguishers
2	Water hose connection with hose
2	Face shields
2	Pair chemical resistant gloves
2	Rubber aprons
1	Eyewash station (adjacent to vat room)
1	Nonaggressive fluid absorbent spill kit (PIG Corp)
1	50-lb bag of absorbent material
4	55-gal OH drums (17E)
4	Telephones (three in main building and one in tower)
1	Radio - UHF, VHFD fixed site
6	Johnson handheld
3	CBs (one in each vehicle)

Quantity	Description
3	Pick up trucks
1	Dumptruck
1	Grader
1	Backhoe
1	Bull Dozer
2	500-gal water trucks

Procedures should be implemented to ensure that this equipment is in a state of readiness and that, after use, reusable equipment is cleaned and fit for reuse. Used equipment should be assessed to ensure that only reusable equipment is cleaned. Other used equipment should be managed as hazardous waste and replaced immediately by the Environmental Management Office.

During thermal treatment operations, munitions and EOD personnel will have on-hand the following additional equipment.

Quantity	Description
1	First Aid Kit
1	Fire extinguishers per vehicle
1	Respirator with appropriate cartridges per person
2	Shovels per EOD vehicle
1	55-gal open head drum
1	Chemical apron per person
1	Pair leather or rubber gloves per person
1	Pair rubber boots per person
1	Pair goggles or face shields per person
4	Handheld Motorola Radios

1 Front End Loader

1 Ambulance or first aid vehicle

4.5 HAZARDOUS MATERIALS STORED AT THIS SITE

Material Stored	Approximate Maximum Quantity	Location
Used Engine Oil	<20 gal	Used Oil Collection Point
Diesel Fuel	<500 gal	Hazardous Material Storage
Paint Products	<10 gal	Hazardous Material Storage

The Material Safety Data Sheets for substances used at this site are located in the training office.

4.6 INSPECTIONS AND PERSONNEL TRAINING

The facility hazardous waste monitor conducts weekly inspections of the hazardous materials generating areas. These inspections are documented in the hazardous waste logs and any deficiencies noted are immediately corrected.

All personnel who work with hazardous materials in the shop are required to take both Hazardous Communications training through Military Public Health and Hazardous Waste Management Training through Environmental Management. Training includes:

- Identification and use of hazardous materials, hazardous waste, and oil products;
- The use of spill and fire control equipment;

- Spill response procedures for various work areas;
- The locations and functions of all shutoff switches;
- The physical characteristics and hazards associated with materials used in the shop; and
- Safe operating procedures for all shop activities.

4.7 PLAN UPDATING AND POSTING REQUIREMENTS

The facility supervisor shall notify the Environmental Management Office in writing whenever changes occur at this facility which may affect the effective implementation of this plan. At a minimum, the plan must be updated annually. The Environmental Management Office is responsible for updating this site-specific contingency plan.

The facility supervisor must post a copy of this site-specific contingency plan in an open area, accessible to all personnel working in the shop. In addition, all personnel must have access to the Material Safety Data Sheets for any hazardous materials used by the facility.

CHAPTER 5 - TRAINING REQUIREMENTS

All military, civilian, and contractor personnel assigned to Melrose AFR will successfully complete a training program that teaches them to perform their duties in a way that ensures compliance with the federal, state, and DoD regulations.

5.1 PERSONNEL TRAINING REQUIREMENT

Commanders will ensure all personnel (military and civilian) who use, handle, or are potentially exposed to oil or hazardous substances complete the Federal Hazard Communication Training Program in accordance with Air Force Occupational, Safety and Health Standard 161-21, dated 23 January 1989 and OPLAN 355-1. This training will be conducted upon initial work area assignment and whenever a new hazard is introduced into their working area. OSHA HAZWOPER Training in accordance with OSHA regulation 29 CFR 1910.120 and HQ ACC - Hazardous Waste Operations and Emergency Response Implementation Guidance.

5.1.1 Level 1 - First Responder (Awareness)

This level is covered under HAZMAT Training administrated by the Readiness Flight. Personnel covered include: Security/Law Enforcement, Command and Control, Air Traffic Control, Accumulation Point Managers, Hazardous Material Storage Location Personnel, Ground Safety Personnel, Readiness Personnel, and On-Scene Disaster Control Group (DCG) (As Assigned).

5.1.2 Level 2 - First Responder (Operations)

This level is covered under HAZMAT Training administrated by the Readiness Flight. Personnel covered include: On-Scene Disaster Control Group (DCG) (As Assigned), Fire Protection, Environmental Managers, Fuels Management Personnel, Bioenvironmental Engineer, Safety, Readiness Personnel, Accumulation Point Managers, and Hazardous Material Users (as directed by EPC).

5.1.3 Level 3 - Hazardous Materials Technician

Level 3 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight. Personnel covered include: Explosive Ordnance Personnel, HAZMAT Response Team, Cleanup Response Team (as assigned), Fuels Management Personnel, and Readiness.

5.1.4 Level 4 Hazardous Materials Specialist

Level 4 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight. Personnel covered include: HAZMAT Response Team Leader(s), Cleanup Response Team Leaders, Hydrazine Specialists, Bioenvironmental Engineers and Technicians, and Environmental Flight.

5.1.5 Level 5 - OSC

This training must be the requirements of the formal Air Training Command (ATC) OSC Course G307R0516-001, in accordance with Air Force Rule 355-1, Chapter 7. Personnel covered include: Installation Commander, Logistics Group Commander; Operations Group Commander, Support Group Commander; Disaster Preparedness, and Senior Fire Officials.

5.1.6 Level 6 - Cleanup Response Team Members

Level 6 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight. Personnel covered include personnel assigned to the Cleanup Response Team and Fuels Management Personnel.

5.2 HAZMAT TEAM TRAINING

All Base personnel designated by the Fire Department as part of the HAZMAT Team must take part in periodic spill response training programs. The training will be in accordance with the Occupational Safety and Health Administration (OSHA) Rule protecting hazardous waste workers and emergency responders (29 CFR 1910.120) Fire fighters will complete their training in accordance with ACC Supplement 1 to Air Force Rule 92-1.

The training will consist of formal classroom training and spill exercises. Spill response exercises will be conducted at least annually. Response to an actual spill will satisfy the annual requirement for spill response exercises. New HAZMAT Team members should be given a copy of the SPR Plan and be briefed when they are assigned to the team.

5.3 CIVIL ENGINEERING CLEANUP TEAM (CECT)

All Base personnel assigned and designated by the Chief of Operations as part of the CECT, must take part in the periodic cleanup response training program. The training will be in accordance with the Occupational Safety and Health Administration (OSHA) rule protecting hazardous waste workers and emergency responders (29 CFR 1910.120).

The training will consist of formal classroom training and spill exercises. Spill response exercises will be conducted at least annually. Response to an actual spill cleanup will satisfy

the annual requirement for a spill response exercise. New CECT members should be given a copy of the SPR Plan and be briefed when they are assigned to the team.

CHAPTER 6 - PLAN REVIEW AND UPDATE

The SPR Plan will be reviewed annually, at a minimum, and amended as required. Other circumstances which will warrant a plan review and update are listed as follows:

- When a RCRA permit is modified;
- When facility changes occur which increase the potential for spills or change the spill prevention and response procedure methods and equipment;
- When the SPR Plan fails or proves to be ineffective in the prevention of or response to a spill event;
- At the request of the U.S. Environmental Protection Agency or the New Mexico Environment Department;
- After enactment of, or amendment to, pertinent federal or state legislation, or changes in DoD or USAF policy. Particular attention should be given to changes in reportable spill quantities;
- After pertinent modifications of federal, regional and state contingency plans;
- After any changes in adjacent land and water use that would affect spill prevention and response considerations; and
- At the request of the Cannon AFB EPC.

The Environmental Protection Committee will be responsible for reviewing the report, monitoring any corrective actions and amending the SPR Plan when necessary. The review of the SPR Plan, and any resulting amendments or changes to the plan will be logged on the record sheet at the front of this document.

ANNEX I

CHECKLISTS FOR SPILL NOTIFICATION AND RESPONSE

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

CHECKLISTS FOR SPILL NOTIFICATION AND RESPONSE

These checklists are to be used by the various response facilities and responders to spills during response to emergencies. The checklists used by the facilities are:

Initial Response Checklist I-2

Spill Report/Response Form I-3

Civil Engineering Service Call (27 CES/CEMRC)

- Service Call Desk Checklist I-4

Base Fire Department (27 CES/CEF)

- Base Fire Department Checklist I-5
- Chemical Mishap I-6
- Assistant Chief Responsibilities I-7
- Fire Department - Upon Arrival I-8
- Fire Department - Restricted Entry I-9

On-Scene Coordinator (27 SPTG/CC)

- On-Scene Coordinator Checklist I-10

INITIAL RESPONSE CHECKLIST

- [ ] Institute evacuation procedures, if applicable.

- [ ] Notify the Fire Department, 911.

- [ ] Give first aid to injured personnel.

- [ ] Stop the source of the spill when possible, without undue risk of personal injury. This includes use of on-site spill containment equipment and materials.

- [ ] Restrict access to spill scene to authorized personnel.

- [ ] Restrict all sources of ignition when flammable substances are involved.

- [ ] Report to On-Scene Coordinator and provide assistance until team is fully operational.

SPILL REPORT/RESPONSE FORM

WHEN A SPILL OCCURS:

NOTIFY BASE FIRE DEPARTMENT VIA EXT. 911

A. Provide the following information:

Name/Rank/Grade of Reporter: _____

Organization Causing Spill: _____

Phone: _____

Time & Date of Incident: _____

Type of Spill: _____ Sewage

_____ Hazardous Waste (Specify) _____

_____ Polychlorinated biphenyl

_____ Oil/Fuel Oil/Hydraulic Fluid (Circle One)

_____ Fuel/JP-4 (Circle One)

Amount Spilled: _____

Location of Spill: _____

Cause of Incident: _____

_____

Extent Spill Traveled (into storm drains, oil/water separators, or ground): _____

_____

Rate of Spill (estimate): _____

_____

Corrective Actions Taken (if any): _____

_____

_____

A copy of this form should be forwarded to 27 CES/CEV within two days of an incident.

SERVICE CALL DESK CHECKLIST

1. Initial Information Required:

Name of Informant: _____
Location of Spill: _____
Substance Spilled: _____
Amount Spilled (Estimated): _____
Time Spill Occurred (Estimated): _____

2. Action Outline:

A. Immediately notify and provide initial information to:

Fire Department (CEF) Time: _____
24 Hours: Ext. 911

Environmental Coordinator/Office Time: _____
Duty Hours: Ext. 2739/4639
Nonduty Hours: Same

B. Initiate notification to the following after receiving notification from either the Fire Department or the Environmental Management office that additional notification is necessary.

Base Civil Engineer (CE) Time: _____
Duty Hours: Ext. 2008
Nonduty Hours: Ext. 2253

Chief of Operations (CEO) Time: _____
Duty Hours: Ext. 4357
Nonduty Hours: Ext. 2001/2002/2578

Squadron Duty Officer (CE/CCQ) Time: _____
Nonduty Hours: Ext. 2001/2002/2578

Base Bioenvironmental Engineer Time: _____
Duty Hours: Ext. 4063
Nonduty Hours: Ext. 4033

Readiness Flight (CEAD) Time: _____
Duty Hours: Ext. 4177
Nonduty Hours: Ext. 2253

Command Post Time: _____
Duty Hours: Ext: 2253

BASE FIRE DEPARTMENT CHECKLIST

1. Initial Information Required:

Name of Informant: _____

Phone Number of Informant: _____

Location of Spill: _____

Substance Spilled: _____

Amount Spilled (Estimated): _____

Time Spill Occurred (Estimated): _____

Injuries: _____

Other Pertinent Information: _____

_____

_____

2. Action Outline:

A. Immediately notify and provide initial information to:

Service Call Desk (CEMRC) Time: _____
24 Hours: Ext. 2001

Note: Do not initiate notification over the Primary Crash Network until determination is made to implement the Spill Prevention and Response Plan.

3. Follow-up Information:

Follow normal Fire Department Standard Operating Procedures for follow-up on oil spills.

CHEMICAL MISHAP

1. Obtain the following: Time

   A. Location of Incident: _____ _____
   B. Nature of Incident: _____ _____
   C. Type/Amount/Name or ID# of Material:
   _____ _____
   _____
   D. Health Hazard: _____
   _____ _____
   E. Callers Name/Phone/Location: _____ _____
   _____
   _____
   F. Any Other Information Available: _____ _____
   _____
   _____

2. Dispatch Vehicles: _____

3. Notify the Following:

A.	Security Police:	Day x4-2677 Night x4-2677	_____
B.	Command Post:	Day x4-2253/2256 Night x4-2253	_____
C.	Fire Chief:	Day x4-4852	_____
D.	CE Commander	Day x4-2008	_____
E.	CE Service Call	Day x4-2001/2002 Night x4-2001/2002	_____
F.	Bioenvironmental	Day x4-4063	_____
G.	Recall Firefighters	Day x4-2794/2881 Night x4-2794/2881	_____
H.	CHEMTREC	1-800-424-9300	_____

4. Other Emergency Actions: _____

_____

_____

ASSISTANT CHIEF'S RESPONSIBILITIES

1. Establish a staging area at least 4,000 feet upwind.

   A. Plot Incident Location; Grid Location: _____

   B. Plot and Establish Entry Control Point (ECP): _____

2. Have Security Police Begin Evacuation, if necessary.

3. Get As Much Information As Possible:

   A. Type/Amount/Name or ID# of Material:

   _____

   _____

   B. Health Hazard: _____

   _____

   C. Callers Name/Phone/Location: _____

   _____

   D. Any Other Information Available: _____

   _____

   _____

4. Request D R F.

5. Request Spill Assessment Team.

6. Establish a Decontamination Area.

7. Address Utility Hazard Potential:

   A. Drainage or Sewers: _____

   _____

   B. Electrical and Gas: _____

   _____

8. Other Emergency Actions: _____

_____

_____

FIRE DEPARTMENT - UPON ARRIVAL

1. If spill or wet areas are seen, stay away from them. Park uphill and upwind from spills.

2. If vapor release is suspected, stay well away from it as an invisible cloud is usually much larger than a visible cloud.

3. If no release is seen, look at spectators to spot any people who are ill or unconscious. If people are down, stay away until you know what the situation is and can protect yourself.

4. Always go in slowly to avoid "getting in too deep" before you realize it.

5. You may have to stop well back from an incident and send in two firefighters in full gear and SCBA to check the situation out. They should go in slowly; approach from upwind; use detection and explosion meters, explosion proof lights, and no radios; and stay out of observed chemicals.

6. Get information shipping papers, material safety data sheets from people at the scene (driver, plant officials, eye witnesses).

7. Establish control points for entering and leaving incident area for emergency services (and public, if necessary).

8. Establish separate holding areas for personnel or victims who accidentally become contaminated.

9. From a distance, use binoculars to look for placards on vehicles.

10. If you do not know, stay back (down the road or outside the gate) and appraise the situation slowly and carefully before doing anything.

11. Establish command post and staging areas well away from the area on the upwind side only.

12. Get technical help with expertise on the hazardous material involved.

13. Remember—you do not carry the equipment and entry suits for all chemicals so you cannot deal with all chemicals.

14. Some gases are toxic (can be absorbed through the skin and through standard turnout gear) and odorless.

15. If you cannot find out what chemical is involved, treat it as highly toxic, violently reactive, or explosive.

FIRE DEPARTMENT - RESTRICTED ENTRY

As soon into the operation as possible, areas of restricted entry (zones) will be established. these areas shall be termed:

1. Area of maximum hazard (exclusion or hot)

2. Decontamination area (warm)

3. Clean area (cold)

The first arriving units will establish an initial hot zone. The HAZMAT Response Team and Safety Officer will establish restricted entry areas. Boundaries of zones may be adjusted as conditions dictate. The following guidelines will apply:

1. Geography, weather conditions, building layout, properties and state of product involved, and other varying factors will influence boundaries of restricted entry areas.

2. Only those persons properly protected will be allowed into the hot and warm zones at any time.

3. Persons exiting the hot zone must pass through controlled access points and undergo proper decontamination and medical evaluation.

4. Exit from warm zone will be allowed only after proper decontamination has been performed.

5. Zone boundaries and controlled access points will be clearly marked.

6. All command posts, canteens, press areas, staging areas, etc. must be located out of the hot and warm zones.

ON-SCENE COORDINATOR CHECKLIST

1. Initial Information Required:

   Name of Informant: _____

   Location of Spill: _____

   Substance Spilled: _____

   Amount Spilled (Estimated): _____

   Time Spill Occurred (Estimated): _____

2. Action Outline:

   A. Report to Civil Engineer Control Center (CECC)

      1. Pick up a radio, vehicle, and driver (Tower and CE frequencies).

      2. Pick up OSC tube and this checklist.

   B. Proceed to site of spill and take command. Assistance will be provided by the Base Civil Engineer, Base Environmental Coordinator, Bioenvironmental Engineer, Legal Office, Photo Lab, Security Police, and Command Post.

   C. Stop spill at the source. Remove hazardous equipment and aircraft.

   D. Make initial damage assessment report to CECC.

      1. Identify spill material, quantity, and source.

      2. Estimate course of spill and time to a key terrain feature.

   E. Order Civil Engineering Cleanup Team actions. Consider:

      1. Manpower available.

      2. Heavy equipment (CE, Supply, Transportation)

      3. Damming materials and predesignated dam positions.

      4. Sorbent materials.

      5. Final containment devices such as radial gates on drainage ditches.

F. Direct Bioenvironmental Engineer to sample affected and unaffected water courses.

G. Direct Security Police to cordon off hazardous areas and detour traffic.

H. Direct Legal Office to gather data if a civilian contractor may be involved.

I. Direct photographer to photograph and record the times of key events and evidence.

J. Direct Procurement to authorize purchase of material and equipment, as needed.

K. Supervise cleanup and restoration.

L. Complete Summary Report.

3. Reports: The OSC will prepare and maintain a report on each oil spill to include the following information:

A. Location of Spill

B. Date and Time of Spill

C. Time of Response

D. Circumstances which caused the spill.

E. Type and amount of pollutant spilled.

F. Actions taken to recover pollutant.

G. Actions taken to prevent reoccurrence of the incident.

H. Cost estimate to correct incident.

ANNEX II

EQUIPMENT INVENTORIES

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

EQUIPMENT INVENTORIES

This annex lists the equipment that has been staged at various areas throughout Melrose AFR and Cannon AFB. The equipment listed may be procured by the On-Scene Coordinator or designee in the event of an oil or hazardous substance spill. Equipment requests shall be made by telephone to the appropriate shop supervisor or squadron commander. Upon authorized requests, the supervisor or commander will arrange prompt delivery of the equipment to the scene of the incident. Availability of assigned vehicles and equipment shall be determined through the vehicle status charts in the Damage Control Center and at Motor Vehicle Dispatch, Ext. 4-2832.

These lists shall be updated annually, or as available resources change. Information gathered for Disaster Preparedness Plan updates can be useful in updating this set of lists.

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

PHONE LIST FOR RESOURCES

_____	Fire Department	Day	4-911
		Night	4-911
_____	Civil Engineering Service Call (SC)	Day	4-2001
		Night	4-2001
_____	Security	Day	4-2677
		Night	4-2677
_____	Environmental Management	Day	4-2739
		Night	4-2001
_____	Bioenvironmental Engineering	Day	4-4063
		Night	4-2001
_____	Liquid Fuels Maintenance	Day	4-2112
		Night	4-2001
_____	Petroleum, Oils, Lubricants (POL)	Day	4-4531
		Night	4-4531
_____	Disaster Preparedness	Day	4-4177
		Night	4-2001
_____	Motor Pool Vehicle Dispatch	Day	4-2833
		Night	4-2001
_____	Medical (Emergency Room)	Day	4-4033
		Night	4-4033
_____	Aerospace Ground Equipment (AGE)	Day	4-2696
		Night	4-2695

SPILL RESPONSE EQUIPMENT

1. Transportation

Item Description	On-Hand
General Purpose Vehicles:	
Bus, 28 passenger	5
Bus, 44 passenger	2
Step Van, 1 Ton	5
Step Van, 1 1/2 Ton	1
Commercial Van, 2 1/2 Ton Cargo	2
Truck, 1 Ton	3
Truck, 1 1/2 Ton	3
Special Purpose:	
Tractor, 5 Ton	2
Tractor, 10 Ton	2
Wrecker, Commercial, 5 Ton	1
Wrecker, M-816, 5 Ton	1
High Reach	1
1200 Gallon Gas Truck	3
H-11 Crane	1
MB-4 Aircraft Tug	3
U-18 Crash Recovery Tug	1
U-39 Snow Removal Truck	1
SnoW Removal, Blast Truck	2
Farm Tractor, WHLD Industrial	2
Sweeper, R/W	2
Sweeper, Street	2

Item Description	On-Hand
C-300 Refueling Truck	1
1,500 Gallon Water Truck	1
Forklift, Rough Terrain, 6,000 Lbs	1
Heavy Equipment:	
Loader, 25,000 Lbs, A/C	2
Dump Truck, 5 Ton	4
Dump Truck, 10 Ton	1
Grader, Road	1

2. Fire Department (HAZMAT Response Truck)

For a complete listing of equipment and tools kept by the Base Fire Department, contact Ext. 4-4270.

3. Base Spill Kit

Item Description	Unit	Quantity
85 Gallon Overpack Drum	EA	15
55 Gallon Drum, Steel, Open Head	EA	10
55 Gallon Drum, Steel, Closed Head	EA	10
Rags	BUNDLE	2
Hard Hats	EA	15
Face Shield, Silicone	EA	15
Aprons, Full Length, Rubber	EA	15
Gloves	PR	15
Shovels	EA	6
Non-Sparking, Square Blade		3
Steel, Square Blade		3
Steel, Pointed Blade		2
Goggles	EA	15
Sample Bags, Plastic	BOX	3
Bung Wrench	EA	2
Rachet Wrench w/ 15/16" Socket	EA	1
Crescent Wrench, 3/4"	EA	2
Boots, Chemical Resistent	PR	15
Handpump, Corrosion Resistent	EA	1

	Unit	Quantity
Respirators, Full Face Shield	EA	30
3M Easi-Air, Size Medium	12	
3M Easi-Air, Size Large	8	
Respirator Cartridges (1 Pair Per Resp.)	PR	
Acid Gas, Organic Vapor	40	
HEPA, Dusts, Mists	10	
Respirator Filter Clips (1 Pr per Resp.)	PR	
Acid Gas, Organic Vapor	10	
HEPA, Dusts, Mists	10	
Vermiculite	LBS	300
Sodium Bicarbonate	LBS	500
Absorbent Socks	EA	200
Socks, PIG, Size Small	EA	25
Socks, PIG, Size Large	EA	25
Pillows, PIG	EA	25
Bucket, 5 Gallon	EA	5
Epoxy Putty Drum Repair Kit	ROLL	12
Storage Bags, Respirator	EA	90
Eye Wash (6 min. Portable)	EA	2
Multi-channel radios with charger unit	EA	3
10 Gallon Water Jugs	EA	3
First Aid Kit	EA	1
Box Ear Protectors	EA	1

Reference Material:
NFPA Fire Protection Guide on Hazardous Materials (Environmental Management)
C.H.R.I.S. Manual (Environmental Management, Fire Department)
SAX Dangerous Properties of Industrial Materials (Environmental Management)

ANNEX III

SUMMARY OF CANNON AIR FORCE BASE CIVIL ENGINEERING CLEANUP TEAM MEMBERS/ORGANIZATIONS AND CURRENT TELEPHONE CONTACT NUMBERS

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

KEY PERSONNEL PHONE LISTING

	DUTY PHONE	AFTER HOURS
Base Operations	4-2801	4-2801
Command Post	4-2253	4-2253
On-Scene Coordinator (OSC) 27th Support Group Commander 1755 Midway Circle Cannon AFB, NM 88103-5000	4-2761	4-5031
Base Civil Engineer 1753 Midway Circle Cannon AFB, NM 88103-5000	4-2008	4-2001
Base Fire Chief	4-911/4852	4-911/4852
CE Service Desk	4-2001/2002	4-2001
Environmental Coordinator	4-2739	4-2001

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

PRIMARY CRASH NETWORK PHONE LISTING

	DUTY PHONE	AFTER HOURS
Bioenvironmental Engineer	4-4063	4-4033
Disaster Preparedness	4-4177	4-2253
Security Police	4-4111	4-4111
Liquid Fuels Maintenance	4-2112	4-2001/2002
Staff Judge Advocate	4-2211	4-2253/4111
Public Affairs	4-4131	4-2253
Safety Office	4-2811	4-2253
Base Hospital (Emergency)	4-4033	4-4033
Explosive Ordnance Disposal	4-2909	4-2253
Maintenance Control Center	4-2541	4-2541
Vehicle Control Center	4-2775	4-2775
Weather Forecasters	4-2748	4-2305
Switchboard	4-3311	4-3311
Chaplain	4-2507	4-2253
Mortuary Affairs	4-2374	4-2253
Alert Photographer	4-2765	4-2253
Base Contracting	4-4520	4-2253

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

OUTSIDE EMERGENCY RESPONSE AGENCIES

U.S. Environmental Protection Agency,
Region VI
Attn: Mr. Richard Mayer
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 655-6776

NM Environmental Department
Office of Hazardous and Radioactive Waste
Attn: Mr. Ed Horst
1190 St. Francis Drive
Santa Fe, New Mexico 87502
(505) 827-4300

Clovis Fire Department
Attn: Mr. Ron Edward
320 Mitchell Street
Clovis, New Mexico 88101
Emergency: 911
Non-emergency: 763-5531

Portales Fire Department
Attn: Capt. Steve Potest
301 South Avenue C
Portales, New Mexico 88130
Emergency: 911
Non-emergency: 1-356-4406

Melrose Fire Department
Attn: Mr. Keith Shaw
420 5th Street
Melrose, New Mexico 88124
Emergency: (505) 253-4222

Clovis High Plains Hospital
Emergency Department
Attn: Ms. Diane Martin
2100 North Thomas Street
Clovis, New Mexico 88101
769-7169

Roosevelt Hospital Laboratory
Attn: Mr. Bobby Lyons
1700 South Avenue O
Portales, New Mexico 88130
1-356-4411

Curry County Sheriff
Emergency: 911
Non-emergency: 769-2335

Roosevelt County Sheriff
Emergency: 911
Non-emergency: 1-365-4404

N.M. State Highway Patrol
Emergency: 911
Non-emergency: 7863-3426

Clovis Civil Defense
769-2381, ext. 502

Portales Civil Defense
1-356-4404

ANNEX IV

SUMMARY LISTING OF OFF-BASE SPILL NOTIFICATIONS PROCEDURES AND RESPONSE ORGANIZATIONS

COORDINATION WITH SPECIAL FORCES

Several USAF special commands and other federal special response tams are readily available to provide technical support, advice, and assistance in the event of a spill or release. Support from these special forces will, when required, be requested as detailed below, and will be funded by the major claimant for the incident.

1.0 USAF AGENCIES

1.1 Air Combat Command (HQ ACC/CEVC), Langley AFB, Langley, VA

Responsible for ensuring environmental compliance of all USAF installation. The office can provide advice and staff assistance on all areas of environmental protection including spill response matters. Request for HQ ACC/CEVC support can be made by DSN 574-3553 or commercial (804) 764-3553.

1.2 Air Force Center for Engineering and Services Agency (AFCESA), Tyndall AFB, Panama City, FL

Provides technical guidance and assistance to major commands and bases in contingency operations and environmental planning. Request for AFCESA support can be made to the Vice Commander, DSN 523-6431 or the Fire Protection/HazMat Personnel at DSN 523-6149/6151 or commercial (904) 283-6151.

1.3 Air Force Occupational and Environmental Health Laboratory (OEHL)

Assigned responsibility for providing consulting services n spill sampling contaminant treatment methods, as well as analytical support during response and recovery operations.

For complex spill problems, on-site support may be provided. Request for OEHL support may be made through DSN 240-3005 (consulting) or 240-3626 (analytical support).

2.0 NON-USAF AGENCIES

2.1 Regional Response Team (RRT), EPA Region IV, Dallas, TX

Can act as emergency response team to assist and advise the OSC, during the pollution emergency. The RRT consists of representatives of participating federal and state agencies and local municipalities, and can bring all their expertise and resources of these agencies and coordinate their actions in supplying needed assistance to the OSC. A directory of the participating agencies is provided in Annex III of this plan. The team can be reached through the EPA Public Information Center at (214) 767-3274.

2.2 State of New Mexico Response Team, Santa Fe, NM

Can provide technical expertise and will be notified during spill response. The State OSC will be familiar with the available sources of spill response equipment within the State of New Mexico. Request for assistance can be made through their 24-hour reporting office at (505) 827-8329. The local contact for the State is Mr. David Tanner, Clovis, NM who can be reached at (505) 769-3728.

2.3 City of Melrose Fire Department

The City of Melrose Fire Department and local Civil defense Agencies will provide available personnel and equipment as requested to control hazards. These agencies will be activated through procedures established in the Cannon AFB OPLAN 355-1 and the mutual aid agreements signed by the Cannon AFB Fire Chief and the City of Melrose Fire Chief. The

Point of Contact for the City of Melrose Fire Department is Mr. Keith Shaw at (505) 253-4222.

2.4 Special Pollution Control Forces

Established under the NCP to assist the RRT, these agencies can provide the OSC with high level trained personnel and equipment, technical expertise, scientific support, communication support, and advice in pollution response matters. These agencies include:

- U.S. Cost Guard National Strike Force;
- EPA Environmental Response Team;
- EPA Technical Assistance Team;
- USCG Emergency Task Force; and
- USCG Public Information Assist Team.

Requests for assistance from these agencies shall be made by the OSC through the RRT, when required, according to proper procedures, established in the EPA/USCG regional contingency plans. The types of assistance provided by these special forces are also described in the federal regional plan. A directory of these organizations in included in Annex III of this plan.

3.0 NATIONAL HOTLINES AND PUBLICATIONS

3.1 Chemical Transportation Emergency Center (CHEMTREC)

A 24-hour hotline that provides warnings and listed guidance to the OSC when a spill product can be identified by either chemical or trace name, or other identifying characteristics. CHEMTREC will also assist the OSC in contacting the manufacturer or shipper for additional information. this service should only be used whenever adequate spill information is not available. the telephone number for CHEMTREC is 1-800-424-9300.

3.2 Chemical Hazards Response Information System (CHRIS)

An official publication of the USCG that currently provides technical information and appropriate response procedures for over 1,000 different substances. The manual contains four volumes which are periodically updated.

3.3 Environmental Technical Information System (ETIS)

A computerized information system which contains Federal and State environmental regulations, directories of Federal and State environmental contacts and computer modeling capabilities. The ETIS systems manager is the U.S. Army Construction Engineering Research Laboratory. AFCESA manages USAF use of the system. Information on the system and how to access it can be requested through DSN 970-6167 or commercial (904) 283-1667.

3.4 DoD Hazardous Material Information System (HMIS)

A computerized DoD database and repository of Material Safety Data Sheet (MSDS) information which provides personnel precautionary information for handling hazardous materials. Updated versions of the database are maintained by the Bioenvironmental Engineer and Base Supply. The database is generated by the Defense General Supply Center

- SSH, Petersburg, Virginia and can be reached at DSN 695-4371 or commercial (804) 279-5589.

4.0 PRIVATE ORGANIZATION AND CONTRACTORS

Melrose AFR does not have any existing arrangements with local emergency organizations and cleanup contractors to supplement in-house spill response resources and expertise. For major emergencies, additional assistance can be requested from the EPA's Regional Response Team. All requests for Regional Response Team assistance should be coordinated with the wing commander and conducted through the contracting squadron (27 SPTG/COS).

5.0 REPORTABLE SPILL NOTIFICATION REQUIREMENTS

5.1 HQ ACC LANGLEY AFB ACC/CEV Duty Hours DSN 574-3553, Environmental Coordinator Non-or Duty Hours DSN 574-2224/574-2225

HQ ACC/CEVCM should be contacted even if Base personnel are uncertain of spill classification. The purpose of the telecon is to verify spill classification when uncertainty exists and to gather available information on reportable spills to assist the initial command telecon report to HQ/CEV. As much of the following information as can be reasonably determined should be initially reported:

a. Name of installation;

b. Location of incident and local geography;

c. OSC name and telephone number;

d. Date and time of spill;

e. Type and estimated quantity of spill substance;

f. Magnitude and severity of threat to public, health, welfare and natural resources;

g. Weather conditions at the spill site;

h. Cause of incident;

i. Anticipated containment and cleanup action and effectiveness;

j. Need for assistance by National, Regional or State response teams; and,

k. Any other pertinent information.

5.2 "Reportable Spill" Notification Requirements

If spill is deemed a "Reportable Spill" by the OSC, the following additional organizations and agencies will be notified promptly following telecon notification of ACC/CEV. The notification should include as much of the information outlined in Item 1 as possible.

Federal and State Agencies:

National Response Center	(800) 424-8802
New Mexico Department of Environmental Quality Hazardous and Radioactive Waste	(505) 827-4300
EPA - Region VI	(214) 655-6776

Additional Air Force Organizations:

If spill is deemed a "Reportable Spill" by the OSC, a confirming message containing the available information outlined below must be released and transmitted to the following organizations. Environmental Flight personnel will use the WIMS-ES Spill Reporting module as the primary reporting mechanism.

HQ ACC LANGLEY AFB VA/CEV/SGPAE//HQ USAF WASH DC//CEV/SGES//HQ AFESC TYNDALL AFB FL//DEVP/PA DEMM// HQ USAF WASH DC//LEYF// (When POL is involved) HQ USAF WASH DC//RDCM// (When industrial facilities are involved) HQ USAF WASH DC//JACL

The reporting module contains prompts and the outline necessary to file an acceptable report. The following information is required to ensure that the spill is reported in an accurate and timely manner.

- Name and address of installation and/or owner;
- Name and telephone number of OSC;
- Incident report (initial, second, third, final);
- Date and time of incident;
- Time of official spill notification to the National Response Center and other regional and State officials;
- Location of incident and the nature of the terrain at the location, to include surface and subsurface drainage characteristics and relationships to water bodies (estimate extent of area affected such as miles of stream or acres of lake);
- Cause of incident;
- Type and estimated amount (barrels, gallons, pounds) of pollutant and the official size classification (minor, medium, major);
- Actual damage and/or potential threat to human life, to property (private, State, or Federal), and to plant or animal life;
- Where appropriate, include fish or wildlife affected and an estimated number killed.
- Corrective action taken to remove pollutant;
- Assistance required;

- Estimated completion date of remedial actions and anticipated effectiveness;
- Estimated quantity and disposition of spill material and contaminated soil;
- Anticipated or actual reaction by the news media and public to incident and specific potential for liability;
- Description of any problem encountered during implementation of the SPR Plan and an explanation of how the Spill Prevention Response Plan was, or will be, modified to prevent the recurrence of the spill event.
- Confirmation that emergency response equipment is back in operation before resuming operation activities;
- Description of any problems encountered during implementation of the SPR Plan and an explanation of how the Spill Prevention and Response Plan was, or will be, modified to prevent the recurrence of the spill event:
- Anticipated or actual reaction by the news media and public to the incident (Specify potential for liability in the internal Air Force reports only); and
- A copy of this SPR Plan if requested.

The information will be transmitted in message format identified in AFR 19-8 within 4 hours of telecon notification to ACC/CEV. If telecon notification is made after 1500 hours local, the message will be transmitted no later than 1000 hours the following day.

6.0 ADDITIONAL OFF-BASE SPILL RESPONSE RESOURCES

AIR FORCE AUTHORITIES
(report as appropriate)

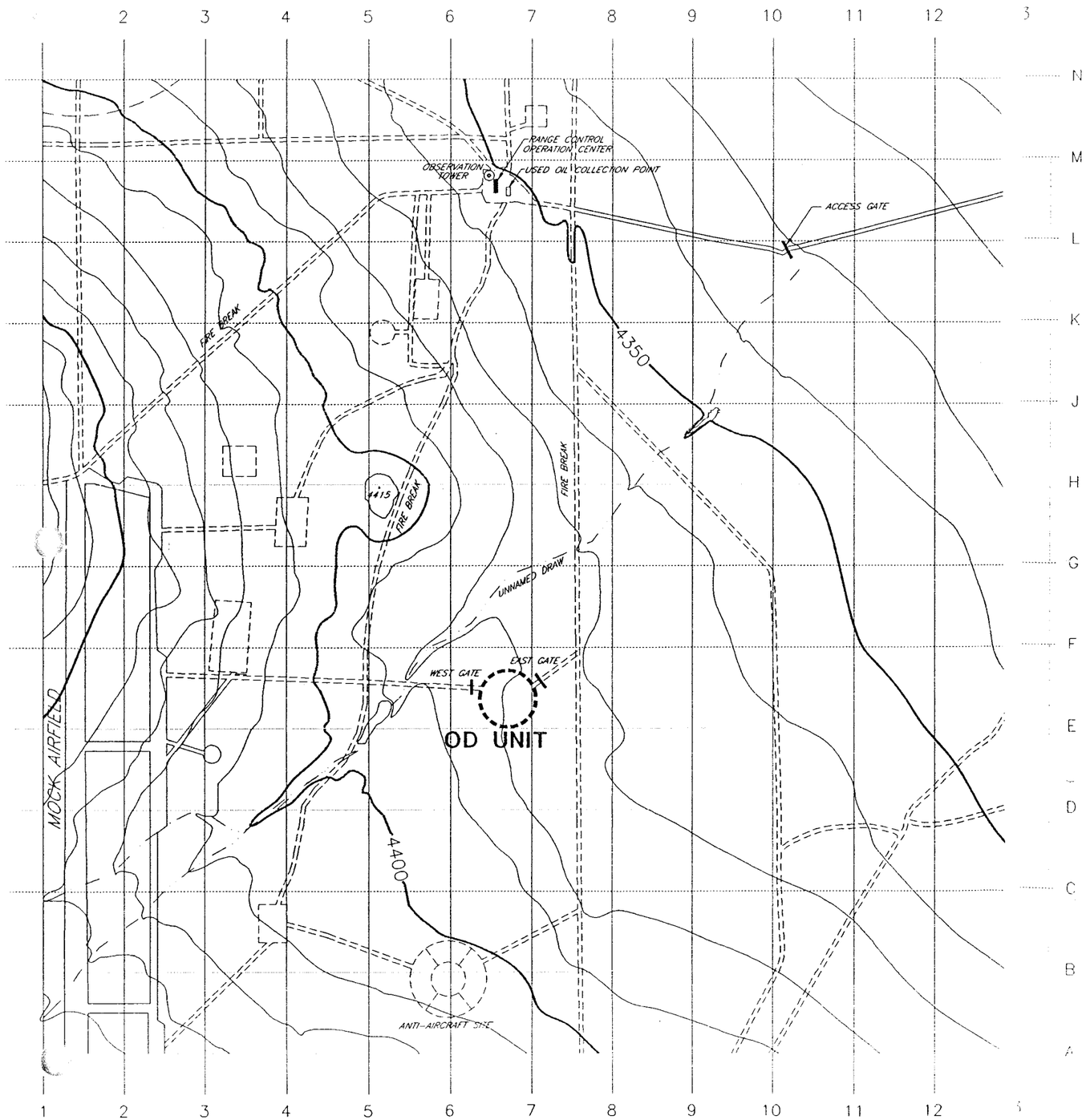
AGENCY/OFFICE SYMBOL	MESSAGE OR PHONE
Headquarters, Air Combat Command, Environmental Compliance, HQ ACC/CEVC	DSN 574-3668 (duty hours) DSN 574-3312 (non-duty hrs) Comm (804) 764-7740
FM 44SPTG GREEN AFB CA//CEV//	Message
HQ ACC LANGLEY AFB VA//CEVC//	Message
HQ USAF BOLLING AFB DC/CEVC//JACE//SGPB	Message (Information Copy)
HQ AFCESA TYNDALL AFB FL//PA//DEMM//	Message
HQ ACC LANGLEY AFB VA//SGPB//	Message
HQ USAF PENTAGON WASH DC//LGSS//	Message (POL spills only)
AFCEE SAN FRANCISCO CA//ESS//	Message (Your appropriate RCO)
SAF PENTAGON WASH DC//AQCM//	Message (When GOCO Facilities are involved)

ANNEX V

RANGE MAP

ANNEX VI

HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES



NORTH

LEGEND

- UNIMPROVED DIRT ROADS
- SECONDARY PAVED ROADS
- 4300 CONTOUR INTERVALS (10 FEET)
- INTERMITTANT STREAM
- OBSERVATION TOWER

1500' 0' 1500'

Scale: 1" = 1500'

REV NO.	ISSUE OR REVISION - DESCRIPTION	REV BY	REV DATE

RADIAN CORPORATION
ENGINEERING AND ENVIRONMENTAL TECHNOLOGY SERVICES
120 S. JEFFERSON CIRCLE
OAK RIDGE, TENNESSEE

DRAWING TITLE

MELROSE AIR FORCE RANGE OD AREA GRID

SCALE 1" = 1500'

NO REPRESENTATION OR WARRANTY EXPRESSED OR IMPLIED IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OF DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDERS ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

DRAWN BY	DATE	DESIGNED BY	DATE
W. MEAD	2-16-94	W. HOWELL	2-16-94
CHECKED BY	DATE	APPROVED BY	DATE
W. HOWELL	2-16-94	W. HOWELL	2-16-94

PROJECT NO.	DRAWING NUMBER	REV	SHT	OF
2642051201			1	1

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	Statutory RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Acenaphthene	83329		1*	2		B	100 (45.4)
Acenaphthylene	208968		1*	2		D	5000 (2270)
Acetaldehyde	75070	Ethanal	1000	1,4	U001	C	1000 (454)
Acetaldehyde, chloro-	107200	Chloroacetaldehyde	1*	4	P023	C	1000 (454)
Acetaldehyde, trichloro-	75876	Chloral	1*	4	U034	D	5000 (2270)
Acetamide, N-(aminothioxomethyl)-	591082	1-Acetyl-2-thiourea	1*	4	P002	C	1000 (454)
Acetamide, N-(4-ethoxyphenyl)-	62442	Phenacetin	1*	4	U187	B	100 (45.4)
Acetamide, 2-fluoro-	640197	Fluoroacetamide	1*	4	P057	B	100 (45.4)
Acetamide, N-9H-fluoren-2-yl-	53963	2-Acetylaminofluorene	1*	4	U005	X	1 (0.454)
Acetic acid	64197		1000	1		D	5000 (2270)
Acetic acid (2,4-dichlorophenoxy)-	94757	2,4-D Acid 2,4-D, salts and esters	100	1,4	U240	B	100 (45.4)
Acetic acid, lead(2+) salt	301042	Lead acetate	5000	1,4	U144		*
Acetic acid, thallium(1+) salt	563688	Thallium(I) acetate	1*	4	U214	B	100 (45.4)
Acetic acid, (2,4,5-trichlorophenoxy)	93765	2,4,5-T 2,4,5-T acid	100	1,4	U232	C	1000 (454)
Acetic acid, ethyl ester	141786	Ethyl acetate	1*	4	U112	D	5000 (2270)
Acetic acid, fluoro-, sodium salt	62748	Fluoroacetic acid, sodium salt	1*	4	P058	A	10 (4.54)
Acetic anhydride	108247		1000	1		D	5000 (2270)
Acetone	67641	2-Propanone	1*	4	U002	D	5000 (2270)
Acetone cyanohydrin	75865	Propanenitrile, 2-hydroxy-2-methyl-2-Methylactonitrile	10	1,4	P069	A	10 (4.54)
Acetonitrile	75058		1*	4	U003	D	5000 (2270)
Acetophenone	98862	Ethanone, 1-phenyl-	1*	4	U004	D	5000 (2270)
2-Acetylaminofluorene	53963	Acetamide, N-9H-fluoren-2-yl-	1*	4	U005	X	1 (0.454)
Acetyl bromide	506967		5000	1		D	5000 (2270)
Acetyl chloride	75365		5000	1,4	U006	D	5000 (2270)
1-Acetyl-2-thiourea	591082	Acetamide, N-(aminothioxomethyl)-	1*	4	P002	C	1000 (454)
Acrolein	107028	2-Propenal	1	1,2,4	P003	X	1 (0.454)
Acrylamide	79061	2-Propenamide	1*	4	U007	D	5000 (2270)
Acrylic acid	79107	2-Propenoic acid	1*	4	U008	D	5000 (2270)
Acrylonitrile	107131	2-Propenenitrile	100	1,2,4	U009	B	100 (45.4)
Adipic acid	124049		5000	1		D	5000 (2270)
Aldicarb	116063	Propanal, 2-methyl-2-(methylthio)-,O-[(methylamino)carbonyl]oxime	1*	4	P070	X	1 (0.454)
Aldrin	309002	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-	1	1,2,4	P004	X	1 (0.454)
Allyl alcohol	107186	2-Propen-1-ol	100	1,4	P005	B	100 (45.4)
Allyl chloride	107051		1000	1		C	1000 (454)
Aluminum phosphide	20859738		1*	4	P006	B	100 (45.4)
Aluminum sulfate	10043013		5000	1		D	5000 (2270)
5-(Aminomethyl)-3-isoxazolol	2763964	Muscimol 3(2H)-Isoxazolone, 5-(aminomethyl)-	1*	4	P007	C	1000 (454)
4-Aminopyridine	504245	4-Pyridinamine	1*	4	P008	C	1000 (454)
Amitrole	61825	1H-1,2,4-Triazol-3-amine	1*	4	U011	A	10 (4.54)
Ammonia	7664417		100	1		B	100 (45.4)
Ammonium acetate	631618		5000	1		D	5000 (2270)
Ammonium benzoate	1863634		5000	1		D	5000 (2270)
Ammonium bicarbonate	1066337		5000	1		D	5000 (2270)
Ammonium bichromate	7789095		1000	1		A	10 (4.54)
Ammonium bifluoride	1341497		5000	1		B	100 (45.4)
Ammonium bisulfite	10192300		5000	1		D	5000 (2270)
Ammonium carbamate	1111780		5000	1		D	5000 (2270)
Ammonium carbonate	506876		5000	1		D	5000 (2270)
Ammonium chloride	12125029		5000	1		D	5000 (2270)
Ammonium chromate	7788989		1000	1		A	10 (4.54)
Ammonium citrate, dibasic	3012655		5000	1		D	5000 (2270)
Ammonium fluoborate	13826830		5000	1		D	5000 (2270)
Ammonium fluoride	12125018		5000	1		B	100 (45.4)
Ammonium hydroxide	1336216		1000	1		C	1000 (454)
Ammonium oxalate	6009707		5000	1		D	5000 (2270)
	5972736						
	14258492						
Ammonium picrate	131748	Phenol, 2,4,6-trinitro-, ammonium salt	1*	4	P009	A	10 (4.54)
Ammonium silicofluoride	16919190		1000	1		C	1000 (454)
Ammonium sulfamate	7773060		5000	1		D	5000 (2270)
Ammonium sulfide	12135761		5000	1		B	100 (45.4)
Ammonium sulfite	10196040		5000	1		D	5000 (2270)
Ammonium tartrate	14307438		5000	1		D	5000 (2270)
	3164292						
Ammonium thiocyanate	1762954		5000	1		D	5000 (2270)
Ammonium vanadate	7803556	Vanadic acid, ammonium salt	1*	4	P119	C	1000 (454)
Amyl acetate	628637		1000	1		D	5000 (2270)
iso-Amyl acetate	123922						
sec-Amyl acetate	626380						
tert-Amyl acetate	625161						
Aniline	62533	Benzenamine	1000	1,4	U012	D	5000 (2270)
Anthracene	120127		1*	2		D	5000 (2270)
Antimony TT	7440360		1*	2		D	5000 (2270)
ANTIMONY AND COMPOUNDS	N.A.		1*	2			**
Antimony pentachloride	7647189		1000	1		C	1000 (454)
Antimony potassium tartrate	28300745		1000	1		B	100 (45.4)
Antimony tribromide	7789619		1000	1		C	1000 (454)
Antimony trichloride	10025919		1000	1		C	1000 (454)
Antimony trifluoride	7783564		1000	1		C	1000 (454)
Antimony trioxide	1309644		5000	1		C	1000 (454)
Argentate(1-), bis(cyano-C)-, potassium	506616	Potassium silver cyanide	1*	4	P099	X	1 (0.454)
Aroclor 1016	12674112	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)
Aroclor 1221	11104282	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)
Aroclor 1232	11141165	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Code T	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Aroclor 1242	53469219	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)
Aroclor 1248	12672296	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)
Aroclor 1254	11097691	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)
Aroclor 1260	11096825	POLYCHLORINATED BIPHENYLS (PCBs)	10	1,2		X	1 (0.454)
Arsenic	7440382		1*	2,3		X	* (0.454)
Arsenic acid	1327522	Arsenic acid H3AsO4	1*	4	P010	X	1 (0.454)
	7778394						
Arsenic acid H3AsO4	1327522	Arsenic acid	1*	4	P010	X	1 (0.454)
	7778394						
ARSENIC AND COMPOUNDS	N.A.		1*	2			**
Arsenic disulfide	1303328		5000	1		X	1 (0.454)
Arsenic oxide As2O3	1327533	Arsenic trioxide	5000	1,4	P012	X	1 (0.454)
Arsenic oxide As2O5	1303282	Arsenic pentoxide	5000	1,4	P011	X	1 (0.454)
Arsenic pentoxide	1303282	Arsenic oxide As2O5	5000	1,4	P011	X	1 (0.454)
Arsenic trichloride	7784341		5000	1		X	1 (0.454)
Arsenic trioxide	1327533	Arsenic oxide As2O3	5000	1,4	P012	X	1 (0.454)
Arsenic trisulfide	1303339		5000	1		X	1 (0.454)
Arsine, diethyl-	692422	Diethylarsine	1*	4	P038	X	1 (0.454)
Arsinic acid, dimethyl-	75605	Cacodylic acid	1*	4	U136	X	1 (0.454)
Arsonous dichloride, phenyl-	696286	Dichlorophenylarsine	1*	4	P036	X	1 (0.454)
Asbestos TTT	1332214		1*	2,3		X	1 (0.454)
Auramine	492808	Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	1*	4	U014	B	100 (45.4)
Azaserine	115026	L-Serine, diazoacetate (ester)	1*	4	U015	X	1 (0.454)
Aziridine	151564	Ethylenimine	1*	4	P054	X	1 (0.454)
Aziridine, 2-methyl-	75558	1,2-Propylenimine	1*	4	P067	X	1 (0.454)
Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione,6-amino-8-[[(aminocarbonyloxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,[1aS-(1aalpha,8beta,8aalpha,8balpha)]-	50077	Mitomycin C	1*	4	U010	A	10 (4.54)
Barium cyanide	542621		10	1,4	P013	A	10 (4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56495	3-Methylcholanthrene	1*	4	U157	A	10 (4.54)
Benz[c]acridine	225514		1*	4	U016	B	100 (45.4)
Benzal chloride	98873	Benzene, dichloromethyl-	1*	4	U017	D	5000 (2270)
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950585	Pronamide	1*	4	U192	D	5000 (2270)
Benz[a]anthracene	56553	Benzo[a]anthracene 1,2-Benzanthracene	1*	2,4	U018	A	10 (4.54)
1,2-Benzanthracene	56553	Benz[a]anthracene Benzo[a]anthracene	1*	2,4	U018	A	10 (4.54)
Benz[a]anthracene, 7,12-dimethyl-	57976	7,12-Dimethylbenz[a]anthracene	1*	4	U094	X	* (0.454)
Benzenamine	62533	Aniline	1000	1,4	U012	D	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	492808	Auramine	1*	4	U014	B	100 (45.4)
Benzenamine, 4-chloro-	106478	p-Chloroaniline	1*	4	P024	C	1000 (454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	3165933	4-Chloro-o-toluidine, hydrochloride	1*	4	U049	B	100 (45.4)
Benzenamine, N,N-dimethyl-4-(phenylazo)-	60117	p-Dimethylaminoazobenzene	1*	4	U093	A	10 (4.54)
Benzenamine, 2-methyl-	95534	o-Toluidine	1*	4	U328	B	100 (45.4)
Benzenamine, 4-methyl-	106490	p-Toluidine	1*	4	U353	B	100 (45.4)
Benzenamine, 4,4'-methylenebis(2-chloro-	101144	4,4'-Methylenebis(2-chloroaniline)	1*	4	U158	A	10 (4.54)
Benzenamine, 2-methyl-, hydrochloride	636215	o-Toluidine hydrochloride	1*	4	U222	B	100 (45.4)
Benzenamine, 2-methyl-5-nitro-	99558	5-Nitro-o-toluidine	1*	4	U181	B	100 (45.4)
Benzenamine, 4-nitro-	100016	p-Nitroaniline	1*	4	P077	D	5000 (2270)
Benzene	71432		1000	1,2,3,4	U109	A	10 (4.54)
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156	Chlorobenzilate	1*	4	U038	A	10 (4.54)
Benzene, 1-bromo-4-phenoxy-	101553	4-Bromophenyl phenyl ether	1*	2,4	U030	B	100 (45.4)
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	305033	Chlorambucil	1*	4	U035	A	10 (4.54)
Benzene, chloro-	108907	Chlorobenzene	100	1,2,4	U037	B	100 (45.4)
Benzene, chloromethyl-	100447	Benzyl chloride	100	1,4	P028	B	100 (45.4)
Benzenediamin, ar-methyl-	95807	Toluenediamine	1*	4	U221	A	10 (4.54)
	496720						
	823405						
1,2-Benzenedicarboxylic acid, dioctyl ester	117840	Di-n-octyl phthalate	1*	2,4	U107	D	5000 (2270)
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)]-ester,	117817	Bis (2-ethylhexyl)phthalate Diethylhexyl phthalate	1*	2,4	U028	B	100 (45.4)
1,2-Benzenedicarboxylic acid, dibutyl ester	84742	Di-n-butyl phthalate Dibutyl phthalate n-Butyl phthalate	100	1,2,4	U069	A	10 (4.54)
1,2-Benzenedicarboxylic acid, diethyl ester	84662	Diethyl phthalate	1*	2,4	U088	C	1000 (454)
1,2-Benzenedicarboxylic acid, dimethyl ester	131113	Dimethyl phthalate	1*	2,4	U102	D	5000 (2270)
Benzene, 1,2-dichloro-	95501	o-Dichlorobenzene 1,2-Dichlorobenzene	100	1,2,4	U070	B	100 (45.4)
Benzene, 1,3-dichloro-	541731	m-Dichlorobenzene 1,3-Dichlorobenzene	1*	2,4	U071	B	100 (45.4)
Benzene, 1,4-dichloro-	106467	p-Dichlorobenzene 1,4-Dichlorobenzene	100	1,2,4	U072	B	100 (45.4)
Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	72548	DDD TDE 4,4' DDD	1	1,2,4	U060	X	1 (0.454)
Benzene, dichloromethyl-	98873	Benzal chloride	1*	4	U017	D	5000 (2270)
Benzene, 1,3-diisocyanatomethyl-	584849	Toluene diisocyanate	1*	4	U223	B	100 (45.4)
	91087						
	26471625						
Benzene, dimethyl-	1330207	Xylene (mixed)	1000	1,4	U239	C	1000 (454)
m-Benzene, dimethyl	108383	m-Xylene					
o-Benzene, dimethyl	95476	o-Xylene					
p-Benzene, dimethyl	106423	p-Xylene					
1,3-Benzenediol	108463	Resorcinol	1000	1,4	U201	D	5000 (2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino)ethyl]-	51434	Epinephrine	1*	4	P042	C	1000 (454)
Benzeneethanamine, alpha,alpha-dimethyl-	122098	alpha,alpha-Dimethylphenethylamine	1*	4	P046	D	5000 (2270)
Benzene, hexachloro-	118741	Hexachlorobenzene	1*	2,4	U127	A	10 (4.54)
Benzene, hexahydro-	110827	Cyclohexane	1000	4	U056	C	1000 (454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Benzene, hydroxy-	108952	Phenol	1000	1,2,4	U188	C	1000 (454)
Benzene, methyl-	108883	Toluene	1000	1,2,4	U220	C	1000 (454)
Benzene, 2-methyl-1,3-dinitro-	606202	2,6-Dinitrotoluene	1000	1,2,4	U106	B	100 (45.4)
Benzene, 1-methyl-2,4-dinitro-	121142	2,4-Dinitrotoluene	1000	1,2,4	U105	A	10 (4.54)
Benzene, 1-methylethyl-	98828	Cumene	1*	4	U055	D	5000 (2270)
Benzene, nitro-	98953	Nitrobenzene	1000	1,2,4	U169	C	1000 (454)
Benzene, pentachloro-	608935	Pentachlorobenzene	1*	4	U183	A	10 (4.54)
Benzene, pentachloronitro-	82688	Pentachloronitrobenzene (PCNB)	1*	4	U185	B	100 (45.4)
Benzenesulfonic acid chloride	98099	Benzenesulfonyl chloride	1*	4	U020	B	100 (45.4)
Benzenesulfonyl chloride	98099	Benzenesulfonic acid chloride	1*	4	U020	B	100 (45.4)
Benzene, 1,2,4,5-tetrachloro-	95943	1,2,4,5-Tetrachlorobenzene	1*	4	U207	D	5000 (2270)
Benzenethiol	108985	Thiophenol	1*	4	P014	B	100 (45.4)
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	50293	DDT 4,4'DDT	1	1,2,4	U061	X	1 (0.454)
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy-	72435	Methoxychlor	1	1,4	U247	X	1 (0.454)
Benzene, (trichloromethyl)-	98077	Benzotrichloride	1*	4	U023	A	10 (4.54)
Benzene, 1,3,5-trinitro-	99354	1,3,5-Trinitrobenzene	1*	4	U234	A	10 (4.54)
Benzidine	92875	(1,1'-Biphenyl)-4,4'diamine	1*	2,4	U021	X	1 (0.454)
1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	81072	Saccharin and salts	1*	4	U202	B	100 (45.4)
Benzo[a]anthracene	56553	Benz[a]anthracene 1,2-Benzanthracene	1*	2,4	U018	A	10 (4.54)
Benzo[b]fluoranthene	205992		1*	2		X	1 (0.454)
Benzo[k]fluoranthene	207089		1*	2		D	5000 (2270)
Benzo[j,k]fluorene	206440	Fluoranthene	1*	2,4	U120	B	100 (45.4)
1,3-Benzodioxole, 5-(1-propenyl)-	120581	Isosafrole	1*	4	U141	B	100 (45.4)
1,3-Benzodioxole,5-(2-propenyl)-	94597	Safrole	1*	4	U203	B	100 (45.4)
1,3-Benzodioxole, 5-propyl-	94586	Dihydrosafrole	1*	4	U090	A	10 (4.54)
Benzoic acid	65850		5000	1		D	5000 (2270)
Benzonitrile	100470		1000	1		D	5000 (2270)
Benzo [rst]pentaphene	189559	Dibenz[a,i]pyrene	1*	4	U064	A	10 (4.54)
Benzo[ghi]perylene	191242		1*	2		D	5000 (2270)
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations greater than 0.3%	81812	Warfarin, & salts, when present at concentrations greater than 0.3%	1*	4	P001	B	100 (45.4)
Benzo[a]pyrene	50328	3,4-Benzopyrene	1*	2,4	U022	X	1 (0.454)
3,4-Benzopyrene	50328	Benzo[a]pyrene	1*	2,4	U022	X	1 (0.454)
p-Benzoquinone	106514	2,5-Cyclohexadiene-1,4-dione	1*	4	U197	A	10 (4.54)
Benzotrichloride	98077	Benzene, (trichloromethyl)-	1*	4	U023	A	10 (4.54)
Benzoyl chloride	98884		1000	1		C	1000 (454)
1,2-Benzphenanthrene	218019	Chrysene	1*	2,4	U050	B	100 (45.4)
Benzyl chloride	100447	Benzene, chloromethyl-	100	1,4	P028	B	100 (45.4)
Beryllium ††	7440417	Beryllium dust ††	1*	2,3,4	P015	A	10 (4.54)
BERYLLIUM AND COMPOUNDS	N.A.		1*	2			**
Beryllium chloride	7787475		5000	1		X	1 (0.454)
Beryllium dust ††	7440417	Beryllium ††	1*	2,3,4	P015	A	10 (4.54)
Beryllium fluoride	7787497		5000	1		X	1 (0.454)
Beryllium nitrate	13597994 7787555		5000	1		X	1 (0.454)
alpha—BHC	319846		1*	2		A	10 (4.54)
beta—BHC	319857		1*	2		X	1 (0.454)
delta—BHC	319868		1*	2		X	1 (0.454)
gamma—BHC	58899	Cyclohexane, 1,2,3,4,5,6-hexachloro-,(1alpha,2alpha,3beta,4alpha,5alpha,6beta)- Hexachlorocyclohexane (gamma isomer) Lindane	1	1,2,4	U129	X	1 (0.454)
2,2'-Bioxirane	1464535	1,2:3,4-Diepoxybutane	1*	4	U085	A	10 (4.54)
(1,1'-Biphenyl)-4,4'diamine	92875	Benzidine	1*	2,4	U021	X	1 (0.454)
[1,1'-Biphenyl]-4,4'diamine,3,3'dichloro-	91941	3,3'-Dichlorobenzidine	1*	2,4	U073	X	1 (0.454)
[1,1'-Biphenyl]-4,4'diamine,3,3'dimethoxy-	119904	3,3'-Dimethoxybenzidine	1*	4	U091	B	100 (45.4)
[1,1'Biphenyl]-4,4'-diamine,3,3'-dimethyl-	119937	3,3'-Dimethylbenzidine	1*	4	U095	A	10 (4.54)
Bis (2-chloroethyl) ether	111444	Dichloroethyl ether Ethane,1,1'-oxybis[2-chloro-	1*	2,4	U025	A	10 (4.54)
Bis(2-chloroethoxy) methane	111911	Dichloromethoxy ethane Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-	1*	2,4	U024	C	1000 (454)
Bis (2-ethylhexyl)phthalate	117817	Diethylhexyl phthalate 1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	1*	2,4	U028	B	100 (45.4)
Bromoacetone	598312	2-Propanone, 1-bromo-	1*	4	P017	C	1000 (454)
Bromoform	75252	Methane, tribromo-	1*	2,4	U225	B	100 (45.4)
4-Bromophenyl phenyl ether	101553	Benzene, 1-bromo-4-phenoxy-	1*	2,4	U030	B	100 (45.4)
Brucine	357573	Strychnidin-10-one, 2,3-dimethoxy-	1*	4	P018	B	100 (45.4)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87683	Hexachlorobutadiene	1*	2,4	U128	X	1 (0.454)
1-Butanamine, N-butyl-N-nitroso-	924163	N-Nitrosodi-n-butylamine	1*	4	U172	A	10 (4.54)
1-Butanol	71363	n-Butyl alcohol	1*	4	U031	D	5000 (2270)
2-Butanone	78933	Methyl ethyl ketone (MEK)	1*	4	U159	D	5000 (2270)
2-Butanone peroxide	1338234	Methyl ethyl ketone peroxide	1*	4	U160	A	10 (4.54)
2-Butanone, 3,3-dimethyl-1-(methylthio)-, O[(methylamino)carbonyl] oxime.	39196184	Thiofanox	1*	4	P045	B	100 (45.4)
2-Butenal	123739 4170303	Crotonaldehyde	100	1,4	U053	B	100 (45.4)
2-Butene, 1,4-dichloro-	764410	1,4-Dichloro-2-butene	1*	4	U074	X	1 (0.454)
2-Butenoic acid, 2-methyl-, 7[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-	303344	Lasiocarpine	1*	4	U143	A	10 (4.54)
Butyl acetate	123864		5000	1		D	5000 (2270)
iso-Butyl acetate	110190						
sec-Butyl acetate	105464						
tert-Butyl acetate	540885						
n-Butyl alcohol	71363	1-Butanol	1*	4	U031	D	5000 (2270)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Butylamine	109739		1000	1		C	1000 (454)
iso-Butylamine	78819						
sec-Butylamine	513495						
	13952846						
tert-Butylamine	75649						
Butyl benzyl phthalate	85687		1*	2		B	100 (45.4)
n-Butyl phthalate	84742	Di-n-butyl phthalate	100	1,2,4	U069	A	10 (4.54)
		Dibutyl phthalate					
		1,2-Benzenedicarboxylic acid, dibutyl ester					
Butyric acid	107926		5000	1		D	5000 (2270)
iso-Butyric acid	79312						
Cacodylic acid	75605	Arsinic acid, dimethyl-	1*	4	U136	X	1 (0.454)
Cadmium **	7440439		1*	2		A	10 (4.54)
Cadmium acetate	543908		100	1		A	10 (4.54)
CADMIUM AND COMPOUNDS	N.A.		1*	2			**
Cadmium bromide	7789426		100	1		A	10 (4.54)
Cadmium chloride	10108642		100	1		A	10 (4.54)
Calcium arsenate	7778441		1000	1		X	1 (0.454)
Calcium arsenite	52740166		1000	1		X	1 (0.454)
Calcium carbide	75207		5000	1		A	10 (4.54)
Calcium chromate	13765190	Chromic acid H2CrO4, calcium salt	1000	1,4	U032	A	10 (4.54)
Calcium cyanide	592018	Calcium cyanide Ca(CN)2	10	1,4	P021	A	10 (4.54)
Calcium cyanide Ca(CN)2	592018	Calcium cyanide	10	1,4	P021	A	10 (4.54)
Calcium dodecylbenzenesulfonate	26264062		1000	1		C	1000 (454)
Calcium hypochlorite	7778543		100	1		A	10 (4.54)
Camphene, octachloro-	8001352	Toxaphene	1	1,2,4	P123	X	1 (0.454)
Captan	133062		10	1		A	10 (4.54)
Carbamic acid, ethyl ester	51796	Ethyl carbamate (urethane)	1*	4	U238	B	100 (45.4)
Carbamic acid, methylnitroso-, ethyl ester	615532	N-Nitroso-N-methylurethane	1*	4	U178	X	1 (0.454)
Carbamic chloride, dimethyl-	79447	Dimethylcarbamoyl chloride	1*	4	U097	X	1 (0.454)
Carbamodithioic acid, 1,2-ethanediylbis, salts & esters	111546	Ethylenebisdithiocarbamic acid, salts & esters	1*	4	U114	D	5000 (2270)
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	2303164	Diallate	1*	4	U062	B	100 (45.4)
Carbaryl	63252		100	1		B	100 (45.4)
Carbofuran	1563662		10	1		A	10 (4.54)
Carbon disulfide	75150		5000	1,4	P022	B	100 (45.4)
Carbon oxyfluoride	353504	Carbonic difluoride	1*	4	U033	C	1000 (454)
Carbon tetrachloride	56235	Methane, tetrachloro-	5000	1,2,4	U211	A	10 (4.54)
Carbonic acid, dithallium(1+) salt	6533739	Thallium(I) carbonate	1*	4	U215	B	100 (45.4)
Carbonic dichloride	75445	Phosgene	5000	1,4	P095	A	10 (4.54)
Carbonic difluoride	353504	Carbon oxyfluoride	1*	4	U033	C	1000 (454)
Carbonochloridic acid, methyl ester	79221	Methyl chlorocarbonate	1*	4	U156	C	1000 (454)
		Methyl chloroformate					
Chloral	75876	Acetaldehyde, trichloro-	1*	4	U034	D	5000 (2270)
Chlorambucil	305033	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	1*	4	U035	A	10 (4.54)
Chlordane	57749	Chlordane, alpha & gamma isomers	1	1,2,4	U036	X	1 (0.454)
		Chlordane, technical					
		4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-					
CHLORDANE (TECHNICAL MIXTURE AND METABOLITES)	N.A.		1*	2			**
Chlordane, alpha & gamma isomers	57749	Chlordane	1	1,2,4	U036	X	1 (0.454)
		Chlordane, technical					
		4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-					
Chlordane, technical	57749	Chlordane	1	1,2,4	U036	X	1 (0.454)
		Chlordane, alpha & gamma isomers					
		4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-					
CHLORINATED BENZENES	N.A.		1*	2			**
CHLORINATED ETHANES	N.A.		1*	2			**
CHLORINATED NAPHTHALENE	N.A.		1*	2			**
CHLORINATED PHENOLS	N.A.		1*	2			**
Chlorine	7782505		10	1		A	10 (4.54)
Chlornaphazine	494031	Naphthalenamine, N,N'-bis(2-chloroethyl)-	1*	4	U026	B	100 (45.4)
Chloroacetaldehyde	107200	Acetaldehyde, chloro-	1*	4	P023	C	1000 (454)
CHLOROALKYL ETHERS	N.A.		1*	2			**
p-Chloroaniline	106478	Benzenamine, 4-chloro-	1*	4	P024	C	1000 (454)
Chlorobenzene	108907	Benzene, chloro-	100	1,2,4	U037	B	100 (45.4)
Chlorobenzilate	510156	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	1*	4	U038	A	10 (4.54)
4-Chloro-m-cresol	59507	p-Chloro-m-cresol	1*	2,4	U039	D	5000 (2270)
		Phenol, 4-chloro-3-methyl-					
p-Chloro-m-cresol	59507	Phenol, 4-chloro-3-methyl-	1*	2,4	U039	D	5000 (2270)
		4-Chloro-m-cresol					
Chlorodibromomethane	124481		1*	2		B	100 (45.4)
Chloroethane	75003		1*	2		B	100 (45.4)
2-Chloroethyl vinyl ether	110758	Ethene, 2-chloroethoxy-	1*	2,4	U042	C	1000 (454)
Chloroform	67663	Methane, trichloro-	5000	1,2,4	U044	A	10 (4.54)
Chloromethyl methyl ether	107302	Methane, chloromethoxy-	1*	4	U046	A	10 (4.54)
beta-Chloronaphthalene	91587	Naphthalene, 2-chloro-	1*	2,4	U047	D	5000 (2270)
		2-Chloronaphthalene					
2-Chloronaphthalene	91587	beta-Chloronaphthalene	1*	2,4	U047	D	5000 (2270)
		Naphthalene, 2-chloro-					
2-Chlorophenol	95578	o-Chlorophenol	1*	2,4	U048	B	100 (45.4)
		Phenol, 2-chloro-					
o-Chlorophenol	95578	Phenol, 2-chloro-	1*	2,4	U048	B	100 (45.4)
		2-Chlorophenol					
4-Chlorophenyl phenyl ether	7005723		1*	2		D	5000 (2270)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
1-(o-Chlorophenyl)thiourea	5344821	Thiourea, (2-chlorophenyl)-	1*	4	P026	B	100 (45.4)
3-Chloropropionitrile	542767	Propanenitrile, 3-chloro-	1*	4	P027	C	1000 (454)
Chlorosulfonic acid	7790945		1000	1		C	1000 (454)
4-Chloro-o-toluidine, hydrochloride	3165933	Benzenamine, 4-chloro-2-methyl-, hydrochloride	1*	4	U049	B	100 (45.4)
Chlorpyrifos	2921882		1	1		X	1 (0.454)
Chromic acetate	1066304		1000	1		C	1000 (454)
Chromic acid	11115745		1000	1		A	10 (4.54)
	7738945						
Chromic acid H2CrO4, calcium salt	13765190	Calcium chromate	1000	1,4	U032	A	10 (4.54)
Chromic sulfate	10101538		1000	1		C	1000 (454)
Chromium TT	7440473		1*	2		D	5000 (2270)
CHROMIUM AND COMPOUNDS	N.A.		1*	2			**
Chromous chloride	10049055		1000	1		C	1000 (454)
Chrysene	218019	1,2-Benzophenanthrene	1*	2,4	U050	B	100 (45.4)
Cobaltous bromide	7789437		1000	1		C	1000 (454)
Cobaltous formate	544183		1000	1		C	1000 (454)
Cobaltous sulfamate	14017415		1000	1		C	1000 (454)
Coke Oven Emissions	N.A.		1*	3		X	1 (0.454)
Copper cyanide CuCN	544923	Copper cyanide	1*	4	P029	A	10 (4.54)
Copper TT	7440508		1*	2		D	5000 (2270)
COPPER AND COMPOUNDS	N.A.		1*	2			**
Copper cyanide	544923	Copper cyanide CuCN	1*	4	P029	A	10 (4.54)
Coumaphos	56724		10	1		A	10 (4.54)
Creosote	8001589		1*	4	U051	X	1 (0.454)
Cresol(s)	1319773	Cresylic acid	1000	1,4	U052	C	1000 (454)
		Phenol, methyl-					
m-Cresol	108394	m-Cresylic acid					
o-Cresol	95487	o-Cresylic acid					
p-Cresol	106445	p-Cresylic acid					
Cresylic acid	1319773	Cresol(s)	1000	1,4	U052	C	1000 (454)
		Phenol, methyl-					
m-Cresol	108394	m-Cresylic acid					
o-Cresol	95487	o-Cresylic acid					
p-Cresol	106445	p-Cresylic acid					
Crotonaldehyde	123739	2-Butenal	100	1,4	U053	B	100 (45.4)
	4170303						
Cumene	98828	Benzene, 1-methylethyl-	1*	4	U055	D	5000 (2270)
Cupric acetate	142712		100	1		B	100 (45.4)
Cupric acetoarsenite	12002038		100	1		X	1 (0.454)
Cupric chloride	7447394		10	1		A	10 (4.54)
Cupric nitrate	3251238		100	1		B	100 (45.4)
Cupric oxalate	5893663		100	1		B	100 (45.4)
Cupric sulfate	7758987		10	1		A	10 (4.54)
Cupric sulfate, ammoniated	10380297		100	1		B	100 (45.4)
Cupric tartrate	815827		100	1		B	100 (45.4)
CYANIDES	N.A.		1*	2			**
Cyanides (soluble salts and complexes) not otherwise specified	57125		1*	4	P030	A	10 (4.54)
Cyanogen	460195	Ethanedinitrile	1*	4	P031	B	100 (45.4)
Cyanogen bromide	506683	Cyanogen bromide (CN)Br	1*	4	U246	C	1000 (454)
Cyanogen bromide (CN)Br	506683	Cyanogen bromide	1*	4	U246	C	1000 (454)
Cyanogen chloride	506774	Cyanogen chloride (CN)Cl	10	1,4	P033	A	10 (4.54)
Cyanogen chloride (CN)Cl	506774	Cyanogen chloride	10	1,4	P033	A	10 (4.54)
2,5-Cyclohexadiene-1,4-dione	106514	p-Benzoquinone	1*	4	U197	A	10 (4.54)
Cyclohexane	110827	Benzene, hexahydro-	1000	1,4	U056	C	1000 (454)
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha, 6beta)-	58899	gamma—BHC	1	1,2,4	U129	X	1 (0.454)
		Hexachlorocyclohexane (gamma isomer)					
		Lindane					
Cyclohexanone	108941		1*	4	U057	D	5000 (2270)
2-Cyclohexyl-4,6-dinitrophenol	131895	Phenol, 2-cyclohexyl-4,6-dinitro-	1*	4	P034	B	100 (45.4)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77474	Hexachlorocyclopentadiene	1	1,2,4	U130	A	10 (4.54)
Cyclophosphamide	50180	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-,2-oxide	1*	4	U058	A	10 (4.54)
2,4-D Acid	94757	Acetic acid (2,4-dichlorophenoxy)-2,4-D, salts and esters	100	1,4	U240	B	100 (45.4)
2,4-D Ester	94111		100	1		B	100 (45.4)
	94791						
	94804						
	1320189						
	1928387						
	1928616						
	1929733						
	2971382						
	25168267						
	53467111						
2,4-D, salts and esters	94757	Acetic acid (2,4-dichlorophenoxy)-2,4-D Acid	100	1,4	U240	B	100 (45.4)
Daunomycin	20830813	5,12-Naphthacenedione, 8-acetyl-10-[3-amino-2,3,6- trideoxy-alpha-L-lyxo-hexo- pyranosyl)oxy]-7,8,9,10- tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	1*	4	U059	A	10 (4.54)
DDD	72548	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	1	1,2,4	U060	X	1 (0.454)
		TDE					
		4,4' DDD					
4,4' DDD	72548	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	1	1,2,4	U060	X	1 (0.454)
		DDD					
		TDE					
DDE	72559	4,4' DDE	1*	2		X	1 (0.454)
4,4' DDE	72559	DDE	1*	2		X	1 (0.454)
DDT	50293	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	1	1,2,4	U061	X	1 (0.454)
		4,4'DDT					

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
4,4'-DDT	50293	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro- DDT	1	1,2,4	U061	X	1 (0.454)
DDT AND METABOLITES	N.A.		1*	2			**
Diallate	2303164	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	1*	4	U062	B	100 (45.4)
Diazinon	333415		1	1		X	1 (0.454)
Dibenz[a,h]anthracene	53703	Dibenzo[a,h]anthracene 1,2:5,6-Dibenzanthracene	1*	2,4	U063	X	1 (0.454)
1,2:5,6-Dibenzanthracene	53703	Dibenz[a,h]anthracene Dibenzo[a,h]anthracene	1*	2,4	U063	X	1 (0.454)
Dibenzo[a,h]anthracene	53703	Dibenz[a,h]anthracene 1,2:5,6-Dibenzanthracene	1*	2,4	U063	X	1 (0.454)
Dibenz[a,i]pyrene	189559	Benzo[rst]pentaphene	1*	4	U064	A	10 (4.54)
1,2-Dibromo-3-chloropropane	96128	Propane, 1,2-dibromo-3-chloro-	1*	4	U066	X	1 (0.454)
Dibutyl phthalate	84742	Di-n-butyl phthalate n-Butyl phthalate 1,2-Benzenedicarboxylic acid, dibutyl ester	100	1,2,4	U069	A	10 (4.54)
Di-n-butyl phthalate	84742	Dibutyl phthalate n-Butyl phthalate 1,2-Benzenedicarboxylic acid, dibutyl ester	100	1,2,4	U069	A	10 (4.54)
Dicamba	1918009		1000	1		C	1000 (454)
Dichlobenil	1194656		1000	1		B	100 (45.4)
Dichlone	117806		1	1		X	1 (0.454)
Dichlorobenzene	25321226		100	1		B	100 (45.4)
1,2-Dichlorobenzene	95501	Benzene, 1,2-dichloro- o-Dichlorobenzene	100	1,2,4	U070	B	100 (45.4)
1,3-Dichlorobenzene	541731	Benzene, 1,3-dichloro m-Dichlorobenzene	1*	2,4	U071	B	100 (45.4)
1,4-Dichlorobenzene	106467	Benzene, 1,4-dichloro p-Dichlorobenzene	100	1,2,4	U072	B	100 (45.4)
m-Dichlorobenzene	541731	Benzene, 1,3-dichloro 1,3-Dichlorobenzene	1*	2,4	U071	B	100 (45.4)
o-Dichlorobenzene	95501	Benzene, 1,2-dichloro 1,2-Dichlorobenzene	100	1,2,4	U070	B	100 (45.4)
p-Dichlorobenzene	106467	Benzene,1,4-dichloro 1,4-Dichlorobenzene	100	1,2,4	U072	B	100 (45.4)
DICHLOROBENZIDINE	N.A.		1*	2			**
3,3'-Dichlorobenzidine	91941	[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-	1*	2,4	U073	X	1 (0.454)
Dichlorobromomethane	75274		1*	2		D	5000 (2270)
1,4-Dichloro-2-butene	764410	2-Butene, 1,4-dichloro-	1*	4	U074	X	1 (0.454)
Dichlorodifluoromethane	75718	Methane, dichlorodifluoro-	1*	4	U075	D	5000 (2270)
1,1-Dichloroethane	75343	Ethane, 1,1-dichloro- Ethylidene dichloride	1*	2,4	U076	C	1000 (454)
1,2-Dichloroethane	107062	Ethane, 1,2-dichloro- Ethylene dichloride	5000	1,2,4	U077	B	100 (45.4)
1,1-Dichloroethylene	75354	Ethene, 1,1-dichloro- Vinylidene chloride	5000	1,2,4	U078	B	100 (45.4)
1,2-Dichloroethylene	156605	Ethene, 1,2-dichloro- (E)	1*	2,4	U079	C	1000 (454)
Dichloroethyl ether	111444	Bis (2-chloroethyl) ether Ethane, 1,1'-oxybis[2-chloro-	1*	2,4	U025	A	10 (4.54)
Dichloroisopropyl ether	108601	Propane, 2,2'-oxybis[2-chloro-	1*	2,4	U027	C	1000 (454)
Dichloromethoxy ethane	111911	Bis(2-chloroethoxy) methane Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-	1*	2,4	U024	C	1000 (454)
Dichloromethyl ether	542881	Methane, oxybis(chloro-	1*	4	P016	A	10 (4.54)
2,4-Dichlorophenol	120832	Phenol, 2,4-dichloro-	1*	2,4	U081	B	100 (45.4)
2,6-Dichlorophenol	87650	Phenol, 2,6-dichloro-	1*	4	U082	B	100 (45.4)
Dichlorophenylarsine	696286	Arsonous dichloride, phenyl-	1*	4	P036	X	1 (0.454)
Dichloropropane	26638197		5000	1		C	1000 (454)
1,1-Dichloropropane	78999						
1,3-Dichloropropane	142289						
1,2-Dichloropropane	78875	Propane, 1,2-dichloro- Propylene dichloride	5000	1,2,4	U083	C	1000 (454)
Dichloropropane—Dichloropropene (mixture)	8003198		5000	1		B	100 (45.4)
Dichloropropene	26952238		5000	1		B	100 (45.4)
2,3-Dichloropropene	78886						
1,3-Dichloropropene	542756	1-Propene, 1,3-dichloro-	5000	1,2,4	U084	B	100 (45.4)
2,2-Dichloropropionic acid	75990		5000	1		D	5000 (2270)
Dichlorvos	62737		10	1		A	10 (4.54)
Dicofol	115322		5000	1		A	10 (4.54)
Dieldrin	60571	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta, 6aalpha,7beta, 7aalpha)-	1	1,2,4	P037	X	1 (0.454)
1,2:3,4-Diepoxybutane	1464535	2,2'-Bioxirane	1*	4	U085	A	10 (4.54)
Diethylamine	109897		1000	1		B	100 (454.4)
Diethylarsine	692422	Arsine, diethyl-	1*	4	P038	X	1 (0.454)
1,4-Diethylenedioxide	123911	1,4-Dioxane	1*	4	U108	B	100 (45.4)
Diethylhexyl phthalate	117817	Bis (2-ethylhexyl)phthalate 1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	1*	2,4	U028	B	100 (45.4)
N,N'-Diethylhydrazine	1615801	Hydrazine, 1,2-diethyl-	1*	4	U086	A	10 (4.54)
O,O-Diethyl S-methyl dithiophosphate	3288582	Phosphorodithioic acid, O,O-diethyl S-methyl ester	1*	4	U087	D	5000 (2270)
Diethyl-p-nitrophenyl phosphate	311455	Phosphonic acid, diethyl 4-nitrophenyl ester	1*	4	P041	B	100 (45.4)
Diethyl phthalate	84662	1,2-Benzenedicarboxylic acid, diethyl ester	1*	2,4	U088	C	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	297972	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	1*	4	P040	B	100 (45.4)
Diethylstilbestrol	56531	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	1*	4	U089	X	1 (0.454)
Dihydrosafrole	94586	1,3-Benzodioxole, 5-propyl-	1*	4	U090	A	10 (4.54)
Diisopropylfluorophosphate	55914	Phosphorofluoridic acid, bis(1-methylethyl) ester	1*	4	P043	B	100 (45.4)
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,	309002	Aldrin	1	1,2,4	P004	X	1 (0.454)
8abeta)-1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro, (1alpha,4alpha,4abeta,5abeta,8beta,	465736	Isodrin	1*	4	P060	X	1 (0.454)

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8abeta)-2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,	60571	Dieldrin	1	1,2,4	P037	X	1 (0.454)
6aalpha,7beta,7aalpha)-2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octa-hydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,	72208	Endrin Endrin, & metabolites	1	1,2,4	P051	X	1 (0.454)
6abeta,7beta,7aalpha)-Dimethoate	60515	Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester	1*	4	P044	A	10 (4.54)
3,3'-Dimethoxybenzidine	119904	[1,1'-Biphenyl]-4,4'diamine,3,3'dimethoxy-	1*	4	U091	B	100 (45.4)
Dimethylamine	124403	Methanamine, N-methyl-	1000	1,4	U092	C	1000 (454)
p-Dimethylaminoazobenzene	60117	Benzenamine, N,N-dimethyl-4-(phenylazo-)	1*	4	U093	A	10 (4.54)
7,12-Dimethylbenz[a]anthracene	57976	Benz[a]anthracene, 7,12-dimethyl-	1*	4	U094	X	1 (0.454)
3,3'-Dimethylbenzidine	119937	[1,1'Biphenyl]-4,4'-diamine,3,3'-dimethyl-	1*	4	U095	A	10 (4.54)
alpha,alpha-Dimethylbenzylhydroperoxide	80159	Hydroperoxide, 1-methyl-1-phenylethyl-	1*	4	U096	A	10 (4.54)
Dimethylcarbamoyl chloride	79447	Carbamic chloride, dimethyl-	1*	4	U097	X	1 (0.454)
1,1-Dimethylhydrazine	57147	Hydrazine, 1,1-dimethyl-	1*	4	U098	A	10 (4.54)
1,2-Dimethylhydrazine	540738	Hydrazine, 1,2-dimethyl-	1*	4	U099	X	1 (0.454)
alpha,alpha-Dimethylphenethylamine	122098	Benzeneethanamine, alpha,alpha-dimethyl-	1*	4	P046	D	5000 (2270)
2,4-Dimethylphenol	105679	Phenol, 2,4-dimethyl-	1*	2,4	U101	B	100 (45.4)
Dimethyl phthalate	131113	1,2-Benzenedicarboxylic acid, dimethyl ester	1*	2,4	U102	D	5000 (2270)
Dimethyl sulfate	77781	Sulfuric acid, dimethyl ester	1*	4	U103	B	100 (45.4)
Dinitrobenzene (mixed)	25154545		1000	1		B	100 (45.4)
m-Dinitrobenzene	99650						
o-Dinitrobenzene	528290						
p-Dinitrobenzene	100254						
4,6-Dinitro-o-cresol and salts	534521	Phenol, 2-methyl-4,6-dinitro-	1*	2,4	P047	A	10 (4.54)
Dinitrophenol	25550587		1000	1		A	10 (4.54)
2,5-Dinitrophenol	329715						
2,6-Dinitrophenol	573568						
2,4-Dinitrophenol	51285	Phenol, 2,4-dinitro-	1000	1,2,4	P048	A	10 (4.54)
Dinitrotoluene	25321146		1000	1,2		A	10 (4.54)
3,4-Dinitrotoluene	610399						
2,4-Dinitrotoluene	121142	Benzene, 1-methyl-2,4-dinitro-	1000	1,2,4	U105	A	10 (4.54)
2,6-Dinitrotoluene	606202	Benzene, 2-methyl-1,3-dinitro-	1000	1,2,4	U106	B	100 (45.4)
Dinoseb	88857	Phenol, 2-(1-methylpropyl)-4,6-dinitro	1*	4	P020	C	1000 (454)
Di-n-octyl phthalate	117840	1,2-Benzenedicarboxylic acid, dioctyl ester	1*	2,4	U107	D	5000 (2270)
1,4-Dioxane	123911	1,4-Diethylenedioxide	1*	4	U108	B	100 (45.4)
DIPHENYLHYDRAZINE	N.A.		1*	2			**
1,2-Diphenylhydrazine	122667	Hydrazine, 1,2-diphenyl-	1*	2,4	U109	A	10 (4.54)
Diphosphoramide, octamethyl-	152169	Octamethylpyrophosphoramide	1*	4	P085	B	100 (45.4)
Diphosphonic acid, tetraethyl ester	107493	Tetraethyl pyrophosphate	100	1,4	P111	A	10 (4.54)
Dipropylamine	142847	1-Propanamine, N-propyl-	1*	4	U110	D	5000 (2270)
Di-n-propylnitrosamine	621647	1-Propanamine, N-nitroso-N-propyl-	1*	2,4	U111	A	10 (4.54)
Diquat	85007		1000	1		C	1000 (454)
	2764729						
Disulfoton	298044	Phosphorodithioic acid, o,o-diethyl S-[2-(ethylthio)ethyl]ester	1	1,4	P039	X	1 (0.454)
Dithiobiuret	541537	Thioimidodicarbonic diamide [(H2N)C(S)]2NH	1*	4	P049	B	100 (45.4)
Diuron	330541		100	1		B	100 (45.4)
Dodecylbenzenesulfonic acid	27176870		1000	1		C	1000 (454)
Endosulfan	115297	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a- hexahydro-, 3-oxide	1	1,2,4	P050	X	1 (0.454)
alpha - Endosulfan	959988		1*	2		X	1 (0.454)
beta - Endosulfan	33213659		1*	2		X	1 (0.454)
ENDOSALFAN AND METABOLITES	N.A.		1*	2			**
Endosulfan sulfate	1031078		1*	2		X	1 (0.454)
Endothall	145733	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	1*	4	P088	C	1000 (454)
Endrin	72208	Endrin, & metabolites 2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9 -hexachloro-1a,2,2a,3, 6,6a,7,7a-octa-hydro-, (1aalpha, 2beta,2abeta,3alpha,6alpha, 6abeta,7beta, 7aalpha)-	1	1,2,4	P051	X	1 (0.454)
Endrin aldehyde	7421934		1*	2		X	1 (0.454)
ENDRIN AND METABOLITES	N.A.		1*	2			**
Endrin, & metabolites	72208	Endrin 2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3, 6,6a,7,7a-octa-hydro-, (1aalpha, 2beta,2abeta,3alpha,6alpha, 6abeta,7beta, 7aalpha)-	1	1,2,4	P051	X	1 (0.454)
Epichlorohydrin	106898	Oxirane, (chloromethyl)-	1000	1,4	U041	B	100 (45.4)
Epinephrine	51434	1,2-Benzenediol,4-[1-hydroxy-2-(methylamino)ethyl]-	1*	4	P042	C	1000 (454)
Ethanal	75070	Acetaldehyde	1000	1,4	U001	C	1000 (454)
Ethanamine, N-ethyl-N-nitroso-	55185	N-Nitrosodiethylamine	1*	4	U174	X	1 (0.454)
1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	91805	Methapyrilene	1*	4	U155	D	5000 (2270)
Ethane, 1,2-dibromo-	106934	Ethylene dibromide	1000	1,4	U067	X	1 (0.454)
Ethane, 1,1-dichloro-	75343	Ethylidene dichloride 1,1-Dichloroethane	1*	2,4	U076	C	1000 (454)
Ethane, 1,2-dichloro-	107062	Ethylene dichloride 1,2-Dichloroethane	5000	1,2,4	U077	B	100 (45.4)
Ethanedinitrile	460195	Cyanogen	1*	4	P031	B	100 (45.4)
Ethane, hexachloro-	67721	Hexachloroethane	1*	2,4	U131	B	100 (45.4)
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	111911	Bis(2-chloroethoxy) methane Dichloromethoxy ethane	1*	2,4	U024	C	1000 (454)
Ethane, 1,1'-oxybis-	60297	Ethyl ether	1*	4	U117	B	100 (45.4)

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Ethane, 1,1'-oxybis(2-chloro-	111444	Bis (2-chloroethyl) ether Dichloroethyl ether	1*	2,4	U025	A	10 (4.54)
Ethane, pentachloro-	76017	Pentachloroethane	1*	4	U184	A	10 (4.54)
Ethane, 1,1,1,2-tetrachloro-	630206	1,1,1,2-Tetrachloroethane	1*	4	U208	B	100 (45.4)
Ethane, 1,1,2,2-tetrachloro-	79345	1,1,2,2-Tetrachloroethane	1*	2,4	U209	B	100 (45.4)
Ethanethioamide	62555	Thioacetamide	1*	4	U218	A	10 (4.54)
Ethane, 1,1,1-trichloro-	71556	Methyl chloroform 1,1,1-Trichloroethane	1*	2,4	U226	C	1000 (454)
Ethane, 1,1,2-trichloro-	79005	1,1,2-Trichloroethane	1*	2,4	U227	B	100 (45.4)
Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester	16752775	Methomyl	1*	4	P066	B	100 (45.4)
Ethanol, 2-ethoxy-	110805	Ethylene glycol monoethyl ether	1*	4	U359	C	1000 (454)
Ethanol, 2,2'-(nitrosoimino)bis-	1116547	N-Nitrosodiethanolamine	1*	4	U173	X	1 (0.454)
Ethanone, 1-phenyl-	98862	Acetophenone	1*	4	U004	D	5000 (2270)
Ethene, chloro-	75014	Vinyl chloride	1*	2,3,4	U043	X	1 (0.454)
Ethene, 2-chloroethoxy-	110758	2-Chloroethyl vinyl ether	1*	2,4	U042	C	1000 (454)
Ethene, 1,1-dichloro-	75354	Vinylidene chloride 1,1-Dichloroethylene	5000	1,2,4	U078	B	100 (45.4)
Ethene, 1,2-dichloro- (E)	156605	1,2-Dichloroethylene	1*	2,4	U079	C	1000 (464)
Ethene, tetrachloro-	127184	Perchloroethylene Tetrachloroethene Tetrachloroethylene	1*	2,4	U210	B	100 (45.4)
Ethene, trichloro-	79016	Trichloroethene Trichloroethylene	1000	1,2,4	U228	B	100 (45.4)
Ethion	563122		10	1		A	10 (4.54)
Ethyl acetate	141786	Acetic acid, ethyl ester	1*	4	U112	D	5000 (2270)
Ethyl acrylate	140885	2-Propenoic acid, ethyl ester	1*	4	U113	C	1000 (454)
Ethylbenzene	100414		1000	1,2		C	1000 (454)
Ethyl carbamate (urethane)	51796	Carbamic acid, ethyl ester	1*	4	U238	B	100 (45.4)
Ethyl cyanide	107120	Propanenitrile	1*	4	P101	A	10 (4.54)
Ethylenebisdithiocarbamic acid, salts & esters	111546	Carbamodithioic acid, 1,2-ethanediylbis, salts & esters	1*	4	U114	D	5000 (2270)
Ethylenediamine	107153		1000	1		D	5000 (2270)
Ethylenediamine-tetraacetic acid (EDTA)	60004		5000	1		D	5000 (2270)
Ethylene dibromide	106934	Ethane, 1,2-dibromo-	1000	1,4	U067	X	1 (0.454)
Ethylene dichloride	107062	Ethane, 1,2-dichloro- 1,2-Dichloroethane	5000	1,2,4	U077	B	100 (45.4)
Ethylene glycol monoethyl ether	110805	Ethanol, 2-ethoxy-	1*	4	U359	C	1000 (454)
Ethylene oxide	75218	Oxirane	1*	4	U115	A	10 (4.54)
Ethylenethiourea	96457	2-Imidazolidinethione	1*	4	U116	A	10 (4.54)
Ethylenimine	151564	Aziridine	1*	4	P054	X	1 (0.454)
Ethyl ether	60297	Ethane, 1,1'-oxybis-	1*	4	U117	B	100 (45.4)
Ethylidene dichloride	75343	Ethane, 1,1-dichloro- 1,1-Dichloroethane	1*	2,4	U076	C	1000 (454)
Ethyl methacrylate	97632	2-Propenoic acid, 2-methyl-, ethyl ester	1*	4	U118	C	1000 (454)
Ethyl methanesulfonate	62500	Methanesulfonic acid, ethyl ester	1*	4	U119	X	1 (0.454)
Famphur	52857	Phosphorothioic acid, O,[4-[(di- methylamino) sulfonyl] phenyl] O,O-dimethyl ester	1*	4	P097	C	1000 (454)
Ferric ammonium citrate	1185575		1000	1		C	1000 (454)
Ferric ammonium oxalate	2944674		1000	1		C	1000 (454)
	55488874						
Ferric chloride	7705080		1000	1		C	1000 (454)
Ferric fluoride	7783508		100	1		B	100 (45.4)
Ferric nitrate	10421484		1000	1		C	1000 (454)
Ferric sulfate	10028225		1000	1		C	1000 (454)
Ferrous ammonium sulfate	10045893		1000	1		C	1000 (454)
Ferrous chloride	7758943		100	1		B	100 (45.4)
Ferrous sulfate	7720787		1000	1		C	1000 (454)
	7782630						
Fluoranthene	206440	Benzo[j,k]fluorene	1*	2,4	U120	B	100 (45.4)
Fluorene	86737		1*	2		D	5000 (2270)
Fluorine	7782414		1*	4	P056	A	10 (4.54)
Fluoroacetamide	640197	Acetamide, 2-fluoro-	1*	4	P057	B	100 (45.4)
Fluoroacetic acid, sodium salt	62748	Acetic acid, fluoro-, sodium salt	1*	4	P058	A	10 (4.54)
Formaldehyde	50000		1000	1,4	U122	B	100 (45.4)
Formic acid	64186		5000	1,4	U123	D	5000 (2270)
Fulminic acid, mercury(2+)salt	628864	Mercury fulminate	1*	4	P065	A	10 (4.54)
Fumaric acid	110178		5000	1		D	5000 (2270)
Furan	110009	Furfuran	1*	4	U124	B	100 (45.4)
Furan, tetrahydro-	109999	Tetrahydrofuran	1*	4	U213	C	1000 (454)
2-Furancarboxaldehyde	98011	Furfural	1000	1,4	U125	D	5000 (2270)
2,5-Furandione	108316	Maleic anhydride	5000	1,4	U147	D	5000 (2270)
Furfural	98011	2-Furancarboxaldehyde	1000	1,4	U125	D	5000 (2270)
Furfuran	110009	Furan	1*	4	U124	B	100 (45.4)
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	18883664	D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)carbonyl]amino] Streptozotocin	1*	4	U206	X	1 (0.454)
D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)carbonyl]amino]-, Streptozotocin	18883664	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1*	4	U206	X	1 (0.454)
Glycidylaldehyde	765344	Oxiranecarboxyaldehyde	1*	4	U126	A	10 (4.54)
Guanidine, N-methyl-N'-nitro-N-nitroso-	70257	MNNG	1*	4	U163	A	10 (4.54)
Guthion	86500		1	1		X	1 (0.454)
HALOETHERS	N.A.		1*	2			**
HALOMETHANES	N.A.		1*	2			**
Heptachlor	76448	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	1	1,2,4	P059	X	1 (0.454)
HEPTACHLOR AND METABOLITES	N.A.		1*	2			**
Heptachlor epoxide	1024573		1*	2		X	1 (0.454)
Hexachlorobenzene	118741	Benzene, hexachloro-	1*	2,4	U127	A	10 (4.54)
Hexachlorobutadiene	87683	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1*	2,4	U128	X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
HEXACHLOROCYCLOHEXANE (all isomers)	608731		1*	2			**
Hexachlorocyclohexane (gamma isomer)	58899	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha, 6beta)- gamma-BHC Lindane	1	1,2,4	U129	X	1 (0.454)
Hexachlorocyclopentadiene	77474	1,3-Cyclopentadiene,1,2,3,4,5,5-hexachloro-	1	1,2,4	U130	A	10 (4.54)
Hexachloroethane	67721	Ethane, hexachloro-	1*	2,4	U131	B	100 (45.4)
Hexachlorophene	70304	Phenol, 2,2'-methylenebis[3,4,6-trichloro-	1*	4	U132	B	100 (45.4)
Hexachloropropene	1888717	1-Propene, 1,1,2,3,3,3-hexachloro-	1*	4	U243	C	1000 (454)
Hexaethyl tetraphosphate	757584	Tetraphosphonic acid, hexaethyl ester	1*	4	P062	B	100 (45.4)
Hydrazine	302012		1*	4	U133	X	1 (0.454)
Hydrazine, 1,2-diethyl-	1615801	N,N'-Diethylhydrazine	1*	4	U086	A	10 (4.54)
Hydrazine, 1,1-dimethyl-	57147	1,1-Dimethylhydrazine	1*	4	U098	A	10 (4.54)
Hydrazine, 1,2-dimethyl-	540738	1,2-Dimethylhydrazine	1*	4	U099	X	1 (0.454)
Hydrazine, 1,2-diphenyl-	122667	1,2-Diphenylhydrazine	1*	2,4	U109	A	10 (4.54)
Hydrazine, methyl-	60344	Methyl hydrazine	1*	4	P068	A	10 (4.54)
Hydrazinecarbothioamide	79196	Thiosemicarbazide	1*	4	P116	B	100 (45.4)
Hydrochloric acid	7647010	Hydrogen chloride	5000	1		D	5000 (2270)
Hydrocyanic acid	74908	Hydrogen cyanide	10	1,4	P063	A	10 (4.54)
Hydrofluoric acid	7664393	Hydrogen fluoride	5000	1,4	U134	B	100 (45.4)
Hydrogen chloride	7647010	Hydrochloric acid	5000	1		D	5000 (2270)
Hydrogen cyanide	74908	Hydrocyanic acid	10	1,4	P063	A	10 (4.54)
Hydrogen fluoride	7664393	Hydrofluoric acid	5000	1,4	U134	B	100 (45.4)
Hydrogen sulfide	7783064	Hydrogen sulfide H2S	100	1,4	U135	B	100 (45.4)
Hydrogen sulfide H2S	7783064	Hydrogen sulfide	100	1,4	U135	B	100 (45.4)
Hydroperoxide, 1-methyl-1-phenylethyl-	80159	alpha,alpha-Dimethylbenzylhydroperoxide	1*	4	U096	A	10 (4.54)
2-Imidazolidinethione	96457	Ethylenethiourea	1*	4	U116	A	10 (4.54)
Indeno(1,2,3-cd)pyrene	193395	1,10-(1,2-Phenylene)pyrene	1*	2,4	U137	B	100 (45.4)
1,3-Isobenzofurandione	85449	Phthalic anhydride	1*	4	U190	D	5000 (2270)
Isobutyl alcohol	78831	1-Propanol, 2-methyl-	1*	4	U140	D	5000 (2270)
Isodrin	465736	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro, (1alpha,4alpha,4abeta,5beta, 8beta,8abeta)-	1*	4	P060	X	1 (0.454)
Isophorone	78591		1*	2		D	5000 (2270)
Isoprene	78795		1000	1		B	100 (45.4)
Isopropanolamine dodecylbenzenesulfonate	42504461		1000	1		C	1000 (454)
Isosafrole	120581	1,3-Benzodioxole, 5-)1-propenyl)-	1*	4	U141	B	100 (45.4)
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964	Muscimol 5-(Aminomethyl)-3-isoxazolol	1*	4	P007	C	1000 (454)
Kepone	143500	1,3,4-Methenc-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachloroctahydro-	1	1,4	U142	X	1 (0.454)
Lasiocarpine	303344	2-Butenoic acid, 2-methyl-, 7[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7(2S*,3R*),7aalpha]]-	1*	4	U143	A	10 (4.54)
Lead ††	7439921		1*	2			*
Lead acetate	301042	Acetic acid, lead(2+) salt	5000	1,4	U144		*
LEAD AND COMPOUNDS	N.A.		1*	2			**
Lead arsenate	7784409 7645252 10102484		5000	1		X	1 (0.454)
Lead, bis(acetato-O)tetrahydroxytri	1335326	Lead subacetate	1*	4	U146	B	100 (45.4)
Lead chloride	7758954		5000	1		B	100 (45.4)
Lead fluoborate	13814965		5000	1		B	100 (45.4)
Lead fluoride	7783462		1000	1		B	100 (45.4)
Lead iodide	10101630		5000	1		B	100 (45.4)
Lead nitrate	10099748		5000	1		B	100 (45.4)
Lead phosphate	7446277	Phosphoric acid, lead(2+) salt (2:3)	1*	4	U145		*
Lead stearate	7428480 1072351 52652592 56189094		5000	1		D	5000# (2270)
Lead subacetate	1335326	Lead, bis(acetato-O)tetrahydroxytri	1*	4	U146	B	100 (45.4)
Lead sulfate	15739807 7446142		5000	1		B	100 (45.4)
Lead sulfide	1314870		5000	1		D	5000# (2270)
Lead thiocyanate	592870		5000	1		B	100 (45.4)
Lindane	58899	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)- gamma-BHC Hexachlorocyclohexane (gamma isomer)	1	1,2,4	U129	X	1 (0.454)
Lithium chromate	14307358		1000	1		A	10 (4.54)
Malathion	121755		10	1		B	100 (45.4)
Maleic acid	110167		5000	1		D	5000 (2270)
Maleic anhydride	108316	2,5-Furandione	5000	1,4	U147	D	5000 (2270)
Maleic hydrazide	123331	3,6-Pyridazinedione, 1,2-dihydro-	1*	4	U148	D	5000 (2270)
Malononitrile	109773	Propanedinitrile	1*	4	U149	C	1000 (454)
Melphalan	148823	L-Phenylalanine, 4-[bis(2-chloroethyl) amino]	1*	4	U150	X	1 (0.454)
Mercaptodimethur	2032657		100	1		A	10 (4.54)
Mercuric cyanide	592041		1	1		X	1 (0.454)
Mercuric nitrate	10045940		10	1		A	10 (4.54)
Mercuric sulfate	7783359		10	1		A	10 (4.54)
Mercuric thiocyanate	592858		10	1		A	10 (4.54)
Mercurous nitrate	10415755 7782867		10	1		A	10 (4.54)
Mercury	7439976		1*	2,3,4	U151	X	1 (0.454)
MERCURY AND COMPOUNDS	N.A.		1*	2			**
Mercury, (acetato-O)phenyl-	62384	Phenylmercury acetate	1*	4	P092	B	100 (45.4)
Mercury fulminate	628864	Fulminic acid, mercury(2+) salt	1*	4	P065	A	10 (4.54)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	56531	Diethylstilbestrol	1*	4	U089	X	1 (0.454)
Phenol, 2,4-dimethyl-	105679	2,4-Dimethylphenol	1*	2,4	U101	B	100(45.4)
Phenol, 2,4-dinitro-	51285	2,4-Dinitrophenol	1000	1,2,4	P048	A	10 (4.5
Phenol, methyl-	1319773	Cresol(s) Cresylic acid	1000	1,4	U052	C	1000 (45
m-Cresol	108394	m-Cresylic acid					
o-Cresol	95487	o-Cresylic acid					
p-Cresol	106445	p-Cresylic acid					
Phenol, 2-methyl-4,6-dinitro-	534521	4,6-Dinitro-o-cresol and salts	1*	2,4	P047	A	10 (4.54)
Phenol, 2,2'-methylenebis(3,4,6-trichloro-	70304	Hexachlorophene	1*	4	U132	B	100 (45.4)
Phenol, 2-(1-methylpropyl)-4,6-dinitro	88857	Dinoseb	1*	4	P020	C	1000 (454)
Phenol, 4-nitro-	100027	p-Nitrophenol 4-Nitrophenol	1000	1,2,4	U170	B	100 (45.4)
Phenol, pentachloro-	87865	Pentachlorophenol	10	1,2,4	U242	A	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	58902	2,3,4,6-Tetrachlorophenol	1*	4	U212	A	10 (4.54)
Phenol, 2,4,5-trichloro-	95954	2,4,5-Trichlorophenol	10	1,4	U230	A	10 (4.54)
Phenol, 2,4,6-trichloro-	88062	2,4,6-Trichlorophenol	10	1,2,4	U231	A	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	131748	Ammonium picrate	1*	4	P009	A	10 (4.54)
L-Phenylalanine, 4-[bis(2-chloroethyl) amino]	148823	Melphalan	1*	4	U150	X	1 (0.454)
1,10-(1,2-Phenylene)pyrene	193395	Indeno(1,2,3-cd)pyrene	1*	2,4	U137	B	100 (45.4)
Phenylmercury acetate	62384	Mercury, (acetato-O)phenyl-	1*	4	P092	B	100 (45.4)
Phenylthiourea	103855	Thiourea, phenyl-	1*	4	P093	B	100 (45.4)
Phorate	298022	Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	1*	4	P094	A	10 (4.54)
Phosgene	75445	Carbonic dichloride	5000	1,4	P095	A	10 (4.54)
Phosphine	7803512		1*	4	P096	B	100 (45.4)
Phosphoric acid	7664382		5000	1		D	5000 (2270)
Phosphonic acid, diethyl 4-nitrophenyl ester	311455	Diethyl-p-nitrophenyl phosphate	1*	4	P041	B	100 (45.4)
Phosphonic acid, lead(2+) salt (2:3)	7446277	Lead phosphate	1*	4	U145		*
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl]ester	298044	Disulfoton	1	1,4	P039	X	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	298022	Phorate	1*	4	P094	A	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288582	O,O-Diethyl S-methyl dithiophosphate	1*	4	U087	D	5000 (2270)
Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester	60515	Dimethoate	1*	4	P044	A	10 (4.54)
Phosphorofluoridic acid, bis(1-methylethyl) ester	55914	Diisopropylfluorophosphate	1*	4	P043	B	100 (45.4)
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56382	Parathion	1	1,4	P089	A	10 (4.54)
Phosphorothioic acid, O,[4-[(dimethylamino) sulfonyl]phenyl]O,O-dimethyl ester	52857	Famphur	1*	4	P097	C	1000 (454)
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	298000	Methyl parathion	100	1,4	P071	B	100 (45.4)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	297972	O,O-Diethyl O-pyrazinyl phosphorothioate	1*	4	P040	B	100 (45.4)
Phosphorus	7723140		1	1		X	1 (0.454)
Phosphorous oxychloride	10025873		5000	1		C	1000 (454)
Phosphorus pentasulfide	1314803	Phosphorus sulfide Sulfur phosphide	100	1,4	U189	B	100 (45.
Phosphorus sulfide	1314803	Phosphorus pentasulfide Sulfur phosphide	100	1,4	U189	B	100 (45.
Phosphorus trichloride	7719122		5000	1		C	1000 (454)
PHTHALATE ESTERS	N.A.		1*	2			**
Phthalic anhydride	85449	1,3-Isobenzofurandione	1*	4	U190	D	5000 (2270)
2-Picoline	109068	Pyridine, 2-methyl-	1*	4	U191	D	5000 (2270)
Piperidine, 1-nitroso-	100754	N-Nitrosopiperidine	1*	4	U179	A	10 (4.54)
Plumbane, tetraethyl-	78002	Tetraethyl lead	100	1,4	P110	A	10 (4.54)
POLYCHLORINATED BIPHENYLS (PCBs)	1336363		10	1,2		X	1 (0.454)
Aroclor 1016	12674112	POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1221	11104282	POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1232	11141165	POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1242	53469219	POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1248	12672296	POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1254	11097691	POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1260	11096825	POLYCHLORINATED BIPHENYLS (PCBs)					
POLYNUCLEAR AROMATIC HYDROCARBONS	N.A.		1*	2			**
Potassium arsenate	7784410		1000	1		X	1 (0.454)
Potassium arsenite	10124502		1000	1		X	1 (0.454)
Potassium bichromate	7778509		1000	1		A	10 (4.54)
Potassium chromate	7789006		1000	1		A	10 (4.54)
Potassium cyanide	151508	Potassium cyanide K (CN)	10	1,4	P098	A	10 (4.54)
Potassium cyanide K(CN)	151508	Potassium cyanide	10	1,4	P098	A	10 (4.54)
Potassium hydroxide	1310583		1000	1		C	1000 (454)
Potassium permanganate	7722647		100	1		B	100 (45.4)
Potassium silver cyanide	506616	Argentate (1-), bis(cyano-C)-, potassium	1*	4	P099	X	1 (0.454)
Pronamide	23950585	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	1*	4	U192	D	5000 (2270)
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	116063	Aldicarb	1*	4	P070	X	1 (0.454)
1-Propanamine	107108	n-Propylamine	1*	4	U194	D	5000 (2270)
1-Propanamine, N-propyl-	142847	Dipropylamine	1*	4	U110	D	5000 (2270)
1-Propanamine, N-nitroso-N-propyl-	621647	Di-n-propylnitrosamine	1*	2,4	U111	A	10 (4.54)
Propane, 1,2-dibromo-3-chloro-	96128	1,2-Dibromo-3-chloropropane	1*	4	U066	X	1 (0.454)
Propane, 2-nitro-	79469	2-Nitropropane	1*	4	U171	A	10 (4.54)
1,3-Propane sultone	1120714	1,2-Oxathiolane, 2,2-dioxide	1*	4	U193	A	10 (4.54)
Propane, 1,2-dichloro-	78875	Propylene dichloride 1,2-Dichloropropane	5000	1,2,4	U083	C	1000 (454)
Propanedinitrile	109773	Malononitrile	1*	4	U149	C	1000 (454)
Propanenitrile	107120	Ethyl cyanide	1*	4	P101	A	10 (4.54)
Propanenitrile, 3-chloro-	542767	3-Chloropropionitrile	1*	4	P027	C	1000 (454)
Propanenitrile, 2-hydroxy-2-methyl-	75865	Acetone cyanohydrin 2-Methylactonitrile	10	1,4	P069	A	10 (4.54)
Propane, 2,2'-oxybis[2-chloro-	108601	Dichloroisopropyl ether	1*	2,4	U027	C	1000 (454)
1,2,3-Propanetriol, trinitrate-	55630	Nitroglycerine	1*	4	P081	A	10 (4
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126727	Tris(2,3-dibromopropyl) phosphate	1*	4	U235	A	10 (4

Hazardou
Toluenediamine
Toluene diisocyanate
o-Toluidine
p-Toluidine
o-Toluidine hydrochlorid
Toxaphene
2,4,5-TP acid
2,4,5-TP esters
1H-1,2,4-Triazol-3-amine
Trichlorfon
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichloroethylene
Trichloromethanesulfeny
Trichloromonofluoromet
Trichlorophenol
2,3,4-Trichlorophenol
2,3,5-Trichlorophenol
2,3,6-Trichlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
3,4,5-Trichlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Triethanolamine dodecy
Triethylamine
Trimethylamine
2,4,6-Trinitrobenzene
1,3,5-Trioxane, 2,4,6-trim
Tris(2,3-dibromopropyl) p
Trypan blue
Unlisted Hazardous Was sivity.
Unlisted Hazardous Was Characteristic of Toxicity
Arsenic (D004)
Barium (D005)
Benzene (D018)
Cadmium (D006)
Carbon tetrachloride (
Chlordane (D020)
Chlorobenzene (D021
Chloroform (D022)
Chromium (D007)
o-Cresol (D023)
m-Cresol (D024)
p-Cresol (D025)
Cresol (D026)
2,4-D (D016)
1,4-Dichlorobenzene (
1,2-Dichloroethane (D
1,1-Dichloroethylene (
2,4-Dinitrotoluene (D0
Endrin (D012)
Heptachlor (and epox
Hexachlorobenzene (I
Hexachlorobutadiene
Hexachloroethane (D(
Lead (D008)
Lindane (D013)
Mercury (D009)
Methoxychlor (D014).
Methyl ethyl ketone (I
Nitrobenzene (D036).
Pentachlorophenol (D
Pyridine (D038)
Selenium (D010)
Silver (D011)
Tetrachloroethylene (
Toxaphene (D015)
Trichloroethylene (D0
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4,5-TP (D017)
Vinyl chloride (D043)
Unlisted Hazardous Wi ability.

Hazardous Substance	CASRN	Regulatory Synonyms	RQ	Code †	RCRA Waste Number	Cat
1-Propanol, 2-methyl-	78831	Isobutyl alcohol	1*	4	U140	D
2-Propanone	67641	Acetone	1*	4	U002	D
2-Propanone, 1-bromo-	598312	Bromoacetone	1*	4	P017	C
Propargite	2312358		10	1		A
Propargyl alcohol	107197	2-Propyn-1-ol	1*	4	P102	C
2-Propenal	107028	Acrolein	1	1,2,4	P003	X
2-Propenamide	79061	Acrylamide	1*	4	U007	D
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717	Hexachloropropene	1*	4	U243	C
1-Propene, 1,3-dichloro-	542756	1,3-Dichloropropene	5000	1,2,4	U084	B
2-Propenenitrile	107131	Acrylonitrile	100	1,2,4	U009	B
2-Propenenitrile, 2-methyl-	126987	Methacrylonitrile	1*	4	U152	C
2-Propenoic acid	79107	Acrylic acid	1*	4	U008	D
2-Propenoic acid, ethyl ester	140885	Ethyl acrylate	1*	4	U113	C
2-Propenoic acid, 2-methyl-, ethyl ester	97632	Ethyl methacrylate	1*	4	U118	C
2-Propenoic acid, 2-methyl-, methyl ester	80626	Methyl methacrylate	5000	1,4	U162	C
2-Propen-1-ol	107186	Allyl alcohol	100	1,4	P005	B
Propionic acid	79094		5000	1		D
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	93721	Silvex (2,4,5-TP) 2,4,5-TP acid	100	1,4	U233	B
Propionic anhydride	123626		5000	1		D
n-Propylamine	107108	1-Propanamine	1*	4	U194	D
Propylene dichloride	78875	Propane, 1,2-dichloro- 1,2-Dichloropropane	5000	1,2,4	U083	C
Propylene oxide	75569		5000	1		B
1,2-Propylenimine	75558	Aziridine, 2-methyl-	1*	4	P067	X
2-Propyn-1-ol	107197	Propargyl alcohol	1*	4	P102	C
Pyrene	129000		1*	2		D
Pyrethrins	121299		1000	1		X
	121211					
	8003347					
3,6-Pyridazinedione, 1,2-dihydro-	123331	Maleic hydrazide	1*	4	U148	D
4-Pyridinamine	504245	4-Aminopyridine	1*	4	P008	C
Pyridine	110861		1*	4	U196	C
Pyridine, 2-methyl-	109066	2-Picoline	1*	4	U191	D
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-	54115	Nicotine, & salts	1*	4	P075	B
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	66751	Uracil mustard	1*	4	U237	A
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56042	Methylthiouracil	1*	4	U164	A
Pyrrolidine, 1-nitroso-	930552	N-Nitrosopyrrolidine	1*	4	U180	X
Quinoline	91225		1000	1		D
RADIONUCLIDES	N.A.		1*	3		
Reserpine	50555	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy-, methyl ester (3beta,16beta,17alpha,18beta,20alpha)-	1*	4	U200	D
Resorcinol	108463	1,3-Benzenediol	1000	1,4	U201	D
Saccharin and salts	81072	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	1*	4	U202	B
Safrole	94597	1,3-Benzodioxole, 5-(2-propenyl)-	1*	4	U203	B
Selenious acid	7783008		1*	4	U204	A
Selenious acid, dithallium (1+) salt	12039520	Thallium selenite	1*	4	P114	C
Selenium ††	7782492		1*	2		B
SELENIUM AND COMPOUNDS	N.A.		1*	2		
Selenium dioxide	7446084	Selenium oxide	1000	1,4	U204	A
Selenium oxide	7446084	Selenium dioxide	1000	1,4	U204	A
Selenium sulfide	7488564	Selenium sulfide SeS2	1*	4	U205	A
Selenium sulfide SeS2	7488564	Selenium sulfide	1*	4	U205	A
Selenourea	630104		1*	4	P103	C
L-Serine, diazoacetate (ester)	115026	Azaserine	1*	4	U015	X
Silver ††	7440224		1*	2		C
SILVER AND COMPOUNDS	N.A.		1*	2		
Silver cyanide	506649	Silver cyanide Ag (CN)	1*	4	P104	X
Silver cyanide Ag (CN)	506649	Silver cyanide	1*	4	P104	X
Silver nitrate	7761888		1	1		X
Silvex (2,4,5-TP)	93721	Propionic acid, 2-(2,4,5-trichlorophenoxy)- 2,4,5-TP acid	100	1,4	U233	B
Sodium	7440235		1000	1		A
Sodium arsenate	7631892		1000	1		X
Sodium arsenite	7784465		1000	1		X
Sodium azide	26628228		1*	4	P105	C
Sodium bichromate	10588019		1000	1		A
Sodium bifluoride	1333831		5000	1		B
Sodium bisulfite	7631905		5000	1		D
Sodium chromate	7775113		1000	1		A
Sodium cyanide	143339	Sodium cyanide Na (CN)	10	1,4	P106	A
Sodium cyanide Na (CN)	143339	Sodium cyanide	10	1,4	P106	A
Sodium dodecylbenzenesulfonate	25155300		1000	1		C
Sodium fluoride	7681494		5000	1		C
Sodium hydrosulfide	16721805		5000	1		D
Sodium hydroxide	1310732		1000	1		C
Sodium hypochlorite	7681529		100	1		B
	10022705					
Sodium methylate	124414		1000	1		C
Sodium nitrite	7632000		100	1		B
Sodium phosphate, dibasic	7558794		5000	1		D
	10039324					
	10140655					

Hazardo	Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Code T	RCRA Waste Number	Cate
Sodium phosphate, tri-	Unlisted Hazardous Wastes Characteristic of Reactivity.	N.A.		1*	4	D003	B
	Uracil mustard	66751	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	1*	4	U237	
	Uranyl acetate	541093		5000	1		B
	Uranyl nitrate	10102064		5000	1		B
Sodium selenite		36478769					
	Urea, N-ethyl-N-nitroso-	759739	N-Nitroso-N-ethylurea	1*	4	U176	X
Streptozotocin	Urea, N-methyl-N-nitroso-	684935	N-Nitroso-N-methylurea	1*	4	U177	X
	Vanadic acid, ammonium salt	7803556	Ammonium vanadate	1*	4	P119	C
	Vanadium oxide V205	1314621	Vanadium pentoxide	1000	1,4	P120	C
	Vanadium pentoxide	1314621	Vanadium oxide V205	1000	1,4	P120	C
Strontium chromate	Vanadyl sulfate	27774136		1000	1		C
Strychnidin-10-one	Vinyl chloride	75014	Ethene, chloro-	1*	2,3,4	U043	X
Strychnidin-10-one, 2,3-	Vinyl acetate	108054	Vinyl acetate monomer	1000	1		D
Strychnine, & salts	Vinyl acetate monomer	108054	Vinyl acetate	1000	1		D
Styrene	Vinylamine, N-methyl-N-nitroso-	4549400	N-Nitrosomethylvinylamine	1*	4	P084	A
Sulfur monochloride	Vinylidene chloride	75354	Ethene, 1,1-dichloro-; 1,1-Dichloroethylene	5000	1,2,4	U078	B
Sulfur phosphide							
Sulfuric acid	Warfarin, & salts, when present at concentrations greater than 0.3%.	81812	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations greater than 0.3%	1*	4	P001	B
Sulfuric acid, dithallium	Xylene (mixed)	1330207	Benzene, dimethyl	1000	1,4	U239	C
Sulfuric acid, dimethyl	m-Benzene, dimethyl	108383	m-Xylene				
2,4,5-T acid	o-Benzene, dimethyl	95476	o-Xylene				
	p-Benzene, dimethyl	106423	p-Xylene				
2,4,5-T amines	Xylenol	1300716		1000	1		C
	Yohimban-16-carboxylic acid,11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester (3beta,16beta,17alpha,18beta,20alpha)-	50555	Reserpine	1*	4	U200	D
	Zinc **	7440666		1*	2		C
2,4,5-T esters	ZINC AND COMPOUNDS	N.A.		1*	2		
	Zinc acetate	557346		1000	1		C
	Zinc ammonium chloride	52628258		5000	1		C
		14639975					
		14639986					
2,4,5-T salts	Zinc borate	1332076		1000	1		C
2,4,5-T	Zinc bromide	7699458		5000	1		C
	Zinc carbonate	3486359		1000	1		C
TDE	Zinc chloride	7646857		5000	1		C
	Zinc cyanide	557211	Zinc cyanide Zn(CN)2	10	1,4	P121	A
1,2,4,5-Tetrachlorobenz	Zinc cyanide Zn(CN)2	557211	Zinc cyanide	10	1,4	P121	A
2,3,7,8-Tetrachlorodibe	Zinc fluoride	7783495		1000	1		C
1,1,1,2-Tetrachloretha	Zinc formate	557415		1000	1		
1,1,2,2-Tetrachloretha	Zinc hydrosulfite	7779864		1000	1		
Tetrachloroethene	Zinc nitrate	7779886		5000	1		
	Zinc phenosulfonate	127822		5000	1		D
	Zinc phosphide	1314847	Zinc phosphide Zn3P2, when present at concentrations greater than 10%	1000	1,4	P122	B
Tetrachloroethylene	Zinc phosphide Zn3P2, when present at concentrations greater than 10%.	1314847	Zinc phosphide	1000	1,4	P122	B
2,3,4,6-Tetrachlorophen	Zinc silicofluoride	16871719		5000	1		D
Tetraethyl lead	Zinc sulfate	7733020		1000	1		C
Tetraethyl pyrophosphi	Zirconium nitrate	13746899		5000	1		D
Tetraethyldithiopyrophos	Zirconium potassium fluoride	16923958		5000	1		C
Tetrahydrofuran	Zirconium sulfate	14644612		5000	1		D
Tetranitromethane	Zirconium tetrachloride	10026116		5000	1		D
Tetraphosphonic acid,	F001			1*	4	F001	A
Thallic oxide	The following spent halogenated solvents used in degreasing: all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.						
Thallium **	(a) Tetrachloroethylene	127184		1*	2,4	U210	B
Thallium and compoun	(b) Trichloroethylene	79016		1000	1,2,4	U228	B
Thallium (I) acetate	(c) Methylene chloride	75092		1*	2,4	U080	C
Thallium (I) carbonate	(d) 1,1,1-Trichloroethane	71556		1*	2,4	U226	C
Thallium (I) chloride	(e) Carbon tetrachloride	56235		5000	1,2,4	U211	A
Thallium chloride TlCl	(f) Chlorinated fluorocarbons	N.A.					D
Thallium (I) nitrate	F002			1*	4	F002	A
Thallium oxide Tl2O3	The following spent halogenated solvents: all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.						
Thallium selenite	(a) Tetrachloroethylene	127184		1*	2,4	U210	B
Thallium (I) sulfate	(b) Trichloroethylene	79016		1000	1,2,4	U228	B
	(c) Methylene chloride	75092		1*	2,4	U080	C
Thioacetamide	(d) 1,1,1-Trichloroethane	71556		1*	2,4	U226	C
Thiodiphosphonic acid,	(e) Carbon tetrachloride	56235		5000	1,2,4	U211	A
Thiofanox	(f) Chlorinated fluorocarbons	N.A.					D
Thiomidodicarbonic di							
Thiomethanol							
Thioperoxydicarbonic d tetramethyl-							
Thiophenol							
Thiosemicarbazide	(a) Tetrachloroethylene	127184		1*	2,4	U210	B
Thiourea	(b) Methylene chloride	75092		1*	2,4	U080	C
Thiourea, (2-chlorophe	(c) Trichloroethylene	79016		1000	1,2,4	U228	B
Thiourea, 1-naphthalen	(d) 1,1,1-Trichloroethane	71556		1*	2,4	U226	C
Thiourea, phenyl-	(e) Chlorobenzene	108907		100	1,2,4	U037	B
Thiram	(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	76131					D
	(g) o-Dichlorobenzene	95501		100	1,2,4	U070	
Toluene	(h) Trichlorofluoromethane	75694		1*	4	U121	

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	Statutory RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
(i) 1,1,2-Trichloroethane	79005		1*	2,4	U227	B	100 (45.4)
F003			1*	4	F003	B	100 (45.4)
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Xylene	1330207					C	1000 (454)
(b) Acetone	67641					D	5000 (2270)
(c) Ethyl acetate	141786					D	5000 (2270)
(d) Ethylbenzene	100414					C	1000 (454)
(e) Ethyl ether	60297					B	100 (45.4)
(f) Methyl isobutyl ketone	108101					D	5000 (2270)
(g) n-Butyl alcohol	71363					D	5000 (2270)
(h) Cyclohexanone	108941					D	5000 (2270)
(i) Methanol	67561					D	5000 (2270)
F004			1*	4	F004	C	1000 (454)
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Cresols/Cresylic acid	1319773		1000	1,4	U052	C	1000 (454)
(b) Nitrobenzene	98953		1000	1,2,4	U169	C	1000 (454)
F005			1*	4	F005	B	100 (45.4)
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:							
(a) Toluene	108883		1000	1,2,4	U220	C	1000 (454)
(b) Methyl ethyl ketone	78933		1*	4	U159	D	5000 (2270)
(c) Carbon disulfide	75150		5000	1,4	P022	B	100 (45.4)
(d) Isobutanol	78831		1*	4	U140	D	5000 (2270)
(e) Pyridine	110861		1*	4	U196	C	1000 (454)
F006			1*	4	F006	A	10 (4.54)
Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum, (2) tin plating on carbon steel, (3) zinc plating (segregated basis) on carbon steel, (4) aluminum or zinc-aluminum plating on carbon steel, (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel, and (6) chemical etching and milling of aluminum.							
F007			1*	4	F007	A	10 (4.54)
Spent cyanide plating bath solutions from electroplating operations.							
F008			1*	4	F008	A	10 (4.54)
Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.							
F009			1*	4	F009	A	10 (4.54)
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.							
F010			1*	4	F010	A	10 (4.54)
Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.							
F011			1*	4	F011	A	10 (4.54)
Spent cyanide solution from salt bath pot cleaning from metal heat treating operations.							
F012			1*	4	F012	A	10 (4.54)
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.							
F019			1	4	F019	A	10 (4.54)
Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process							
F020			1*	4	F020	X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code 1	RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri-or-tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5-trichlorophenol.)							
F021			1*	4	F021	X	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.							
F022			1*	4	F022	X	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.							
F023			1*	4	F023	X	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexa-chlorophene from highly purified 2,4,5-trichlorophenol.)							
F024			1*	4	F024	X	1 (0.454)
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent desiccants(sic), wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in Section 261.32.)							
F025			1*	4	F025	X	##1 (0.454)
Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution..							
F026			1*	4	F026	X	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.							
F027			1*	4	F027	X	1 (0.454)
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-tri-chlorophenol as the sole component.)							
F028			1*	4	F028	X	1 (0.454)
Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.							
F032			1*	4	F032	X	1(0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	Statutory RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except wastes from processes that have had the F032 waste code deleted in accordance with § 261.35 and do not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.							
F034			1*	4	F034	X	1(0.454)
Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.							
F035			1*	4	F035	X	1(0.454)
Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.							
F037			1*	4	F037	X	1 (0.454)
Petroleum refinery primary oil/water/solids separation sludge—Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in § 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing.							
F038			1*	4	F038	X	1 (0.454)
Petroleum refinery secondary (emulsified) oil/water/solids separation sludge—Any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from once-through non-contact cooling waters segregated for treatment from other process or oil cooling wastes, sludges and floats generated in aggressive biological treatment units as defined in § 261.31(b)(2) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are not included in this listing.							
K001			1*	4	K001	X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	Statutory RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.							
K002			1*	4	K002		#
Wastewater treatment sludge from the production of chrome yellow and orange pigments.							
K003			1*	4	K003		#
Wastewater treatment sludge from the production of molybdate orange pigments.							
K004			1*	4	K004	A	10 (4.54)
Wastewater treatment sludge from the production of zinc yellow pigments.							
K005			1*	4	K005		#
Wastewater treatment sludge from the production of chrome green pigments.							
K006			1*	4	K006	A	10 (4.54)
Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).							
K007			1*	4	K007	A	10 (4.54)
Wastewater treatment sludge from the production of iron blue pigments.							
K008			1*	4	K008	A	10 (4.54)
Oven residue from the production of chrome oxide green pigments.							
K009			1*	4	K009	A	10 (4.54)
Distillation bottoms from the production of acetaldehyde from ethylene.							
K010			1*	4	K010	A	10 (4.54)
Distillation side cuts from the production of acetaldehyde from ethylene.							
K011			1*	4	K011	A	10 (4.54)
Bottom stream from the wastewater stripper in the production of acrylonitrile.							
K013			1*	4	K013	A	10 (4.54)
Bottom stream from the acetonitrile column in the production of acrylonitrile.							
K014			1*	4	K014	D	5000 (2270)
Bottoms from the acetonitrile purification column in the production of acrylonitrile.							
K015			1*	4	K015	A	10 (4.54)
Still bottoms from the distillation of benzyl chloride.							
K016			1*	4	K016	X	1 (0.454)
Heavy ends or distillation residues from the production of carbon tetrachloride.							
K017			1*	4	K017	A	10 (4.54)
Heavy ends (still bottoms) from the purification column in the production of epi-chlorohydrin.							
K018			1*	4	K018	X	1 (0.454)
Heavy ends from the fractionation column in ethyl chloride production.							
K019			1*	4	K019	X	1 (0.454)
Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.							
K020			1*	4	K020	X	1 (0.454)
Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.							
K021			1*	4	K021	A	10 (4.54)
Aqueous spent antimony catalyst waste from fluoromethanes production.							
K022			1*	4	K022	X	1 (0.454)
Distillation bottom tars from the production of phenol/acetone from cumene.							
K023			1*	4	K023	D	5000 (2270)
Distillation light ends from the production of phthalic anhydride from naphthalene.							
K024			1*	4	K024	D	5000 (2270)
Distillation bottoms from the production of phthalic anhydride from naphthalene.							
K025			1*	4	K025	A	10 (4.54)
Distillation bottoms from the production of nitrobenzene by the nitration of benzene.							
K026			1*	4	K026	C	1000 (454)
Stripping still tails from the production of methyl ethyl pyridines.							
K027			1*	4	K027	A	10 (4.54)
Centrifuge and distillation residues from toluene diisocyanate production.							
K028			1*	4	K028	X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code T	Statutory RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane. K029			1*	4	K029	X	1 (0.454)
Waste from the product steam stripper in the production of 1,1,1-trichloroethane. K030			1*	4	K030	X	1 (0.454)
Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene. K031			1*	4	K031	X	1 (0.454)
By-product salts generated in the production of MSMA and cacodylic acid. K032			1*	4	K032	A	10 (4.54)
Wastewater treatment sludge from the production of chlordane. K033			1*	4	K033	A	10 (4.54)
Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane. K034			1*	4	K034	A	10 (4.54)
Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane. K035			1*	4	K035	X	1 (0.454)
Wastewater treatment sludges generated in the production of creosote. K036			1*	4	K036	X	1 (0.454)
Still bottoms from toluene reclamation distillation in the production of disulfoton. K037			1*	4	K037	X	1 (0.454)
Wastewater treatment sludges from the production of disulfoton. K038			1*	4	K038	A	10 (4.54)
Wastewater from the washing and stripping of phorate production. K039			1*	4	K039	A	10 (4.54)
Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate. K040			1*	4	K040	A	10 (4.54)
Wastewater treatment sludge from the production of phorate. K041			1*	4	K041	X	1 (0.454)
Wastewater treatment sludge from the production of toxaphene. K042			1*	4	K042	A	10 (4.54)
Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T. K043			1*	4	K043	A	10 (4.54)
2,6-Dichlorophenol waste from the production of 2,4-D. K044			1*	4	K044	A	10 (4.54)
Wastewater treatment sludges from the manufacturing and processing of explosives. K045			1*	4	K045	A	10 (4.54)
Spent carbon from the treatment of wastewater containing explosives. K046			1*	4	K046	B	100 (45.4)
Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds. K047			1*	4	K047	A	10 (4.54)
Pink/red water from TNT operations. K048			1*	4	K048		#
Dissolved air flotation (DAF) float from the petroleum refining industry. K049			1*	4	K049		#
Slop oil emulsion solids from the petroleum refining industry. K050			1*	4	K050	A	10 (4.54)
Heat exchanger bundle cleaning sludge from the petroleum refining industry. K051			1*	4	K051		#

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory RQ	Statutory Code †	Statutory RCRA Waste Number	Final RQ Category	Final RQ Pounds (Kg)
API separator sludge from the petroleum refining industry.							
K052			1*	4	K052	A	10 (4.54)
Tank bottoms (leaded) from the petroleum refining industry.							
K060			1*	4	K060	X	1 (0.454)
Ammonia still lime sludge from coking operations.							
K061			1*	4	K061		#
Emission control dust/sludge from the primary production of steel in electric furnaces.							
K062			1*	4	K062		#
Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332).							
K064			1*	4	K064		##
Acid plant blowdown slurry/sludge resulting from thickening of blowdown slurry from primary copper production.							
K065			1*	4	K065		##
Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities.							
K066			1*	4	K066		##
Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production.							
K069			1*	4	K069		#
Emission control dust/sludge from secondary lead smelting.							
K071			1*	4	K071	X	1 (0.454)
Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.							
K073			1*	4	K073	A	10 (4.54)
Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.							
K083			1*	4	K083	B	100 (45.4)
Distillation bottoms from aniline extraction.							
K084			1*	4	K084	X	1 (0.454)
Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.							
K085			1*	4	K085	A	10 (4.54)
Distillation or fractionation column bottoms from the production of chlorobenzenes.							
K086			1*	4	K086		#
Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.							
K087			1*	4	K087	B	100 (45.4)
Decanter tank tar sludge from coking operations.							
K088			1*	4	K088		
Spent potliners from primary aluminum reduction.							
K090			1*	4	K090		
Emission control dust or sludge from ferrochromium-silicon production.							
K091			1	4	K091		
Emission control dust or sludge from ferrochromium production.							
K093			1*	4	K093	D	5000 (2270)
Distillation light ends from the production of phthalic anhydride from ortho-xylene.							
K094			1*	4	K094	D	5000 (2270)
Distillation bottoms from the production of phthalic anhydride from ortho-xylene.							
K095			1*	4	K095	B	100 (45.4)
Distillation bottoms from the production of 1,1,1-trichloroethane.							
K096			1*	4	K096	B	100 (45.4)
Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.							
K097			1*	4	K097	X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	RQ	Code T	RCRA Waste Number	Category	Pounds (kg)
Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.							
K098			1*	4	K098	X	1 (0.454)
Untreated process wastewater from the production of toxaphene.							
K099			1*	4	K099	A	10 (4.54)
Untreated wastewater from the production of 2,4-D							
K100			1*	4	K100		*
Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.							
K101			1*	4	K101	X	1 (0.454)
Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.							
K102			1*	4	K102	X	1 (0.454)
Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.							
K103			1*	4	K103	B	100 (45.4)
Process residues from aniline extraction from the production of aniline.							
K104			1*	4	K104	A	10 (4.54)
Combined wastewater streams generated from nitrobenzene/aniline production.							
K105			1*	4	K105	A	10 (4.54)
Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.							
K106			1*	4	K106	X	1 (0.454)
Wastewater treatment sludge from the mercury cell process in chlorine production.							
K107			10	4	K107	X	10 (4.54)
Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines.							
K108			10	4	K108	X	10 (4.54)
Condensed column overheads from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.							
K109			10	4	K109	X	10 (4.54)
Spent filter cartridges from product purification from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.							
K110			10	4	K110	X	10 (4.54)
Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.							
K111			1*	4	K111	A	10 (4.54)
Product washwaters from the production of dinitrotoluene via nitration of toluene.							
K112			1*	4	K112	A	10 (4.54)
Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.							
K113			1*	4	K113	A	10 (4.54)
Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.							
K114			1*	4	K114	A	10 (4.54)
Vicinals from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.							
K115			1*	4	K115	A	10 (4.54)
Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.							
K116			1*	4	K116	A	10 (4.54)
Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.							
K117			1*	4	K117	X	1 (0.454)

Hazardous Substance	CASRN	Regulatory Synonyms	Statutory			Final RQ	
			RQ	Code †	RCRA Waste Number	Category	Pounds (Kg)
Wastewater from the reaction vent gas scrubber in the production of ethylene bromide via bromination of ethene.							
K118			1*	4	K118	X	1 (0.454)
Spent absorbent solids from purification of ethylene dibromide in the production of ethylene dibromide.							
K123			1*	4	K123	A	10 (4.54)
Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenebisdithiocarbamic acid and its salts.							
K124			1*	4	K124	A	10 (4.54)
Reactor vent scrubber water from the production of ethylenebisdithiocarbamic acid and its salts.							
K125			1*	4	K125	A	10 (4.54)
Filtration, evaporation, and centrifugation solids from the production of ethylenebisdithiocarbamic acid and its salts.							
K126			1*	4	K126	A	10 (4.54)
Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylenebisdithiocarbamic acid and its salts.							
K131			100	4	K131	X	100 (45.4)
Wastewater from the reactor and spent sulfuric acid from the acid dryer in the production of methyl bromide.							
K132			1000	4	K132	X	1000 (454)
Spent absorbent and wastewater solids from the production of methyl bromide.							
K136			1*	4	K136	X	1 (0.454)
Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.							

* Indicates the statutory source as defined by 1, 2, 3, and 4 below.
†† No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 100 micrometers (0.004 inches).
††† The RQ for asbestos is limited to friable forms only.
1—Indicates that the statutory source for designation of this hazardous substance under CERCLA is CWA Section 311(b)(4).
2—Indicates that the statutory source for designation of this hazardous substance under CERCLA is CWA Section 307(a).
3—Indicates that the statutory source for designation of this hazardous substance under CERCLA is CAA Section 112.
4—Indicates that the statutory source for designation of this hazardous substance under CERCLA is RCRA Section 3001.
1*—Indicates that the 1-pound RQ is a CERCLA statutory RQ.
# Indicates that the RQ is subject to change when the assessment of potential carcinogenicity is completed.
The Agency may adjust the statutory RQ for this hazardous substance in a future rulemaking; until then the statutory RQ applies.
§—The adjusted RQs for radionuclides may be found in Appendix B to this table.
**—Indicates that no RQ is being assigned to the generic or broad class.

ANNEX VII

DISTRIBUTION LIST

27TH FIGHTER WING (ACC)
MELROSE AIR FORCE RANGE
NEW MEXICO 88103-5000
25 FEBRUARY 1993

DISTRIBUTION LIST

Office	Office Symbol	No Copies
Civil Engineering Squadron	CES/CC	2
Readiness Flight	CES/CEX	1
EOD	CES/CED	3
Service Call	CES/CDQA	1
Fire Department	CES/CEF	3
Environmental Management	CES/CEV	5
Operations Support Squadron	OSS/OSTR	1
Security Police Emergency Desk	SPS/SPOL	2
Associate Units		2
Melrose AFR Contractor (Westar, Inc.)		20

APPENDIX F1-1
OPERATOR'S INSPECTION GUIDE AND TROUBLE REPORT, AF 1800

ITEMS TO BE CHECKED *(continued)*
16. OTHER *(specify)*
17. OTHER *(specify)*
18. OTHER *(specify)*
19. OTHER *(specify)*

OPERATOR'S SIGNATURE SIGNIFIES ACCOMPLISHMENT OF CHECKS

DAY	DAY	DAY
1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30
		31

MONTHLY TIRE PRESSURE CHECK

TIRE PRESSURE GAUGED *(COLD)* AND ADJUSTED TO:

FRONT _____ LBS REAR _____ LBS

OPERATOR'S SIGNATURE	DATE PERFORMED

OPERATOR'S INSPECTION GUIDE AND TROUBLE REPORT

(GENERAL PURPOSE VEHICLES)

DATE (R)

VEHICLE TYPE	REGISTRATION NUMBER

USING ORGANIZATION	LOCATION	PHONE NUMBER

NAME OF VEHICLE CONTROL OFFICER	GRADE	PHONE NUMBER

ITEMS TO BE CHECKED WEEKLY
INSPECTIONS CAN BE DONE MORE FREQUENTLY AS DIRECTED BY MAJCOM
(Operator's signature required on reverse)

1. CLEAN VEHICLE *(exterior and interior)*
2. DAMAGE *(exterior and interior, missing parts)*
3. TIRES *(visually check for damage/abnormalities)*
4. LEAKS *(visually check fuel/oil/coolant)*
5. ENGINE OIL AND COOLANT *(visually check fluid levels)*[1]
6. BATTERY *(visually check fluid level/hold-down secure/cleanliness)*
7. DRIVE BELTS *(visually check for fraying or cracking)*
8. LIGHTS *(visually check all for proper operation)*
9. SAFETY DEVICES *(seatbelts/harness, headrests, warning lights, etc.)*
10. INSTRUMENTS/HORN/WINDSHIELD WIPERS *(functionally check for operation)*
11. BRAKES/STEERING *(functionally check-responsive/effective/smooth)*
12. UNUSUAL OCCURRENCES *(noise/vibration/odor/erratic instruments/etc.)*
13. OTHER *(specify)*
14. OTHER *(specify)*
15. OTHER *(specify)*

[1] *Check engine oil following each refueling.*

VEHICLE/EQUIPMENT DISCREPANCY AND MAINTENANCE REPORT

OPERATOR REPORT			REPORTED TO MAINTENANCE			MAINTENANCE CONTROL REPORT			
ITEM NO.	DISCREPANCY	DATE FOUND	DATE	TIME	OPERATOR'S SIGNATURE	WORK ORDER NUMBER	DATE	STATUS[1] CODE	INIT

[1]STATUS CODE: C = Corrected *C – T by Temp Fix* *C – P by Perm Fix* *: D = Delay* *D – P for Parts* *D – M for Maint* *D – D for Disposition:* *W = Waiver of Repairs* *N = No Repairs* *See AFM 77-310, Vol 2, Chap 6*

*U.S. Government Printing Office: 1992 — 311-790/60118

EMERGENCY INSTRUCTIONS FOR MOTOR VEHICLE DRIVERS AND INITIAL RESPONDERS

SECTION I - TO BE COMPLETED BY TRANSPORTATION OFFICE

1. THIS TRUCK IS CARRYING *(Detailed commodity description)*	2. TYPE OF PLACARD REQUIRED
3. UN ID NUMBER	4. BILL OF LADING NUMBER

SPECIFIC INSTRUCTIONS

5. IN CASE OF ACCIDENT/INCIDENT/BREAKDOWN

a. **SEND FOR FIREMEN, POLICE, AMBULANCE (CALL 911).**

b. SET BRAKE AND BLOCK VEHICLE TO PREVENT MOVEMENT.

c. PLACE NON-FLAME PRODUCING HIGHWAY WARNING DEVICES FOR TRAFFIC APPROACHING FROM EACH DIRECTION.

d. **DO NOT** ATTEMPT TO TOW LOADED VEHICLE.

e. **DO NOT** EXPOSE CARGO TO IMPACT, SPARKS, SMOKING, FLAMES OR HEAT OF ANY KIND.

f. **DO NOT** TOUCH CARGO UNTIL QUALIFIED PERSONNEL ARRIVE.

6. FIRE FIGHTING METHODS

a. **SEND FOR FIREMEN, POLICE, AMBULANCE (CALL 911).**

b. FIRES MAY BE FOUGHT UNTIL FLAMES REACH THE CARGO, AT WHICH TIME FIREMEN AND OTHERS WOULD BE WITHDRAWN TO THE FOLLOWING DISTANCES:

PUBLIC	FIREMEN
FEET	FEET

c. EXTINGUISHING INSTRUCTION *(X one)*

☐ WATER ☐ NO WATER

d. IF FIRE IS IN TRACTOR/CAB/ENGINE, SEPARATE FROM TRAILER.

7. SPECIFIC HAZARD INSTRUCTIONS/PRECAUTIONS *(X all that apply)*

	BLAST		EXPLOSION		FIRE
	INTENSE HEAT		FLASHBACK		REIGNITION
	INHALATION		RADIOACTIVE		OTHER *(Specify)*

8. SEE ATTACHED EMERGENCY RESPONSE GUIDEBOOK, NO. P5800.4, INSTRUCTIONS:

9. SEE FURTHER INSTRUCTIONS ON THE BACK OF THIS FORM. *(X block if applicable)* ☐

10. PROMPTLY NOTIFY THE FOLLOWING:

a. **MUNITIONS AND EXPLOSIVES**
FOR DOD EMERGENCY ASSISTANCE ONLY:
CALL ARMY OPERATIONS CENTER COLLECT.
ASK FOR WATCH OFFICER: 202-697-0218

b. **INHALATION HAZARDS**
TO INITIATE EMERGENCY RESPONSE ACTIONS, CALL:
_____
(To be completed by shipper based on specific commodity)

c. IN ALL CASES OF ACCIDENT/INCIDENT/BREAKDOWN INVOLVING MUNITIONS AND EXPLOSIVES, INHALATION HAZARDS AND OTHER HAZARDOUS MATERIALS, PROMPT NOTIFICATION MUST BE GIVEN TO:
SHIPPER _____
CONSIGNEE _____
MTMC HOTLINES:
EASTERN US: 800-524-0331 NJ ONLY: 800-642-1361
WESTERN US: 800-331-1822 CA ONLY: 800-348-4639

d. ADDITIONAL ASSISTANCE MAY BE OBTAINED FROM:
CHEMTREC: 800-424-9300
NRC: 800-424-8802

e. FOR SAFE HAVEN/REFUGE:
IMMEDIATELY CALL APPROPRIATE MTMC AREA HOTLINE.

f. IN THE EVENT OF DELAYS, NOTIFY THE SHIPPER IMMEDIATELY.

SECTION II - TO BE COMPLETED BY DRIVER

1. DRIVER PRECAUTIONS STATEMENTS *(Read before signing and X each item below)*

	a. I WILL COMPLY WITH ALL COMPANY RULES AND FEDERAL, STATE AND LOCAL REGULATIONS.		g. I WILL NOT ALLOW SMOKING OR USE OF FLAME OR SPARK PRODUCING EQUIPMENT WITHIN 50 FEET OF THE VEHICLE.
	b. I WILL KEEP AT LEAST 600 FEET FROM TRUCKS LOADED WITH OTHER HAZARDOUS MATERIALS AND A SAFE DISTANCE FROM OTHER VEHICLES WHILE OPERATING OVER PUBLIC ROADS.		h. I WILL PERFORM TIRE CHECKS AND CORRECTIONS EVERY TWO HOURS/100 MILES AND AT REST STOPS.
			i. I WILL SELECT SAFE PARKING SPACES AT AUTHORIZED STOPPING LOCATIONS DESIGNATED BY THE STATE *(where designated)* AND/OR BY THE CARRIER.
	c. I WILL HAVE A COPY OF THE ROUTE PLAN AND WILL USE DESIGNATED ROUTES, AVOIDING CONGESTED RESIDENTIAL AND BUSINESS ROUTES.		j. I WILL NOT GROUP TOGETHER WITH OTHER EXPLOSIVE VEHICLES AT STOPPING LOCATIONS.
	d. I WILL PROTECT THE PUBLIC FROM HAZARDS OF CARGO.		k. I WILL INSPECT VEHICLE AND MAINTAIN REQUIRED SURVEILLANCE.
	I WILL NOT PERMIT UNAUTHORIZED PERSONNEL TO RIDE IN OR ON THE VEHICLE.		l. I UNDERSTAND THE NATURE OF THE CARGO AND ACTIONS TO TAKE IN THE EVENT OF AN ACCIDENT, INCIDENT OR FIRE.
	f. I WILL NOT EXCEED POSTED SPEED LIMITS.		m. I WILL ENSURE THAT DUAL AND SUBSEQUENT DRIVERS RECEIVE, READ, UNDERSTAND AND SIGN THIS FORM.

2. SIGNATURE OF SHIPPER REPRESENTATIVE	3. SIGNATURE OF FIRST DRIVER	4. SIGNATURE OF SECOND DRIVER

APPENDIX G
CONTINGENCY PLAN

Replaced

APPENDIX G1-1
CANNON AFB CONTINGENCY PLAN

SECTION ONE - OVERALL MISSION

This Spill Prevention and Response Plan (SPR) is intended to fulfill the requirements of a Spill Prevention Control and Countermeasures (SPCC) Plan, an Oil and Hazardous Substance Pollution Contingency (OHSPC) Plan and the hazardous waste spill prevention and response requirements. The SPCC portion of the document primarily pertains to spill prevention and includes a discussion of the major types of spill prevention procedures, methods and equipment incorporated into the Base facilities. The Contingency Plan portion of the document specifies procedures to be followed when responding to releases, accidents and spills involving oils, sewage or hazardous substances. These include spill detection, reporting, containment, cleanup and disposal procedures. The plan should be implemented in conjunction with the Cannon Air Force Base (AFB) Disaster Preparedness OPLAN, 355-1, in the event that the circumstances warrant implementation of the OPLAN. Also included within this document are general procedures for training programs and procedures for plan reviews and updates. The SPR Plan is supported by several vital annexes which provide the specific information associated with the facilities found on Cannon AFB.

These annexes provide relevant site descriptions including: location, maximum spill quantity, probable spill route and secondary containment (Annex I); Site-Specific Contingency Plans for major potential spill sites (Annex II); and other supporting information (Annexes III-XII) required to activate this plan.

IN THE EVENT OF A SPILL OF OIL, SEWAGE, OR A HAZARDOUS SUBSTANCE, CONCERNED PARTIES SHOULD REFER DIRECTLY TO THE FLOWCHART AT THE BEGINNING OF SECTION FOUR ENTITLED "PLAN EXECUTION." FOR GENERAL RESPONSE PROCEDURES REFER TO ANNEXES I, II AND III FOR SITE-SPECIFIC INFORMATION.

SECTION TWO - RESPONSIBILITIES

Environmental Protection Committee

The Base Environmental Protection Committee is responsible for reviewing the SPR Plan prior to its promulgation by the Installation Commander and prior to finalization of any modifications occurring during the annual review and update of the plan. The committee will: develop pollution abatement policy guidance; monitor implementation of this plan and other pollution abatement directives; and insure that supporting procedures by responsible commanders are published.

Tasked Commanders and Staff Agency Chiefs

It is the responsibility of tasked commanders and staff agency chiefs to publish such procedures that are necessary for implementing this plan, insure that adequate training is conducted, and insure that environmental protection/pollution abatement procedures are implemented in their areas of responsibility. They will designate additional project officers and monitors as required to insure an effective program and continually inspect the work areas under their control to insure that effective pollution abatement procedures are followed. They will also insure that Site-Specific Contingency Plans developed for their particular areas are posted in prominent locations at potential spill sites.

On-Scene Coordinator (OSC)

The OSC is the individual assigned the responsibility for directing and coordinating all spill response actions for Air Force spills (see Executive Order 12316). The OSC will have the authority to utilize the expertise and resources of the HAZMAT Team and Primary Crash Network personnel in determining and performing response actions. It is also the responsibility of the OSC to assure that training programs regarding spill response activities are routinely conducted at the Base. The OSC will make sure only certified/trained personnel perform spill containment, recovery, cleanup and disposal or restoration activities.

The primary OSC for spills of oil, sewage, or hazardous substances at Cannon AFB will be the Commander, 27 Support Group (27 SG). The first alternate OSC will be the Base Civil Engineer, the second alternate OSC will be the Base Fire Chief, and the third alternate will be the Chief, Environmental Management. The alternate OSC will assume full responsibility in the absence of the primary OSC.

The following is a summary of the responsibilities of each party that may serve as the OSC, their roles, and functions regarding the Oil and Hazardous Substance Contingency Plan:

(1) Commander 27 SG will:

a. Act as primary On Scene Coordinator responsible for directing and coordinating all spill response actions.

b. Implement Cannon AFB OPLAN 355-1, if deemed necessary.

c. Properly report and document oil or hazardous substance spills as detailed in Annexes VII and VIII. Authorize, and coordinate with the national on-scene commander (NOSC) all required notifications and requests for assistance to Federal (outside the Air Force), State, or local agencies and the news media.

(2) Base Civil Engineer (BCE) will:

a. Act as first alternate OSC in the event the Commander 27 SG is unavailable or delegates his authority to the BCE.

b. Provide Environmental personnel to furnish technical expertise relative to pollution control techniques.

c. Within his capability, provide personnel, transportation and equipment for containment, cleanup, and restoration of landscape due to spills of oils, sewage and hazardous substances that exceed the capability of the Base agency responsible for the spill.

d. Notify the Commander 27 SG of personnel and equipment requirements that exceed Base capability.

e. Plan, program, and construct interception devices for sewer connected drains to prevent potential sources of pollution from emptying directly into the Cannon AFB sewage lagoon and playa lakes. Ensure that adequate types and quantities of spill response and protective equipment, sandbags, absorbent material, cleanup equipment, etc., are stocked as designated in this plan, and that such gear is properly inspected, operated, and maintained.

f. Provide a Liquid Fuels Technician to supply technical assistance on explosion hazard to the OSC.

g. Provide suitable inventory and storage for chemical agents, absorbent materials, and equipment not otherwise specified to be furnished by other units which are employed in combating pollution.

(3) Base Fire Chief will:

a. Act as the OSC until the Commander 27 SG or BCE arrives at the spill scene. He will serve as second alternate On Scene Coordinator in the event the Commander 27 SG or the BCE are unavailable.

b. Direct Fire Department to record all spill reports received from the Emergency Call Line (4117) on a designated telephone log.

c. Immediately respond to spills as necessary to protect life and property with due regard for the environment.

d. Direct emergency dispatch operator to notify Base Hospital if injuries are reported.

e. Provide technical assistance to the OSC concerning response to and handling of combustible or flammable substances.

f. Direct emergency dispatch operator to notify the Environmental Flight on spill occurrences, if necessary.

g. Measure explosive concentrations, and determine if an explosive hazard exists. This information will be provided to the OSC for use in establishing the cordon.

h. Provide a minimum of five trained personnel, transportation, and equipment for containment, cleanup and restoration of equipment due to spills of hazardous chemicals where special protection equipment is required (i.e., self-contained breathing systems, corrosive resistant clothing, etc.) This team shall be called the base HAZMAT Response Team (HMT). Training of the HMT members shall include the 24 Hour HAZMAT First Responder course.

i. Maintain a current list of all members of the HMT along with their duty telephone numbers as well as non-duty telephone numbers.

j. Contact the HMT members and inform them to assemble at a designated area as soon as possible.

k. Evaluate and identify the spill area and determine whether health hazards have been eliminated.

l. Direct emergency dispatch operator to notify Security Police of spill occurrence if evacuation is required.

m. Notify the Chief of Operations when Cleanup Response Team (CRT) is needed for containment and cleanup.

n. Direct emergency dispatch operator to notify all or appropriate personnel on the Spill Emergency Notification Personnel Checklist (Annex VII).

o. Fully equip, train, and maintain HMT members consisting of Fire Department personnel on 24-hour alert, to provide initial control, emergency rescue, and hazard mitigation at the scene of a hazardous spill.

(4) Chief, Environmental Management will:

a. Acts as third alternate OSC in the even to the commander is unavailable or if the commander delegates the responsibility to the fire chief.

b. Respond to all spill emergency calls. Provide technical and scientific support to the OSC in environmental pollution matters during all oil or hazardous substance incidents.

c. Advise the OSC as to the need to, or in his/her absence, activate specific members of the HMT and CRT.

d. Determine the adequacy of the ultimate cleanup effort, and advise the OSC of any additional cleanup requirements.

e. Represent the commanding officer in matters of coordination between Cannon AFB and federal/state agencies exercising jurisdiction in environmental pollution control.

f. Ensure proper containerization and disposal of all hazardous wates resulting from the spill.

g. Maintain official records and photographs documenting the extent of the spill and all contaminants, cleanup and recovery actions taken and procedures used.

h. Review all 35% project plans and specifications to ensure that provisions requiring proper packing, storing, transportation, and handling of oil, sewage or hazardous substances, and containment and cleanup of oil or hazardous substances spills during construction, are included.

Primary Crash Network

Members notified by the Primary Crash Network, as designated by the Fire Department, are tasked to respond to all spills when requested by the OSC and to

provide services for spill containment, recovery, cleanup, disposal and restoration activities as directed by the OSC.

The personnel on the Primary Crash Network and their designated responsibilities are discussed in the following paragraphs:

(1) The Environmental Flight will:

a. Report to the scene of the spill immediately upon notification.

b. Provide technical expertise on severity of spill, containment, and remediation.

c. Assess environmental impact.

d. Notify the State of New Mexico, the National Response Center (NRC) , and Air Combat Command (ACC) of reportable spills and submit pollution incident reports.

e. Ensure proper cleanup and disposal of contaminated materials.

f. Notify Base Bioenvironmental Engineer of spill, and materials requiring testing.

(2) Bioenvironmental Engineer will:

a. Take periodic samples of all onbase waterways for background information.

b. Upon notification of a spill, and at the direction of the OSC, sample and test the affected waterways to monitor the extent and degree of pollution caused by the spill, if any.

c. Provide the technical assistance and advice to the OSC and the hospital with respect to the health hazards associated with oils and hazardous substances.

(3) Disaster Preparedness Officer will insure that the Cannon AFB Disaster Preparedness OPLAN 355-1 is coordinated with the SPR Plan in the event of a hazardous substance spill requiring the implementation of the Disaster Preparedness OPLAN 355-1.

(4) Chief of Security Police will:

a. Instruct his organization to immediately mobilize to an actual or potential oil, sewage or hazardous substance spill, to isolate the spill area and control traffic when and where necessary as directed by the OSC.

b. Ensure that during non-duty hours, including holidays, routine security checks are conducted on all oil, sewage and hazardous substance storage areas. Immediately report any signs of tampering or unauthorized entry to the law enforcement desk.

c. Insure that while individuals in the security force are on normal patrols, they are continuously aware of oil, sewage and hazardous substance spills and report all areas that appear to be suspect.

(5) Liquid Fuels Maintenance Technician will report to the scene, at the request of the OSC, to measure explosive vapor concentrations and determine where explosion hazards exist. This information will be provided to the OSC for use in establishing the cordon.

(6) Staff Judge Advocate will:

a. Respond to all oil, sewage and hazardous substance pollution spills, at the request of the OSC, to insure that information, records, and samples adequate for legal purposes are obtained and safeguarded for future use.

b. Advise the OSC on the legal aspects of spill response when parties other than the Air Force are responsible for the spill.

c. Obtain necessary permission from land owners to investigate and clean up spills.

(7) Public Affairs Officer will:

a. Respond to all oil or hazardous substance spills when requested by the OSC.

b. Keep abreast of all Base actions during a spill and prepare to provide prompt and accurate news releases on the nature of the discharge and the steps being taken to correct the problem. This policy must be followed to obtain understanding from the public, insure cooperation from all interested parties, and to check the spread of misinformation.

c. Coordinate all news media releases involving Base actions with the Wing Commander.

d. If the Regional Response Team News Office is activated, coordinate all news releases with them. If a Regional Response Team News Office is not activated, the EPA's Public Information Office can be contacted (404-881-3004), if deemed appropriate.

e. Prepare and direct a public awareness program to inform Cannon AFB personnel about spill prevention programs as well as spill discovery and notification responsibilities and procedures.

(8) Safety Officer will provide technical assistance to the OSC with respect to the safety of personnel.

(9) Base Hospital Commander will:

a. Insure that medical personnel and ambulance(s) are dispatched to the site of the spill as directed.

b. Insure that emergency treatment is rendered and injured personnel are removed to the Base Hospital for treatment.

c. Insure that current and follow-up information on injured personnel is provided to the OSC as soon as possible.

d. Insure that hospital staff are familiar with health effects of hazardous substances present on the Base.

e. Establish a 27th Medical Group Disaster Casualty Control Plan (DCCP) to ensure prompt admittance of the injured for treatment and including strict control measures to prevent risks of hazards to hospital personnel and the public.

(10) Transportation Officer will provide OSC with transportation as required for spill response personnel and equipment.

(11) Weather Squadron Officer will:

a. Insure that the OSC is provided with up-to-date weather information as requested.

b. Assist in calculating direction and downwind concentration of airborne contaminants.

(12) Chief of Operations and Training will insure that a photographer will document, with photographs, as directed by the OSC, the extent of the spill as well as the containment, countermeasures, and restoration procedures utilized.

(13) The Comptroller shall:

a. Assign job numbers to identify resources on materials and labor due to oil or hazardous substance spills.

b. Accumulate costs and report to the Wing Commander the value of resources expended.

c. Initiate action to recover funds as appropriate.

(14) In addition to the Base organizations and personnel assigned to the response effort, provisions have been made for including offbase organizations in the response organization when onbase spill response resources and expertise are insufficient and when offbase water, land, or air are adversely affected. Some of the significant offbase spill response resources that can be incorporated into Spill Response Procedures, as needed, are discussed in the paragraphs below. A current listing of telephone numbers to contact these organizations is included in Annex VII.

a. Air Combat Command (ACC/CEV)

This MAJCOM Office is responsible for ensuring environmental compliance at Cannon AFB. It also provides advice and staff assistance in all areas of environmental protection including spill response matters. HQ ACC/CEVCM is located at Langley AFB, VA and can be contacted in the following manner:

DSN	574-3553
Commercial	(804) 764-3553

b. Headquarters Air Force Engineering Service Center (AFESC)

The Air Force Engineering Service Center is assigned the responsibility of providing technical guidance and assistance to major commands and Bases in contingency operations and environmental planning. Technical expertise can be provided by AFESC to the Air Force OSC on hazardous material identification, as well as spill control, cleanup and disposal. The AFESC/DEVP is located at Tyndall Air Force Base, Florida.

c. Regional Response Team

EPA Region VI can act as an emergency response team to assist and advise the OSC during a pollution emergency. The EDA's Regional Response Team consists of representatives of participating federal, state, and local authorities, and can lend their expertise and resources in supplying needed assistance to the OSC. A directory of the participating agencies is provided in Annex VIII of this plan. The team can be reached through the EPA Public Information Center at (214) 767-3274.

d. State of New Mexico Response Team

The State of New Mexico Response Team, located in Santa Fe, New Mexico, can provide technical expertise and shall be notified during spill response. The state OSC will be familiar with the available sources of spill response equipment within the State of New Mexico. Request for assistance can be made through their reporting office at (505) 827-8329. The local contact for the state is Mr. David Tanner in Clovis, New Mexico who can be reached at (505) 769-3728.

e. City of Clovis Fire Department

The City of Clovis Fire Department and local Civil Defense Agencies will provide available personnel and equipment as requested to control hazards. These agencies will be activated through procedures established in the Cannon AFB OPLAN 355-1 for Disaster Preparedness. The phone number for the City of Clovis Fire Department is (505) 763-5531.

f. Private Contractors

Private contractors are included in the response organization primarily to conduct clean-up and restoration work when Base resources are insufficient to conduct these activities. No advance contract arrangements have been made by the Base with any outside contractors. Before arrangements with a private contractor are made, the Contracting Division (27 CONS/COS) should be contacted.

g. CHEMTREC

CHEMTREC, the Chemical Transportation Emergency Center, is a 24-hour hot line that provides warnings and limited guidance to the OSC when a spill product can be identified by either chemical or trade name. CHEMTREC will also assist the OSC in contacting the manufacturer or shipper for additional information. This service should be used whenever adequate spill response information is not available. The telephone number for CHEMTREC is 1-800-424-9300.

h. CHRIS MANUAL - Chemical Hazardous Response Information System

CHRIS Manual is an official publication of the U.S. Coast Guard that currently provides technical information and appropriate response procedures for over 1,000 different substances. The manual contains four volumes which are periodically updated.

i. ETIS-Environmental Technical Information System

ETIS is a computerized information system which contains Federal and State environmental regulations, directories of Federal and State environmental contacts and computer modeling capabilities. The ETIS overall system manager is the U.S. Army Construction Engineering Research Laboratory located at Champaign, Illinois. The Environmental Planning Directorate at AFESC manages Air Force use of the system. Additional information on the system and how to access it can be obtained by calling DSN 970-6167 or Commercial (904) 283-1667.

j. OHMTADS-Oil and Hazardous Materials Technical Assistance

Usually called TADS, this system is a computerized information retrieval file on various hazardous substances. The data base contains chemical, biological, toxicological and response information on more than 1,000 chemicals and can be accessed by either chemical or trade names. The TADS system should be considered for both spill response planning and as a source of vital information during a spill response. AFESC/DEEV can provide information on this system including how to subscribe or access the system through ETIS.

k. USAF Occupational and Environmental Health Laboratory (OEHL)

OEHL is assigned responsibility for providing consulting services on spill sampling contaminant treatment methods, as well as analytical support during response and recovery operations. For complex spill problems, on-site support may be provided. Request

for OEHL support may be made through AUTOVON 240-3305 (consulting) or 240-3626 (analytical support).

l. DOD Hazardous Material Information System (HMIS)

The HMIS is a computerized source of information that cross-references many National Stock Numbers (NSNs) to their particular chemical characteristics and other pertinent data for the management of these materials in an emergency situation.

HAZMAT Response Team (HMT)

A minimim of five trained personnel will remain on 24-hour alert at the Base Fire Department. The HMT will work under the direction of the Base Fire Chief and in coordination with the OSC. The necessary equipment will be on hand to perform the following tasks in the event of an emergency:

- Serve as the first responder (if directed by the Fire Chief) to any spill where the amount of material spilled exceeds the Reportable Quantity (RQ) listed in Annex XI;

- Provide emergency rescue of endangered personnel, while protecting others from existing hazards;

- Establish a cordon around affected areas with controlled access/egress;

- Control, mitigate, or otherwise contain spill material to prevent loss of life, property, and degradation of the environment;

- Coordinate with the Hydrazine Response Team in the event of a hydrazine spill; and

- Coordinate with outside spill response agencies and emergency personnel if OPLAN 355-1 is implemented.

Hydrazine Response Team (HRT)

HRT members, as designated by Fuel System Repair personnel, are tasked to respond to all hydrazine spills when requested by the OSC and to perform spill containment, neutralization, recovery, decontamination, cleanup, disposal and restoration activities as directed by the OSC. Cannon AFB does not have personnel assigned to the Hydrazine Response Team; in the event of a hydrazine spill, the HRT from Holloman AFB will be activated.

Individuals Assigned, Attached to, or Working at Cannon AFB

Each individual assigned, attached to, or working at Cannon AFB is tasked to report any spill of oil, sewage, or hazardous substance to the Base Fire Department and to take every reasonable precaution to prevent the spillage of oil, sewage, or hazardous substances. In addition, all contractors performing services onbase will be notified prior to the initiation of the contract of their responsibilities to take every reasonable precaution to prevent the spillage of oil, sewage, or hazardous substances and to report any spills of this nature to the Base Fire Department.

Cleanup Response Team (CRT):

The CRT will be staffed by the Civil Engineering Squadron and shall be under the control of the Base Civil Engineer. The CRT shall:

a. Be staffed, trained, and equipped to handle oil and hazardous substance spills that may be encountered at Cannon AFB. Hazardous substance spills include nitrogen tetroxide and hydrazine;

b. Respond to all Cannon-related spill emergency calls on and off base as requested by the OSC;

c. Clean up the spills to satisfy all federal, state, and local requirements;

d. Conduct bimonthly training sessions to prepare CRT members for oil and hazardous substance spills that may be encountered; and

e. Be placed on a recall roster to permit after hour clean up of oil and hazardous substance spills.

Outside Response Organizations

Cannon AFB does not have any existing arrangements with local emergency organizations and cleanup contractors to supplement in-house spill response resources and expertise. For major emergencies, additional assistance can be requested from the EPA's Regional Response Team. All requests for Regional Response Team assistance should be coordinated with the wing commander.

SECTION THREE-SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC)

General

Spill prevention control and countermeasures (SPCC) procedures, methods and equipment have been established and implemented at all the Cannon AFB oil and hazardous substance storage and transfer areas. The specific spill prevention mechanisms associated with each facility having a potential for a "Reportable Spill" of a hazardous substance are summarized in the Annex I Table and Keys.

This annex, when used in conjunction with Annex II (Site-Specific Contingency Plans) and Annex IV (Chemical Specific Response), satisfies the intent of the Spill Prevention and Response Plan to cover the requirements of an SPCC plan, as outlined in 40 CFR 112, and an Oil and Hazardous Substances Contingency Plan. Refer to Annex I for the following information:

- Facility Number;
- Location of the Base Disaster Preparedness Map (Figure I-1);
- Name and Maximum Spill Quantity of Substance Stored;
- Primary and Secondary Containment;
- On-site spill response equipment; and,
- The probable spill route.

The table in Annex I can also be used in with reference to the map in Annex X. This map shows the locations of large, secondary containment structures, oil storage areas, hazardous substance accumulation areas, and mercury storage locations. Other annexes include:

- Annex III - Checklists of Spill Notification and Response
- Annex V - Locations of Oil/Water and Oil/Fuel Separators

- Annex VI - Provides a description of committed equipment and materials required to control spills.
- Annex VII - Summary of response personnel and their telephone numbers.
- Annex VIII - Offbase spill response organizations and notification procedures.
- Annex IX - Base maps, showing the location of the shops at Cannon AFB and the locations of oil/water and oil/fuel separators.
- Annex XI - A complete listing of hazardous substances and their reportable quantities.

A summary listing of most chemicals found at Cannon AFB and their reportable quantities is provided as a "quick reference" on Page x of this plan. This "quick reference" corresponds with and refers to the chemical specific response guides located in Annex IV.

Definitions pertaining to the implementation of SPCC practices are provided below.

Secondary Containment

Secondary containment is the physical containment or capture of a spill, thus preventing or limiting its release to the environment. Examples include dikes, curbs, berms, drip pans and collection systems. Additional examples may include remote secondary containment systems such as floating booms and flow diversions utilizing basins, sumps, ponds, etc. Major concrete secondary containment structures and Satellite Accumulation Points (SAPs) are shown on the Base Map in Annex X. The tables in Annex I describe the secondary containment features at each accumulation point.

Visual Inspections

Visual inspections consist of touring or patrolling the potential spill site to detect spills, evidence of spills, or other conditions that could result in a spill (Refer to Annex I for procedures and criteria). These include routine inspections performed by the operating and supervisory personnel and detailed inspections performed by members of the Environmental Protection Subcommittee for Spills. One of the members of the subcommittee shall be a registered professional engineer who can certify the plan.

Preventative Maintenance

Preventative maintenance, as a part of the SPCC program, involves the periodic lubrication, adjustment and replacement of worn parts in all equipment where equipment failure could result in a spill of oils, sewage or hazardous substances or impede response efforts. This includes the implementation of all Standing Operating Procedures and Reoccurring Maintenance Programs for the specific areas.

Housekeeping

Good housekeeping is the practice of maintaining a clean, orderly work environment; thereby, reducing the possibility of accidental spills caused by mishandling of equipment and materials, and facilitating the detection of spills and leaks.

Material Compatibility

Material compatibility refers to the compatibility of oil, sewage and hazardous substances with the materials of construction that store or transport them; compatibility of storage or transfer devices with their environment; and compatibility of different substances upon mixing.

Security

Security involves the deterrence of unauthorized, unknowing, or accidental entry of personnel, animals or vehicles into potential spill areas when such entry could result

in the damage or misuse of equipment containing or conveying oils, sewage or hazardous substances.

Monitoring

Monitoring entails the prevention of oil, sewage and hazardous substance spills by observing operational conditions that could indicate or result in a spill, and early detection of existing spills by monitoring environmental conditions. Secondary or backup monitoring should be used where acute health hazards are involved.

SECTION FOUR - OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLAN

General

The Oil and Hazardous Substance Contingency Plan for Cannon AFB designates the procedures to be followed in the event of releases, accidents and spills involving oils, sewage or hazardous substances and the organizations, personnel and equipment responsible for carrying out the response functions.

Response Organizations

The On-Scene Coordinator (OSC) is the individual assigned the authority for directing and coordinating all spill response actions. The OSC will have the authority to utilize the expertise and resources of the HAZMAT Response Team (HMT) and personnel associated with the Primary Crash Network. Activation of the HMT will occur only if called by the OSC or his designate. The activation of the HMT and the Primary Crash Network is effected to provide a coordinated response to contain, control, recover and restore the environment from all spills. Annex VII summarizes all Base telephone numbers used for contacting these organizations. Off-duty telephone numbers are maintained by the primary and alternate OSCs, the Fire Department, and the Civil Engineering Service Call Desk. Annex VIII summarizes all offbase response organizations along with the telephone numbers used for contacting those organizations. The responsibilities of the OSC and personnel assigned to the HMT and Primary Crash Network regarding contingency planning are outlined in Section Two - Responsibilities.

CANNON AIR FORCE BASE

RESPONSE PROCEDURE FOR FIRE / HAZARDOUS SPILL EMERGENCIES

1. EVACUATE the building or area if required

2. NOTIFY the Base Fire Department at Ext. 4117

3. REPORT the following information

   Name, Location, Phone Number

   Name of Hazardous Situation
   (fire, chemical spill, oil spill)

   Exact Location of Problem

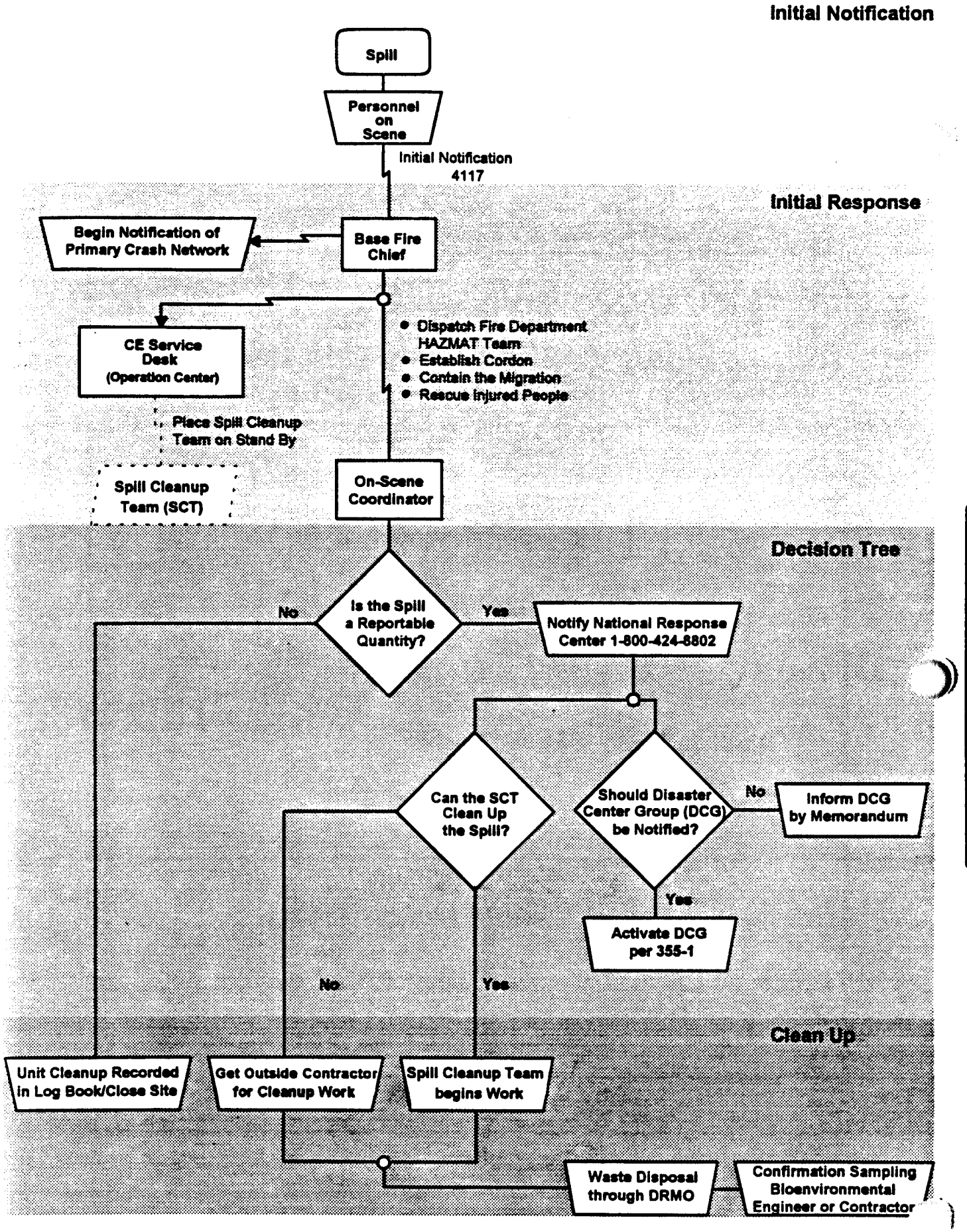
   Corrective Actions Taken (if any)

4. AVOID CONTACT with spilled material

5. IF POSSIBLE:

   REMOVE INJURED
   EXTINGUISH FLAME OR CONTAIN SPILL

6. REMAIN at the scene at a safe distance to direct emergency personnel & provide information


Initial Notification
Spill
Personnel on Scene
Initial Notification 4117
Initial Response
Begin Notification of Primary Crash Network
Base Fire Chief
CE Service Desk (Operation Center)
Dispatch Fire Department HAZMAT Team
Establish Cordon
Contain the Migration
Rescue Injured People
Place Spill Cleanup Team on Stand By
Spill Cleanup Team (SCT)
On-Scene Coordinator
Decision Tree
Is the Spill a Reportable Quantity?
No
Yes
Notify National Response Center 1-800-424-8802
Can the SCT Clean Up the Spill?
Should Disaster Center Group (DCG) be Notified?
No
Inform DCG by Memorandum
Yes
Activate DCG per 355-1
No
Yes
Clean Up
Unit Cleanup Recorded in Log Book/Close Site
Get Outside Contractor for Cleanup Work
Spill Cleanup Team begins Work
Waste Disposal through DRMO
Confirmation Sampling Bioenvironmental Engineer or Contractor

CANNON AIR FORCE BASE

RESPONSE PROCEDURE FOR FIRE / HAZARDOUS SPILL EMERGENCIES

1. EVACUATE the building or area if required

2. NOTIFY the Base Fire Department at Ext. 4117

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   (fire, chemical spill, oil spill)

   Exact Location of Problem

   Corrective Actions Taken (if any)

4. AVOID CONTACT with spilled material

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   REMOVE INJURED
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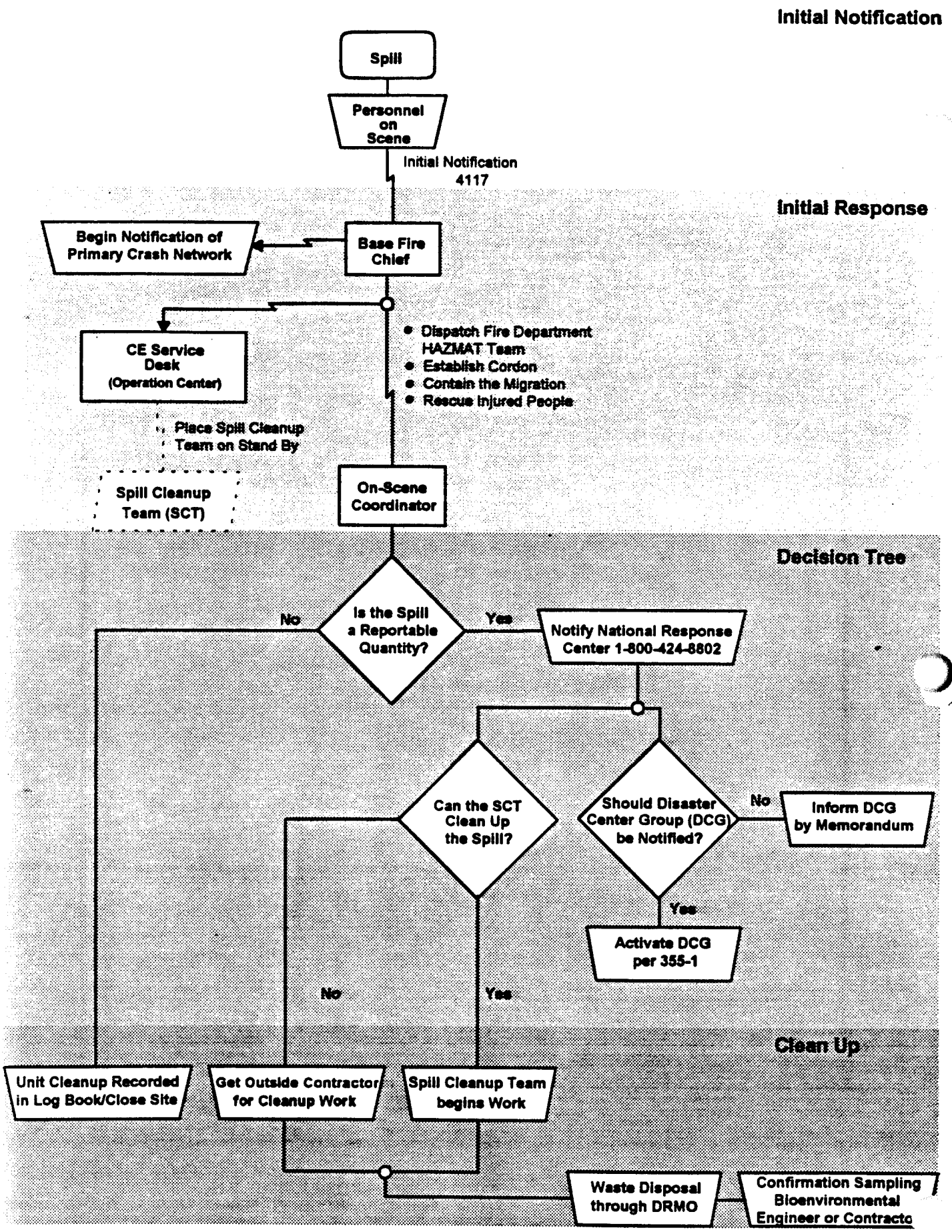
6. REMAIN at the scene at a safe distance to direct emergency personnel & provide information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Activate DCG per 355-1
No
Yes
Clean Up
Unit Cleanup Recorded in Log Book/Close Site
Get Outside Contractor for Cleanup Work
Spill Cleanup Team begins Work
Waste Disposal through DRMO
Confirmation Sampling Bioenvironmental Engineer or Contracto

PLAN EXECUTION

Due to the diversity of materials stored onbase and the variable severity of the hazards presented in the event of a spill, the response actions will vary. General procedures should be reviewed and, if necessary, updated prior to adopting courses of action in a particular situation. The table in Annex I and maps in Annexes IX and X should be consulted with regard to the reportable spill quantities, probable spill routes, and contingency actions. If a Site-Specific Contingency Plan exists for the spill area in question, it will be noted in the Contingency Action Plan column of the Annex I table, and should be referred to in Annex II for use in the event of a spill. The execution of the SPR Plan is divided into four phases:

- Phase I - Spill Discovery and Initial Notification;
- Phase II - Response Actions;
- Phase III - Short-Term Site Restoration; and
- Phase IV- Long-Term Site Restoration.

It should be noted that this plan deals primarily with solid and liquid pollutants.

RELEASES OF GASEOUS SUBSTANCES (E.G., HYDRAZINE, CHLORINE, AMMONIA, ETC.), BECAUSE OF THEIR RAPID DISPERSION AND OFTEN HIGHLY HAZARDOUS NATURE SHOULD BE DEALT WITH IN ACCORDANCE WITH CANNON AFB OPLAN 355-1, CANNON AFB DISASTER PREPAREDNESS PEACETIME OPERATIONS PLAN.

Phase I - Spill Discovery and Initial Notification

Phase I designates the initial spill response procedures to be followed by any individual discovering a spill or potential spill of oil, sewage or hazardous substances. The person(s) discovering a spill is responsible for providing initial defensive actions without undue risk of personal injury. The initial notification will vary depending on the amount of material spilled.

(1) The party discovering the spill will:

a. Implement the following actions as necessary upon discovery of a spill. The order of the actions will depend on existing conditions.

- Initiate evacuation, if necessary.
- Notify Base Hospital (Ext. 4033) for injuries.
- Notify Base Fire Department, Ext. 4117, of all spills involving hazardous substances, oils, or sewage.
- Check causes and stop the source of spill, when possible, without undue risk of personal injury; use of on-site spill containment equipment and materials may be necessary.
- Make spill scene "OFF LIMITS" to unauthorized personnel.
- Restrict all sources of ignition when flammable substances are involved.
- Report to On-Scene Coordinator (OSC) upon arrival.

b. When notifying the Fire Department of the spill occurrence, the following information should be provided if known or can reasonably be determined.

- Name of individual reporting spill.
- Location of spill.

- Number of injured personnel and nature of injuries (if applicable).
- Type of substance spilled.
- Amount spilled (estimated).
- Rate material currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any additional pertinent information (i.e., other potential hazards).

c. Base personnel other than Fire Department personnel receiving reports of spills shall aid in channeling the report to the Fire Department who will respond as outlined.

(2) The Fire Department will:

a. Immediately respond as necessary to protect life and property with due regard for the environment.

b. Record spill reports on a Spill Report/Response Form (Annex III), which is designed to record the information listed in the above paragraph (1)b along with the time of the report.

c. Notify the Fire Chief and Environmental Flight (or Base Civil Engineer if Environmental Flight cannot be contacted) as well as the Base Hospital if injuries are reported. The Fire Chief, in coordination with the Civil Engineering Service Desk and the OSC, will notify those members of the Primary Crash Network who will be needed for the spill response. The Fire Chief will serve as the OSC until relieved by the Base Civil Engineer or the Base

Commander. This designation is vital for success of the spill response. The current duty telephone numbers for these personnel are listed in Annex VII.

d. Activate the HAZMAT Response Team to establish cordon, contain migration, and rescue the injured.

e. Notify the Chief of Operations or Deputy Chief of Operations when the cleanup team is needed.

(3) The Base Environmental Flight or Civil Engineer will:

a. Immediately proceed to the spill site and evaluate the severity of the spill and determine the response necessary for containment and recovery.

b. Advise the OSC as to the necessity for activation of the Primary Crash Network or Hydrazine Response Team.

c. On the authorization of the OSC, notify specifically requested members of the Primary Crash Network or instruct the CE Service Call Desk (Fire Department non-duty hours) to notify these members to assemble at the area designated by the OSC or the Environmental Flight within 15 minutes of notification.

d. Respond with available personnel, equipment and materials, if requested by appropriate authority and approved by the OSC.

e. Advise the cleanup team on cleanup procedures and proper disposal methods.

(4) The CE Service Call Desk will:

a. Maintain a current list of all members of the Primary Crash Network including their duty telephone numbers (Annex VII) as well as non-duty telephone numbers. A backup copy of this list will be posted at the Fire Department dispatch desk which receives all CE Service Call Desk calls during non-duty hours.

b. Contact the Primary Crash Network members designated by the OSC or the Environmental Flight and inform them to assemble within 15 minutes at a specified location.

Phase II - Spill Containment and Response Actions

A. Spill Containment and Control

The HAZMAT response effort requires the total cooperation of all organizations to handle the incident. The HAZMAT Response Team (HMT) is built around functional roles with one or more persons assigned to each role. Staffing for the HMT is provided by the Base Fire Department. Specific checklists covering each of the following functional roles shall be developed to handle incidents involving both facility and transportation, specific chemicals, and generic responses. Each of the functional roles is defined below:

The Hazard Group Supervisor shall:

a. Assist the OSC with overall scene management and directly supervises the HMT; and

b. Keep the OSC fully advised of technical or specific information relative to the spill incident at hand.

The Information Management Monitor shall:

a. Assemble and analyze all technical reference material, incident data, and other resources to include interviews with Bioenvironmental Engineering personnel and other technical specialists; and

b. Make recommendations to the HMT group supervisor concerning evacuation criteria, personal protective equipment, and mitigation procedures.

The Information Management Monitor is one of the first positions that shall be filled during an incident.

The Safety and Health Monitor shall:

a. Monitor the safety and health of all personnel within the hazard area (hot and warm zones);

b. Consult with Bioenvironmental Engineering personnel and other technical specialists on the safety and health aspects of the incident;

c. Have the authority to alter, suspend, or terminate activities which pose a condition of imminent danger or are immediately dangerous to life or health;

d. Remain in constant contact with the Hazard Group supervisor and maintain a log of exposure times for each person in the hot zone;

e. Be knowledgeable in the operations being used; and

f. Trained in the emergency handling of hazardous materials.

The Entry Personnel shall:

a. Perform the physical reconnaissance of the problem area, if it is safe to do so. They shall document and report the presence of potential life hazards and environmental factors;

b. Assist in plan formulation for control actions;

c. Don proper protective equipment and gear and enter the hot zone to perform product control. All personnel in the hot zone must work in pairs. There must be backup personnel wearing appropriate level of protective equipment on standby to perform assistance or rescue of personnel in the hot zone ; and,

d. Ensure that emergency medical services personnel are available with transport capabilities.

A minimum of four to six persons is required to perform these functions..

The Decontamination Team shall:

a. Determine the proper decontamination procedures and setup the decontamination site before anyone enters the hot zone;

b. Coordinate all decon activities with the Hazard Group Supervisor, the safety and Health Monitor, and the Information Management Monitor; and

c. Perform decontamination procedures on all persons leaving the hot zone. Decontamination personnel shall wear personal protective equipment appropriate to the incident.

The Resources Management Team shall:

a. Control all tools, protective clothing, and equipment used during the incident;

b. Be responsible for all members of the HMT not specifically assigned to other functional areas;

c. Document the use of all expendable items; and

d. Assist the Entry Team in donning and doffing their protective equipment.

B. Spill Resonse Actions

The OSC or his designee will direct and coordinate all spill response actions and the Environmental Flight representative will maintain an Incident Log detailing all actions taken during the course of the pollution spill response. The log will include a description of pollutants, the actions taken to recover the pollutants and restore the environment, and any additional significant information. Spill response actions under the responsibility of the OSC are:

(1) Activate or authorize action from appropriate members of the HMT based on information obtained during initial notification or information provided by the Environmental Flight, and immediately investigate the reported spill.

(2) Determine the source, type, extent, approximate quantity, and cause of the spill and institute appropriate action to stop the source of spill, if the spill is still occurring.

(3) Evaluate the magnitude and severity of the threat to public health, welfare, and natural resources. Material Safety Data Sheets should be utilized as required to determine potential health, fire, and pollution affects associated with the spill materials. Material Safety Data Sheets are on file with Bioenvironmental Engineering and should be maintained at each facility.

(4) Take appropriate safety precautions to protect response personnel and any additional personnel located in close proximity to the probable spill route. Material Safety Data Sheets or equivalents should be used to determine special protective clothing requirements and symptoms of exposure to the spill material. The Security Police Squadron (27 SPS) will be used to initiate evacuation procedures, establish traffic control points and the entry control points as determined by the OSC.

(5) Institute spill containment procedures. The primary concern is to confine spills as close to their source as practical and, if at all possible, prevent spills from exiting Base property. In accomplishing this task, the OSC should refer to the following sources of information either contained in this document or kept on file:

(a) Annex I for maximum potential spill quantities, reportable spill quantities, available secondary containment, probable spill routes, and general contingency actions.

(b) Annex II for Site-Specific Contingency Plans when the existence of such a plan is stated under "Contingency Action" in Section II of Annex I.

(c) Material Safety Data Sheets which are on file with Bioenvironmental Engineering, describe the health hazards, fire hazards, pollution potential, and physical and chemical properties of the spill material.

(d) Annex IV for emergency response listing and guides.

(e) Annex V for a listing of the oil/water and oil/fuel separators located on Base which may potentially be used for containment of spills.

(f) Annex VI for spill response equipment inventories and locations of equipment.

(g) Annex IX and X for maps to assist in the determination of probable spill routes, access to the spill sites and location of oil/water and oil fuel separators.

(6) Determine if the vulnerable areas listed in Annex X (e.g., wastewater lagoons) might be adversely affected and notify the appropriate personnel and/or organizations listed in Annex VIII.

(7) Determine the party responsible for the spill.

(a) If the Air Force is the responsible party, spill cleanup actions will be the responsibility of the facility where the spill occurred. For spills that the facility cannot handle with on-site spill equipment and materials, the CRT will perform clean up. Basic materials required for spill cleanup actions will be maintained by units responsible for the areas at points where spills are likely to occur.

(b) If someone other than the Air Force is the responsible party, the responsible party should be informed of the spill and their response action evaluated by the Base OSC. If their response actions are inadequate in the judgment of the OSC,

they should first be informed of their financial liability, and then if their spill response actions remain inadequate, the Base OSC should assume control of the spill response. In all response actions involving parties other than the Air Force, the Base Judge Advocate should be informed. If a contractor is involved with a spill, the contracting division should be notified (Ext. 4520).

(8) Direct the Environmental Flight to contact HQ ACC/CEVCM by telecon (DSN 574-3553), if uncertain of the spill classification. The purpose of the telecon is to verify the spill classification or aid in the classification when uncertainty exists and to gather available information on reportable spills to support the initial command telecon report to HQ USAF/LEEV. For spills occurring after normal duty hours or on weekends, the ACC/CE alert duty officer should be contacted through the ACC Command Post (DSN 574-2224/2225). As much of the information required in Annex VIII as can be reasonably determined should be initially reported.

(9) Determine if a "Reportable Spill" has occurred. Annex X includes "Reportable Spill" criteria for the substances identified on the Base as potential "Reportable Spill" substances. A "Quick Reference" list of most base chemicals is provided on page vii. If the spill is deemed a "Reportable Spill" by the OSC, the Environmental office representative will release and transmit a confirming message containing the available information identified in Annex VII within four hours of the telecon notification to HQ ACC/CEVCM. If the telecon notification is made after 1500 hours local, the message will be transmitted no later than 1000 hours the following day.

(10) Telephonic and message notification of other Federal and State agencies must be made promptly by the Environmental Flight representative following telecon notification of reportable spill to HQ ACC/CEVCM. These agencies are listed in Annex VIII.

(11) Direct the Base Bioenvironmental Engineer to take samples to determine the chemical nature, pollutant concentration, and extent of the spill as required for response actions and documentation. If the Bioenvironmental Engineer is unable to take samples, notify the Environmental Flight representative to call out the contract laboratory to sample.

(12) Advise Base Public Affairs of the size and nature of the spill and response actions.

(13) Initiate cleanup actions. Pollutants will be collected to the maximum extent possible.

(a) Reusable or reclaimable JP-4 will be stored in tanks for proper disposition. All other oils and hazardous substances will be disposed of through DRMO IAW in accordance with Cannon AFB Operations Plan 18-4, Management of Recoverable and Unuseable Liquid Petroleum Products, or Cannon AFB Hazardous Waste Management Operations Plan, as appropriate.

(b) Absorbent and similar material will be placed in 55-gallon drums, labeled, turned in to the DRMO (by the organization causing the spill) and stored there, if necessary, until eventual disposal in accordance with Federal, State and local environmental laws and regulations.

(c) Hazardous pollutants will be collected in polyethylene lined drums (see 49 CFR 178.133) or other approved drums, as specified by 49 CFR 172.101 or 102, labeled, turned in to DRMO (by the organization causing the spill), and stored there, if necessary, until eventual disposal in accordance with DOD and RCRA regulations. The Chemical Hazards Response Information System (CHRIS), Hazardous Chemical Data Sheets and Material Safety Data Sheets should be consulted for special procedures and precautions.

(14) Develop corrective action plans to ensure that spills or similar spills do not occur again. Corrective actions may include equipment repairs or design changes, modification of Standard Operating Procedures, and revision of the SPR Plan. The OSC should follow up on all corrective actions to ensure they are properly implemented.

(15) On completion of cleanup operations, a "final" report will be submitted to HQ ACC/CEV, with information copies to HQ USAF/LEEV and DHEC. In addition, the final report must be submitted within 60 days of a "major" oil spill to the National Response Team and the Regional Response Team; within 60 days of a 1,000-gallon oil spill or two reportable oil spills in twelve months to the Regional Administrator of EPA; within 60 days of a reportable spill of Clean Water Act Section 311 substances to the Regional EPA Enforcement Division Director and DHEC; and within 15 days of a spill of hazardous waste requiring the implementation of the SPR Plan to the Regional Administrator of EPA. Both regulatory agency reports and internal Air Force reports should contain all of the information listed in Annex VIII. However, the regulatory agency reports must be in narrative format and the internal Air Force reports must be in the message format specified in Air Force Rule 19-8.

Phase III - Short-Term Site Restoration

Phase III site resotration occurs when: 1) the spill has been deemed a "Reportable Quantity" 2) the release has been mitigated, flow of spill material has ceased, and migration pathways have been closed, and 3) the event is no longer an imminent threat to humans or the environment.

Cleanup and disposal will then be the responsibility of the base Spill Cleanup Team (SCT) under the authority of the On-Scene Coordinator (OSC) in coordination with the Base Civil Engineer and the Chief, Environmental Management. The cleanup method used will depend on the characteristics of the spilled material, size of spill, location of spill, character of the area, and potential impacts.

If the decision is to clean up the spill with on-base resources, the OSC will instruct the Cleanup Response Team (CRT) to assemble and move to the Control Site. Cleanup personnel shall use proper protective equipment at all times during cleanup operations.

The CRT shall:

- Treat the spill, if safe and feasible, to mitigate hazards;

- Clean all contaminated surfaces of the spilled material. Water, detergents and/or solvents can be used to remove residual spill material from asphalt, and other hard, impermeable surfaces;

- Collect spill residue, other contaminated material, and all nonreusable cleanup materials-including disposable clothing, sorbents, brushes, rags, brooms, and containers. Package material in U.S. Department of Transportation approved containers. Mark and Label container in accordance with Department of Transportation and EPA requirements, as appropriate;

- Thoroughly decontaminate and inspect all reusable protective clothing and equipment before they are returned to their proper storage location; and

- Ventilate indoor areas.

If it is decided that cleanup is beyond the capabilities of the CRT, the OSC shall activate any other appropriate on-base resources to aide in clean-up or coordinate any required additional assistance with the Wing Commander. In the event of cleanup by outside contractor or agency, the OSC shall maintain on scene command and support cleanup, as needed, until relieved by higher authority, if necessary.

Phase IV - Long-Term Site Restoration

Phase IV may require an extended time period to complete. This phase includes spill site restoration where hazardous chemicals have contaminated large quantities of earth or groundwater, or where surface water is contaminated. Phase IV actions will prevent further contamination, restore contaminated earth and water, and permit productive use of the spill site. These restoration activities are administrated and contracted out to a service contractor through the Environmental Flight Installation Restoration Program (IRP) section.

SECTION FIVE - TRAINING

1. Personnel Training Requirement

a. Commanders will ensure all personnel (military and civilian) who use, handle, or are potentially exposed to oil or hazardous substances complete the Federal Hazard Communication Training Program in accordance with AFOSH Standard 161-21, dated 23 January 1989.

b. This training will be conducted upon initial work area assignment and whenever a new hazard is introduced into their working area.

c. OSHA HAZWOPER Training in accordance with OSHA regulation 29 CFR 1910.120 and HQ ACC - Hazardous Waste Operations and Emergency Response Implementation Guidance.

Level 1- First Responder (awareness level) covered under HAZMAT Training administrated by Disaster Preparedness

Employees Covered

Security/Law Enforcement (811xx, 811x0, 811x2)
Command and Control (274xx, 19xx)
Air Traffic Control (16xx, 271xx, 272xx)
Accumulation Point Managers
Hazardous Material Storage Location Personnel
Ground Safety Personnel
Disaster Preparedness (19xx, 242xx)
On Scene Disaster Control Group (DCG) (As Assigned)

Levels 2,3,4,5,6 and 7 will be provided by the Environmental Flight

Level 2- First Responder (Operations Level) administrated by Disaster Preparedness

Employees Covered

On Scene Disaster Control Group (DCG) (As Assigned)
Fire Protection (all 571x0)
Environmental Managers
Fuels Management Personnel
Bioenvironmental Engineer (91xx)
Safety (241x0)
Disaster Preparedness (19xx, 242xx)
Accumulation Point Managers
Hazardous Material Users (as directed by EPC)

Levels 3,4,6 and 7 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight.

Level 3- Hazardous Materials Technician training

Employees Covered

Explosive Ordnance Personnel (464x0)
HAZMAT Response Team (selected 571x0)
Cleanup Response Team (as assigned)
Fuels Management Personnel
Hydrazine Response Team
Disaster Preparedness (19xx, 242xx)

Level 4- Hazardous Materials Specialists

Employees Covered

HAZMAT Response Team Leader(s)

Cleanup Response Team Leaders
Hydrazine Specialists
Bioenvironmental Engineers & Technicians
Environmental Flight

Level 5- On Scene Coordinator (OSC)
This training must be the requirements of the formal Air Training Command (ATC) On Scene Coordinator Course G307R0516-001, IAW AFR 355-1, Chapter 7.

Employees Covered
Installation Commander, Logistics Group Commander,
Operations Group Commander, Support Group Commander (0066)
Disaster Preparedness (19xx, 242xx)
Senior Fire Officials (571xx)

Level 6- Cleanup Response Team Members

Employees Covered
Personnel assigned to the Cleanup Response Team
Fuels Management Personnel

Level 7- Air Force Installation Restoration Site Managers

Employees Covered
Bioenvironmental Engineer (91xx)
IRP Remedial Project Managers (as assigned)

2. Contractor Handling Oils and Hazardous Materials - Contractors working in areas associated with oils and hazardous substances are responsible for training their personnel in spill response and reporting procedures. The Contract Administrator for Cannon

AFB is responsible for providing contractors with a summary of spill response and reporting procedures.

3. HAZMAT Response Team (HMT) Training

a. All Base personnel designated by the Fire Department as part of the HMT must take part in periodic spill response training programs. The training will be in accordance with the Occupational Safety and Health Administration (OSHA) Rule protecting hazardous waste workers and emergency responders (29 CFR 1910.120) Fire fighters will complete their training in accordance with ACC Supplement 1 to Air Force Rule 92-1.

b. The training will consist of formal classroom training and spill exercises. Spill response exercises will be conducted at least annually. Response to an actual spill will satisfy the annual requirement for spill response exercises. New HMT members should be given a copy of the SPR Plan and be briefed when they are assigned to the team.

4. Hydrazine (H-70) Response Team (HRT) Training

a. Qualified Fuel System Repair personnel as part of the HRT must take part in periodic H-70 Leak Verification Training Course Code 012. The training will be in accordance with T.O. IF-16C/D-2-49GS-00-1. Other required training will consist of FTD F-16 Hydrazine Tank Training, annual Scott Air Pack Respirator Course Code 312.

b. The training will consist of formal classroom training and spill exercises. The H-70 spill response exercise will be conducted at least annually. New HRT members should be given a copy of the SPR Plan and F-16 Hydrazine Procedures for Leak Detection, Fired EPU Checks and Spill Cleanup Checklist, and trained when they are assigned to the team.

5. Cleanup Response Team (CRT)

a. All Base personnel assigned and designated by the Chief of Operations as part of the CRT, must take part in the periodic cleanup response training program. The training will be in accordance with the Occupational Safety and Health Administration (OSHA) rule protecting hazardous waste workers and emergency responders (29 CFR 1910.120).

b. The training will consist of formal classroom training and spill exercises. Spill response exercises will be conducted at least annually. Response to an actual spill cleanup will satisfy the annual requirement for a spill response exercise. New CRT members should be given a copy of the SPR Plan and be briefed when they are assigned to the team.

SECTION SIX - PLAN REVIEW AND UPDATE

The SPR Plan will be reviewed, at a minimum, annually and amended as required. Other circumstances which will warrant a plan review and update are listed as follows:

- When a RCRA permit is modified;
- When facility changes occur which increase the potential for spills or change the spill prevention and response procedure methods and equipment;
- When the SPR Plan fails or proves to be ineffective in the prevention of or response to a spill event;
- At the request of the U.S. Environmental Protection Agency or the New Mexico Department of Environmental Control;
- When changes occur involving the OSC, HAZMAT Response Team, or spill response equipment list;
- After enactment of, or amendment to, pertinent Federal or State legislation, or changes in DOD or USAF policy. Particular attention should be given to changes in reportable spill quantities;
- After pertinent modifications of Federal, regional and State contingency plans;
- After any changes in adjacent land and water use that would affect spill prevention and response considerations; and
- At the request of the Cannon AFB Environmental Protection Committee.

The Environmental Protection Committee will be responsible for reviewing the report, monitoring any corrective actions and amending the SPR Plan when necessary. The review of the SPR Plan, and any resulting amendments or changes to the plan will be logged on the record sheet at the front of this document. If amendments or changes significantly affect the SPCC portion of the plan, Annex I, the plan must be recertified by a professional engineer (40 CFR Part 112.3(d)).

19.0 Melrose Air Force Range

19.1 Immediate Spill Emergency Action Plan

WARNING: Predesignated personnel at Cannon AFB have been specifically tasked, trained, and equipped to respond to all hazardous substance spills. Unauthorized individuals shall never undertake the response to or investigation of any actual or suspected hazardous spill.

IN CASE OF AN OIL OR HAZARDOUS SUBSTANCE SPILL

- KEEP CALM, think, avoid panic and confusion.

- CLEAR area to a safe distance from the spill.

- IN CASE OF FIRE OR INJURY, use the nearest alarm box or telephone, 4117. Know the location of the nearest alarm box and the nearest telephone in your area.

- SPREAD the alarm--pass the word.

- RESCUE any injured individual(s) when possible without risking your safety.

- IMMEDIATELY REPORT spills by most expedient means (i.e., voice, telephone) to your supervisor, or other authority as listed below (See Annex VII for complete personnel listing):

Facility Supervisor(s)	Extension
Facility Supervisor	2877
Chief, Quality Assurance	2877
Range Manager	2571

- IF SAFE and POSSIBLE, stop source of spill. Prevent spill from entering open drainage ditches and all storm and sewer openings. Use spill containment equipment and materials available on site. Avoid contact with liquids and fumes.

- If spill occurs in bermed areas, assure drain valve is closed and locked.

- RESTRICT all sources in ignition--smoking, combustible engine, open flame if flammable vapors are suspected or present.

- IF FIRE DEVELOPS, use proper equipment on hand to extinguish the fire, pending arrival of the Fire Department. Do not attempt to extinguish a large fire with hand-held fire extinguisher.

QUICKLY determine the need to evacuate all or part of the facility and implement the emergency evacuation procedures as required.

WARNING: In case of evacuation, evacuate personnel through the nearest safe exit, particularly when toxic gases or fumes are present.

IMMEDIATELY report spill (if not yet reported) to the Fire Department as directed in this chapter. Indicate severity of the situation and assistance required.

19.2 General Facility Information

Melrose Air Force Range is located approximately 40 miles west of Cannon Air Force Base in Roosevelt County, New Mexico. The primary function of the range is to provide support facilities for Air Force aircraft to practice conventional and nuclear bombing and strafing techniques. The primary wastes generated by the range are diesel fuel, MOGAS, used engine oil, and waste paints.

The shop has been in operation since 1965 and is attached to Operations Group (OG). The facility consists of the following structures:

- Operations Center
- Fire Department annex
- Aboveground storage tanks for fuels

Personnel at this facility are military and civilian and work the following shifts:

Shift	Area Supervisor	Extension	Military	Civilian
Days	Range Manager	2571	1	7

19.3 Potential Spill Routes

Spills within the buildings will be contained inside. If a spill occurs in the compound the spill will migrate into the ground and will have to be cleaned up accordingly.

19.4 Fire Safety Plan

Building Construction

Metal frame on concrete foundation. Steel roof.

Evacuation

In the event of a fire or potential fire/explosion, all personnel in any building within 500 feet in all directions will be evacuated. Toxic/flammable vapors or fumes being carried downwind may endanger personnel in building in all directions. Notify the Fire Department immediately to alert local authorities.

Containment Measures

- Minor spills occurring inside the building should be confined with absorbents. material should be picked up and containerized, if possible. The spill area should be cleaned up using absorbent materials.

- Major spills should be contained by absorbent materials and cleaned up by the Spill Clean Up and Recovery Team.

Utilities

The building is heated using natural gas. Primary lighting is provided through overhead florescent bulbs. There are lights located at each exit from the facility.

Fire and Spill Equipment

Fire extinguisher are located throughout the facility. The following spill response equipment and materials are stored in the facility:

Quantity	Description
13	Halon 1211, 28 pound, Model GH-17F fire extinguishers
2	Water hose connection with hose
2	Face shields
2	Pair chemical resistant gloves
2	Rubber aprons
1	Eyewash station (adjacent to vat room)
1	Non-aggressive fluid absorbent spill kit (PIG Corp)
1	50 lb bag of absorbent material
4	55 gallon OH drums (17E)
4	Telephones (three in main building and one in tower)
	Radios - UHF, VHFD fixed site
	6 Johnson handheld
	3 CBs (one in each vehicle)

Quantity	Description
Heavy equipment:	
3	Pick up trucks
1	Dumptruck
1	Grader
1	Backhoe
1	Bull Dozer
2	500 Gallon water trucks

Procedures should be implemented to ensure that this equipment is in a state of readiness and that, after use, reusable equipment is cleaned and fit for reuse. Used equipment should be assessed to ensure that only reusable equipment is cleaned. Other used equipment should be managed as hazardous waste and replaced immediately by the Environmental Management Office.

19.5 Hazardous Materials Stored at this Site

Material Stored	Approximate Max. Quantity	Location
Used Engine Oil	<20 gallons	UOCP
Diesel Fuel	<500 gallons	HM Storage
MoGas	<500 gallons	HM Storage
Paint Products	<10 gallons	HM Storage

NOTE: UOCP - Used Oil Collection Point

The Material Safety Data Sheets for substances used at this site are located in the training office.

19.6 Inspections and Personnel Training

The facility hazardous waste monitor conducts weekly inspections of the hazardous materials generating areas. These inspections are documented in the hazardous waste logs and any deficiencies noted are immediately corrected.

All personnel who work with hazardous materials in the shop are required to take both Hazardous Communications training through Military Public Health and Hazardous Waste Management Training through Environmental Management. Training includes:

- Identification and use of hazardous materials, hazardous waste, and oil products;
- The use of spill and fire control equipment;
- Spill response procedures for various work areas;

- The locations and functions of all shutoff switches;

- The physical characteristics and hazards associated with materials used in the shop; and

- Safe operating procedures for all shop activities.

19.7 Plan Updating and Posting Requirements

The facility supervisor shall notify the Environmental Management Office in writing whenever changes occur at this facility which may affect the effective implementation of this plan. At a minimum, the plan must be updated annually. The Environmental Management Office is responsible for updating this site-specific contingency plan.

The facility supervisor must post a copy of this site-specific contingency plan in an open area, accessible to all personnel working in the shop. In addition, all personnel must have access to the Material Safety Data Sheets for any hazardous materials used by the facility.

MEMORANDUM OF UNDERSTANDING
PLAINS REGIONAL MEDICAL CENTER-CLOVIS/PORTALES
AND
27th MEDICAL GROUP, CANNON AFB, NEW MEXICO

In consideration of the requirements of the residents of the area served by the institutions herein named, this agreement is entered into between Plains Regional Medical Center-Clovis/Portales (herein referred to as PRMC-C/P) and the 27th Medical Group (herein referred to as the 27th MG).

I. PURPOSE

The purpose of this agreement is to provide for orderly patient transport procedures to PRMC-C/P by 27th MG and to clarify guidelines by which military beneficiaries may receive emergency care at PRMC-C/P Emergency Room. The procedures govern the provision of emergency medical care by PRMC-C/P, as well as the return or transfer of patients, whose conditions no longer require that level of medical care, to 27th MG.

II. GENERAL PROCEDURES

1. The 27th MG will provide emergency ambulance service 24-hours per day, 7 days per week for Cannon AFB, NM. The 27th MG will provide Level 4 emergency medical service. The posted hours of operation are listed below.

- Weekdays
  - -- Walk-in Acute Care Clinic: 0700-2000 Hours (USAF Provider) (See Note*)
  - -- Closed to outpatient care: 2000-0700 Hours
- Weekends
  - -- Level 4 Emergency Service: 0700 Sat-0700 Mon (Contract Physician) (See Note*)
- Holidays
  - -- Level 4 Emergency Service: 0700 - 0700 (Contract Physician) (See Note*)

*NOTE: 2000 hours on week nights will be the last time a patient will be allowed to sign-in for outpatient medical care at the 27th MG. Providers will stay until care for the last patient is completed. Beginning 1 Oct 93, weekend and holiday service availability will closely mirror that of weekdays.

2. After hours, all patients requesting ambulance service by the 27th MG will be transported directly to PRMC-C/P Emergency Room by Cannon AFB. The office at Cannon which dispatches its ambulance will immediately notify PRMC-C/P by telephone of the emergency. The ambulance will be manned by EMT-A medics who will initially evaluate the patient on scene, start essential life-saving measures, and implement other emergency procedures that will stabilize the patient prior to and during transport in

accordance with standard EMT National Guidelines. They will also establish radio contact with PRMC-C/P during transport.

3. Patients may also provide their own transportation, and may report directly to PRMC-C/P without first notifying the 27th MG or PRMC-C/P.

4. During duty hours, active duty personnel who desire medical care will report to the 27th MG. After hours (i.e. 2000-0700 on week nights), active duty personnel will proceed to the PRMC-C/P Emergency Room for bona fide emergency care only. Procedures will be established to inform the 27th MG by telephone of each AD personnel who has signed in to the PRMC-C/P Emergency Room. Procedures for handling Personnel Reliability Program (PRP) personnel will be in accordance with procedures outlined in the 27th MG Level 4 Concept of Operations.

5. A 27th MG physician will assess any active duty patient admitted to PRMC-C/P as soon as possible, to determine whether continued hospitalization at PRMC-C/P is needed. Inpatient care for active duty members will be by preference at the 27th MG Hospital, as much as possible given its capability.

6. For all non-active duty patients, the PRMC-C/P physician will be responsible for the care of the patient during the entire hospitalization. Elective transfer of these patients to the 27th MG will be by mutual agreement of the patient and the physicians at both facilities.

7. After hours, PRMC-C/P will assume responsibility for the patient when they are notified by radio or phone.

8. These parties agree that patients will be transported and provided medical care based upon medical need, not ability to pay.

9. This agreement provides for the transport after hours of all acutely ill patients by the 27th MG to PRMC-C/P Emergency Room, including but not limited to the following categories: (a) trauma, (b) burns, (c) cardiac, (d) neurosurgery, (e) perinatal, (f) behavioral, and (g) poison.

10. Close coordination on a daily basis will be maintained between 27th MG and PRMC-C/P to exchange data on patients treated by PRMC-C/P. PRMC-C/P will provide the 27th MG, on a daily basis, a complete list of all 27th MG beneficiaries seen in its ER, with all diagnoses, in order for the 27th MG to be able to comply with its reporting requirements.

11. The 27th MG will assume responsibility for processing all medical bills for the care of active duty patients. PRMC-C/P will forward all those bills to the 27th MG Resource Management

Office for processing.

12. PRMC-C/P will charge for the care of active duty members at a rate of 20% below its normal billed rate and accept 100% of the prevailing CHAMPUS rate for all eligible CHAMPUS beneficiaries. PRMC-C/P will charge/collect for all applicable and required CHAMPUS deductibles and cost shares from CHAMPUS beneficiaries.

13. The 27th MG will continue after implementation of this agreement its standard practice of instructing its obstetrical patients to report directly to the 27th MG obstetrical ward whenever they have a problem related to their pregnancy. The obstetrical service will remain available to evaluate and treat them 24 hours per day, seven days per week.

14. The 27th MG agrees to accept for immediate re-evaluation on an outpatient basis at the Cannon AFB Hospital all pediatric and obstetric cases that are seen in the PRMC-C/P Emergency Room, if the Emergency Room physician determines that more definitive care is indicated. The 27th MG will arrange for transport of these cases by ambulance, if necessary, from PRMC-C/P to the Cannon AFB Hospital.

15. The 27th MG will provide to PRMC-C/P a monthly list of all 27th MG general surgeons on-call. The list will include the provider name and contact telephone number.

16. All emergency active duty surgeries to be performed at PRMC-C/P will be performed by surgeons assigned to the 27th MG.

17. All follow-up medical care required by Active Duty military members will be performed by the 27th MG. Follow-up medical care will be initiated the next morning during the 27th MG sick call hours.

III. SUMMARY

This agreement provides for the emergency medical care of 27th MG beneficiaries by PRMC-C/P.

This agreement clarifies guidelines by which military beneficiaries may receive emergency care at PRMC-C/P Emergency Room.

This agreement provides for the reporting of patient information between PRMC-C/P and the 27th MG.

IV. DURATION OF AGREEMENT

The agreement has a term of one year and will remain in effect for that period unless a party provides written notice of cancellation sixty (60) days in advance. This agreement entered this 23 day of June, 1993 and shall remain in full force and effect until the 23 day of June, 1994.

WILLIAM L. BURNER III, Colonel, USAF, MC, FS
Commander, 27th Medical Group, Cannon AFB, NM

GRANT NELSON
Administrator, Plains Regional Medical Center-Clovis/Portales

PRMC-C/P Original Copy

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE DEPARTMENT OF DEFENSE
AND
THE ENVIRONMENTAL PROTECTION AGENCY
FOR THE
IMPLEMENTATION OF P.L. 96-510
THE COMPREHENSIVE ENVIRONMENTAL RESPONSE,
COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA)

1. PURPOSE

The Department of Defense (DOD) and the Environmental Protection Agency (EPA) are entering into this agreement to clarify each Agency's responsibilities and commitments for conducting and financing response actions authorized by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and specifically delegated by Executive Order 12316.

This agreement does not redelegate any responsibilities set out in Executive Order 12316. Rather, it clarifies respective operational roles, responsibilities, and procedures, consistent with the applicable provisions of Executive Order 12316 and Executive Order 12088. This agreement does not create any substantive or procedural rights in other parties, does not affect enforcement rights and remedies with regard to any party, and is intended only for Federal administrative purposes of EPA and DOD.

These responsibilities and procedures are guided by the following:

- DOD facilities are defined as government-owned, government-operated facilities controlled by DOD; and government-owned land controlled by DOD that is either contractor-operated or leased to other parties.
- DOD is generally responsible for financing actions taken in response to releases from DOD facilities, or assuring that another party finances such actions.
- DOD and EPA will conduct response actions consistent with response procedures established by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).
- At DOD's request and in its discretion, EPA will provide DOD with technical assistance to support the response actions conducted by DOD.
- Civil works activities of the Department of Army Corps of Engineers are not subject to the terms of this agreement.

DOD will consult with EPA concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution.

2. BASIS OF AGREEMENT

CERCLA provides a comprehensive framework for response to the release or potential release of hazardous substances, pollutants, and contaminants.

Section 104 of CERCLA and Executive Order 12316 place authority for responding to releases from DOD facilities with the Secretary of Defense. These response actions must be conducted in accordance with the NCP as amended by EPA under section 105 of CERCLA.

3. RESPONSIBILITIES AND RESPONSE PROCEDURES

For purposes of this agreement, releases of hazardous substances are divided into three categories:

- Releases from current DOD facilities;
- Releases from former DOD facilities; and
- Other releases for which DOD is a responsible party.

For each category, section 3 describes procedures to be followed by DOD and EPA in determining which Agency will conduct and/or finance the response action consistent with CERCLA, the requirements of Executive Order 12316, and the NCP. At DOD's request and in its discretion, EPA will provide technical assistance or serve in an advisory role when DOD conducts a response.

3.1 Releases from Current DOD Facilities

a. Current DOD facilities with on-facility contamination and no off-facility contamination

When there is contamination on a current DOD facility and no off-facility contamination, DOD will conduct and finance the response action or assure that another party does so. At DOD's request, EPA will provide technical assistance or serve in an advisory role. This section does not apply to releases for which DOD is not a responsible party under section 107(b) of CERCLA (e.g., "midnight dumping").

b. Current DOD facilities with off-facility contamination

When there is off-facility contamination and clear evidence that a current DOD facility is the sole source, DOD will conduct and finance the response action or assure that another party does so. At DOD's request, EPA will provide technical assistance to DOD or serve in an advisory role.

When there is off-facility contamination and no clear evidence that a DOD facility is the sole source, EPA will finance and conduct investigations and studies off-facility to determine the source and extent of the contamination and recommended response action. DOD will finance and conduct investigations and studies on the DOD facility to determine the source and extent of the contamination and the recommended response action. DOD and EPA will

coordinate these efforts and resulting decisions to minimize costs and duplication of activities, and will exchange all reports, studies, and other relevant site information.

If, after DOD and EPA review these investigations, it is determined that the current DOD facility is the sole source of the contamination, DOD will conduct and finance the response action or assure that another party does so and will reimburse EPA for costs EPA expended at the site.

If, after DOD and EPA review these investigations, it is determined that the current DOD facility is one of two or more sources of the contamination, EPA and DOD will jointly determine the most appropriate response and financing methods.

3.2 Releases From Former DOD Facilities

a. Releases from former DOD Facilities, when DOD is the sole responsible party

If EPA, in consultation with DOD, determines that a former DOD facility is the sole source of the contamination, DOD will finance any response action, including off-facility response actions, or will assure that another party does so. If EPA agrees, DOD may choose to conduct the response action. If EPA conducts the response action, DOD will reimburse the Hazardous Substance Response Trust Fund (Fund) for the action. EPA concurrence is required before DOD conducts a response action.

In cases where DOD disagrees with the determination of responsibility, proposed action, or its cost, DOD may use the dispute resolution section of this agreement.

b. Releases from former DOD facilities, when DOD is one of two or more responsible parties.

If EPA, in consultation with DOD, determines that DOD is one of two or more parties responsible for the contamination, EPA will conduct and finance the response action and EPA, in consultation with DOD, will determine the appropriate response costs. DOD will reimburse EPA that amount.

If EPA agrees, DOD may choose to conduct the response action. If EPA conducts the response action, DOD will reimburse the Fund for the action. EPA concurrence is required before DOD conducts a response action.

In cases where DOD disagrees with the determination of responsiblility, proposed action, or its cost, DOD may use the dispute resolution section of this agreement.

3.3 Other Releases for Which DOD is a Responsible Party

When there is a release for which DOD is a responsible party, and which does not involve a current or former DOD facility, EPA will investigate the need for a response action, and the extent of responsibility of different

parties for the release, including DOD's responsibility. EPA, in consultation with DOD, will determine the appropriate response costs and DOD will reimburse EPA that amount. If EPA agrees, DOD may choose to conduct the response action for the portion of the release for which it is responsible. EPA concurrence is required before DOD conducts a response action.

For releases from DOD vessels, including vessels owned or bareboat chartered and operated, DOD and EPA will jointly determine the most appropriate response.

In cases where DOD disagrees with the determination of responsibility, proposed action, or its cost, DOD may use the dispute resolution section of this agreement.

4. FUNDING OF RESPONSE

DOD will request sufficient funds in its budget to pay for response actions programmed by the Department under this agreement. DOD will ensure that projects in this budget program are listed in the same manner as other environmental projects under OMB Circular A-106.

When EPA undertakes a response for which DOD is responsible under CERCLA, DOD will reimburse the Fund for its share. Where funds are not immediately available for reimbursement, DOD's next fiscal year budget request will include a request for Fund reimbursement. Provisions of this agreement for payment by DOD shall not be construed as affecting the particular source of appropriations for payment by the government, including special appropriations or 31 U.S.C. 724a.

Any commitment of funds is subject to the availability of appropriations.

Each Agency will maintain records of all costs incurred which may involve payments to or from the Fund and will provide documentation of these costs at the other Agency's request.

5. COMMUNITY RELATIONS

When EPA undertakes a response action, EPA will be responsible for establishing a community relations program for the site, as specified in the Guidance for Implementing the Superfund Program (Part III, Section 4).

When DOD undertakes a response action, DOD will be responsible for providing information to the local community.

For EPA and DOD actions at the same site, EPA and DOD will conduct a joint community relations program.

6. EXCHANGE OF INFORMATION

DOD and EPA will exchange information on a regular basis. EPA and DOD will inform each other at the earliest possible stage of any evidence of contamination, types of contamination, and potential actions. EPA and DOD will

keep each other informed regarding the type and availability of data or information. Such data or information will be made available upon request, subject to Agency technical or peer review. Upon request and following Agency technical or peer review, DOD and EPA will submit drafts of specific technical reports to each other for review. Review comments will be addressed in final reports.

Agency technical or peer review will be expedited when information is requested. All requests for data or information will be responded to within ten working days of the request.

EPA and DOD will notify each other prior to providing the other Agency's information or data to another party. All confidential business information exchanged under this agreement is subject to procedures set forth at 40 CFR Part 2.

This section applies to information related to all releases under section 3 of this agreement, including releases under section 3.1.

7. RESOLUTION OF INTERAGENCY CONFLICTS

Any conflict arising under this agreement will be resolved at successive levels of Agency decisionmaking until agreement is reached. The EPA Regional Administrator and the Commanding Officer of the Defense Component Major Command in question will first attempt to resolve any disputes. Failing resolution, the EPA Assistant Administrator for Solid Waste and Emergency Response and the appropriate Military Department Assistant Secretary will attempt to reach agreement. If this is unsuccessful, the matter will be referred to the EPA Administrator and the Secretary of Defense.

The dispute resolution process is not a substitute for necessary and timely removal actions, and each Agency reserves rights otherwise provided by law to pursue any response or enforcement actions.

8. MULTIPARTY AGREEMENTS

Where appropriate, EPA Regional Offices and DOD installations may enter into agreements with State and local authorities regarding response actions. Such agreements must be consistent with this agreement, except that dispute resolution sections of such agreements may supersede section 7 of this MOU.

9. AMENDMENTS

This agreement may be amended at any time by mutual agreement of EPA and DOD. Amendments will be in writing, and will be signed by appropriate DOD and EPA officials.

10. PERIOD OF AGREEMENT

Unless ended or extended by mutual agreement, this MOU will continue in effect until December 1, 1985. This agreement may be terminated upon notifi-

cation by either DOD or EPA to the other party. A minimum of ninety days' advance written notice of termination is required.

11. EFFECTIVE DATE

This agreement will become effective upon signature of both parties.

LAWRENCE J. KORB
Assistant Secretary of Defense
(Manpower, Reserve Affairs and Logistics)

Date: 8/12/83

LEE M. THOMAS
Assistant Administrator
Office of Solid Waste and Emergency Response

Date: 8/12/83

AGREEMENT FOR MUTUAL AID IN
FIRE PROTECTION

This Agreement, entered into this 13th day of July 1989, between the Secretary of the Air Force acting pursuant to the authority of 42 U.S.C. (1856(A)) and the City of Clovis, New Mexico Fire Department is for securing to each the benefits of mutual aid in fire prevention, in the protection of life and property from fire, and in fire fighting. It is agreed that:

a. On request to a representative of the Cannon Air Force Base Fire Department, firefighting equipment and personnel of the Cannon Air Force Base Fire Department will be dispatched to any point within the area for which the City of Clovis, NM Fire Department normally provides fire protection as designated by the representatives of the City of Clovis, NM Fire Department.

b. On request to a representative of the City of Clovis, NM Fire Department by a representative of the Cannon Air Force Base Fire Department, firefighting equipment and personnel of the City of Clovis, NM Fire Department will be dispatched to any point within the firefighting jurisdiction of the Cannon Air Force Base Fire Department as designated by the representative of the Cannon Air Force Base Fire Department.

c. Any dispatch of equipment and personnel pursuant to this agreement is subject to the following conditions:

(1) Any request for aid hereunder shall include a statement of the amount and type of equipment and personnel requested, and shall specify the location to which the equipment and personnel are to be dispatched, but the amount and type of equipment and number of personnel to be furnished shall be determined by a representative of the responding organization.

(2) The responding organization shall report to the officer in charge of the requesting organization at the location to which the equipment is dispatched and shall be subject to the orders of that official.

(3) A responding organization shall be released by the requesting organization when the services of the responding organization are no longer required or when the responding organization is needed within the area for which it normally provides fire protection.

(4) In the event of a crash of aircraft owned or operated by the United States or aircraft of any foreign nation within the area for which the City of Clovis, NM Fire Department normally provides fire protection, the Chief of the Cannon Air Force Base Fire Department or his/her representative may assume full command on arrival at the scene of the crash.

d. The City of Clovis, NM Fire Department may claim reimbursement for the direct expenses and losses which are additional firefighting costs above the normal operating costs incurred while fighting a fire under this agreement as provided in 44 C.F.R., Part 151.

e. Each party waives all claims against every other party for compensation for any loss, damage, personal injury or death occurring as a consequence of the performance of this agreement.

f. All equipment used by the City of Clovis, NM Fire Department in carrying out this agreement will, at the time of action hereunder, be owned by it; and all personnel acting for the City of Clovis, NM Fire Department under this agreement will, at the time of such action, be an employee or volunteer member of the City of Clovis, NM Fire Department.

FOR CITY OF CLOVIS, NEW MEXICO

Donald E. Clifton

DONALD E. CLIFTON
City Manager

FOR THE SECRETARY OF THE AIR FORCE

David E Benson

DAVID E. BENSON, Colonel, USAF
Commander

AGREEMENT FOR MUTUAL AID IN FIRE PROTECTION

This Agreement, entered into this 7th day of July 19 92, between the Secretary of the Air Force acting pursuant to the authority of 42 U.S.C. 1856(a) and the City of Portales, New Mexico Fire Department is for securing to each the benefits of mutual aid in fire prevention, in the protection of life and property from fire, and in firefighting. It is agreed that:

a. On request to a representative of the Cannon Air Force Base Fire Department, firefighting equipment and personnel of the Cannon Air Force Base Fire Department will be dispatched to any point within the area for which the City of Portales, New Mexico Fire Department normally provides fire protection as designated by the representatives of the City of Portales, New Mexico Fire Department.

b. On request to a representative of the City of Portales, New Mexico Fire Department by a representative of the Cannon Air Force Base Fire Department, firefighting equipment and personnel of the City of Portales, New Mexico Fire Department will be dispatched to any point within the firefighting jurisdiction of the Cannon Air Force Base Fire Department as designated by the representative of the Cannon Air Force Base Fire Department.

c. Any dispatch of equipment and personnel pursuant to this agreement is subject to the following conditions:

(1) Any request for aid hereunder shall include a statement of the amount and type of equipment and personnel requested, and shall specify the location to which the equipment and personnel are to be dispatched, but the amount and type of equipment and number of personnel to be furnished shall be determined by a representative of the responding organization.

(2) The responding organization shall report to the officer in charge of the requesting organization at the location to which the equipment is dispatched, and shall be subject to the orders of that official.

(3) A responding organization shall be released by the requesting organization when the services of the responding organization are no longer required or when the responding organization is needed within the area for which it normally provides fire protection.

(4) In the event of a crash of aircraft owned or operated by the United States or military aircraft of any foreign nation within the area for which the City of Portales, New Mexico Fire Department normally provides fire protection, the Chief of the Cannon Air Force Base Fire Department or his or her representative may assume full command on arrival at the scene of the crash.

d. The City of Portales, New Mexico Fire Department may claim reimbursement for the direct expenses and losses which are additional firefighting costs above the normal operating costs incurred while fighting a fire under this agreement as provided in 44 C.F.R., Part 151.

e. Each party waives all claims against every other party for compensation for any loss, damage, personal injury, or death occurring as a consequence of the performance of this agreement. This provision does not waive any right of reimbursement pursuant to paragraph d above.

f. All equipment used by the City of Portales, New Mexico Fire Department in carrying out this agreement will, at the time of action hereunder, be owned by it; and all personnel acting for the City of Portales, New Mexico Fire Department under this agreement will, at the time of such action, be an employee or volunteer member of the City of Portales, New Mexico Fire Department.

FOR THE CITY OF PORTALES, NM

KEN GOSLEE
City Manager

FOR THE SECRETARY OF THE AIR FORCE

DAVID E. BENSON, Colonel, USAF
Commander

AGREEMENT FOR MUTUAL AID IN FIRE PROTECTION

This Agreement, entered into this 12th day of Sept. 19 01, between the Secretary of the Air Force acting pursuant to the authority of 42 U.S.C. 1856(a) and the City of Melrose, New Mexico Fire Department is for securing to each the benefits of mutual aid in fire prevention, in the protection of life and property from fire, and in firefighting. It is agreed that:

a. On request to a representative of the Cannon Air Force Base Fire Department, firefighting equipment and personnel of the Cannon Air Force Base Fire Department will be dispatched to any point within the area for which the City of Melrose, New Mexico Fire Department normally provides fire protection as designated by the representatives of the City of Melrose, New Mexico Fire Department.

b. On request to a representative of the City of Melrose, New Mexico Fire Department by a representative of the Cannon Air Force Base Fire Department, firefighting equipment and personnel of the City of Melrose, New Mexico Fire Department will be dispatched to any point within the firefighting jurisdiction of the Cannon Air Force Base Fire Department as designated by the representative of the Cannon Air Force Base Fire Department.

c. Any dispatch of equipment and personnel pursuant to this agreement is subject to the following conditions:

(1) Any request for aid hereunder shall include a statement of the amount and type of equipment and personnel requested, and shall specify the location to which the equipment and personnel are to be dispatched, but the amount and type of equipment and number of personnel to be furnished shall be determined by a representative of the responding organization.

(2) The responding organization shall report to the officer in charge of the requesting organization at the location to which the equipment is dispatched, and shall be subject to the orders of that official.

(3) A responding organization shall be released by the requesting organization when the services of the responding organization are no longer required or when the responding organization is needed within the area for which it normally provides fire protection.

(4) In the event of a crash of aircraft owned or operated by the United States or military aircraft of any foreign nation within the area for which the City of Melrose, New Mexico Fire Department normally provides fire protection, the Chief of the Cannon Air Force Base Fire Department or his or her representative may assume full command on arrival at the scene of the crash.

d. The City of Melrose, New Mexico Fire Department may claim reimbursement for the direct expenses and losses which are additional firefighting costs above the normal operating costs incurred while fighting a fire under this agreement as provided in 44 C.F.R., Part 151.

e. Each party waives all claims against every other party for compensation for any loss, damage, personal injury, or death occurring as a consequence of the performance of this agreement. This provision does not waive any right of reimbursement pursuant to paragraph d above.

f. All equipment used by the City of Melrose, New Mexico Fire Department in carrying out this agreement will, at the time of action hereunder, be owned by it; and all personnel acting for the City of Melrose, New Mexico Fire Department under this agreement will, at the time of such action, be an employee or volunteer member of the City of Melrose, New Mexico Fire Department.

FOR THE CITY OF MELROSE

Bobby Bennett, Mayor

Keith Shaw, Fire Chief

FOR THE SECRETARY OF THE AIR FORCE

DAVID E. BENSON, Colonel, USAF
Commander

SECTION IV

FIRING SYSTEMS PROCEDURES

4-1. GENERAL.

4-2. This section contains procedures for preparation and use of nonelectric and electric firing systems, use of detonation cord, use of dual firing system, procedures for preparation and use of ignition trains, and prevention and handling of misfires.

4-3. NONELECTRIC SYSTEMS.

4-4. Nonelectric priming is the preparation of an explosive charge for nonelectric detonation. The priming materials consists mainly of a blasting cap which provides shock adequate to initiate the explosive, the safety fuse which transmits the flame that fires the blasting cap, and fuse igniter which initiates the safety fuse.

4-5. SAFETY PRECAUTIONS. In addition to the general safety requirements, the following precautions will be strictly adhered to in the use of nonelectric firing systems.

NOTE

Blasting caps less than the equivalent of a commercial No. 8 cap will not be used.

a. The ready supply of nonelectric blasting caps will be kept in approved compartmented wood or plactic boxes. Blasting caps will be handled only by their open ends as heating of the initiating explosives renders them more sensitive.

b. Capped safety fuses will be handled carefully so that blasting caps do not contact each other.

c. The preparation of initiators will be performed at a distance of not less than 7.6 meters (25 feet) from the supply of blasting caps or other explosives.

d. The preparation of initiators and the priming of explosives will not be performed in advance of requirements. Prepared initiators, if not used, will be expended. They will not be returned to explosive storage locations.

e. Only sufficient explosives or initiators to meet the requirement of the operation involved will be brought to the disposal site.

4-6. CAPPING THE SAFETY FUSE. When capping the fuse with nonelectric blasting cap, the following procedures will be used.

NOTE

- Use a clean, sharp blade to cut fuse. If crimpers are used, edges will be clean and sharp.
- Cutting a 15.2 centimeters (6 inch) length of fuse will reduce the possibility of misfire from a damp powder train because of absorption of moisture from open air.

a. Cut and discard a 15.2 centimeters (6 inch) length from free end of fuse (figure 4-1).

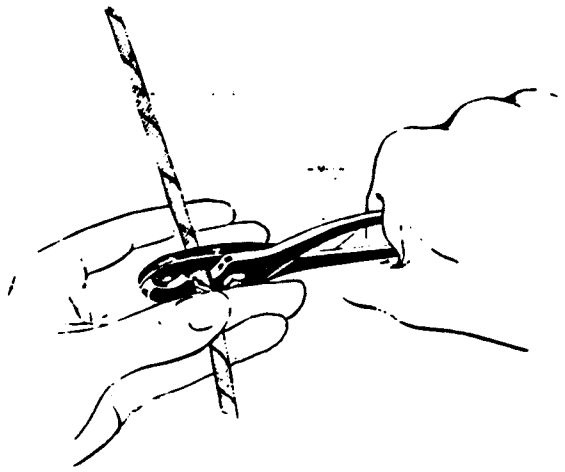


Figure 4-1. Cutting the Fuse

WARNING

Test burning of safety fuse will be performed downwind at a minimum safety distance of 7.6 meters (25 feet) from blasting caps or other explosives.

NOTE

All fuse in the same roll should burn at the same rate, although rate of burning may vary from approximately 30 to 45 seconds per foot in different rolls. The M700 fuse burns at approximately 40 seconds per foot.

b. Cut off 30 centimeters (one foot) of fuse and check burning rate.

c. Figure length of fuse necessary to allow personnel to reach a safe distance at the determined burning rate per meter (foot).

d. Cut necessary length of fuse squarely across. A minimum of 1.8 meters (six feet) will be used.

e. Attach fuse igniter as follows:

(1) M2.

(a) Slide fuse retainer over end of fuse and seat firmly.

(b) Waterproof joint between fuse and igniter, if necessary, by applying sealing compound.

(2) M60.

(a) Unscrew fuse holder cap two or three turns.

(b) Press shipping plug into igniter to release split collett, and rotate plug as it is removed.

(c) Insert end of fuse in place until fuse rests against primer base.

(d) Tighten cap sufficiently to hold fuse in place, thus waterproofing joint.

NOTE

Omit the following step if a priming adapter is not being used.

f. Pass the other end of fuse through priming adapter (figure 4-2).

WARNING

Do not tap the blasting cap with or against a hard object or blow into the cap. Caps are highly sensitive and detonation may occur.

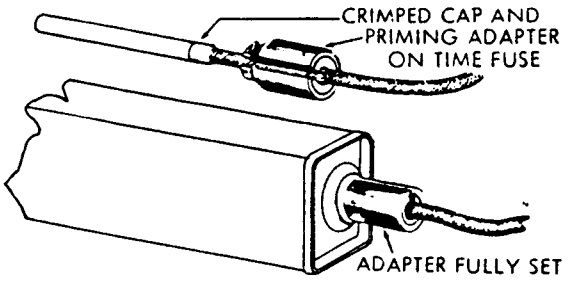


Figure 4-2. Priming Adapter

g. Remove one blasting cap from box. Visually inspect open end of cap for dirt or foreign matter. If dirt or foreign matter is detected, hold open end of cap down and shake gently to remove the object(s). Repeat visual inspection. If dirt or foreign matter remains, reject cap.

h. Hold fuse vertically at approximately arms length and eye level with square-cut end up.

WARNING

Never force fuse into blasting cap.

i. Slip blasting cap gently down over fuse so that explosive in cap is in contact with end of fuse.

WARNING

If fuse is not in contact with explosives in cap, it may cause a misfire.

j. If end of fuse is flattened or is too large to enter blasting cap freely, recut fuse.

WARNING

- Crimpers are equipped with fuse cutter; make certain cutting section is not used during crimping operation. A crimp too near explosive in blasting cap may cause detonation.
- When crimping a cap, do not point cap toward other personnel or explosives.

CAUTION

While grasping safety fuse/detonating cord, do not pull downward. Possible misfire could result.

k. Crimp blasting cap at a 3 to 6 millimeters (1/8 to 1/4 inch) from open end, using one of the methods below (figure 4-3).

(1) Method 1:

(a) When fuse is properly seated with cap, grasp fuse just below cap with thumb and middle finger, placing forefinger on closed end of cap holding cap in position.

(b) Place crimpers around cap just above thumb and middle finger and start crimp.

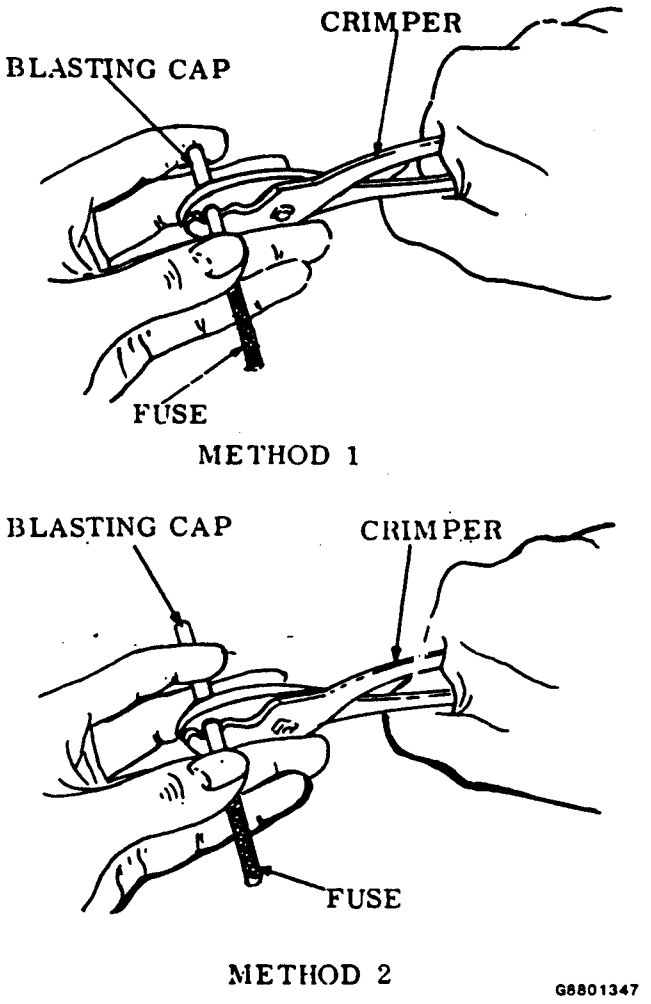


Figure 4-3. Starting Crimp

(c) After crimp is started, remove hand holding cap and grasp safety fuse approximately three feet behind crimpers.

(2) Method 2:

(a) When fuse is properly seated within cap, grasp fuse just below cap with thumb, third (ring) and little fingers, placing forefinger on one side of cap and middle finger on opposite side, below explosive holding cap in position.

(b) Place crimpers around cap just above thumb and third (ring) fingers, and start crimp.

(c) After crimp is started, remove hand holding cap and grasp safety fuse approximately three feet behind crimpers.

WARNING

The fuse will be held at arm's length at side of body with head turned away to avoid excessive body damage if detonation occurs.

l. Holding cap and fuse away from body (figure 4-4), crimp blasting cap.

4-7. PRIMING THE CHARGE. Priming with or without priming adapter is as follows:

a. With Priming Adapter:

(1) Pull cap into adapter and insert into cap well of explosive.

(2) Screw adapter into place (see figure 4-2).

b. Without Priming Adapter (Method 1):

(1) Wrap a string tightly around a block; tie securely leaving approximately six inches of loose string on each end after making tie.

(2) Insert blasting cap with fuse attached into cap well.

(3) Tie loose string around fuse to prevent blasting cap from being withdrawn from block.

c. Without Priming Adapter (Method 2):

(1) Insert fused cap into cap well.

(2) Secure fuse to block, using tape or other available material, to prevent cap from being withdrawn.

d. Plastic Explosives.

(1) Plastic explosives not having cap wells may be primed by forming a cap well in charge using pointed end of crimpers and inserting blasting cap in formed cap well.

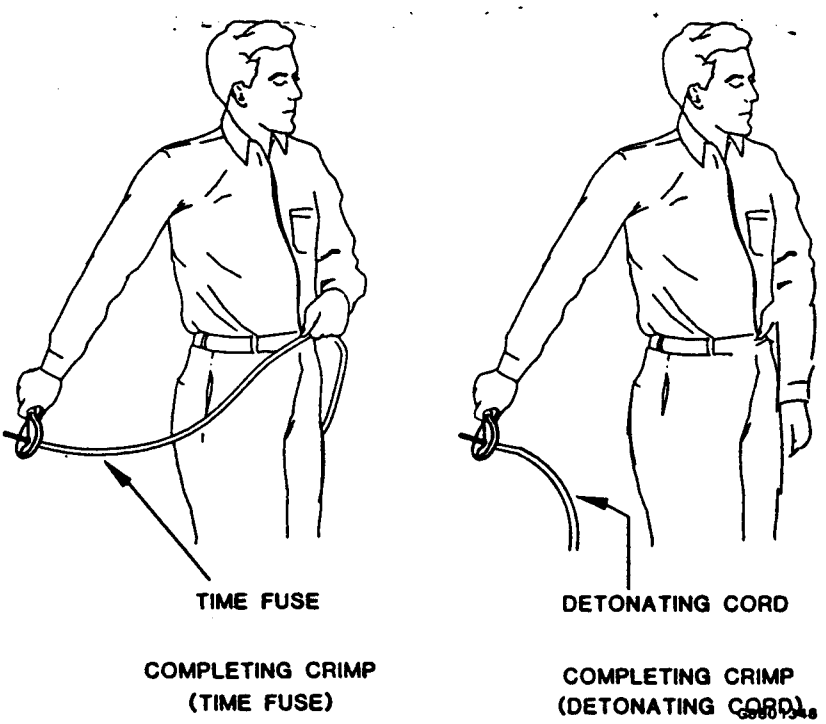


Figure 4-4. Completing Crimp

WARNING

Do not allow time safety fuse to coil up and contact itself after being ignited. Rupture of safety fuse wrapping could result in ignition of safety fuse at a point nearer blasting cap, resulting in a premature detonation. Ensure that time fuse is fairly straight and secure near each end to prevent coiling.

4-8. IGNITING FUSE. Fuse may be ignited using M60 fuse igniter as follows:

NOTE

If M60 igniter fails to function, it can be reset quickly without disassembly by pushing plunger all the way in and firing as before. If igniter still fails to function, replace with serviceable igniter.

a. Remove safety pin.

b. Push plunger all the way in.

c. Turn release ring 1/4 turn and pull.

d. Note time of ignition.

e. Retire to safe distance and figure expected time of detonation.

4-9. ELECTRIC FIRING SYSTEMS.

4-10. Electric firing system provides an electric spark or impulse to initiate detonation. Electric impulse travels from power source through lead wires to blasting cap. Components of the system are electric blasting cap, firing wire and reel, and blasting machine.

NOTE

The preferred method for conducting disposal operations when an electromagnetic radiation hazard is present is the nonelectric initiation system.

4-11. SAFETY PRECAUTIONS. The general safety requirements in section I will be followed during all disposal operations using an electric firing system. A possibility exists that electric systems may be energized to dangerous levels from outside sources, such as, static electricity, induced electric currents, radar, radio communication equipment, high tension wires, etc. The following precautions will be taken to reduce the possibility of premature initiation of electric blasting caps:

a. Electric blasting caps will be connected to firing circuit before connection to main charge. This procedure will minimize damage should an electric blasting cap prematurely detonate.

b. Minimum distances between transmitters and electro-explosive devices will be in accordance with AFR 127-100.

c. Caps less than the equivalent of commercial No. 8 will not be used.

d. Electric blasting caps of different manufacture or type will not be used in the same system.

e. When uncoiling the leads of blasting caps, cap will not be held directly in hand, but will be held by wires approximately 15.2 centimeters (six inches) from cap. Lead wires will be straightened out by hand and not thrown, waved or snapped to loosen coils.

f. Individuals connecting/testing electric blasting caps will make use of available protective cover when completing circuit. Distance between the individual and blasting cap will be the maximum permitted by length of cap leads. The individual will keep his back toward blasting cap when making connection.

g. Blasting caps will be tested for continuity with a galvanometer or M51 test set prior to connecting to firing circuit. Shunt will not be removed from lead wires of blasting cap until the moment of testing.

h. Individual removing shunt will ground himself to prevent accumulated static electricity from firing blasting cap. (Physically touching the ground will suffice.) Immediately after testing, lead wires will be shunted by twisting bare ends of wires together. Wires will remain shunted until connection into firing circuit.

i. Both ends of firing wires will be shunted except when firing the charge or testing the circuit. Connection between blasting caps and the circuit firing wires will not be made unless power end of firing wires is shunted.

j. Firing wires will be secured near point where blasting cap(s) are connected.

k. Prior to making connections to blasting machine, firing circuit will be tested with a galvanometer or M51 test set for electrical continuity.

l. The blasting machine or its activating device will not be surrendered to the individual designated to fire the charge until the supervisor is assured that area is cleared of personnel, equipment, aircraft, etc.

m. Disposal operations will not be conducted during an electrical storm or when such a storm is approaching. Additionally, disposal by detonation using an electrical firing system will not be conducted during sand, dust or snow storms. Under such conditions, all electrical operations will be suspended, cap and lead wires shunted and personnel removed from the disposal area.

4-12. TESTING ELECTRIC WIRES, BLASTING CAPS, AND CIRCUITS. Blasting caps, firing wire, and entire circuits will be tested prior to disposal operation in accordance with the following paragraphs.

4-13. Firing Wire. Insulated wires must have sufficient insulating material removed from ends. Clean bared ends of wires by scraping with a suitable tool. Multi-strand core wire, after cleaning, will be tightly twisted. Firing wire will be tested on reel, and will be retested after unreeling as uncoiling may separate broken wires. Firing wire will be tested as follows:

a. When using M51 blasting cap test set:

(1) Check test set by connecting posts with a piece of bare wire (figure 4-5). Indicator lamp should flash when handle is squeezed. Remove bare wire.

(2) Separate firing wire conductors at both ends, and connect those at one end to test set binding posts. Actuate test set. Indicator lamp should not flash. If it does, firing wire has a short circuit; locate and repair as required.

(3) Twist wires together at one end and connect those at other end to test set posts. Actuate test set. Indicator lamp should flash. If it does not flash, firing wire has a break; locate and repair as required.

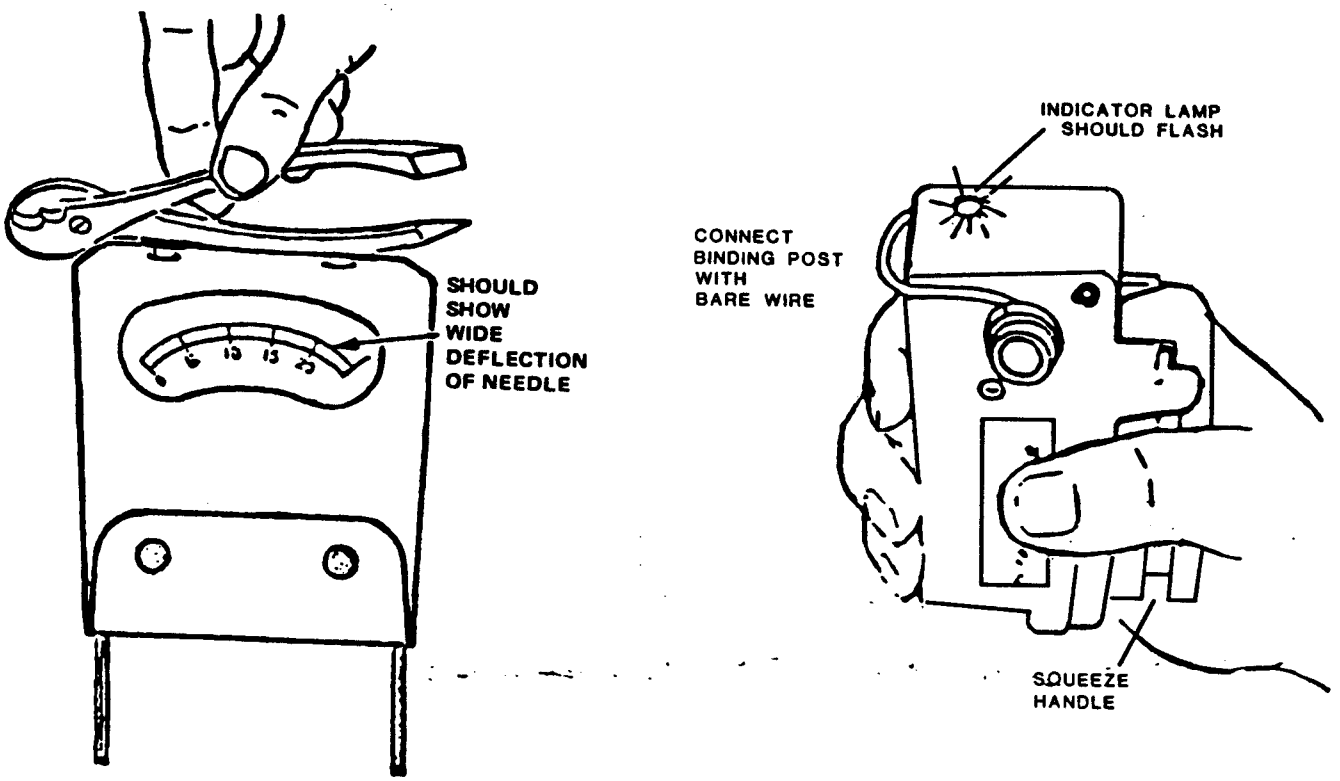


Figure 4-5. Testing Galvanometer or Test Set

b. When using blasting galvanometer:

(1) Check galvanometer by holding a piece of metal across its terminals (figure 4-5). If battery is good, this should show a wide deflection of the needle. If this does not cause a wide deflection of the needle (23 to 25 units), battery is weak and will be replaced. When used in a cold climate, galvanometer will be protected from freezing by keeping it under clothing and near the body.

(2) Separate firing wire conductors at both ends and touch those at one end to galvanometer posts. Needle should not move. If it does, firing wire has a short circuit; locate and repair as required.

(3) Twist wires together at one end and touch those at other end to galvanometer posts. This should cause a wide deflection of the needle (about 6-1/2 ohms or 23 to 25 units for a 500 foot length). No movement of the needle indicates a break; a slight movement indicates a point of high resistance which may be caused by a dirty wire, loose wire connections or wires with several strands broken off at connections. Locate and repair as required.

4-14. Blasting Caps. Blasting caps will be tested as follows:

WARNING

- When uncoiling cap lead wires, cap will not be held directly in the hand, but will be held by wires approximately 15.2 centimeters (6 inches) from cap.
- Always point explosive end of blasting cap away from body, other personnel, and explosives.
- Individuals will make use of available protective cover and keep their backs toward blasting cap when testing caps for continuity with a galvanometer or M51 test set. Distance between individuals and blasting cap will be the maximum permitted by length of cap leads.
- Lead wires will be straightened out by hand. Do not throw, wave or snap to loosen coils.

a. Carefully extend cap lead wires to maximum length.

b. Secure cap to prevent movement by placing in a hole or behind a barricade.

WARNING

Individual removing shunt will ground himself to prevent accumulated static electricity from firing the blasting cap. (Physically touching the ground will suffice.)

c. When using M51 blasting cap test set:

(1) Check test set as described in paragraph 4-13, if required.

(2) Remove short circuit shunt from lead wires of electric blasting cap.

(3) Attach one cap lead wire to one binding post and attach other cap lead wire to other post, and squeeze test set handle. If indicator lamp flashes, blasting cap is satisfactory. If it does not flash, cap is defective and should not be used.

d. When using blasting galvanometer:

(1) Check galvanometer as described in paragraph 4-13, if required.

(2) Remove shunt.

(3) Hold one cap lead wire to one post of galvanometer and touch other lead wire to other post.

(4) Galvanometer needle will deflect if cap is satisfactory.

e. Defective caps may be disposed of by placing with material to be detonated if earth covering is not required. Otherwise, dispose of caps in accordance with section VI.

f. Shunt lead wires of all caps immediately after testing. Wires will remain shunted until connection to firing circuit.

4-14A. Connecting Electric Blasting Caps to Circuit.

a. If two or more blasting caps are used, connect their leadwires into a parallel circuit described in paragraph 4-23 or a series circuit described in paragraph 4-22.

WARNING

- Firing wire will be shunted at initiating point prior to connection of blasting caps.
- Person making connection will work as far from blasting cap as cap leadwires will allow with back turned to cap to minimize injury in case of premature detonation.

b. Splice free cap leadwires to firing wires using procedures in paragraph 4-16.

c. Prime charge using procedures in paragraph 4-17.

d. Return to initiating point.

4-15. Circuit Testing. The firing circuit will be tested as follows (figure 4-6):

a. Ensure that all joints and bare sections are separated and placed out of contact with the ground and all other conductors.

b. Attach (or hold) one end of firing wire to one post of M51 test set or galvanometer and attach (or touch) other end to other post.

c. Circuit is complete if M51 test set flashes or if needle moves across scale. The amount of deflection of needle depends on length and type of firing wire and number of blasting caps in the firing circuit. If test indicates a break, repair firing wire.

4-16. CONNECTING/SPLICING ELECTRIC WIRES. Connecting/splicing may be accomplished by any one of the following methods:

NOTE

Other methods of splicing may be used as long as electrical continuity is maintained.

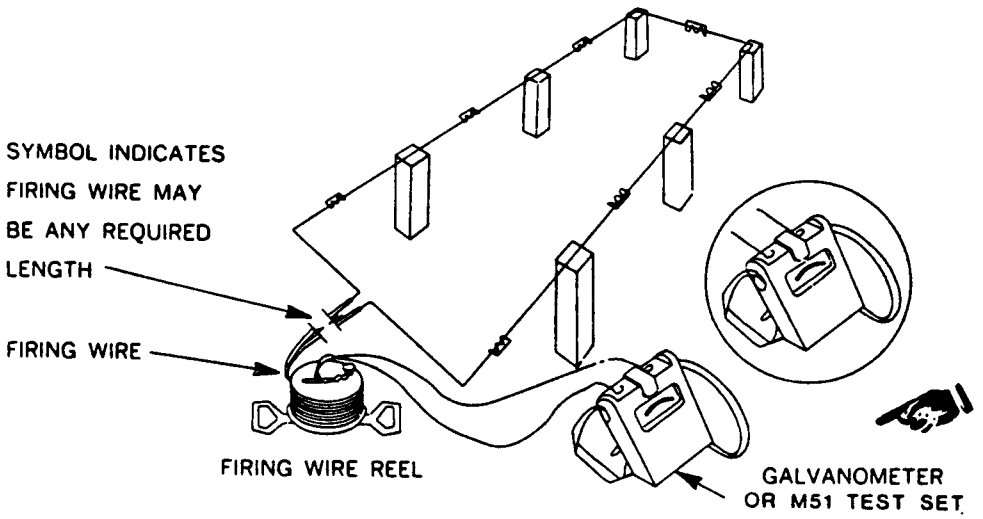


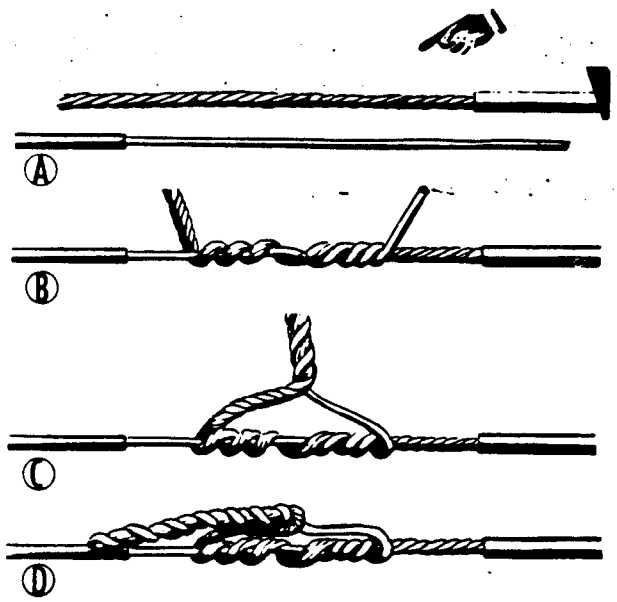
Figure 4-6. Testing Firing Circuit

a. Method 1 (figure 4-7).

(1) Point free ends in opposite directions (detail A), join with a few tight twists around each other, and bend remaining ends up, away from joint (see detail B).

(2) Twist these ends to form a pigtail (detail C), which is at right angles to connected wires.

(3) Push pigtail to one side to lie along one of the wires and tape splice to ensure complete insulation (see detail D).



A Stripping wires
B First step of splice
C Second step of splice
D Completed splice

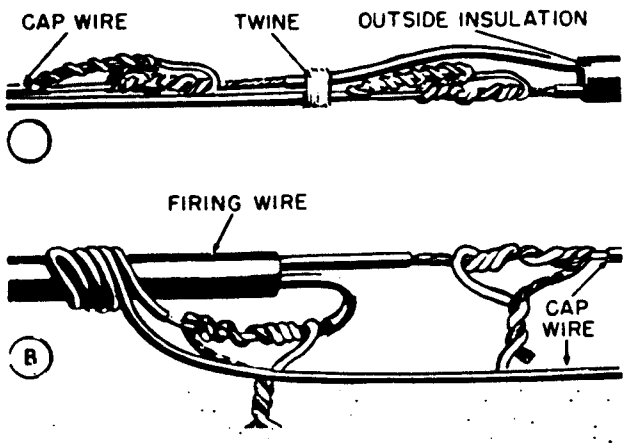
Figure 4-7. Wire Splicing

b. Method 2.

(1) Place the two wires to be connected, side by side, with free ends pointing in same direction and wind them together by twisting.

(2) Tape to ensure complete insulation.

c. Staggered Splices (figure 4-8).



A Staggered splice

B Separated splice

Figure 4-8. Splicing Two Pairs of Wires

d. Protection/Insulation of Splices. Protect all bare wire splices in wiring circuits to prevent their short-circuiting to ground or to each other. Whenever possible insulate them from ground or other conductors by wrapping them with friction tape or other electric insulating tape. Circuits, not taped or insulated, lying on moist ground must be supported on rocks, blocks or sticks so that only insulated portion of wires touch the ground.

WARNING

Never try to force a cap into cap well that is too small to admit the cap easily.

4-17. PRIMING THE CHARGE. Priming will be accomplished by one of the following methods, determined by the type of explosive used.

a. Charges having cap wells (threaded or unthreaded) may be primed as follows:

(1) Use of blasting cap with priming adapter. The cap lead wires are passed through the slot of the adapter (figure 4-9), and blasting cap is pulled into place in adapter. The cap and adapter are then inserted into cap well or the demolition charge and adapter is screwed into place.

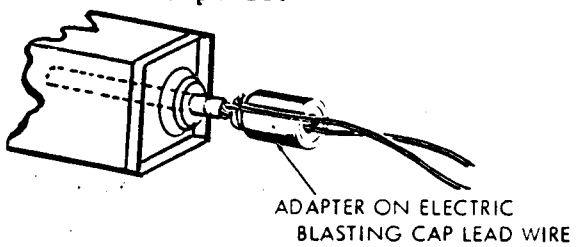


Figure 4-9. Priming Adapter

(2) Use of blasting cap without priming adapter. When priming adapters are not available or demolition charge does not have a threaded cap well, cap is inserted in well and cap wires are tied around the charge by two half hitches (figure 4-10). As an alternate method use tape to secure blasting cap to prevent blasting cap withdrawal.

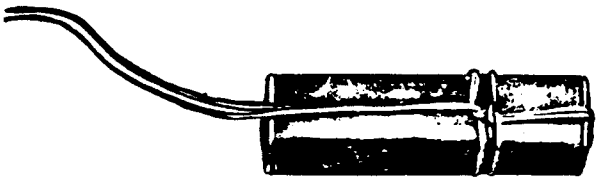


Figure 4-10. Two Half Hitches

b. M1 Chain Demolition Block. Tape an electric blasting cap to one of the free ends of the detonating cord chain. The explosive end of the cap will point toward the chain demolition block.

c. Plastic Explosives Composition C. Plastic explosive blocks not having cap wells will be primed by forming a cap well in the block using the pointed end of crimpers and inserting blasting cap into the formed cap wells.

d. MK7 Mod 7 Shaped Charge. The MK7 charge will be primed by inserting the blasting cap only slightly into the plastic explosive, with a mound of Composition C built up around the blasting cap to act as a booster. The cap should be placed in the approximate center of the charge length with its axis perpendicular to the explosive surface. A blasting cap holder may be used.

4-18. BLASTING MACHINE. The blasting machine will be test-operated, attached, and fired in accordance with the following:

a. Test operate the blasting machine by actuating several times with nothing attached to the terminals.

WARNING

Do not connect the blasting machine to the firing wires until all prefiring tests have been completed and until a signal is received from the supervisor that the area has been cleared of all personnel and equipment.

b. To prevent a misfire, ensure that the following have been accomplished prior to firing the blasting machine.

(1) All blasting caps are included in the firing circuit.

(2) All connections between blasting cap wires, connecting wires, and firing wires are properly made.

(3) Short circuits are avoided.

(4) Grounds are avoided.

(5) The number of blasting caps in any circuit does not exceed rated capacity of blasting machine being used.

c. Connect blasting machine by untwisting ends of firing wire and fastening them to the two posts of blasting machine.

NOTE

Do not attempt to fire a single electric blasting cap or several such caps, with less than minimum current required for firing. Failure to fire will probably result.

d. Fire blasting machine using one of the following methods:

(1) Ten-cap blasting machine:

(a) Insert hand through strap (if attached).

(b) Grasp bottom of blasting machine.

(c) Insert handle.

(d) Twist vigorously.

(2) Thirty cap, fifty cap, one hundred cap blasting machines:

(a) Set machine squarely on a solid, level place and lift plunger by handle to its maximum extension.

(b) With body well balanced, feet wide apart, and in a partially stooped position, grasp handle firmly with both hands and push plunger down with a quick, hard stroke.

(3) M-34 blasting machine:

(a) Release D-ring allowing handle activated plunger to spring out.

(b) Squeeze handle, actuating plunger several strokes (3 to 4), to allow gear driven alternator to feed electrical output into storage capacitors (an internal switching circuit discharges electrical energy into output terminals, and thus into firing circuit).

(c) When machine is successfully actuated, a momentary glow is normally visible through indicator lamp housing.

4-19. DUAL FIRING SYSTEMS.

4-20. Since failure of a firing circuit is generally the cause of a misfire, a dual firing system should be used whenever possible. It may consist of either two electric circuits or two nonelectric circuits. Circuits will be entirely independent of each other.

4-21. NONELECTRIC DUAL FIRING SYSTEM. This consists of two independent nonelectric systems for firing a single charge or set of charges. If two or more charges are to be fired simultaneously, two detonating cord ring mains (figure 4-11) are laid out, and a branch line from each charge is tied into each ring main. Figure 4-12 shows layout for nonelectric dual firing system for a single charge.

4-22. ELECTRIC DUAL FIRING SYSTEM. This dual firing system consists of two independent electric circuits, each with an electric blasting cap in each charge, so that firing of either circuit will detonate all charges (figure 4-13).

4-23. DUAL PRIMING SYSTEM. Dual priming should be used when dual firing systems are not used. Dual priming system consists of one electric firing wire with two electric blasting caps connected in parallel (figure 4-14).

4-24. USE OF DETONATING CORD.

4-25. Detonating cord is used to initiate explosive charges either singly or as a component of an electric or nonelectric firing system.

4-26. SAFETY PRECAUTIONS. In addition to the general safety requirements, the following precautions will be strictly adhered to when using detonating cord:

a. Avoid kinks and sharp bends.

b. Handle with special care to avoid breaking covering or explosive train.

c. Lay lines out as straight as possible but not stretched taut. Detonating cord forms a spiral as it is unwound from spool and must be straightened out carefully before firing to avoid misfire.

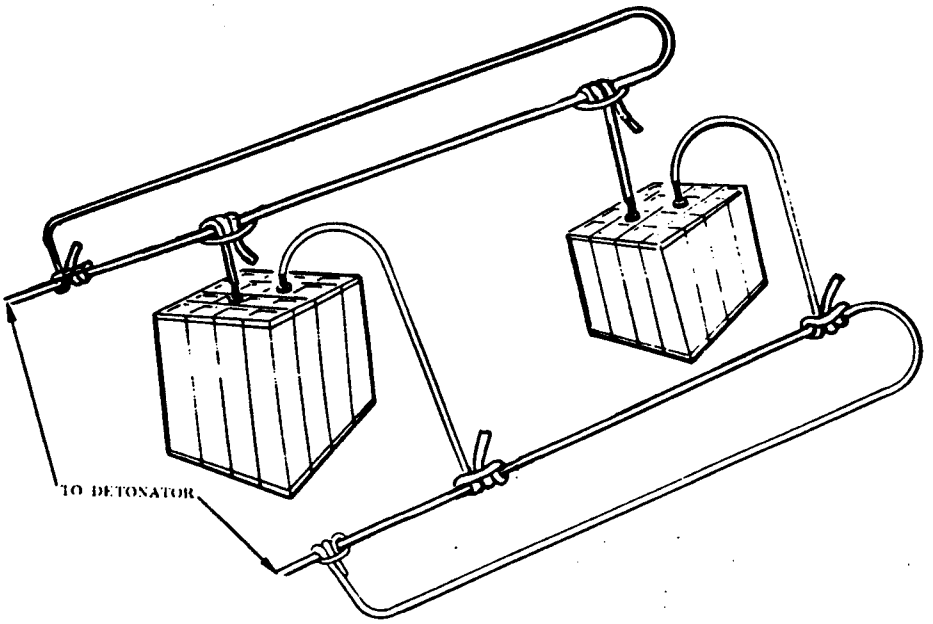


Figure 4-11. Nonelectric Dual Firing System Using Two Ring Mains

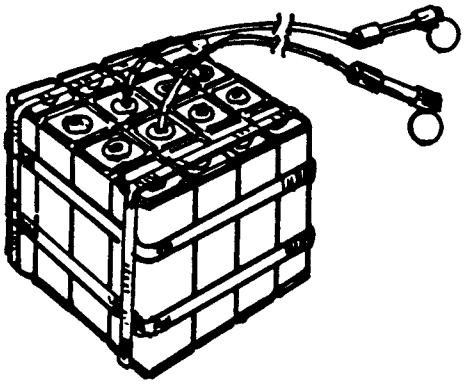


Figure 4-12. Nonelectric Dual Firing System for a Single Charge

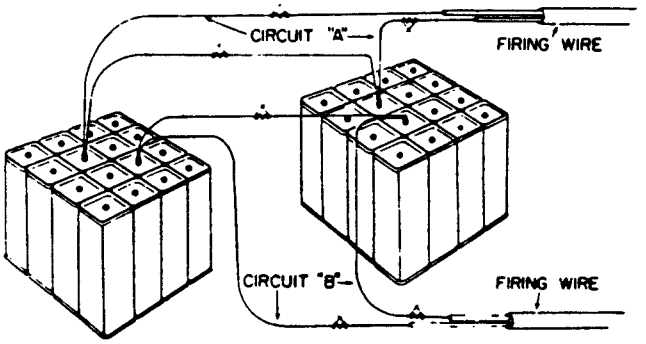


Figure 4-13. Electric Dual Firing System

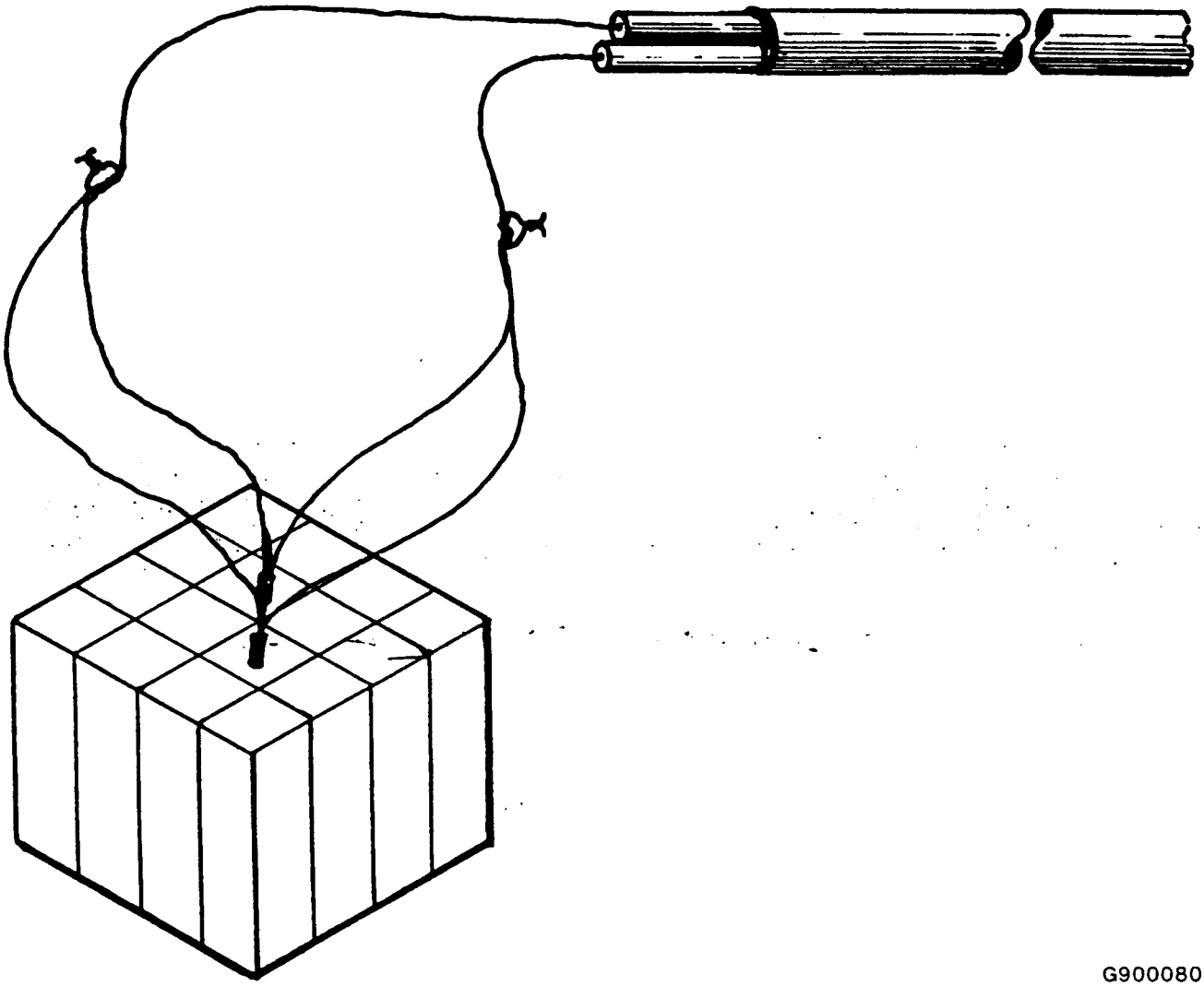


Figure 4-14. Dual Priming System

d. Do not remove any part of outer covering.

e. When making branch line connections, ensure that detonating cords touch only at connections.

f. Angle formed by branch line and cap end of main line will not be less than 90 degrees from direction in which blast is coming. At a smaller angle, branch line may be blown off main line without being detonated.

4-27. CAPPING DETONATING CORD. When capping detonating cord with nonelectric blasting cap, the following procedures will be used:

NOTE

Use a clean, sharp blade to cut detonating cord. If fuse cutter is used, edges will be clean and sharp.

a. Cut detonating cord (see figure 4-1) squarely across and long enough to ensure that sufficient length extends from pit/trench to allow connection to blasting cap.

NOTE

Omit the following step if a priming adapter is not being used.

b. Pass end of detonating cord through adapter.

WARNING

Do not tap blasting cap with any object or blow into cap. Caps are highly sensitive and detonation may occur.

c. Remove one blasting cap from cap box. Visually inspect open end of cap for dirt or foreign matter. If dirt or foreign matter is detected, hold open end of cap down and shake gently to remove object(s). Repeat visual inspection. If dirt or foreign matter remains, reject cap.

d. Hold detonating cord vertically at approximately arms length and eye level with square-cut end up.

WARNING

Never force detonating cord into blasting cap.

NOTE

If end of cord is flattened or is too large to enter blasting cap freely, recut detonating cord.

e. Slip blasting cap gently down over detonating cord so that explosive in cap is in contact with end of detonating cord.

WARNING

- Crimpers are equipped with fuse cutter; make certain cutting section is not used during crimping operation. A crimp too near explosive in blasting cap may cause detonation.
- When crimping a cap, do not point cap toward other personnel or explosives.

CAUTION

While grasping detonating cord, do not pull downward. Possible misfire could result.

f. Crimp blasting cap at a point 3 to 6 millimeters (1/8 to 1/4 inch) from open end using one of the methods below (see figure 4-3).

(1) Method 1:

(a) When detonating cord is properly seated within cap, grasp detonating cord just below cap with thumb and middle finger, placing forefinger on closed end of cap holding cap in position.

(b) Place crimpers around cap just above thumb and middle finger and start crimp.

(c) After crimp is started, continue to hold cap in crimpers and remove hand from cap and detonating cord (see figure 4-4).

(2) Method 2:

(a) When detonating cord is properly seated within cap, grasp detonating cord just below cap with thumb, third (ring), and little fingers, placing forefinger on one side of cap and middle finger on opposite side below explosive, holding cap in position.

(b) Place crimpers around cap Just above thumb and third (ring) finger and start crimp.

(c) After crimp is started, continue to hold cap in crimpers and remove hand from cap and detonating cord (see figure 4-4).

WARNING

Detonating cord will be held at arm's length at side of body with head turned away to avoid excessive body damage if detonation occurs.

g. Holding cap and detonating cord away from body (see figure 4-4), release grasp of detonating cord approximately three feet behind crimpers and complete crimping of blasting cap.

4-28. PRIMING THE CHARGE. Priming an explosive charge with detonating cord is accomplished by various methods. Those most frequently used are as follows:

WARNING

Composition C-4 blocks cannot be reliably detonated by wrapping with detonating cord. Use subparagraph 4-28.f when priming C-4.

NOTE

If priming adapters are not used or demolition block (charge) does not have a threaded cap well, use one of the following priming methods (figure 4-15).

a. Without Priming Adapter (Method 1).

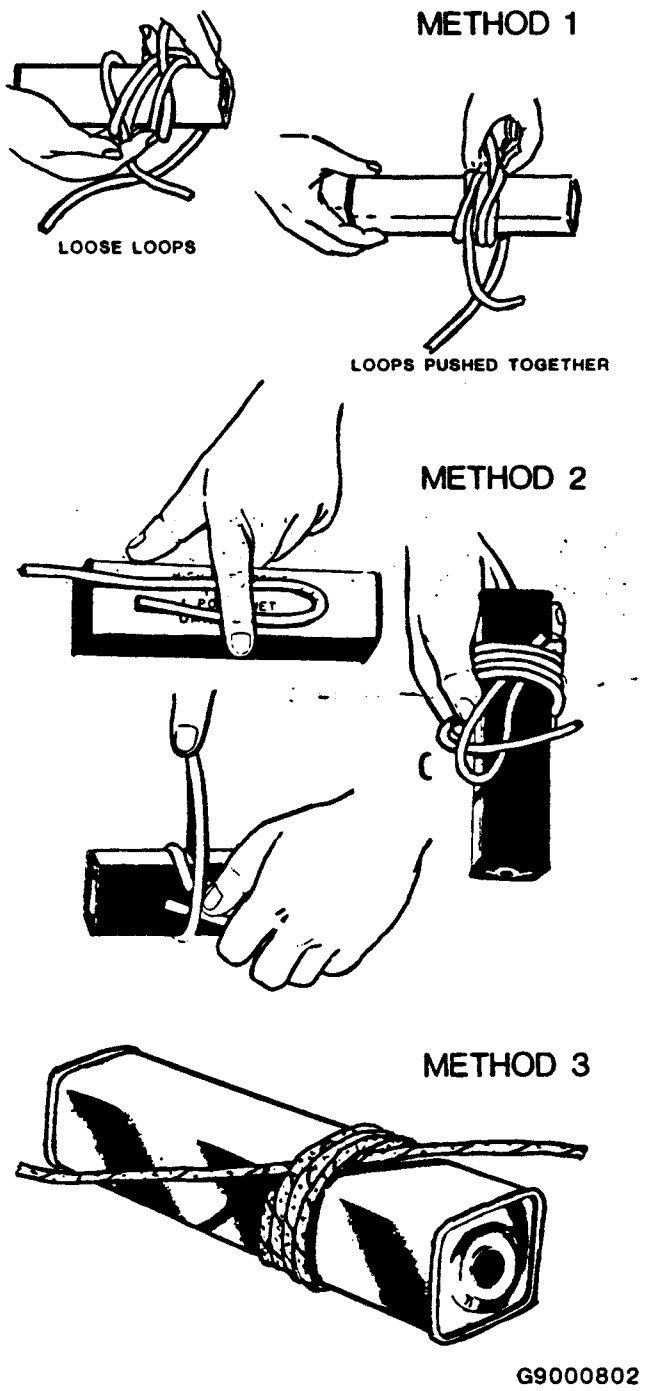


Figure 4-15. Detonating Cord Priming Methods

(1) Tie detonating cord securely around explosive by a clove hitch with two extra turns.

(2) Fit cord snugly against block and push loops close together.

b. Without Priming Adapter (Method 2).

(1) Place loop of detonating cord on block and wrap detonating cord four times around block.

(2) Draw free end of detonating cord through loop and pull until tight.

c. Without Priming Adapter (Method 3).

(1) Cut piece of detonating cord the desired length and lay one end at an angle across block.

(2) Wrap running end three times over this end and around block; at fourth turn slip running end under three wraps parallel with end laid at an angle and draw tight.

NOTE

The following method is recommended for charges placed above ground and will not be used when charges are buried.

d. With Priming Adapter.

(1) Cap detonating cord in accordance with paragraph 4-27.

(2) Pull cap into adapter and insert into cap well of explosive.

(3) Screw adapter in place.

e. Using M1 Chain Demolition Block. M1 chain demolition block has detonating cord running lengthwise through individual block. If an additional length of detonating cord is required, it is connected to detonating cord or chain with a clip or square knot. If cord running through blocks is cut too closely to end block to permit such a connection, extra length of detonating cord may be fastened by a clove hitch with two extra turns near end of block over booster.

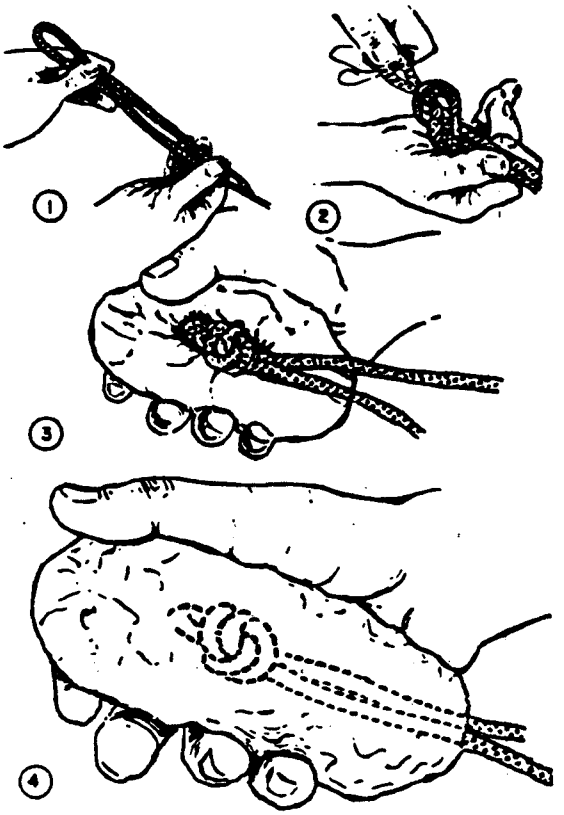
WARNING

Chewing or ingesting of C-4 or even breathing of vapors of burning C-4 may produce severe illness. Severe nausea and continuous violent convulsions may result from exposure which could cause permanent physical impairment.

f. Using Molded Composition C. Tie an overhand knot in detonating cord and mold Composition C around knot. Ensure knot is covered by at least 1.27 centimeters (1/2 inch) of a Composition C on all sides and that Composition C extends at least 2.54 centimeters (one inch) on each end (figure 4-16).

NOTE

Do not damage covering or explosive core. Such damage may cause a misfire.



1. LOOP
2. TYING KNOT
3. PLACING KNOT IN CHARGE
4. PRIMED CHARGE

G9000803

Figure 4-16. Priming Composition C with Detonating Cord

NOTE

- Lay out the lines of detonating cord as straight as possible but not stretched taut. Detonating cord forms a spiral as it is unwound from the spool and must be straightened out carefully before firing to avoid misfire.

- Avoid kinks and sharp bends in laying out detonating cord A misfire is probable in these cases.

- Ensure that branch lines touch one another or the main line only at the connections. Touching branch lines may be blown apart without detonation.

- The angle formed by branch line and cap end of main line will not be less than 90 degrees from the direction from which the blast is coming. At a smaller angle, branch line may be blown off main line without being detonated.

4-29. DETONATING CORD CONNECTIONS. Connections may be made using the M1 Clip, connector, knots, or electrical tape in accordance with the following procedures:

a. M1 Detonating Cord Clip (figure 4-17). The clip is used to connect detonating cord parallel or at right angles. The main line shall be inserted in the tongue of the clip. Branch lines are clipped into the U-shaped trough. The clip shall be bent against the cord holding the connection securely. Ends of cord being spliced shall be overlapped about 0.305 meters (12 inches). Secure with a clip at both ends of the overlap. When securing cord, the tongue of the clip is bent upward. This locks the clip in place.

b. Detonating Cord Connector (figure 4-18). The connector may be used to connect detonating cord end to end or at right angles. The connector may also be

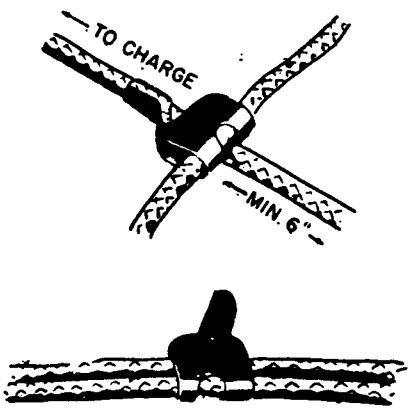


Figure 4-17. Detonating Cord Connections, M1 Detonating Cord Clip

used to fasten a blasting cap, either electric or nonelectric, to the detonating cord.

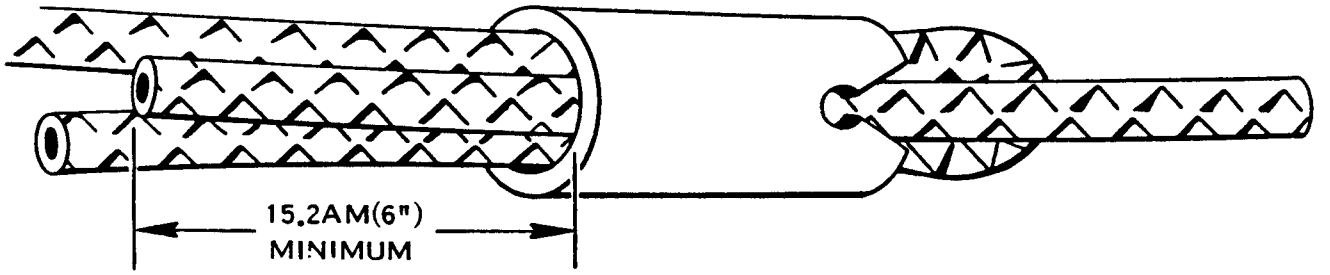
c. Wire Ties. Wire twist ties may be used to make parallel and right angle detonating cord connections and when attaching electric/nonelectric blasting caps into a firing circuit. See figure 4-18A.

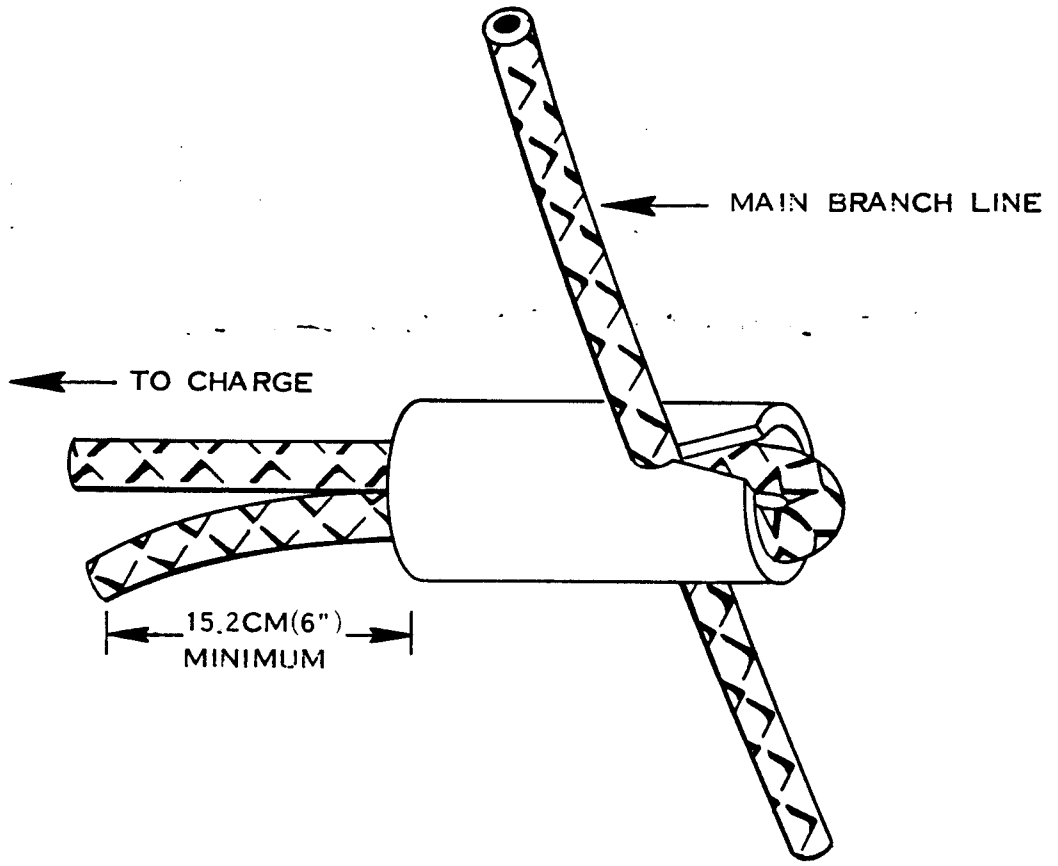
d. Square Knot (figure 4-19) is used to connect detonating cord end to end. The six inches of cord protects the active part of the cord from moisture. At low temperatures detonating cord becomes brittle. A Detonating cord clip or electrical tape should be used for cold weather.

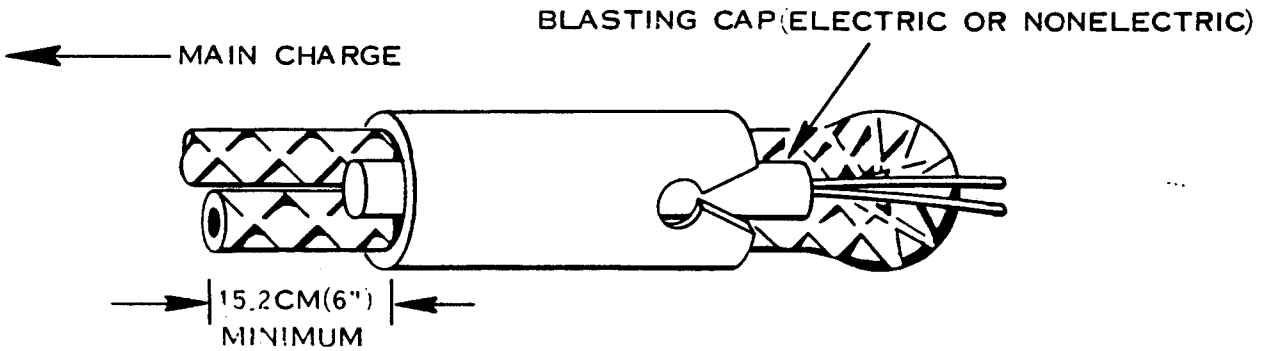
WARNING

The angle formed by branch line and cap end of main line will not be less than 90 degrees from the direction from which the blast is coming. At a smaller angle, branch line may be blown off main line without being detonated.

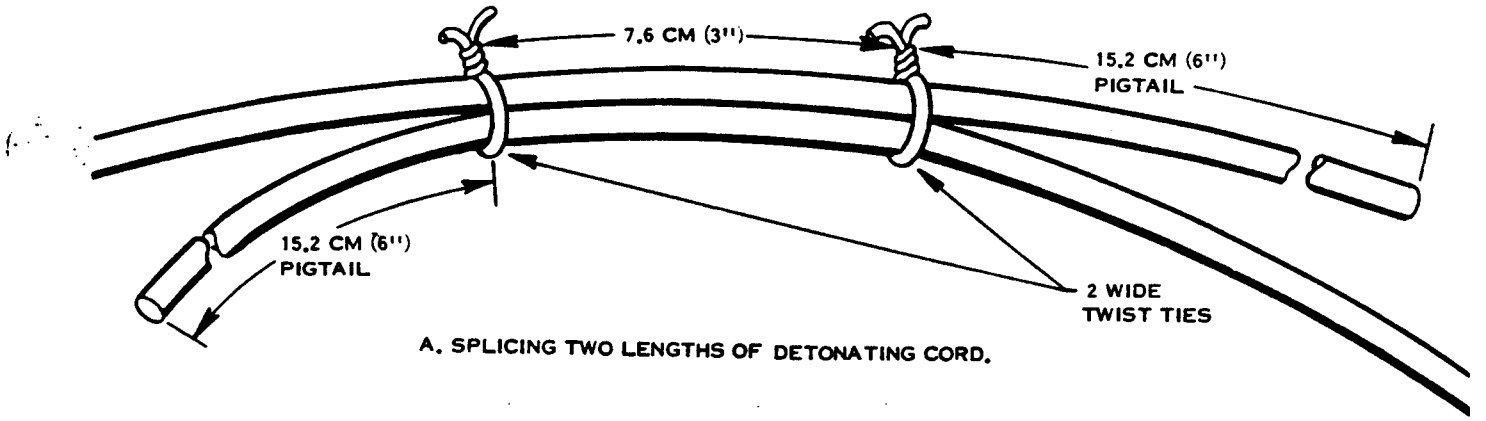
e. Girth Hitch (figure 4-20). A branch line may be fastened to a main line by means of a girth hitch. The loose end of the girth hitch will be on



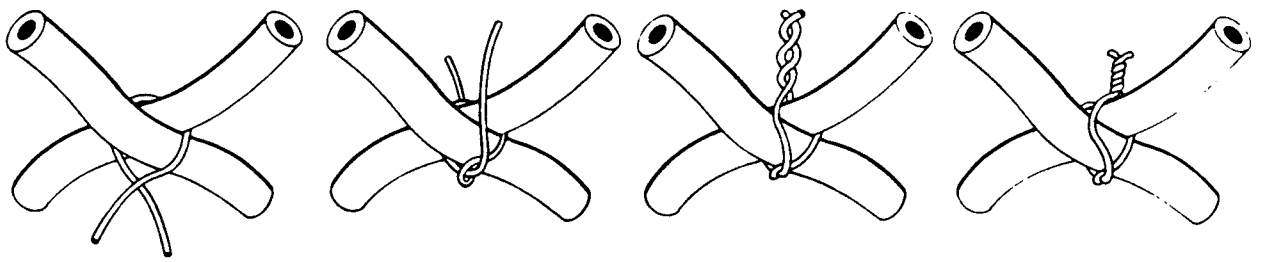




4-18. Detonating Cord Connector



A. SPLICING TWO LENGTHS OF DETONATING CORD.



B. RIGHT ANGLE CONNECTION.

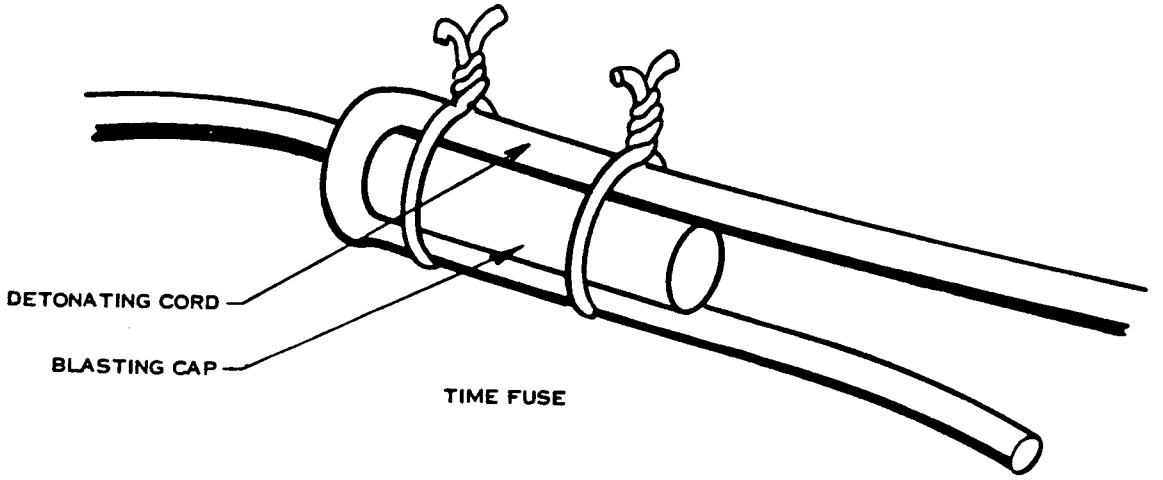


Figure 4-18A. Wire Twist Connections

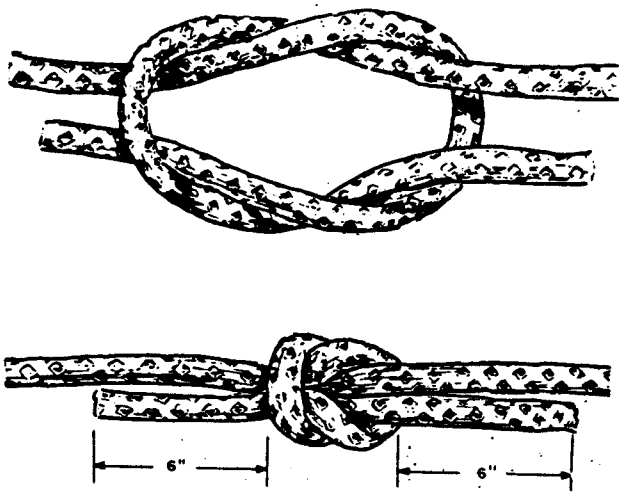


Figure 4-19. Detonating Cord Connections, Square Knot

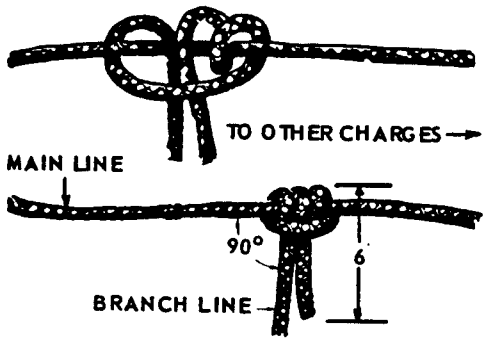


Figure 4-20. Detonating Cord Connection, Girth Hitch

the opposite side of branch line from initiating point on the main. A girth hitch will hold only on detonating cord that has a fabric covering and not on detonating cord that has a plastic covering or on reinforced detonating cord. On plastic covered detonating cord, the branch line connection knot is a girth hitch with an extra turn. At least 15.2 centimeters (six inches) of running end of branch line is left free beyond the tie. A ring main may be used in which the main line is brought back and attached to itself with a girth hitch. This makes detonation of all charges more positive because the detonating wave approaches branch lines from both directions and charges will be detonated even when there is a break in main line. Branch lines coming from a ring main will be at a 90 degree angle. Any number of branch lines may be connected to main line, but a branch line is never connected at a point where main line is spliced.

f. Electrical Tape (figure 4-21). Electrical tape may be used to splice two lengths of detonating cord together and for attaching branch lines to the main line. When splicing two cords together, overlap the two ends about 46 centimeters (18 inches) and tap the center 15.2 centimeters (six inches). Connect branch lines by taping about 15.2 centimeters (six inches) pigtail extending along the main line towards the source of initiation. Tape may also be used to connect an electric or nonelectric blasting cap to detonating cord as shown in figure 4-21.

4-30. IGNITION TRAINS.

4-31. An ignition train will be used in pit, trench or surface burning operations to allow personnel sufficient time to reach a safe distance prior to combustion of munitions being disposed of. A nonelectric ignition train consists of a fuse igniter, safety fuse and a small bag of smokeless powder. An electrical ignition train consists of a blasting machine, firing wire, flash-vented squib and a small bag of smokeless powder which may be purchased locally in one-pound

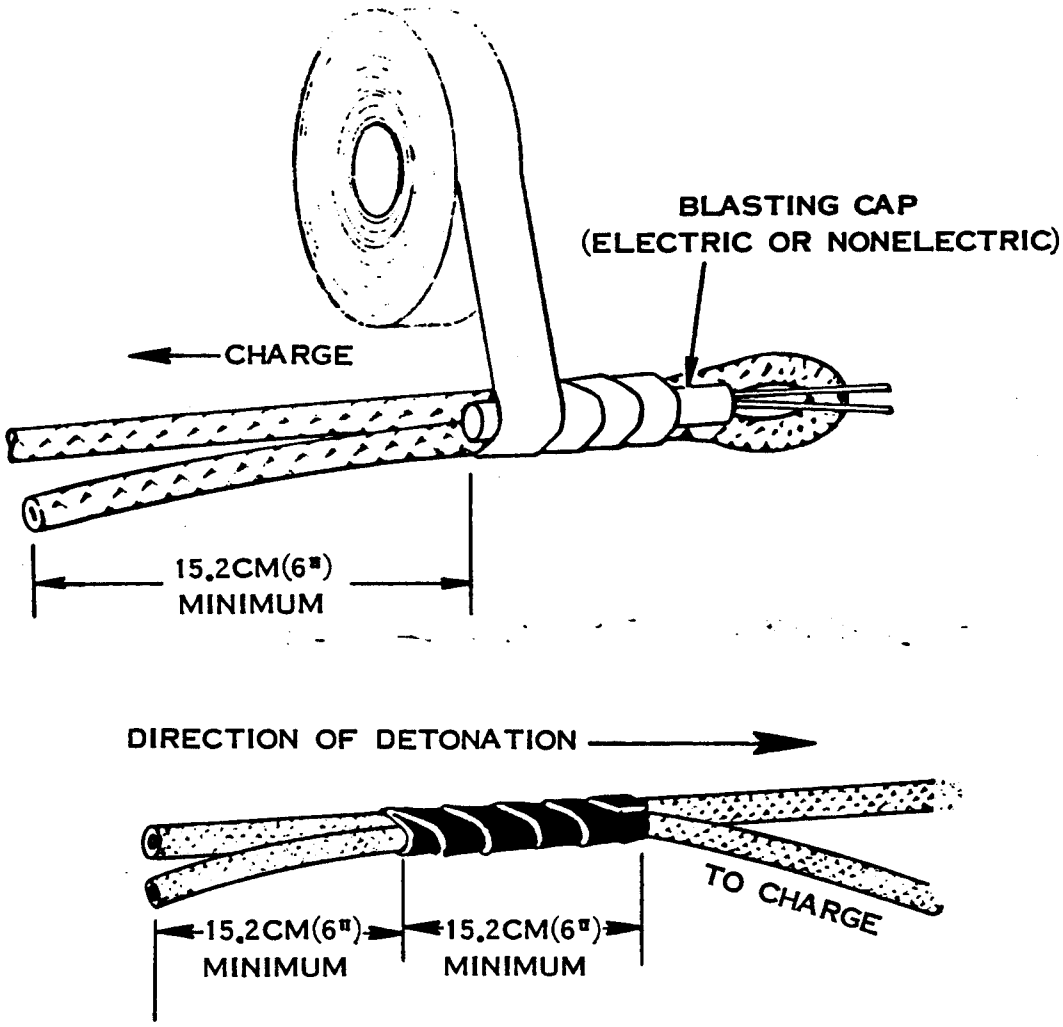


Figure 4-21. Electrical Tape Splicing

cans, NSN 1375-00-772-1369 or 1370. Official nomenclature is Powder, rifle, smokeless, Class 1.3C.

4-32. PREPARATION. Ignition trains will be prepared as follows:

a. Nonelectric.

NOTE

- Use a clean, sharp blade to cut fuse. If crimpers are used, edges will be clean and sharp.
- Cutting a 15.2 centimeters (six inch) length of fuse will reduce the possibility of misfire from a damp powder train.

(1) Cut and discard a 15.2 centimeters (six inch) length from free end of fuse (see figure 4-1).

WARNING

Test burning of safety fuse will be performed downwind at a minimum safety distance 7.6 meters (25 feet) from blasting caps or other explosives.

NOTE

All fuse in the same roll should burn at the same rate, although rate of burning may vary from approximately 30 to 45 seconds per foot in different rolls. M700 fuse burns at a constant rate of 40 seconds per foot.

(2) Cut off 30.5 centimeters (one foot) of fuse and check burning rate.

(3) Figure length of fuse necessary to allow personnel to reach a safe distance at determined burning rate per foot.

(4) Cut necessary length of fuse squarely across. A minimum of 1.8 meter (six feet) will be used.

(5) Attach M60 fuse igniter to one end of fuse as follows:

(a) Unscrew fuse holder cap two or three turns.

(b) Press shipping plug into igniter to release split collet, and rotate plug as it is removed.

(c) Insert end of fuse in place of plug until fuse rests against primer hose.

(d) Tighten cap sufficiently to hold fuse in place, thus waterproofing joint.

WARNING

Disassembly of munitions items to obtain propellant is unauthorized.

(6) Split other end of safety fuse and insert into a small plastic bag of smokeless powder, approximately one ounce (figure 4-22).

(7) Secure bag to safety fuse with tape.

(8) Insert plastic bag of propellant into combustible material.

(9) Ignite safety fuse as follows:

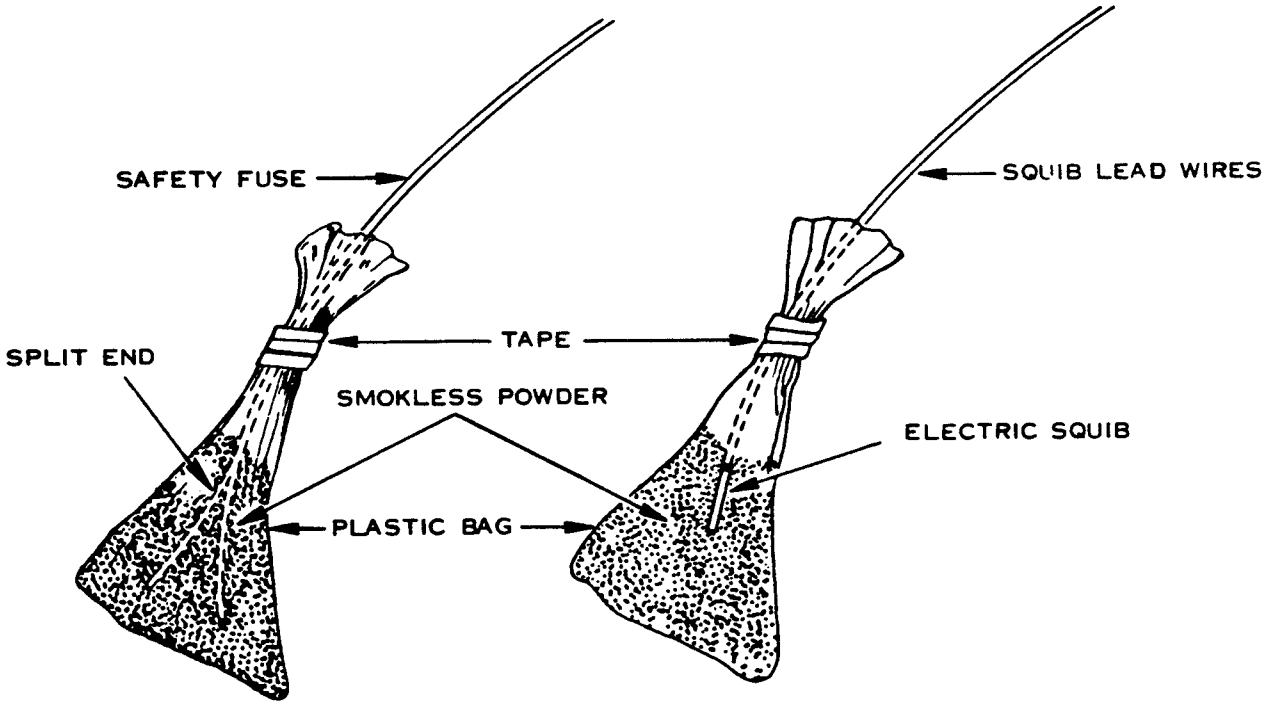


Figure 4-22. Plastic Bag of Smokeless Powder

NOTE

- Fuse igniters may be replaced without disassembling ignition train.
- If M60 igniter fails to function, it can be reset quickly without disassembly by pushing plunger all the way in and firing as before. If igniter still fails to function, replace with serviceable igniter.

(a) Remove safety pin.

(b) Push plunger all the way in.

(c) Turn release ring 1/4 turn and pull.

(d) Note time of ignition.

(e) Retire to safe distance and figure expected time of ignition.

b. Electric.

NOTE

- When preparing and using an electric ignition train, all applicable safety precautions in paragraph 4-11 will be observed.
- Squibs and firing wire (circuits) will be tested prior to preparation of ignition train in the same manner as blasting caps, firing wire, and circuits in accordance with paragraphs 4-11 through 4-16.

(1) Attach M1 flash-vented squib lead wires to firing wire.

(2) Secure bag to squib by taping top of bag to squib lead wires.

(3) Insert bag into combustible material in pit.

(4) Attach firing wire to blasting machine and operate in accordance with paragraph 4-18.

c. Preparation of Standard Incendiary Hand Grenade for Electric or Nonelectric Initiation.

WARNING

Do not remove safety pin.

NOTE

Only one thermite grenade will be initiated per blasting cap.

(1) Electric Initiation. Prepare grenade after completion of required steps in paragraphs 4-11 through 4-16 as follows:

(a) Raise safety lever and place an electric blasting cap between grenade body and safety lever.

(b) Tape blasting cap in place, place on charge, and retire to safe area to initiate.

(2) Nonelectric Initiation. Prepare the grenade after completion of required steps in paragraphs 4-3 through 4-6 as follows:

(a) Raise the safety lever and place the cap of a previously prepared, nonelectric firing assembly (safety fuse) between the grenade body and safety lever.

(b) Tape blasting cap in place.

(c) Place on charge.

(d) Prepare to initiate and retire to safe area.

4-33. MISFIRES.

WARNING

- A misfire will not be approached for a minimum of 30 minutes after expected detonation/ignition.
- Misfire will always be approached by one man with a second man acting as safety backup.

4-34. Working on or near a misfire is the most hazardous of all disposal operations. A misfire may occur in spite of all precautions. Personnel will not approach the misfire for a minimum of 30 minutes after expected detonation/ignition. One qualified person will examine the misfire, with a second qualified person acting as a safety backup. The safety backup will stay clear of the immediate danger area He will utilize natural barriers or

obstructions for protection, but remain in a position to observe the actions of the person examining the misfire. He will be prepared to go to the aid of the person examining the misfire if an accident should occur.

4-35. PREVENTION OF NONELECTRIC MISFIRES. All safety precautions will be followed; and in addition, the probability of a misfire may be reduced if the following procedures are adhered to:

a. Prepare all initiators properly, ensuring use of proper blasting cap.

b. Place charges carefully.

c. Place initiator properly.

d. Perform any tamping operation with care to avoid damage to an otherwise carefully prepared charge.

e. Ensure safety fuse is ignited prior to withdrawing.

f. Fire charge according to proper technique.

g. If possible, a dual firing system will be used. If both initiators are properly assembled, the possibility of a misfire is reduced to a minimum.

4-36. HANDLING NONELECTRIC MISFIRES. Nonelectric misfires will be handled as follows:

a. Nonelectric Blasting Cap Failure:

(1) Allow a minimum of 30 minutes after expected detonation before starting investigation.

(2) Insert a new fused blasting cap into the charge. Do not disturb old blasting cap.

b. Detonating Cord Failure:

(1) Allow a minimum of 30 minutes after expected detonation before starting investigation.

(2) Attach a new initiating blasting cap to detonating cord, taking care to fasten properly.

(3) If detonating cord still fails, remove earth cover and reprime explosive charge with new detonating cord. Failed detonating cord will be disposed of by placing in the pit. Replace earth cover.

c. Explosive Charge Failure: After determining in accordance with paragraphs a and b above that blasting cap and/or detonating cord are satisfactory, replace failed explosive charge as follows:

(1) Allow a minimum of 30 minutes after expected detonation before starting investigation.

(2) Replace charge as follows:

(a) If failed charge has not been buried, place a new charge (counter-charge) at the side of the failed charge and prime as before.

(b) If a failed charge has been covered with 61 centimeters (two feet) of earth, carefully remove approximately 30 centimeters (one foot) of earth. Carefully remove the rest of the earth cover down to charge using a wooden tool/stick or hands. Place a new charge of 2-1/2 pounds of Comp C, or equivalent, over failed charge. Prime as before. Replace earth cover.

4-37. PREVENTION OF ELECTRIC MISFIRES. All safety precautions will be followed; and in addition, the probability of a misfire may be reduced if the following procedures are adhered to:

a. Ensure use of proper blasting cap.

b. All blasting caps are included in firing circuit.

c. All connections between blasting cap wires, connecting wires and firing wires are properly made.

d. Short circuits and grounds are avoided.

e. The number of blasting caps in any circuit does not exceed the rated capacity of blasting machine being used.

f. All charges should be dual primed.

4-38. HANDLING ELECTRIC MISFIRES. Electric misfires will be handled as follows:

a. Check firing wire connections to blasting machine terminals to be sure that contacts are good.

b. Make two or three more attempts to fire the circuits.

c. Disconnect blasting machine and check firing wire for continuity.

d. Shunt firing wire.

e. Allow a minimum of 30 minutes before starting investigation.

f. Check entire circuit, including firing wire, for breaks and short circuits.

g. Disconnect the old blasting cap wires and shunt. Do not disturb blasting cap.

h. Connect the wires of the new blasting cap to the firing circuit and reprime.

SECTION V

TREATMENT OF CHEMICAL AGENT CASUALTIES

5-1. GENERAL.

5-2. This section covers chemical agents contained in munitions covered in this manual. Description, required safety equipment, symptoms and self aid are listed for each agent. Decontamination procedures are listed in T.O. 11C15-1-3.

5-3. LACRIMATORS (TEAR AGENTS).

5-4. DESCRIPTION. CA (brombenzylcyanide), CS (O-chlorobenzalmalononitrile) and CN (Chloroacetonephenone) are described as follows:

a. CA is usually a liquid boiling at 468°F (242°C) and solidifying at 77°F (25°C). The odor of CA has been likened to sour fruit.

b. CN is a white crystalline solid which can also be used in liquid form in appropriate solvents. CN melts at 129°F (54°C). The odor of CN has been likened to apple blossums. A CN cloud is bluish white at time of release.

c. CS is a white crystalline solid and is stable under ordinary storage conditions. CS has a pungent pepper-like odor and the cloud is white at time of release. CS melts at 194°F (90°C). CS may also be used in liquid form, in an appropriate solvent. CS is faster acting, more potent and less toxic than CN and its effectiveness is approximately ten times that of CN.

5-5. SAFETY MEASURES. Protective face masks, M-17 or equal, will be worn when disposing of CS and CN munitions. Ordinary field clothing will be secured at the neck, wrists and ankles, and rubber gloves should be worn when disposing of CS. Following exposure, clothing will be inspected for residue, and if found, will be changed to prevent contamination of other personnel.

5-6. SYMPTONS. Symptoms following exposure to CA, CS and CN are as follows:

a. CA and CN. The vapors and smokes of these agents cause basically the same reaction as does CS. However, their toxicity is generally higher and their effectiveness as lacrimators is generally lower than CS. Higher concentrations of CN and CA are required to produce an equivalent effect to that of CS. Recovery is quick if exposure is brief but in prolonged exposures mild inflammation of the eyes and some light intolerance may occur. Do not rub eyes. There may also be a moderate sense of irritation in the nose and a stinging sensation of the skin, particularly in hot weather. Droplets of liquid or solid in the eyes are corrosive and produce burns resembling those of strong acids. The liquid on the skin or clothing may cause superficial skin burns near body folds, especially in hot weather and sometimes may cause vomiting.

b. CS. CS may cause irritation and stinging of the skin, especially the face, neck, ears and body folds. Stinging may occur even at moderately low contaminations. Higher concentration may cause dermatitis and rarely, blisters on the same body areas. Stinging normally subsides after 6 to 10 minutes, even with continued exposure. An increase in stinging may be noted when individual is removed to fresh air. Even

if this occurs, permanent damage is very unlikely.

5-7. SELF AID. Put on the protective mask, M-17 or equal, clear it, and keep the eyes open as much as possible. When vision clears, carry on with duties. When it is safe to do so, remove the mask and blot away tears, but do not rub eyes. If liquid or solid agent has entered the eye (rare occurrence), try forcibly to hold eye open and flush with water from the canteen. The chest symptoms after exposure to CS can be relieved merely by talking. Personnel with eye or skin burns should report to a medical service as soon as possible.

5-8. STERNUTATORS (VOMITING AGENTS).

5-9. DESCRIPTION. The principle agents in this group are DA (dephinylchlorarsine) DM, adamsite (diphenylaminochloroarsine) and DC (dyphanylcyanoarsine). DM (adamsite) is the most commonly used sternutator. DM, DA and DC are all crystalline solids which are usually dispersed by heat as fine particulate smokes. When concentrated, DC is canary yellow; DA and DC smokes are white. All are colorless when diluted with air. Low concentrations of these agents are effective and may not be detectable at the time of exposure.

5-10. SAFETY MEASURES. Protective face masks, M-17 or equal, will be worn when disposing of DM munitions.

5-11. SYMPTOMS. Vomiting agents produce a feeling of pain and a sense of fullness in the nose and sinuses, accompanied by a severe headache, intense burning in the throat, tightness and pain in the chest and irritation of the eyes. Coughing is uncontrollable, sneezing violent and persistent. Nasal secretion is greatly increased, and quantities of ropy saliva flow from the mouth. Nausea and vomiting are prominent. Mental depression may occur during the progression of symptoms. Mild symptoms, caused by exposure to very low concentrations, resemble those of a severe cold. The onset of symptoms may be delayed for several minutes after initial exposure, especially with DM, and effective exposure may occur before the presence of smoke is suspected. If the mask is then put on, symptoms will increase for several minutes in spite of adequate protection. As a consequence, the victim may believe his mask is ineffective and by removing it cause himself to be further exposed.

5-12. SELF-AID. Put on the mask and wear it in spite of coughing, sneezing, salivation and nausea. Lift the mask from the face briefly if necessary to permit vomiting or to drain saliva from the facepiece. Carry on duties as vigorously as possible; this will help to lessen and shorten the symptoms. Medical treatment is seldom necessary since recovery is usually prompt.

5-13. SCREENING SMOKES.

5-14. DESCRIPTION. FM (Titanium tetrachloride), FS (Sulfur Trioxidechlorosulfonic acid), HC (mixture of grained aluminum, zincoxide and hexachloroethane), WP (White Phosphorus) and PWP (Plasticized White Phosphorus) are described as follows:

a. FM is a corrosive liquid which decomposes on contact with moist air, yielding a dense white smoke. It is so unpleasant to breathe that dangerous exposure is unlikely.

b. FS is a heavy, strongly acid liquid which, when dispersed in the air, absorbs moisture to form a dense, white fog consisting of small droplets of hydrochloric and sulfuric acids.

c. On burning HC mixture, zinc chloride is produced, which rapidly absorbs moisture from the air to form

grayish white smoke. The more humid the air, the more dense the smoke.

d. WP and PWP are pale yellow waxy solids that inflame spontaneously on contact with air to give a hot, dense, white smoke. WP and PWP are very brittle and the exploding of the munition in which they are used causes them to be broken into smoke particles which burn very rapidly.

5-15. SAFETY PRECAUTIONS. FM and FS are highly corrosive in liquid form and protective clothing and face masks will be worn when the liquid is handled. Zinc chloride formed by burning HC mixture is corrosive to respiratory tract. Protective face masks, M-17 or equal, will be worn when disposing HC munitions. Solid WP is an incendiary and will be handled carefully.

5-16. SYMPTOMS. Symptoms caused by exposure to FM, FS, HC, WP and PWP are as follows:

a. FM smoke irritates the nose and throat but dangerous exposure is unlikely. Spray droplets can be injurious to the eyes but seldom cause corneal injury. Liquid splashes can cause acid burns of the skin and severe eye injury including corneal erosion.

b. FS smoke exposure can cause inflammation of the eyes, respiratory tract and skin. The symptoms are usually limited to a prickling sensation of the skin, but exposure to heavy concentrations or long exposures to ordinary field concentrations, may result in severe irritation of the eyes, skin and respiratory tract. Mild cough and soreness in the chest and moderate irritation of the exposed skin are occasionally seen. Splashes of liquid in the eye are extremely painful and cause mineral acid burns with corneal erosions. Liquid FS on the skin may cause painful acid burns.

c. Active exposure to high concentrations of HC smoke produces an immediate sense of suffocation and irritation of the nose and throat, coughing and choking. Prolonged exposure to low concentrations causes an elevation of temperature.

d. WP and PWP smoke in field concentrations may cause some temporary irritation of the eyes, nose, and throat. Vapors of WP and PWP (no vapors in smoke) are very poisonous and can produce bone decay. Burning particles of WP and PWP can produce extensive burns which heal very slowly.

5-17. SELF-AID. Self aid for FM, FS, WP and PWP is as follows:

a. FM. Wear the mask in all concentrations of FM smoke. Wash any liquid splash off the skin with water. If spray or liquid splash has entered the eye, forcibly open the eye and flush with water from the canteen, then report for medical attention when the situation permits.

b. FS. Wear the mask in all concentrations of FS smoke. If the skin is splashed with liquid FS, wash off at once with water. If liquid FS gets into the eye, forcibly hold the eye open and flush with water from the canteen, and report for medical treatment as soon as the situation permits.

c. WP/PWP. Self-aid is as follows:

(1) Wear protective mask in all concentrations of WP or PWP smoke that cause any cough or irritation of eyes, nose, or throat.

(2) If burning particles strike and stick to clothing, take off contaminated clothing quickly before phosphorus burns through the skin.

(3) If burning particles strike the skin, smother the flame with water, wet cloth or wet sand. Keep the phosphorus covered with wet material to exclude air until the particles can be removed. WP/PWP continues to burn unless deprived of oxygen.

(4) Try to remove the particles with a knife, stick or other available object. It may be possible to remove some particles by rubbing with a wet cloth.

(5) If the eyes become contaminated, flush the eyes immediately with water. Tilt the head to one side, pull the eyelids apart with the fingers and pour water slowly into the eye so that it will run off the side of the face to avoid spreading of contamination.

(6) Report to the medical services as soon as possible.

SECTION VI

MUNITION DISPOSAL PROCEDURES

6-1. GENERAL.

6-2. Air Force munitions categories are listed in alphabetical order in tables 6-1 through 6-13. Missile explosive components are covered in section VII, rockets and motors in section VIII and aircraft egress items in section IX. Reference is made in the tables to pit/trench burning and furnace burning as covered in section III, paragraphs 3-6 and 3-9; otherwise, disposal procedures are listed herein and the appropriate paragraph number given in DISPOSAL PARAGRAPH columns. Tables are as follows:

TABLE	TITLE
6-1	Aircraft External Source Release and Related Devices
6-2	20MM, 30MM, and 40MM Artillery and Small Arms
6-3	Bombs
6-4	CBU/CDU Dispensers, Bomb Units and Submunitions
6-5	Chemical Munitions
6-6	Demolition Charges
6-7	Fuzes
6-8	Grenades
6-9	Land Mines
6-10	Miscellaneous Explosive Devices and Accessory Elements
6-11	Priming and Initiation Devices
6-12	Pyrotechnics
6-13	Explosives Components, Guided Bombs

Table 6-1. Aircraft External Stores Release and Related Devices (Sheet 1 of 4)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
1	Bolt, Explosive*	MK1 MOD 0 P/N 12S1133-3 P/N 7359-1 P/N 2504-13	3-6, 6-7, 3-9
2	Capsule, Powder Booster, Reefing Line	P/N 54A6171	3-6, 3-9
3	Cartridges Delay	T-47 M252 P/N 215911 P/N C-116-10 CCU-17B CCU-18B CCU-19B	3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9
	NOTE Completely expended engine starter cartridges may be buried under at least 61 centimeters (two feet) of earth in a land fill area.		
	Engine Starter	MXU-4/A MXU-4A/A MXU-129/A	3-6, 6-48 3-6, 6-48 3-6, 6-48
	Explosive Bolt, LAU-6/A*	P/N 3602079-5	3-6, 6-7
	Explosive Bolt*	P/N 811193	3-6, 6-7
	Explosive Bolt*	P/N 804354	3-6, 6-7
	Fire Extinguisher	P/N 841155 P/N 873364	3-6, 3-9 3-6, 3-9

Table 6-1. Aircraft External Stores Release and Related Devices (Sheet 2 of 4)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
3 (Cont)	Engine Starter (Cont)	P/N 87400	3-6, 3-9
		P/N 876561	3-6, 3-9
		P/N 893616	3-6, 3-9
		P/N 895408	3-6, 3-9
		P/N 895409	3-6, 3-9
		P/N 931182	3-6, 3-9
		P/N 30900400	3-6, 3-9
		P/N 30903802	3-6, 3-9
	Impulse	ARD 446-1	3-6, 3-9
		ARD 863-1	3-6, 3-9
		CCU-1/B	3-6, 3-9
		CCU-16/B	3-6, 3-9
		CCU-43/B	3-6, 3-9
		CCU-44/B	3-6, 3-9
		CCU-45B	3-6, 3-9
		4A2685-1 and -3	3-6, 3-9
		SK15365-2	3-6, 3-9
		SK15365-9	3-6, 3-9
		12S-1085-3	3-6, 3-9
		25-322-1439-1	3-6, 3-9
		25-322-1439-2	3-6, 3-9
		3215	3-6, 3-9
		M3A1	3-6, 3-9
		M57	3-6, 3-9
		MK1 Mod 3	3-6, 3-9
		MK2 Mod 1	3-6, 3-9
		MK8 Mod 0	3-6, 3-9
		MK9 Mod 0	3-6, 3-9
		MK13 Mod 0	3-6, 3-9
		MK17 Mod 0	3-6, 3-9
		MK17 Mod 1	3-6, 3-9
		MK19 Mod 0	3-6, 3-9
		MK23 Mod 0	3-6, 3-9
		MK24 Mod 0	3-6, 3-9
		MK49 Mod 0	3-6, 3-9
		MK67 Mod 0	3-6, 3-9
		MK103 Mod 0	3-6, 3-9
		MK104 Mod 0	3-6, 3-9
		MK124 Mod 0	3-6, 3-9
		MK125 Mod 0	3-6, 3-9
		842556	3-6, 3-9
		67D7263	3-6, 3-9
		P/N 18230 (SK15383-7)	3-6, 3-9
	Parachute Deployment Kit, Bomb Ejection	CCU-11B	3-6
		CCU-106/B	3-6, 3-9
		CCU-107/B	3-6, 3-9
		MLU-8/B*	3-6, 3-9
		MLU-9/B	3-6
		MLU-11/C*	3-6, 3-9
		MLU-12/C	3-6
	Powder Actuated Tool	All calibers and colors	3-6, 3-9

Table 6-1. Aircraft External Stores Release and Related Devices (Sheet 3 of 4)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • Ensure that safety pins are installed in cutters being disposed of. If safety pins are not installed, the cutter is hazardous and will be disposed of by EOD. • Reefing line cutters will not be handled by lanyards.		
4	Cutter, Reefing Line, Powder Activated*	M9 503-003 M21 M22 011020-1 1SE152-4	3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9
5	Detonator, Explosive*	SKD 538-76	3-6, 6-7
6	Detonator Assembly*	272B30 40080-19 272B304 0150-29 0150-49	3-6, 6-7 3-6, 6-7 3-6, 6-7 3-6, 6-7 3-6, 6-7
7	Detonator, Electric*	MK83 Mod 0	3-6, 6-7
8	Explosive Kit, Parachute Release*	MLU-5/B MLU-7/B MLU-14/B MLU-15/B	3-6 3-6 Refer to table 9-1 (items 20 and 23) Refer to table 9-1 (items 20 and 23)
9	Primacord Assembly	59B46004	3-6, 6-7
10	Gas Generator	P/N 842077 P/N 840278 P/N 807991 P/N 4A2680-3 P/N 12S1080-3 P/N S04-111121-11	3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9 3-6, 3-9
11	Igniter, Propellant	P/N 212358	3-6, 3-9
12	Jettison Set	P/N 813024 P/N 813026 P/N 813029	3-6 3-6 3-6
13	Kit, Firing	P/N 608-001	3-6

Table 6-1. Aircraft External Stores Release and Related Devices (Sheet 4 of 4)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
14	Latch Assembly, Fuselage Pylon*	P/N 785638-1 P/N 795070-1	3-6, 6-7 3-6, 6-7
15	Thruster, Cartridge Actuated*	P/N 4426-1	3-6, 3-9
	WARNING • Electric squibs have a very low "no-fire" rating and are, therefore, very sensitive to induced electrical current. Care will be exercised to prevent excessive exposure. • Electric squib lead wires will be shunted/shorted before handling.		
16	Squibs:*		
	Electric	S75	3-6, 3-9
		S68-2	3-6, 3-9
		S68-4	3-6, 3-9
		S68-6	3-6, 3-9
		S68-8	3-6, 3-9
		S68-10	3-6, 3-9
		S68-12	3-6, 3-9
		S68-15	3-6, 3-9
		M75A	3-6, 3-9
		56B9267	3-6, 3-9
	Fire Extinguisher	P/N 4199	3-6, 3-9
		P/N 13083-5	3-6, 3-9
		P/N 13083-45	3-6, 3-9
		P/N 805300-2	3-6, 3-9
		P/N 805300-24	3-6, 3-9
		P/N 30903823	3-6, 3-9
	Release	P/N 1344	3-6, 3-9
	(Squib) and Plate Assembly	P/N 359428	3-6, 3-9

*Static fire. Preferable method when only a few items are to be disposed of.

Table 6-2. 20MM, 30MM, and 40MM Ammunition, Artillery, and Small Arms (Sheet 1 of 3)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • When pit burning (paragraph 3-6) is authorized for any item listed in this table, pit will be covered with pierced steel planking or a suitable substitute such as two or three thicknesses of heavy-duty "anchor"or security fencing staked to ground, steel rod pallets or steel grating. • Projectile for 20MM dummy cartridge, M51A1E1, M51E3, and M51A1B1, is spot welded or silver soldered into cartridge case and case is filled with LAMINAC. If attempts are made to burn cartridge without venting case or separating case and projectile, case will rupture violently. If projectile and cases are not separated, a minimum of two each 0.63 centimeters (1/4 inch) holes will be drilled completely through case 90 degrees from each other. • 20MM cartridge primers are extremely sensitive to static electricity and/or induced electrical current.		
1	20MM, DUMMY	M51A1B1	3-6, 3-9
		M51A1E1	3-6, 3-9
		M51A2	3-6, 3-9
		M51E3	3-6, 3-9
		M254	3-6
	TP		3-6, 3-9
	AP-I		3-6, 3-9
	AP-T		3-6, 3-9
	TPT		3-6, 3-9
	HPT		3-6, 3-9
	HEI		6-8
	HEIT		6-8
	HEIT-SD		6-8
	Incendiary		6-8
2	30MM, HEI, PGU-13/B	P/N 28108350 and 7400592	6-9
	TP, PGU-15/B	P/N 28108351 and 7400601	3-6, 6-8
	Dummy, PGU-16/B	P/N 7400705	Pending
	API, PGU-14/B	P/N 28110198 and 7400807	

Table 6-2. 20MM, 30MM, and 40MM Ammunition, Artillery, and Small Arms (Sheet 2 of 3)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
			NOTE Because of the depleted uranium penetrator of 30MM API type ammunition, no field disposal is authorized. When sufficient quantity for shipment has been amassed (36 rounds in M548 container), return to Seneca or Sierra Army Depot for disposal, whichever is geographically closest. Seneca Army Depot FY1533 Romulus, NY 14544 Sierra Army Depot FY1348 Herlong, CA 96113
3	40MM, Cartridge Grenade,	M407A1	3-6, 6-9
	Practice	M385	3-6, 6-9
	HE, w/fuze, PD551	M406	6-8, 6-9
	HE, w/fuze, PD M533	M384	6-8, 6-9
	HEDP	M433	6-8, 6-9
	White Star, Parachute	M583	3-6, 6-9
	Signal Star, Cluster	M585	3-6, 6-9
		M781	3-6, 3-9
	Multiple Projectile	MXM576E1	3-6, 6-9
	Red Smoke	XM675	3-6, 6-9
4	66MM, Rocket, (HEAT) (LAW)	M72 Series	6-11
5	Mortar		
	60MM, HE, w/fuze	M49A2	6-10
	81MM, TP w/fuze, PD525	M43A1	6-10
	81MM, Illuminating	M301A2	6-10
	w/fuze, Time, M84	M301A3	6-10
	81MM, HE, w/fuze, PD M524A5	M374	6-10
6	Artillery		
	40MM, HE-P, w/fuze, PD MK27	MK2	6-9
	40MM, HEI-P, w/liner, PD MK27	MK2	6-9
	40MM, HEI-T, NSD w/fuze, PD MK27	MK11, Mod 2	6-9

Pages 6-6A and 6-6B are deleted in their entirety.

Table 6-2. 20MM, 30MM, and 40MM Ammunition, Artillery, and Small Arms (Sheet 3 of 3)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
6 (Cont)	90MM, Canister, APERS, (Recoilless)	XM590E1	6-10
	90MM, HEAT (Recoilless) w/fuze, PIBD, M530A1	X371E1	6-10
	90MM, Practice, w/fuze, PIBD, M530	M371	6-10
	105MM, HE, w/fuze, PD M557	M1	6-10
	HE-P, w/fuze, BD, M62A1	M327	6-10
	NOTE		
	Many military small arms may be used in commercial firearms. Precautions will be taken to prevent pilferage.		
7	Small Arms:	All	
	Cartridge, 10-Gauge, Blank		3-6, 3-9
	Cartridge, 12-Gauge, Shotgun		3-6, 3-9
	Cartridge, .410-gauge, Shotgun		3-6, 3-9
	Cartridge, Caliber .22		3-6, 3-9
	Cartridge, Caliber .22, Hornet		3-6, 3-9
	Cartridge, 5.56MM		3-6, 3-9
	Cartridge, 7.62MM		3-6, 3-9
	Cartridge, Caliber .30, Carbine		3-6, 3-9
	Cartridge, Caliber .30		3-6, 3-9
	Cartridge, Grenade, 5.56MM		3-6, 3-9
	Cartridge, 9MM		3-6, 3-9
	Cartridge, Caliber .38, Special		3-6, 3-9
	Cartridge, Caliber .45		3-6, 3-9
	Cartridge, Caliber .45, Blank Line Throwing		3-6, 3-9
	Cartridge, Caliber .50		3-6, 3-9
	Cartridge, Caliber .50, Blank		3-6, 3-9
	Cartridge, Powder Actuated		3-6, 3-9

Table 6-3. Bombs

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • Fragmentation and missile distance will be carefully considered. • Use frontal and overhead personnel protection where required. • Eyes will be protected when disposing of flash bombs.		
1	Fragmentation	M41A1	6-12
		M82	6-12
		M88	6-12
		M81	6-12
2	Photoflash	M120	6-12
		M122	6-12
3	General Purpose	M30	6-12, 6-13
		M57 or MK 81	6-12, 6-13
		M64 or MK 82	6-12, 6-13
		M117	6-12, 6-13
		M65 or MK 83	6-12, 6-13
		M66 or MK 84	6-12, 6-13
		M118	6-12, 6-13
4	Demolition	BLU-31/B	6-12, 6-13
5	Semi-Armor Piercing	M59	6-12, 6-13
6	Penetrator	BLU-107/B	6-50
7	Penetrator	BLU-109/B	6-12, 6-13

Table 6-4. CBU Dispensers

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • If a misfire occurs when disposing of any CBU listed, the 30-minute wait period after expected detonation will be observed prior to entering the area unless additional wait period has been specified for a particular CBU. • Unexploded bomblets or explosive components will be disposed of in place by EOD. **NOTE** Multiple CBUs and/or components, each primed as specified in the specific procedure, may be disposed of at one time. The number will be determined by the range safety distance.		
1	CBU-1 Series (SUU-7 dispenser, BLU-4 bombs)		6-14
2	CBU-2 Series (SUU-7 dispenser, BLU-3 bombs)		6-14
3	CBU-3 Series (SUU-10 dispenser, BLU-7 bombs)		6-15
4	CBU-7 Series (SUU-13 dispenser, tube assemblies, BLU-18/B bombs per tube)		6-21
5	CBU-12 Series (SUU-7 dispenser, BLU-17/B bombs) WP		6-16
6	CBU-14 Series (SUU-14 dispenser, BLU-3/B bombs)		6-17
7	CBU-22 Series (SUU-14 dispenser, BLU-17/B bombs) WP		6-17
8	CBU-24 (SUU-30 dispenser, BLU-26/B bombs)		6-18
9	CBU-25 (SUU-14 dispenser, BLU-24 series bombs)		6-19
10	CBU-29 (SUU-30 dispenser, BLU-36/B bombs)		6-18
11	CBU-30 (SUU-13 dispenser, CDU-12/B bomb clusters)		Pending
12	CBU-33 (KMU-339 with BLU-45/B)		6-23

Table 6-4. CBU Dispensers (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
13	CBU-38 (SUU-13 dispenser, BLU-49 series bombs)		6-22
14	CBU-46 Series (SUU-7 dispenser, BLU-66 bombs)		6-14
15	CBU-49 (SUU-30 dispenser, BLU-59/B bombs)		6-18
16	CBU-52 (SUU-30 dispenser, BLU-61 bombs)		6-18
17	CBU-58 (SUU-30 dispenser, BLU-63/B bombs)		6-18
18	CBU-70 (SUU-30B/B dispenser, BLU-85/B bombs)		6-20
19	CBU-71 (SUU-30H/B dispenser, BLU-86 bombs)		6-18
20	MK20 Series (Rockeye) (MK-7 dispenser, MK 118 bombs)		6-24
21	CBU-75A/B (SUU-54A/B dispenser, BLU-86/B and BLU-63/B bomblets)		6-25

Table 6-5. Chemical Munitions

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING Heavy volume of smoke is produced by disposal of chemical munitions. Care will be taken to prevent smoke clouds from obscuring highways, airports, railroads, surrounding communities or animal grazing areas. **NOTE** Multiple chemical munitions may be disposed of one at a time. The number will be determined by range safety distance.		
1	Incendiary Bombs (small)	AN-M50A2 AN-M50XA1 AN-M50XA3 M70 M126	3-6 3-6 3-6 3-6 3-6
	WARNING Do not decluster the M31 or M35 cluster. Clusters contain M74 bombs. M74 bomb fuzes are very sensitive and will arm during declustering. **NOTE** The M36 cluster may be disposed of as a complete unit or may be declustered by removing hinge pins and disposing of individual bombs by burning in a pit.		
2	Incendiary Bomb Cluster	M31 (M74 bombs) M35 (M74 bombs) M36 (M126 bombs)	3-5, 3-6 3-5, 3-6 3-5, 3-6
	NOTE Mixture/fillers may be placed directly in the pit or punctured/opened cans may be placed in the pit.		
3	Incendiary Mixtures and Fire Bomb Fillers: PTI M2 and M3 Thickener Napalm B Incendiary Oil		 3-6 3-6 3-6 3-6

Table 6-5. Chemical Munitions (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	NOTE Bomb cases will be punctured with pick or pointed bar prior to burning.		
4	Fire Bombs		
	BLU-1 Series		3-5, 6-26
	BLU-10 Series		3-5, 6-26
	BLU-11/B		3-5, 6-26
	BLU-23/B		3-5, 6-26
	BLU-27 Series		3-5, 6-26
	BLU-32 Series		3-5, 6-26
	M116 Series		3-5, 6-26
5	PWP Bomb		
	M47		6-27
	WARNING • HC smoke is toxic and can cause poisoning in heavy concentrations. Even low concentrations can be dangerous in closed places. Protective masks will be available. • Necessary precautions will be taken to ensure that HC munitions are kept dry. Spontaneous ignition may occur if HC becomes wet.		
6	Smoke (HC) Grenades:		
	Hand	AN-M8	3-5, 3-6
	Colored Smoke, Hand	M18	3-5, 3-6
	Colored Smoke, Rifle	M22 and M23 Series	3-5, 3-6
7	Smoke (HC) Pots		
	M1 Series		3-5
	M5		3-5
8	Bulk HC Mix		3-5
	NOTE • See section V for field aid treatment of WP burns. • Do not cover pit, when burning WP munitions.		
9	WP Grenades		
	Hand	M15	3-6, 6-28
	Rifle	M19A1	3-6, 6-28
	Hand and Rifle	M34	3-6, 6-28
10	WP Igniter, M23		3-6, 6-28

Table 6-5. Chemical Munitions (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
11	WP Rocket Warhead, M156		3-6, 6-28

WARNING

Some M25 series hand grenades contain DM which causes a fallout of arsenical compounds and a residue of arsenic compounds at the burning site. Disposal sites will be remote from drinking water sources and animal grazing areas.

NOTE

See section V for field aid treatment of CN or DM exposure.

12	Riot Control Items Except CS/CN Pellets		3-5, 3-6
	Hand Grenade (CN) w/fuze	M7 Series	3-5, 3-6
	Hand Grenade (CN/DM)	M25 Series	3-6
	Cartridge, Chemical Mace	MK 5	3-5, 3-6
	Cartridge, Chemical Mace	MK 4	3-5, 3-6
	Cartridge, Chemical Mace	MK 3	3-5, 3-6
	Mini-Streamer, Chemical Mace	No. 282	3-5, 3-6

WARNING

Disposal of CS by burning will produce hydrogen cyanide (HCN). For protection against HCN when burning is authorized, the M9/M9A1 gas mask with the M11 canister, NSN 4240-00-112-9365, or the M17/M17A1 gas mask with the M13A2 filter (green connectors), NSN 4240-00-165-5026, will be used.

NOTE

Burning of munitions listed in item 13 which contain CS and/or CR is prohibited within all fifty United States. All unserviceable items will be shipped to:

Pine Bluff Arsenal
MF FY1345
AF Munitions Storage Account
Pine Bluff, AR 71601

NOTE

- Units located outside the fifty states will dispose of CS items in accordance with paragraph 3-5/3-6.
- See section V for field aid treatment of CS exposure.

Table 6-5. Chemical Munitions (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
13	Riot Control Items Containing CS or CR:		
	40MM Riot Control (CS)	XM674	
	Hand Grenade (CS) w/fuze	M7 Series	
	Hand Grenade (CS) w/fuze	M25 Series	
	CS capsule		
	Disperser, Riot Control	M36	
	WARNING When burning items containing thermite, the pit will be ignited remotely because thermite may explode.		
14	Cryptographic Equipment Destroyer:		
	M1A1	3-6	
	M1A2		3-6
	M2A1		3-6
15	Fire Starter:		
	M1		3-6
	M2		3-6
16	81MM Mortar, WP w/fuze, PD M524A5	M375	6-28
17	105MM, WP w/fuze, PD M557	M60 Series	6-28
18	Emergency Incendiary Document Destroyer (Sodium Nitrate)	M3	3-6
19	Incendiary File Destroyer (Sodium Nitrate)	ARC-M4	3-6
20	Grenade, Hand Incendiary (TH-3)	AN-M14	3-6
21	Flame Thrower Ignition Units		3-6
22	Igniter Cylinder, M1		3-6
23	Incendiary Rocket, M1		3-6

Table 6-6. Demolition Charges

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	NOTE If demolition charges listed in this table are serviceable excess or have been coded unserviceable for reasons other than actual deterioration of the charge, charges will be used in disposal of other munitions.		
1	Assembly:		
	M37		6-29
	M183		6-29
2	Black Powder		6-30
3	Bulk Smokeless Powder		6-31
4	Block, TNT,		6-29
	M2 (Tetrytol)		6-29
	M118 (PETN or RDX)		6-29
5	Chain, M1 (Tetrytol)		6-29
6	Cratering (Ammonium Nitrate)		6-29
7	Dynamite		6-32
8	Shaped:		
	M2 Series		6-29
	M3 Series		6-29
	MK 45 Mod 0 (RDX)		6-29
9	C-4:		
	M5A1		6-29
	M112		6-29
10	Flexible Linear Shaper Charge (FLSC)		6-29
11	Explosive Cutter:		
	MK23		6-29
	(E-XROD) MK24		6-29

Table 6-7. Fuzes

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • Special precautions will be taken to ensure positive identification of the fuzes to be destroyed. This is necessary to prevent the possibility of burning fuzes that will detonate en masse. • If a barrier bag containing unserviceable fuze(s) is ballooned from generated gas, carefully puncture bag with a pointed wooden stick. Hold bag open until sound of escaping gas stops.		
1	Nonexplosive:		
	NOTE • Nonexplosive fuzes contain a mild liquid chemical vial. Vials will be ruptured prior to certification. • Nonexplosive fuzes listed will be demilitarized in accordance with ADR instructions. Inspect, ensure vials are ruptured, and certify in accordance with T.O. 11A-1-60.		
	M123 Series M124 Series M125 Series M132 Series M133 Series M134 Series		
2	With Primer Detonators:		
	NOTE • Primer detonators will be removed, if applicable, prior to demilitarization. Primer detonators will be disposed of by burning in a pit (paragraph 3-6). • Listed fuzes, after removal of primer detonators, will be demilitarized in accordance with ADR instruction. Inspect and certify in accordance with T.O. 11A-1-60.		
	M100 Series M101 Series M102 Series M112 Series M113 Series M115 Series M116 Series		

Table 6-7. Fuzes (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	With Primer Detonators (Cont)		
	M160 Series		
	M161 Series		
	M162 Series		
	M172 Series		
	M175 Series		
	M176 Series		
	M177 Series		
	M184 Series		
	M185 Series		
	M189 Series		
	M190 Series		
	M191 Series		
	M192 Series		
	M193 Series		
3	With Boosters:		
	FMU-54 Series		6-33
	FMU-112 Series		6-33
	FMU-124 Series		6-33
	FMU-139 Series		6-33
	FMU-143 Series		6-33
	M103 Series		6-33
	M110 Series		6-33
	M111 Series		6-33
	M120 Series		6-33
	M138 Series		6-33
	M139 Series		6-33
	M140 Series		6-33
	M145 Series		6-33
	M146 Series		6-33
	M152		6-33
	M153		6-33
	M155		6-33
	M158		6-33
	M163		6-33
	M164		6-33
	M165		6-33
	M166		6-33
	M168		6-33
	M170		6-33
	M173		6-33
	M188		6-33
	M198		6-33
	M403		6-33
	M532		6-33
	M904 Series		6-33
	M907 Series		6-33
	M908		6-33
	MK 149		6-33
	MK 339		6-33

Table 6-7. Fuzes (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
4	Without Boosters:		
	FMU-7 Series		6-33, 3-6
	FMU-8/B		6-33, 3-6
	FMU-26 Series		6-33, 3-6
	FMU-30/B		6-33, 3-6
	FMU-35/B		6-33, 3-6
	FMU-56 Series		6-33, 3-6
	FMU-72/B		6-33, 3-6
	FMU-110 Series		6-33, 3-6
	FMU-113 Series		6-33, 3-6
	FMU-81		6-33, 3-6
	FMU-105/B		6-33, 3-6
	M6 Series		6-33, 3-6
	M7A1		6-33, 3-6
	M10 Series		6-33, 3-6
	M12		6-33, 3-6
	M126A1		6-33, 3-6
	M147 Series		6-33, 3-6
	M151		6-33, 3-6
	M157		6-33, 3-6
	M159		6-33, 3-6
	M205 Series		6-33, 3-6
	M206 Series		6-33, 3-6
	M603		6-33, 3-6
	M604		6-33, 3-6
	M905		6-33, 3-6
	M906		6-33, 3-6
	M909		6-33, 3-6
	M990		6-33, 3-6
	MK 30 Mod 0		6-33, 3-6
	MK 32 Mod 0		6-33, 3-6

Table 6-8. Grenades, Hand, Fragmentation, Practice and Rifle

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	NOTE See table 6-5 for disposal of chemical grenades.		
1	Practice, Hand, w/fuze	M21 M30	3-6 3-6
2	HEAT, Rifle	M31	6-34
3	Fragmentation, Hand, w/fuze		6-35

Table 6-9. Land Mines

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
1	Antipersonnel, NM (Tetryl)	M14	6-36
2	Antipersonnel (C-4)	M18A1	6-37

Table 6-10. Miscellaneous Explosive Devices and Accessory Elements

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
1	Adapter Booster	(All)	6-38
2	Boosters	(All)	6-38
3	Boosters	(All)	6-38
4	Igniters, HCD 1.1	(All)	6-38
5	Igniter, MXU-35A		6-38

Table 6-10. Miscellaneous Explosive Devices and Accessory Elements (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	NOTE When burning items 6 through 13 in a pit, the pit will be covered with pierced steel planking or suitable substitute such as two or three thicknesses of heavy duty "Anchor" or security fencing staked to the ground, steel rod pallets or steel grating.		
6	Primer Detonators	(All)	3-6, 6-7
7	Delay Elements	(All)	3-6, 6-7
8	Explosive Detents	(All)	3-6, 3-7
9	Igniters, HCD 1.2 and 1.3 (Except MXU-35/A)	(All)	3-6
10	Model T Spotting Charge		3-6
11	Mine Spotting Charge		3-6
12	Spotting Charges (Except Model T and Mine)		6-39
13	Tail, Delay and Ejection Assembly (PWN-8B, -10A, -10B, -11A, and -12A)	Part No. 65C57262 Part No. 71D48901 Part No. 71D48894 Part No. 70H2221	3-6 3-6 3-6 3-6
14	Fuze Extension, M1A1	Part No. 9231708-7	6-47
15	Timer Actuator DTU-31/B	Part No. 8819404	35, 3-6

Table 6-11. Priming and Initiating Devices

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • Primers and initiating devices will be stacked in piles separated from each other and other explosives. • Blasting caps and percussion primers are very sensitive to heat, shock, and/or friction. Care will be exercised when handling these items. • Electric blasting caps and squibs have a very low "no-fire" rating and therefore are very sensitive to induced electrical current. Care will be exercised when handling to prevent excessive exposure to this condition. • Lead wires will be shorted/shunted before handling caps or squibs. • Time blasting fuse igniters, detonators, and firing devices will not be lifted out or handled by the pull rings or safety pin cords. Safety pins will not be removed on items to be burned/detonated.		
	NOTE • If devices listed in this table are serviceable excess or have been coded unserviceable for reasons other than actual deterioration, devices will be used in disposal of other munitions. • Firing devices with percussion primers removed will be certified in accordance with T.O. 11A-1-60.		
1	Blasting Cap, Electric/Non-electric	J2 M6 J1 M7	6-7 6-7 6-7 6-7
	NOTE Detonating cord will be unrolled before burning.		
2	Cord, Detonating		3-6, 6-40
3	Destructor, Explosive	M10 M19	3-6, 6-40 3-6, 6-40
4	Firing Device, Pressure	M1 M1A1	3-6, 6-40 3-6, 6-40
5	Firing Device, Pull	M1	3-6, 6-40
6	Firing Device, Pull Release	M3	3-6, 6-40

Table 6-11. Priming and Initiating Devices (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
7	Firing Device, Pressure, Release	M1 M5	3-6, 6-40 3-6, 6-40
8	Fuse, Time Blasting		3-6
9	Igniter, Time Blasting Fuse	M2 M60	3-6, 6-40 3-6, 6-40
10	Primer, Percussion	M2 Commercial No. 3	3-6, 6-40 3-6, 6-40
11	Squib, Electric	M1	3-6, 6-40
12	Firing Device, Multipurpose	M142	3-6, 6-40

Table 6-12. Pyrotechnics

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING When disposing of pyrotechnics, personnel will look away from the flash as the brilliance may be injurious to the eyes. **NOTE** • Pyrotechnics being disposed of by burning should be held to the smaller quantities to avoid detonation of the mass due to confinement. • Pit will be covered with pierced steel planking or suitable substitute such as two or three thicknesses of heavy duty "Anchor" or security fencing staked to the ground, steel rod pallets or steel grating.		
	WARNING The MK 4 Mod 3 Signal Cartridge contains red phosphorus. Use sufficient combustible material and fuel oil in the burn pit to ensure a hot, long-burning fire to completely consume the flares to preclude a white phosphorus residue.		
1	Cartridge, Signal, Practice Bomb	MK 4, Mod 3	6-41, 3-6
2	Cartridge, Photoflash	M185 M112 Series M123 Series	6-41 6-41 6-41
	WARNING Charges contain FM (Titanium Tetrachloride). Breathing its concentrated vapors is harmful to the respiratory system and exposure will damage eye tissue.		

Table 6-12. Pyrotechnics (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	WARNING • Personnel and equipment will not be allowed in an area 152.5 meters (500 feet) downwind and 61 meters (200 feet) either side of the disposal area during disposal operations. • The following protective equipment will be readily available for all personnel. The protective mask will be worn when smoke is present and the gloves will be worn when handling leaking or contaminated munitions. 1. Protective mask (M17A1 or equivalent). 2. Butyl rubber gloves. 3. Container of water (for personal use). • Charges will be handled carefully to avoid damage to seals. Damaged seals can allow leakage of the liquid which is highly corrosive to personnel and equipment. **NOTE** Personnel exposed to FM will accomplish self-aid in accordance with procedures includes in section V.		
3	Charge		
	CXU-1/B	Part No. 4374366-1	3-6
	CXU-2/B	Part No. 4374363-1	3-6
	CXU-3/B	Part No. 1302A5100	3-6
4	Countermeasures Chaff Cartridge and Package	RR-136/AL	3-6
		RR-141/AL	3-6
		RR-170/AL	3-6
		RR-180/AL	3-6
		MJU-6/B	6-42
5	Countermeasures Flare Package (IR)	RR-119/AL	3-6
6	Fire Starter		3-6
	WARNING The fuze blocks for the MK 6, MK 24, and MK 45 flares contain fiberglass which crystalizes when burned. Use gloves to prevent contamination of the skin during police-up operations. If skin becomes contaminated, wash thoroughly with water.		

Table 6-12. Pyrotechnics (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
7	Flare, Aircraft, Parachute	LUU-2 Series	3-5, 3-6, 6-49
		LUU-4	3-5, 3-6, 6-49
		M8A1	3-5, 3-6
		M9A1	3-5, 3-6
		MK 6, Mod 6	3-6
		MK 24	3-6
		MK 45 Series	3-6
	WARNING Fuze blocks for the LUU-1/B and LUU-5/B flares contain fiberglass which crystalizes when burned. Gloves will be used during clean-up operations. If skin becomes contaminated, wash thoroughly with water.		
8	Flare, Target Marker	LUU-1/B	3-6
		LUU-5/B	3-6
9	Flare, Countermeasure	MJU-3/B	
		MJU-7/B	3-6
		MJU-10/B	3-6
		MJU-23/B	3-6
		M206	3-6
10	Flare, Cartridge AN/ALA-17 Flare	XM3529	3-6, 6-44
11	Flare, Decoy (IR)	MK 50 Mod 0	3-6
		MJU-2/B	
12	Flare, Surface	M49 Series	3-6
		M76 Series	3-6
13	Flare, Tracking, Infrared	MK21	3-6
		TAU-15/B	3-6
		TAU-56/B	3-6
		W112B	3-6
14	Fusee, Railroad, Warning		3-6

Table 6-12. Pyrotechnics (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
15	Igniter, Ramjet Engine		3-6
16	Marker, Marine, Location	MK1 Series MK2 Series MK25 Series	3-6 3-6 6-43
17	Signal, Illumination, Aircraft	M37 Series through M58 Series	3-6
18	Signal, Illumination, Ground	M127 Series M131 Series	3-6, 6-45 3-6, 6-45
19	Signal, Illumination, Marine		3-6
20	Signal, Smoke, Ground	LUU-10/B	6-51, 3-6
	WARNING The AN-MK 5 and MK 6 Mod 3 Signals contain red phosphorus. Use sufficient combustible material and fuel oil in burn pit to ensure a hot, long burning fire to completely consume flares to preclude a white phosphorus residue.		
21	Signal, Smoke and Illumination, Aircraft	AN-MK 5 Series MK 6 Mod 3	3-6 3-6
22	Signal, Smoke and Illumination Marine	AN-MK 13 Series MK 124 Series	3-6, 3-9 3-6, 3-9
23	Signal Kit, Personnel Distress	A/P25S-1 Series A/P25S-5 Series	6-8, 6-41 6-8, 6-41
24	Simulator, Booby Trap	M117 M118 M119	6-41 6-41 6-41
25	Simulator, Detonation Explosion	M80	6-41
26	Simulator, Gunflash	M110	6-41
27	Simulator, Hand Grenade	M116	6-41
28	Simulator, Projectile, Airburst	M27 Series M74 Series	6-41 6-41
29	Simulator, Projectile, Groundburst	M115 Series	6-41
30	Squibs for RR-136 and RR-170 Packages and MJU-7/B Flare	BBU-35/B BBU-36/B 16171-0002 114350	3-6 3-6 3-6 3-6

Table 6-12. Pyrotechnics (Cont)

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
31	Cartridge, Impulse, M796 (for M206 flare)	9311660	3-6
32	Projectile, Airburst, Smoke PJU-7A/E	Part No. 8387310	3-6, 6-41
33	Launch Charge, CCK-77/E	Part Nos. 102717 and 8387217	3-6, 6-41
34	Smokey Sam Simulator Rocket Motor, GTR-18	Part No. 1335AS280	3-6
35	Igniter, PVU-3/E	Part No. 1335AS250	3-6, 3-9

Table 6-13. Explosives Components, Guided Bombs

ITEM	NOMENCLATURE	IDENTIFICATION NUMBER	DISPOSAL PARAGRAPH
	NOTE Disassembly procedures for MAU-115, 157/B, and 157A/B computer control groups are contained in T.O. 11K1-9-3. The disassembly procedures for MAU-169/B is contained in T.O. 11G7-7-2-7.		
MAU-115, 157 Series MAU-169/B CCG Laser Guided Bomb (GBU-10, -11, -12) see figure 6-16.			
1	Gas Generator	P/N 604231-1	7-8
2	Battery, Thermal	P/N 666229-1 P/N 742622-1 P/N 746243-1	3-6 3-6
Computer Control Group GBU-8 and GBU-9 see figure 6-17			
3	Battery, Squib-activated	GAP 4293	6-11
4	Explosive Cutter Assembly	P/N 86113	6-46
5	Gas Container	P/N 93154	6-46

6-3. SAFETY PRECAUTIONS

6-4. General safety precautions and general requirements pertaining to disposal ranges, personnel, etc., will be adhered to at all times. Any additional precaution/requirement pertaining to a specific item is listed in the appropriate disposal method.

6-5. DISPOSAL METHODS.

6-6. DETONATION. Disposal by detonation is accomplished by various methods depending on characteristics of the item being disposed of. Usually a pit is used, but item placement, method of placing explosive charge, priming, earth cover, etc., will vary.

6-7. METHOD 1.

a. Prepare pit.

b. Place items in wooden or cardboard container.

c. Completely cover top items with Composition C, or equivalent.

d. Place container in pit.

e. Prime Composition C using electric/nonelectric blasting cap firing systems in accordance with section IV.

f. Retire to proper distance.

g. Effect detonation.

6-8. METHOD 2. (Linked/Delinked Cartridges.)

NOTE

Any number of cartridges may be disposed of depending on range limitations.

a. Delink cartridges, if applicable.

b. Prepare pit.

c. Place a minimum of 2.3 centimeters (0.5 inch) layer of Composition C in bottom of pit.

d. Place one layer of cartridges on Composition C.

e. Cover projectiles with a minimum of 2.3 centimeters (0.5 inch) layer of Composition C.

f. Repeat subparagraphs d. and e. for each additional layer.

g. Connect layers of Composition C.

h. Prime top layer with detonating cord.

i. Cover with at least 0.61 meter (two feet) of earth.

j. Prepare for detonation using electric or nonelectric firing systems in accordance with section IV.

k. Retire to proper distance.

l. Effect detonation.

6-9. METHOD 3. (30MM AND 40MM CARTRIDGES.)

a. Prepare pit.

b. Cut M112 C-4 explosive blocks in half lengthwise.

c. Lay out two lines (layers) of C-4 strips where one line will be in contact with the center of the projectile body and the other line in contact approximately two inches up from base of cartridge case.

d. Place one layer of rounds on strips of C-4 with projectiles side-by-side in line.

e. Lay on two more lines of C-4 on top of cartridges in same manner as bottom layer.

NOTE

- Do not stack rounds higher than five layers.
- On each succeeding layer, place rounds so projectiles are facing the opposite direction from the layer below.
- 30MM and 40MM cartridges may be disposed of as single items or as linked/clipped items.

f. Repeat subparagraphs d. and e. for each additional layer.

g. Connect lines (layers) of C-4 at each end.

h. Prime top lines (layers) of C-4 with adequate length of detonating cord.

i. Cover with a minimum of two feet of earth.

j. Prepare for detonation.

k. Retire to proper distance.

l. Effect detonation.

6-10. METHOD 4.

NOTE

81MM propellant increments will be removed prior to disposing of cartridges. Increments will be burned in pit (paragraph 3-6).

a. Prepare pit.

b. Place cartridges horizontally side-by-side and in contact with each other.

c. Place 0.57 kilogram (1.25 pounds) of Composition C, or equivalent, on each cartridge.

d. Prime Composition C with detonating cord.

e. Cover cartridges with at least 0.61 meter (two feet) of earth.

f. Prepare for detonation using electric or nonelectric firing system in accordance with section IV.

g. Retire to proper distance.

h. Effect detonation.

6-11. METHOD 5. (66MM)

WARNING

Some 66MM rockets contain a radioactive sight. They can be identified by the words "RADIOACTIVE SIGHT" on the side of the launcher. Also, rockets with a radioactive sight will have two yellow cross-hairs in the sight, while those without a radioactive sight will have all red cross-hairs. All radioactive sights will be removed, prior to rocket disposal, and disposed of in accordance with T.O. 00-110N-2.

a. Prepare pit.

b. Place rockets horizontally in pit.

c. Tape approximately 0.11 kilogram (0.25 pound) of Composition C, or equivalent, to launcher adjacent to trigger safety handle of each rocket.

d. Prime Composition C with detonating cord.

e. Cover rockets with at least 0.61 meter (two feet) of earth.

f. Prepare for detonation using electric or nonelectric firing system in accordance with section IV.

g. Retire to proper distance.

h. Effect detonation.

6-12. METHOD 6. (Bombs)

a. Prepare pit.

b. Unpack or decluster bombs, if applicable.

c. Place bombs in pit.

NOTE

Nose fuze cavity priming breaks up the heavy nose fragment more effectively than tail fuze cavity priming.

d. Prime each bomb by filling fuze cavity with Composition C. If fuze cavity is obstructed, prime by placing a 1.14 kilograms (2.5 pound) demolition charge 2/3 of the distance back from nose.

e. Prime Composition C or demolition charge with detonating cord.

f. Cover bombs with at least 0.61 meter (two feet) of earth.

g. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

h. Retire to proper distance.

i. Effect detonation.

6-13. METHOD 7. (Bombs, General Purpose)

NOTE

Nose fuze cavity priming breaks up the heavy nose fragment more effectively than tail fuze cavity priming.

a. Prime bomb by filling nose with Composition C. If nose fuze cavity is not accessible, prime tail fuze cavity. If both cavities are inaccessible, place a minimum of 1.14 kilograms (2½ pounds) of Composition C, or equivalent, on top of bomb case, approximately 2/3 of the distance back from nose. More positive initiation is obtained if priming charge is held in place with a sandbag.

b. Prime Composition C using electric/nonelectric blasting cap firing system in accordance with Section IV.

c. Retire to proper distance.

d. Effect detonation.

6-14. METHOD 8. (CBU-1, -2 and -46)

WARNING

The dispenser will be placed with forward end pointing in a safe direction.

a. Place dispenser on sandbags or other firm support on firm ground with forward end pointing in a safe direction.

b. Place 54.5 kilograms (120 pounds) of Composition C, or equivalent as follows:

(1) Measure 0.61 meter (two feet) aft of the fore end of the nose fairing placing three M183 demolition charges, one on each side of the dispenser and one on top centerline responding to forward measurement.

(2) Measure 1.1 meters (42 inches) forward aft end of dispenser and place three M183 demolition charges, one on each side of dispenser and one on top centerline responding to aft measurement.

c. Connect all charges with detonating cord or with leads furnished with M183 demolition kit.

d. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

e. Retire to proper distance.

f. Effect detonation.

6-15. METHOD 9 (CBU-3 Series)

WARNING

The dispenser will be placed with the forward end pointing in a safe direction.

a. Place dispenser on sandbags or other firm support on firm ground with forward end pointing in a safe direction.

b. Place 9.1 kilograms (20 pounds) of Composition C, or equivalent, as follows: (figure 6-1)

(1) Measure 64 centimeters (25 inches) forward from forward suspension lug and 38 centimeters (15 inches) aft of rear suspension lug.

(2) Place four M112 blocks centered over forward measurement.

(3) Place four M112 blocks under nose end directly under top charge.

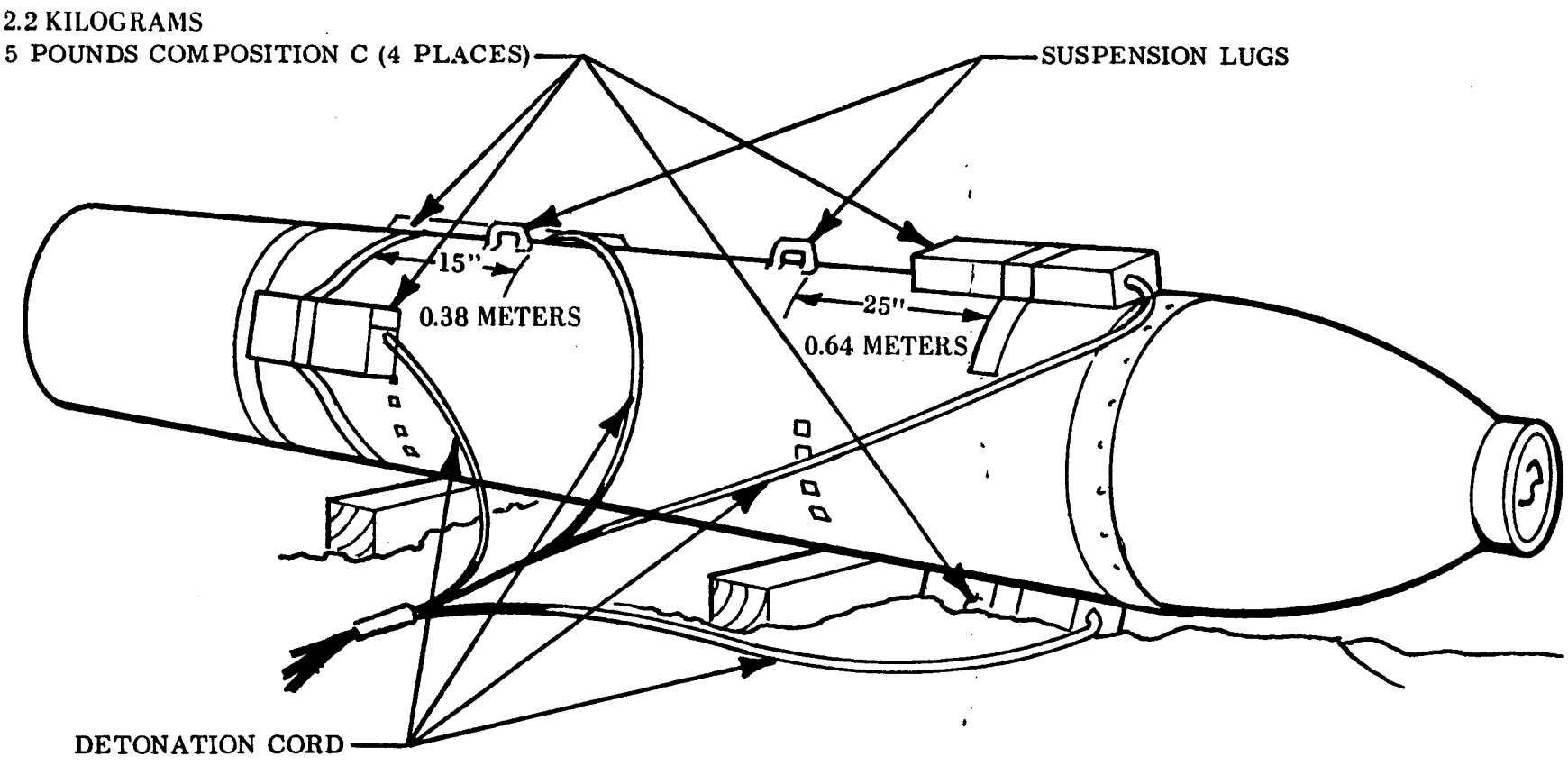


Figure 6-1. CBU-3 Series Charge Placement

(4) Place four M112 blocks on both sides of aft end with center of blocks corresponding to aft measurement.

c. Tape charges to dispenser to ensure complete contact and to preclude shifting.

d. Prime all charges with detonating cord.

e. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

f. Withdraw to proper distance.

g. Effect detonation.

6-16. METHOD 10 (CBU-12 Series).

WARNING

The dispenser will be placed with forward end pointing in a safe direction.

a. Place dispensers on firm ground with forward end pointing in a safe direction.

b. Place 54.5 kilograms (120 pounds) of Composition C or equivalent as follows:

(1) Measure 0.61 meter (24 inches) aft of fore end of nose fairing placing two M183 demolition charges on each side of dispenser. Place sideways against dispenser and secure in place.

(2) Measure 1.07 meters (42 inches) forward of aft end of dispenser, placing two M183 demolition charges one on each side of dispenser. Place charges sideways against dispenser and secure in place.

(3) Measure 0.71 meter (28 inches) aft of fore end of nose placing one M183 charge on top center line.

(4) Measure 1.17 meters (46 inches) forward of aft end of dispenser placing one M183 charge on top center line.

c. Connect all charges with detonating cord or with leads furnished with M183 demolition kits.

d. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

e. Withdraw to proper distance.

f. Effect detonation.

6-17. METHOD 11. (CBU-14, CBU-22)

a. Place CBU, single tube down, on firm ground. Brace with earth/sand to ensure upright position.

b. Place demolition charge as follows:

(1) Place four M112 blocks, or equivalent, under the nose approximately 0.43 meter (17 inches) from end.

(2) Place four M112 blocks, or equivalent, on both sides approximately 0.43 meter (17 inches) from end. Secure with tape.

(3) Place four M112 blocks, or equivalent, on both sides approximately 0.43 meter (17 inches) from end. Tape securely to ensure tube contact and to preclude shifting.

(4) Prime all four positions with detonating cord.

c. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

d. Retire to proper distance.

e. Effect detonation.

6-18. METHOD 12. (CBU-24, CBU-29, CBU-49, CBU-52, CBU-58 and CBU-71.)

WARNING

- Bombs in the CBU-29, CBU-49 and CBU-71 contain random time delay fuzes and detonation could occur at indeterminate times after arming. The disposal area will not be reentered for a minimum of 72 hours.

- Position all dispensers with forward end pointing in a safe direction.

a. Place CBU on sandbags or other firm support on firm ground with forward end pointing in a safe-direction.

b. Place 36.4 kilograms (80 pounds) of Composition C, or equivalent, as follows: (figure 6-2).

(1) 9.1 kilograms (20 pounds) lengthwise under nose approximately 0.38 meter (15 inches) from end.

(2) 9.1 kilograms (20 pounds) lengthwise on top of nose approximately 0.38 meter (15 inches) from end. Secure with tape.

(3) 9.1 kilograms (20 pounds) on both sides of tail approximately 0.68 meter (27 inches) from tail end. Tape explosives securely against dispenser to ensure complete contact and to preclude shifting.

c. Prime all four charges with detonating cord.

d. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

e. Retire to proper distance.

f. Effect detonation.

6-19. METHOD 13 (CBU-25).

a. Place CBU, single tube down, on firm ground. Brace with earth/sand to ensure upright position.

b. Using 27.3 kilograms (60 pounds) of Composition C, or equivalent, place charges as follows: (figure 6-3).

(1) Place 12 M112 blocks lengthwise under nose approximately 0.27 meter (11 inches) from end.

(2) Place 12 M112 blocks lengthwise on top of nose approximately 0.27 meter (11 inches) from end. Secure with tape.

(3) Place 12 M112 blocks on both sides of tail approximatley 0.27 meter (11 inches) from end. Tape explosives securely against dispenser to ensure complete contact and to preclude shifting.

c. Prime all four charges with detonating cord.

NOTE

Earth cover of explosive charges will be complete. Sandbags may be used but will be carefully placed to cover the charge and to ensure complete contact between explosives and tube assemblies.

d. Cover explosive charges, except that on top of dispenser, with earth/sand, being careful not to disturb detonating cord.

e. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

f. Retire to proper distance.

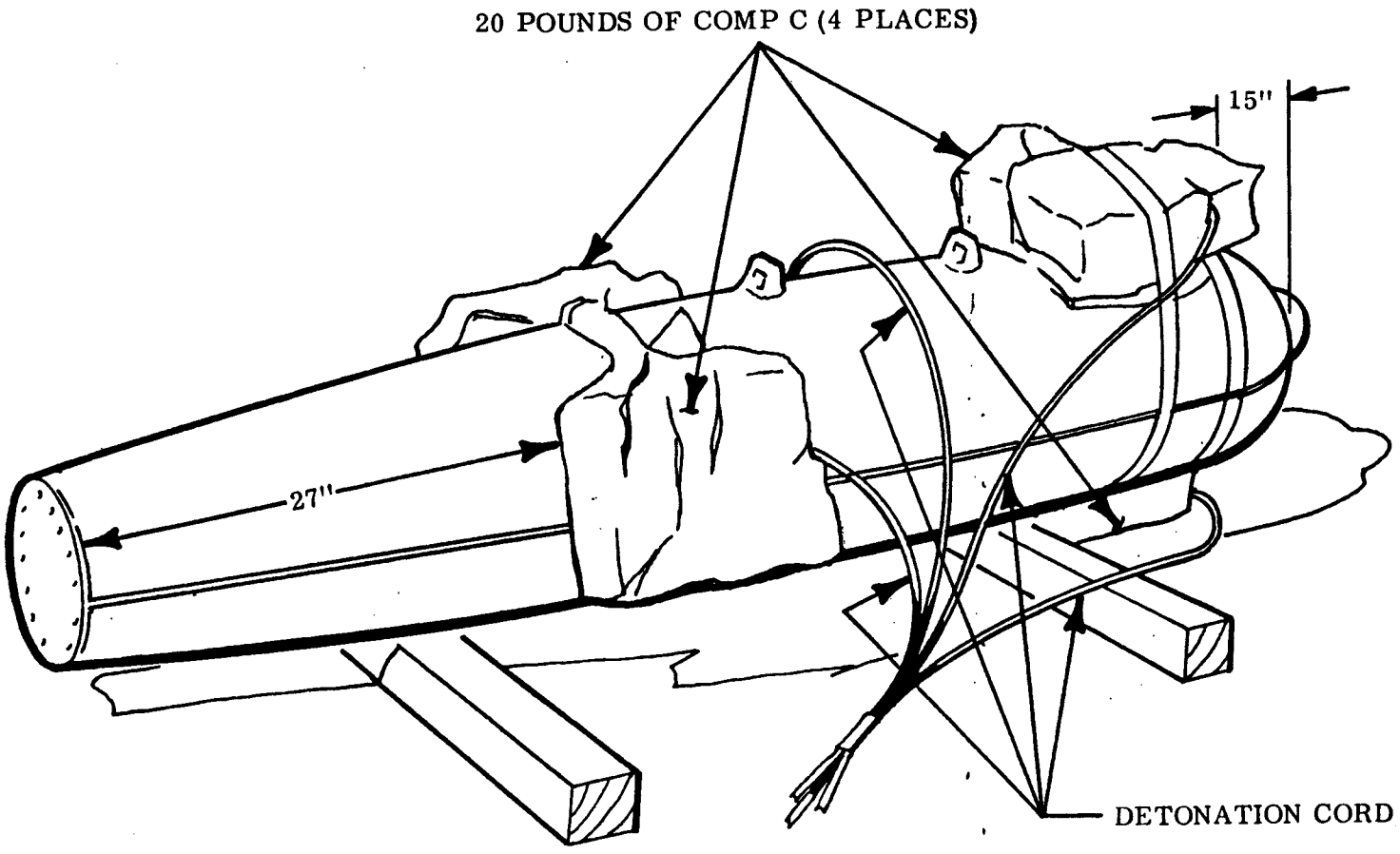


Figure 6-2. CBU-24, -29, -49, -52 and -58 Charge Placement

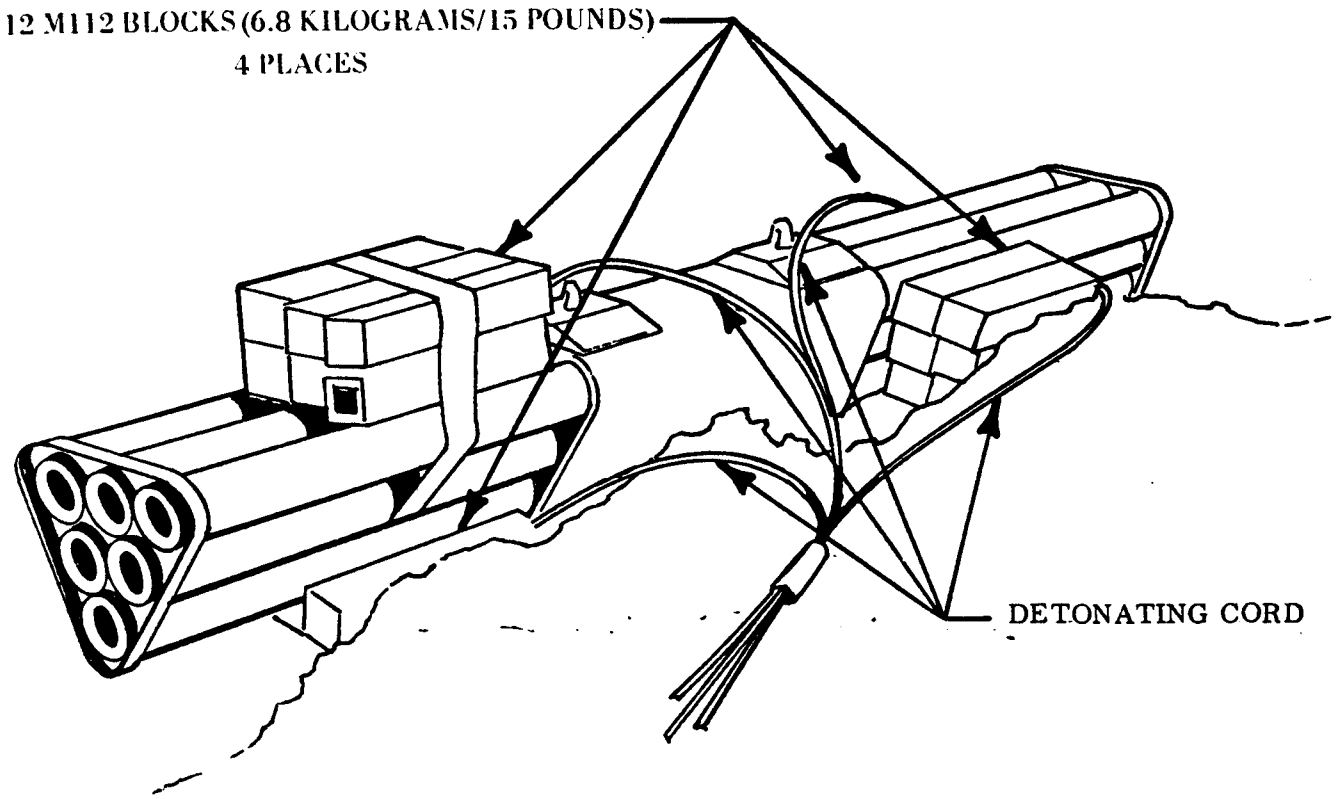


Figure 6-3. CBU-25 Charge Placement

g. Effect detonation.

6-20. METHOD 14 (CBU-70).

a. Prepare trench approximately 4 meters (13 feet) long, 2 meters (4 feet) deep, and 0.9 meter (3 feet) wide.

b. Place CBU in pit with suspension lugs up.

c. Measure from nose aft 0.28 (11), 0.78 (31), and 1.29 meters (51 inches) (figure 6-4).

d. Center 9.1 kilograms (20 pounds) of Composition C (one M183 kit), or equivalent over each measurement.

e. Connect all three charges with detonating cord.

f. Prime all three charges with detonating cord in accordance with Section IV.

g. Cover CBU with at least 0.61 meter (two feet) of earth.

h. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

i. Retire to proper distance.

j. Effect detonation.

6-21. METHOD 15 (CBU-7 Tube Assemblies).

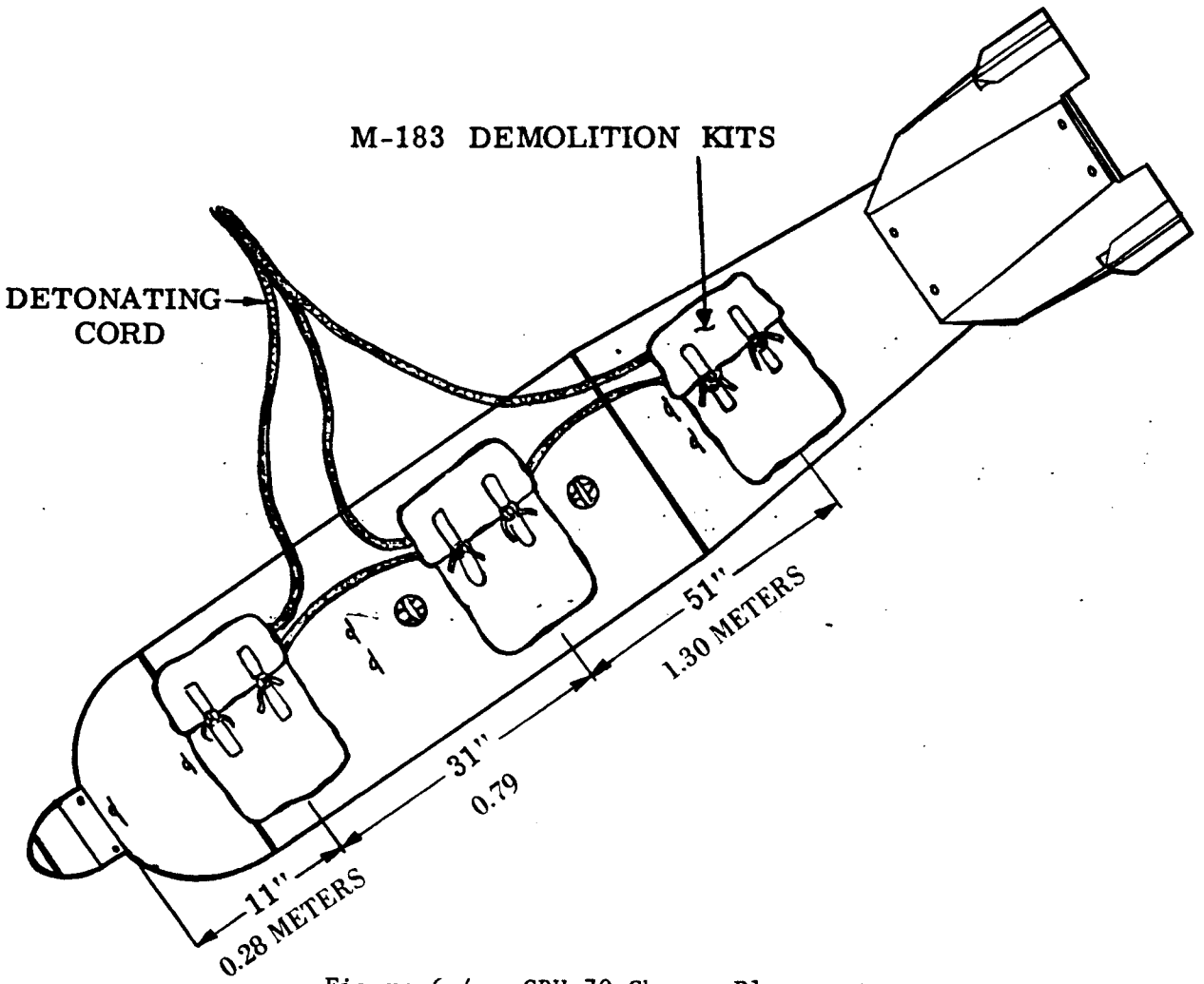


Figure 6-4. CBU-70 Charge Placement

NOTE

The CBU-7 will be unloaded in accordance with T.O. 11A9-20-7. If CBU-7 cannot be unloaded due to rust, dents, or damage, the complete unit will be disposed of by EOD.

a. Place tube on firm ground.

b. Place M112 block of Composition C, or equivalent, on top center of tube assembly (figure 6-5).

c. Prime Composition C using electric/nonelectric blasting cap firing system in accordance with Section IV.

d. Retire to proper distance.

e. Effect detonation.

6-22. METHOD 16 (CBU-38)

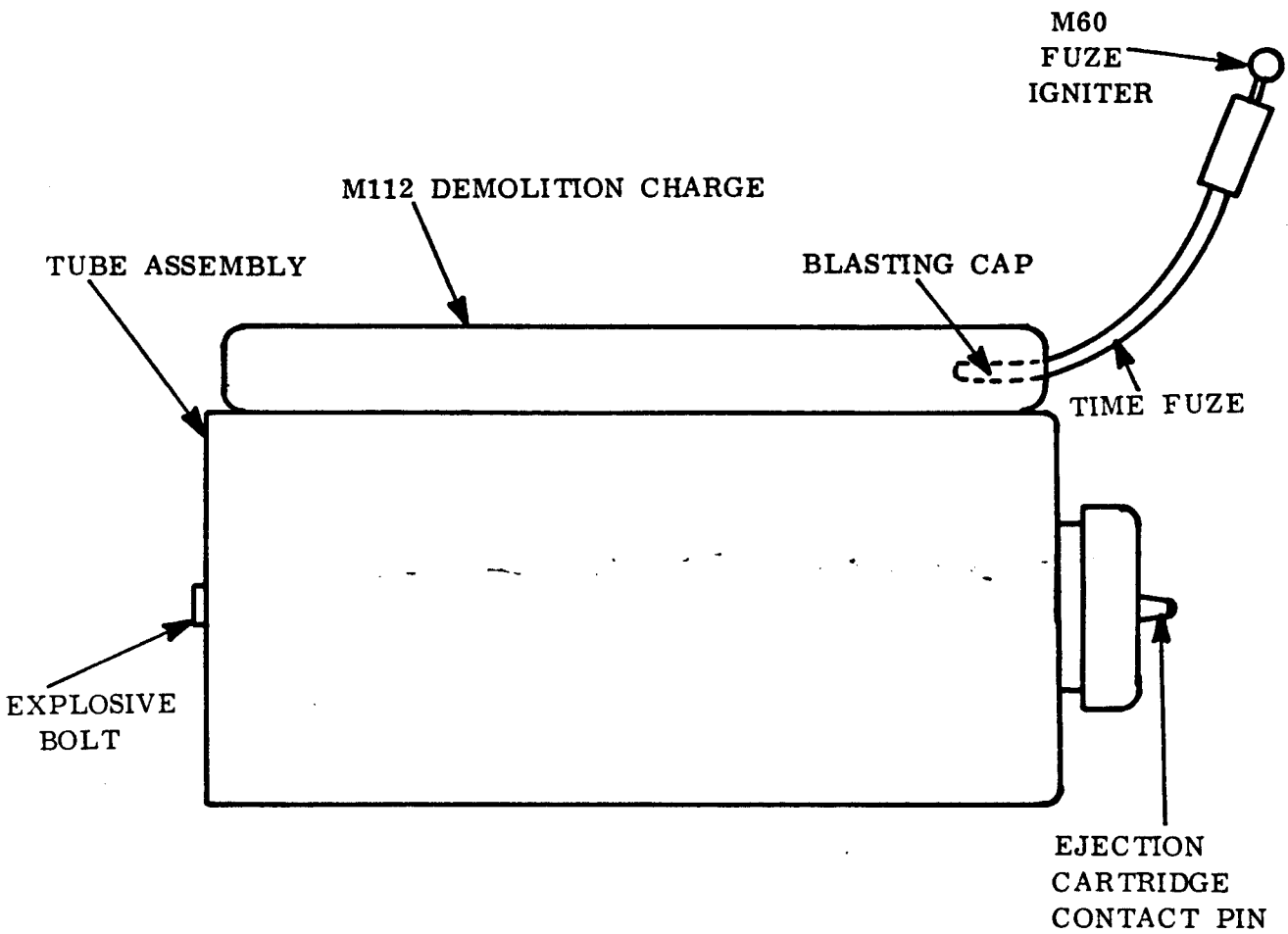


Figure 6-5. Charge Placement for CBU-7 Tube Assembly Disposal

NOTE

The CBU-38 may be disposed of as a complete unit or disassembled in accordance with T.O. 11A9-20-7 and individual BLU-49 series bombs disposed of.

a. CBU-38 (figure 6-6).

WARNING

The dispenser will be placed with forward end pointed in a safe direction.

(1) Place dispenser on firm ground with forward end pointed in a safe direction.

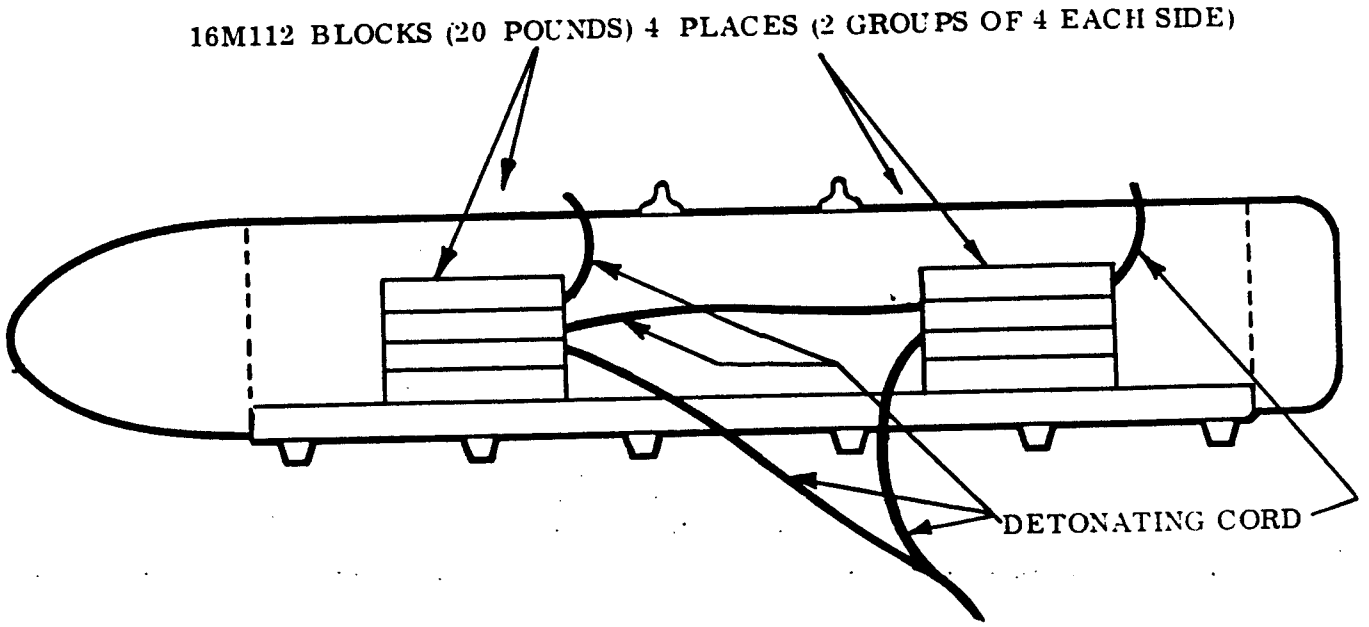


Figure 6-6. CBU-38 Charge Placement

(2) Place 9.1 kilograms (20 pounds) of Composition C, or equivalent, as follows: (See figure 6-6.)

(a) Place four M112 blocks against top edge of safety pallet approximately 0.31 meter (12 inches) from each end of safety pallet on each side of dispenser.

(b) Prime all four positions with detonating cord.

(3) Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

(4) Retire to proper distance.

(5) Effect detonation.

b. BLU-49 Series.

(1) Prepare pit.

(2) Place bombs in pit.

(3) Place M5 block of Composition C, or equivalent, in contact with side of each bomb approximately two-thirds of the distance back from nose.

(4) Connect all explosive charges with additional Composition C.

(5) Prime Composition C with detonating cord.

(6) Cover bombs with at least 0.61 meter (two feet) of earth.

(7) Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

(8) Retire to proper distance.

(9) Effect detonation.

6-23. METHOD 17. (KMU-339, CBU-33, figure 6-7.)

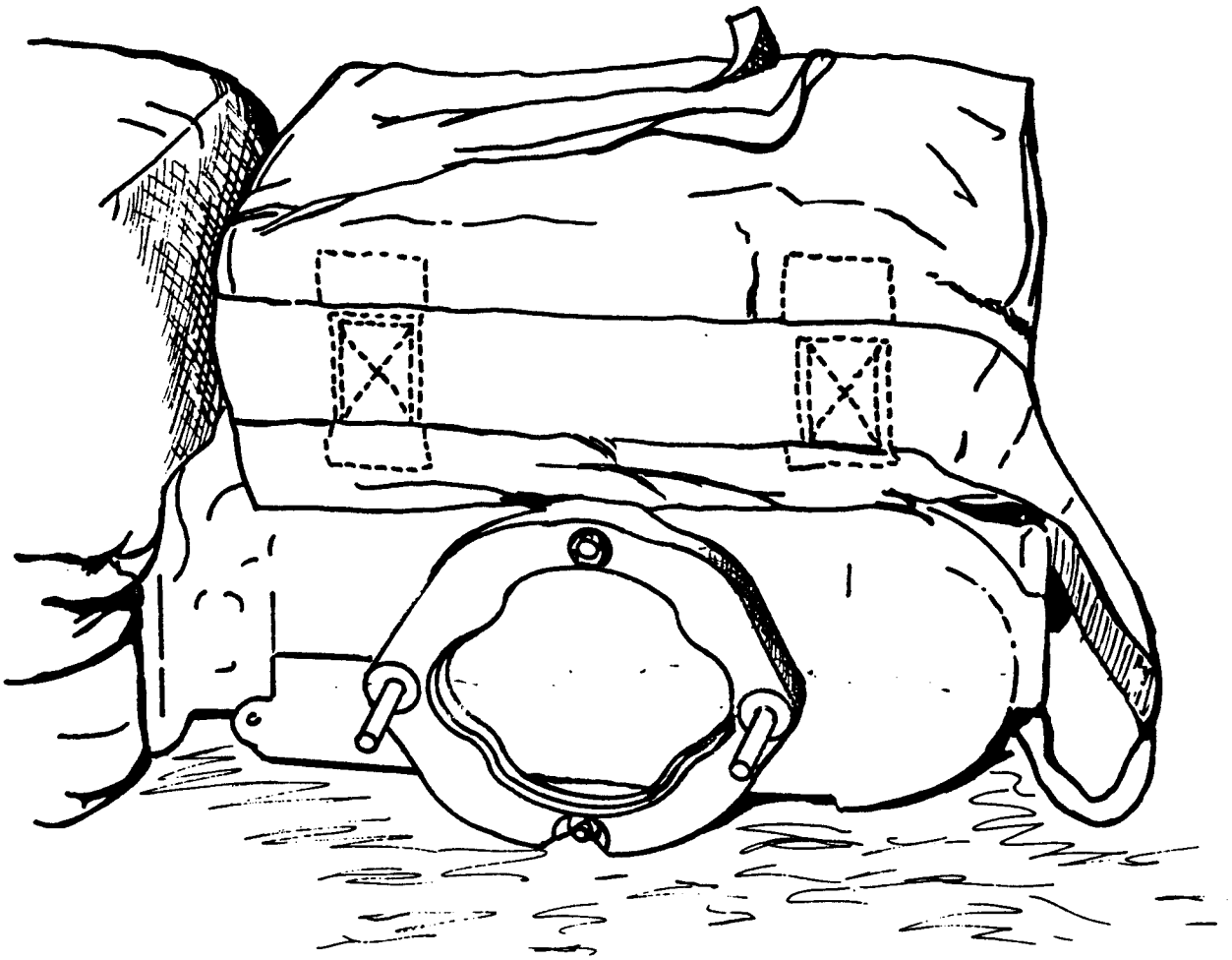


Figure 6-7. Disposal, KMU-339/B Cluster

NOTE

The CBU-33 will be unloaded in accordance with T.O. 11A9-26-7. If CBU-33 cannot be unloaded due to rust, dents, or damage, complete unit will be disposed of by EOD.

a. Place KMU-339 on firm ground in horizontal position.

b. Place not less than eight sandbags directly against aft end of KMU.

c. Place 9.1 kilograms (20 pounds) of Composition C, or equivalent, on top of KMU.

d. Prime Composition C using electric/nonelectric firing system in accordance with Section IV.

e. Retire to proper distance.

f. Effect detonation.

6-24. METHOD 18 (MK20 Series, Rockeye).

WARNING

The dispenser will be placed with forward end pointed in a safe direction.

a. Place dispenser on firm ground with forward end pointed in a safe direction.

b. Place 9.1 kilograms (20 pounds) of Composition C or equivalent, as follows: (See figure 6-8.)

(1) Place eight M112 blocks on each side of dispenser approximately 0.25 meter (10 inches) forward of fin release band.

(2) Prime both sides with detonating cord.

c. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

d. Retire to proper distance.

e. Effect detonation.

6-25. METHOD 19 (CBU-75).

WARNING

Do not reenter the disposal area for 24 hours. Some bombs in this dispenser contain random delay fuzes, and detonation of unexploded armed bombs and fuzes could occur at indeterminate times.

a. Place CBU-75 on firm ground with suspension lugs top center.

b. Secure four 9.1 kilogram (20 pound) charges of Composition C, or equivalent, two on each side of the dispenser as shown in figure 6-9.

c. Prime all four positions with detonating cord in accordance with Section IV.

d. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

e. Retire to proper distance.

f. Effect detonation.

6-26. METHOD 20 (Fire Bombs).

a. Place bomb on firm ground.

b. Wrap both ends of bomb case with two wraps of detonating cord.

c. Connect end wraps with two lengths of detonating cord along bomb bottom centerline.

d. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

e. Retire to proper distance.

f. Effect detonation.

6-27. METHOD 21 (M47 PWP Bomb).

NOTE

See Section V for self-aid treatment of PWP burns.

a. Place bomb on firm ground.

b. Cut an M112 block of Composition C lengthwise in fourths.

c. Form Composition C into a worm approximately 0.39 centimeter (3/4-inch) in diameter and 1.27 meters (50 inches) long.

d. Place Composition C the entire length of bomb.

e. Prime Composition C with detonating cord.

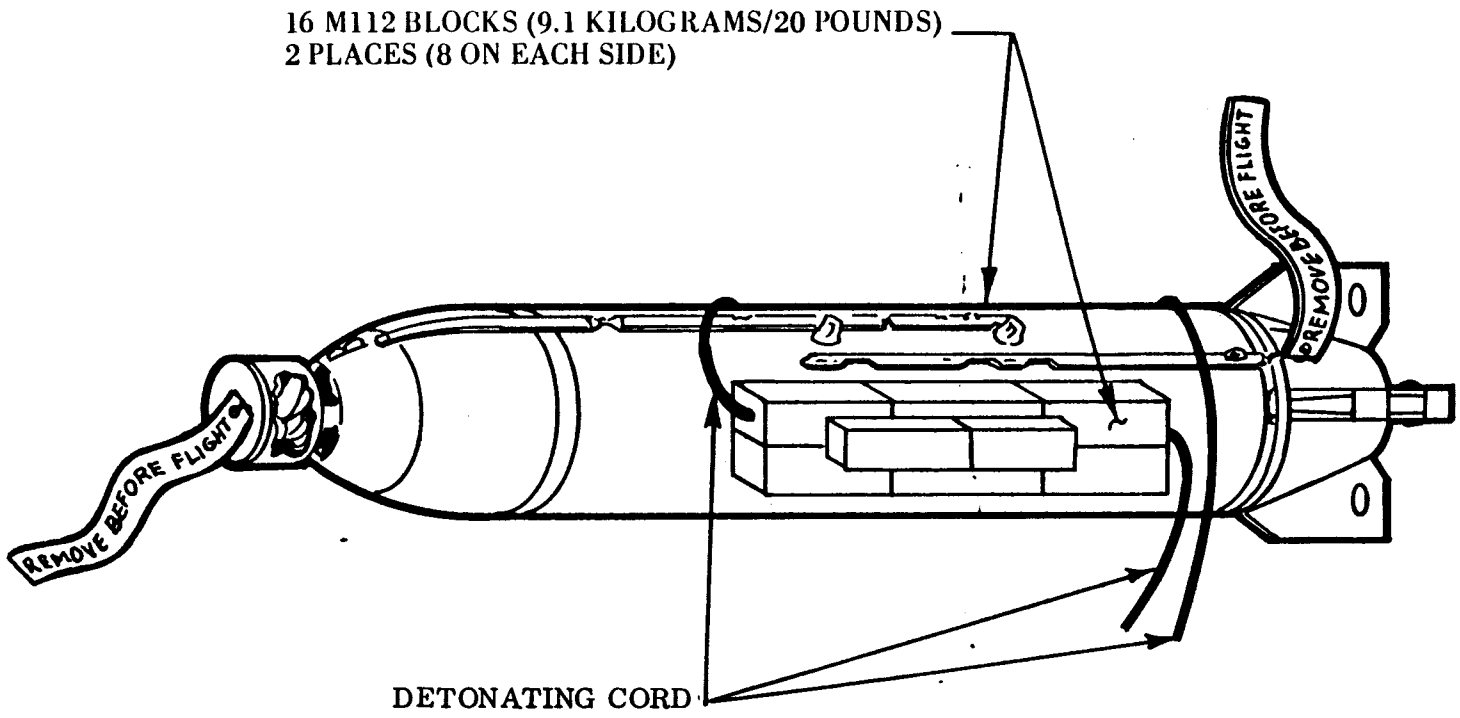


Figure 6-8. MK20 Series (Rockeye) Charge Placement

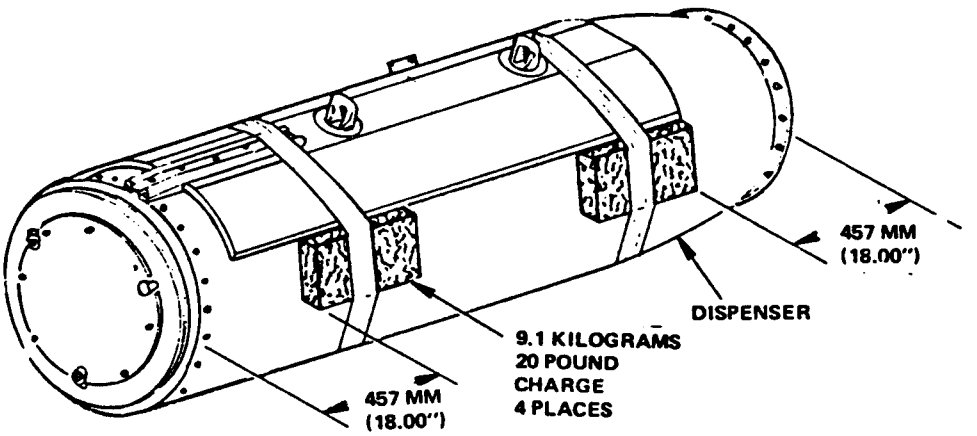


Figure 6-9. CBU-75 Charge Placement

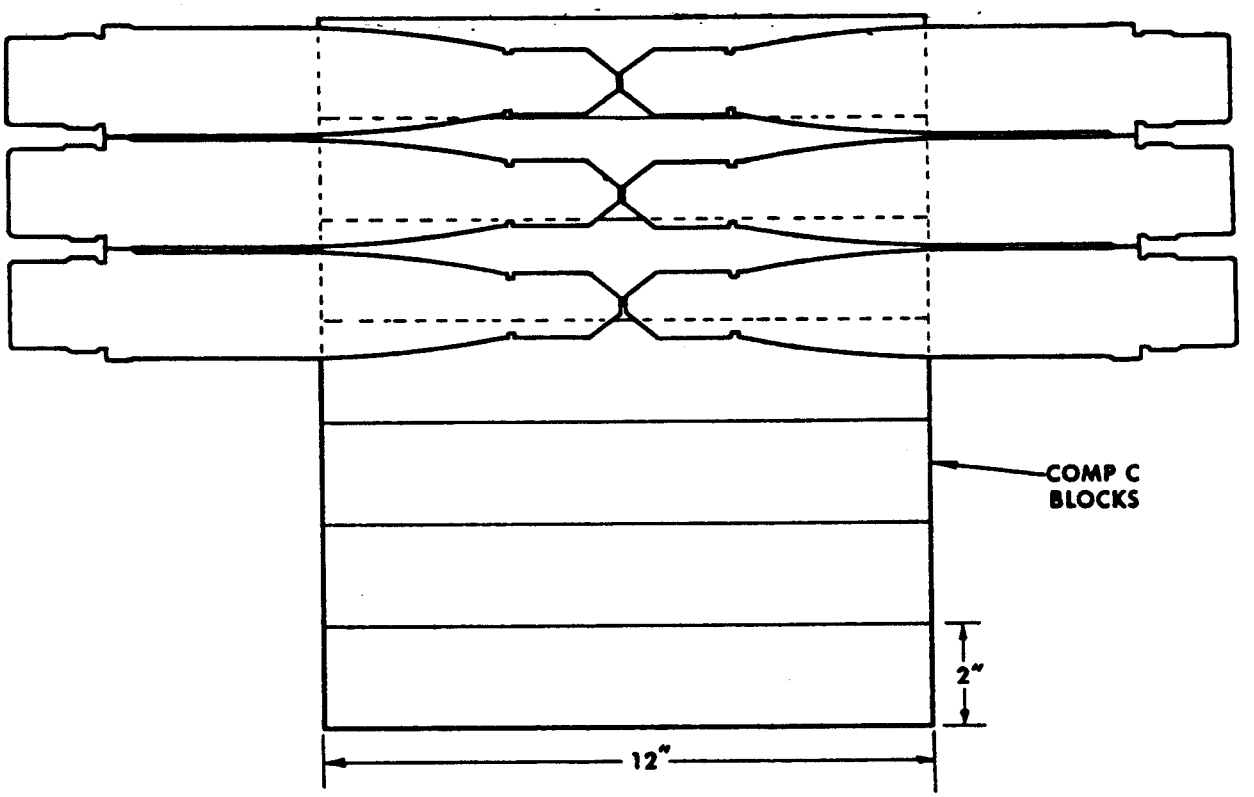


Figure 6-10. Warhead Placement

f. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

g. Retire to proper distance.

h. Effect detonation.

6-28. METHOD 22 (WP Grenades, Igniters, Warheads, 81MM, 105MM).

NOTE

81MM propellant increments will be removed prior to disposing of cartridges. Increments will be burned in a pit (paragraph 3-6).

a. Place a layer of Composition C on the surface. Amount will be determined by range safety distance and/or quantity of items to be disposed of.

b. Place items on Composition C. Recommended placement of warheads is shown in figure 6-10.

c. Prime Composition C using electric/nonelectric blasting cap firing system in accordance with Section IV.

d. Retire to proper distance.

e. Effect detonation.

6-29. METHOD 23 (Demolition Charges).

WARNING

- Extreme care will be taken in handling exuding demolition charges as the exudation is extremely sensitive.
- Gases emitted from demolition charges when exploded are dangerous. Precautions will be taken to avoid prolonged contact or breathing of these gases.
- Shaped charges will be handled with extreme care and will be disposed of individually or in small quantities.

a. Prepare pit.

WARNING

Shaped charges will be carefully placed horizontally in pit with the initiating end pointed toward personnel. This position forces the jet created by shaped charges away from personnel.

b. Place containers/charges in pit.

NOTE

Ensure that Comp C covering the shaped charge extends over both ends.

c. Completely cover top container/charge with Composition C, or equivalent.

d. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

e. Retire to proper distance.

f. Effect detonation.

6-30. METHOD 24 (Black Powder).

WARNING

No more than 11.4 kilograms (25 pounds) of black powder will be disposed of at one time in one line.

NOTE

If more than one line of black powder is formed, lines will be not less than 45.75 meters (150 feet) apart.

a. Spread black powder in a straight line on ground approximately 76 millimeters (three inches) wide and 50 millimeters (two inches) deep.

NOTE

Ignition train will be laid to ensure downwind burning of black powder.

b. Check wind direction.

c. Lay ignition train in accordance with Section IV.

d. Ignite ignition train in accordance with Section IV.

e. Retire to proper distance.

6-31. METHOD 25 (Smokeless Powder).

NOTE

Line(s) of combustible material shall be as long as necessary to accommodate the powder being disposed of within the safety distance restrictions of the disposal site.

a. Lay a bed of combustible material approximately 76 millimeters (three inches) deep and 20 centimeters (eight inches) wide.

b. Spread smokeless powder on combustible material in a train approximately 150 millimeters (six inches) wide and 100 millimeters (four inches) deep.

NOTE

Ignition train will be laid to ensure downwind burning of smokeless powder.

c. Check wind direction.

d. Lay ignition train in accordance with Section IV.

e. Ignite ignition train in accordance with Section IV.

f. Retire to proper distance.

6-32. METHOD 26 (Dynamite).

WARNING

- Exuding or frozen dynamite is extremely hazardous and will be disposed of by EOD.
- Dynamite shall be shielded from direct ray of sun.
- Only tools of wood or nonsparking metal will be used in opening containers.

NOTE

Serviceable dynamite may be slit lengthwise into halves with an ordinary knife prior to burning. This procedure lessens the chance of detonation during burning. Knives with folding blades should not be used.

a. BURN.

(1) Lay bed of combustible material on ground.

(2) Remove sticks from containers.

(3) Place sticks on combustible material in a single layer not greater in width than length of one stick.

(4) Lay ignition train in accordance with Section IV.

(5) Ignite ignition train in accordance with Section IV.

(6) Retire to proper distance.

b. DETONATE.

(1) Prepare pit.

(2) Place container or containers in pit.

(3) Prime container using electric/nonelectric blasting cap firing system in accordance with Section IV.

(4) Retire to proper distance.

(5) Effect detonation.

6-33. METHOD 27 (Fuzes with/without Boosters).

WARNING

Fuzes thrown from the pit will be disposed of in place by EOD.

NOTE

The M111 Series and M146 Series fuzes may be burned in pit (paragraph 3-6).

a. Prepare pit.

b. Unpack and place items in pit in contact with each other, booster to booster.

NOTE

When more than one layer is placed in pit, each row will be placed booster to booster and charges placed as a first layer.

c. Place Composition C, or equivalent, in contact with all boosters.

d. Prime with detonating cord.

e. Cover with at least 0.61 meter (two feet) of earth to decrease fragments.

f. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

g. Retire to proper distance.

h. Effect detonation.

6-34. METHOD 28 (HEAT Rifle Grenades).

a. Prepare pit.

b. Place grenades in pit in close contact with each other.

c. For each six grenades, place one M112 block of Composition C, or equivalent on top of grenades at break in center of body.

d. Prime Composition C with detonating cord.

e. Cover grenades with at least 0.61 meter (two feet) of earth.

f. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

g. Retire to proper distance.

h. Effect detonation.

6-35. METHOD 29 (Fragmentation Grenades).

a. Prepare pit.

b. Place grenades in pit in close contact with each other.

c. For each 20 grenades, place one M5 block of Composition C, or equivalent.

d. Prime Composition C with detonating cord.

e. Cover grenades with at least 0.61 meter (two feet) of earth.

f. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

g. Retire to proper distance.

h. Effect detonation.

6-36. METHOD 30 (M14 Antipersonnel Mine).

NOTE

Wrenches removed from container will be disposed of as scrap metal.

a. Prepare pit.

b. Remove wrenches from container.

c. Place container in pit.

d. Remove packing divider between mines and detonators.

e. Unpack detonators and carefully return to container.

f. Place 11 M112 blocks of Composition C, or equivalent, over mines and detonators.

g. Prime Composition C, or equivalent, using electric or nonelectric blasting cap firing system in accordance with section IV.

h. Retire to proper distance.

i. Effect detonation.

6-37. METHOD 31 (M18A1 Antipersonnel Mine).

NOTE

- Blasting caps removed from bandoleer will be disposed of by detonation.
- Firing wire may be disposed of as scrap or placed with mines to be detonated.

a. Prepare pit.

b. Remove mines and blasting caps from bandoleers.

c. Cut blasting caps from firing wire and shunt cap wires.

d. Place bandoleers with accessories in bottom of pit.

e. Stack mines adjacent to each other on top of bandoleer with side marked FRONT facing down (figure 6-11).

f. Place on M112 block of Composition C, or equivalent, on top mines.

g. Prime Composition C, or equivalent, using electric or nonelectric firing system in accordance with section IV.

h. Retire to proper distance.

i. Effect detonation.

6-38. METHOD 32 (Miscellaneous).

a. Prepare pit.

b. Unpack items and place in wooden container so that boosters are in contact with each other.

c. Place container(s) in pit.

d. Place demolition charge in contact with an item on the top layer.

e. Prime demolition charge with detonating cord.

f. Cover container(s) with at least 0.61 meter (two feet) of earth.

g. Prepare for detonation using electric or nonelectric firing system in accordance with section IV.

h. Retire to proper distance.

i. Effect detonation.

6-39. METHOD 33 (Spotting Charges).

a. Prepare pit.

b. Unpack charges, if applicable.

c. Place spotting charges horizontally in pit. Pyramid a maximum of 10 spotting charges (layers of 4, 3, 2, and 1). Additional pyramids may be constructed, if necessary.

d. Place one M112 block of Composition C, or equivalent, on top and mold to side of pyramid.

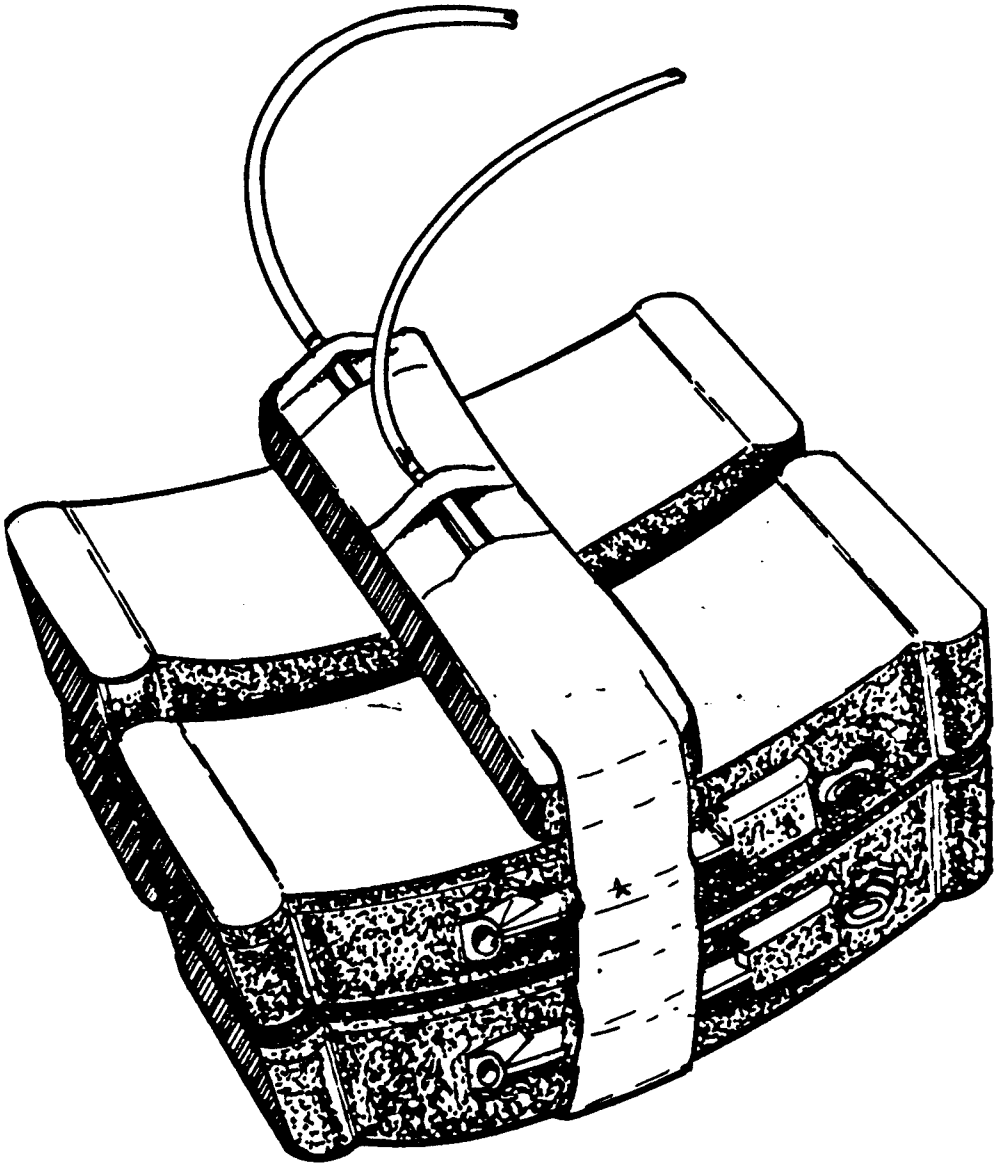


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Figure 6-11. M18A1 Antipersonnel Mine

e. Prime top of pyramid with detonating cord.

f. Cover pyramid with at least 0.61 meter (two feet) of earth.

g. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

h. Retire to proper distance.

i. Effect detonation.

6-40. METHOD 34 (Priming and Initiating Device).

a. Prepare pit.

b. Place items in wooden or cardboard container. Items may be placed directly in pit if bottom is smooth enough to ensure items will not be buried.

c. Completely cover top items, in or out of a container, with Composition C, or equivalent.

d. Prime Composition C with detonating cord.

e. Cover container/items with at least 0.61 meter (two feet) of earth.

f. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

g. Retire to proper distance.

h. Effect detonation.

6-41. METHOD 35 (Pyrotechnics).

a. Prepare pit.

b. Place cartridges/simulators primer end up in wooden container.

c. Place container(s) in pit.

d. Spread Composition C, or equivalent, on top in contact with each primer.

e. Prime Composition C with detonating cord.

f. Cover container(s) with at least 0.61 meter (two feet) of earth.

g. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

h. Retire to proper distance.

i. Effect detonation.

6-42. METHOD 36 (MJU-6/B)

a. Prepare pit.

b. Unpack chaff unit(s).

c. Place chaff unit(s) horizontally in pit.

d. Place one-half pound of Composition C, or equivalent, on chaff unit as shown in figure 6-12.

e. Dual prime with electric/nonelectric blasting caps, in accordance with Section IV.

f. Confine chaff dispersion by carefully covering chaff unit(s) with dirt or sandfilled bags. Do not cover blasting caps, firing leads/fuse or plastic explosive.

g. Retire to proper distance.

h. Effect detonation.

WARNING

The MK25 Mod 3 marker contains red phosphorus. Ensure that pyrotechnic composition is completely consumed to preclude a white phosphorus residue which ignites spontaneously upon exposure to air.

6-43. METHOD 37 (MK25 MOD 3 Marker).

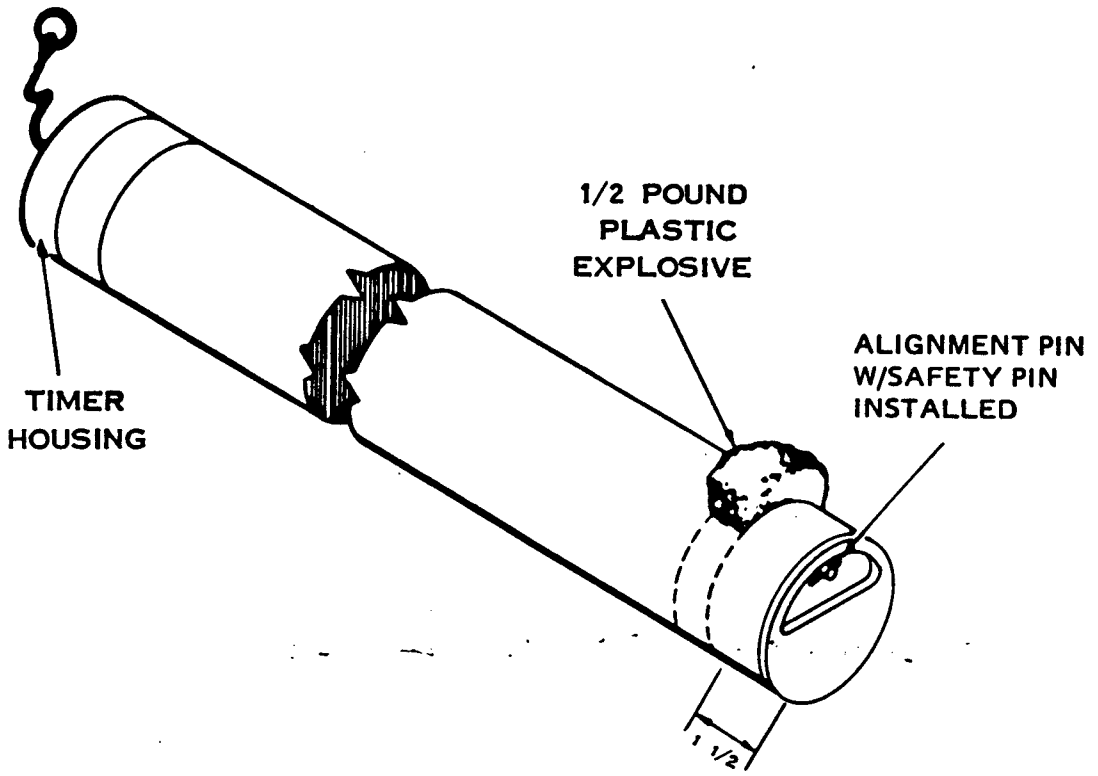

Figure 6-12. MJU-6 Countermeasures Chaff Cartridge and Package Charge Placement

NOTE

No more than two markers will be placed in a single drum. This limitation allows detection of a dud or partial burnout. Additional drums may be prepared if required.

a. Prepare a 55-gallon drum by pouring into it 36 to 40 gallons of water and adding five pounds of common salt. Stir until salt is dissolved.

b. Remove markers from storage container.

c. Turn base plate from SAFE to ARMED position.

d. Push the two brass port plugs into battery cavity.

WARNING

Avoid excessive contact with the smoke produced as it is a caustic irritant to the skin and mucous linings of the nose and throat.

NOTE

Marker functions within 2 to 3 seconds and burns from 13 to 19 minutes.

e. Place marker, base plate down, into the salt water and allow marker to function.

NOTE

- If a dud or partial burn occurs, proceed to subparagraph j.
- Allow marker to remain in the salt water for approximately 10 minutes after burnout prior to removal so that marker can cool.

f. Don asbestos gloves and face shield.

g. Remove burned out marker from drum and place on ground with smoke port end away from work area.

h. Using wooden pole, strike the housing of the marker to break loose any phosphorus residue. Some small amounts of smoke may occur in conjunction with the striking effort.

i. Inspect and certify scrap in accordance with T.O. 11A-1-60.

j. If duds or partial burnouts occur during disposal operation, wait ten minutes and remove from drum while wearing asbestos gloves and face shield, and accomplish final disposal as follows:

(1) Place duds in a box partly filled with sand or dirt for transporting to detonation site.

(2) Transport to detonation site.

(3) Detonate in accordance with paragraph 6-6.

6-44. METHOD 38 (FLARE, CARTRIDGE, XM3529).

WARNING

Do not stand directly in line with ejection end of cartridge. Personnel injury could result.

a. Ensure safety clips are installed.

b. Remove flares from container.

NOTE

Number of pyramids of eight flares to be prepared will be determined by range safety distance.

c. Place eight flares (1 container) on ground in a pyramid.

d. Mold a M112 block Composition C, or equivalent, over both ends of stacked flares.

e. Prime both molds of Composition C with electric/nonelectric blasting caps.

f. Retire to proper distance.

g. Effect detonation.

6-45. METHOD 39 (M127 and M131 signals).

a. Remove signals from wooden container.

b. Place signals in a single row on firm ground parallel to and touching each other.

c. Place a M-112 block Composition C centered on top of each two signals.

d. Connect Composition C blocks with additional Composition C at both ends of flares.

e. Prepare for detonation using electric or nonelectric firing system in accordance with Section IV.

f. Retire to proper distance.

g. Effect detonation.

6-46. METHOD 40 (KMU Cutter and Container).

a. Deactivate explosive cutter and gas container as follows: (figure 6-13 and 6-14).

WARNING

Safety pin will be installed prior to deactivation.

(1) Ensure that safety pin is installed.

(2) Open control section access door.

(3) Disconnect explosive cutter connector and actuation system connector.

(4) Remove the four control surface assemblies.

(5) Remove control section closeout fairing by removing four buttonhead cap screws.

WARNING

- Remain clear of ground test port until nitrogen is completely bled off.
- If nitrogen cannot be completely bled off, the control section will be disposed of by EOD.

(6) Remove ground test port caps.

(7) Actuate the explosive cutter by applying 28 volts across pins "A-B" and "B-C." A minimum current of 7 amperes for 10 milliseconds will initiate the cutter and allow the gas pressure to bleed through the ground test port.

NOTE

Unserviceable batteries will be disposed of by burning in a pit (paragraph 3-6).

b. Remove batteries and test in accordance with T.O. 11K1-4-7.

c. Inspect and certify the control section in accordance with T.O. 11A-1-60.

6-47. METHOD 41 (M1A1 Fuze Extension).

a. Place fuze extensions on firm ground, parallel to each other and touching.

b. Place M112 blocks of Comp C, or equivalent, across the middle of the extensions ensuring that the Comp C extends completely across all extensions (figure 6-15). Two and one-half blocks will extend across ten extensions.

c. Prime both ends of Comp C with electric/nonelectric blasting caps in accordance with section IV.

d. Retire to proper distance.

e. Effect detonation.

6-48. METHOD 42 (Engine Starter Cartridges).

NOTE

Use this method when destroying large quantities or in areas where dunnage, engine oil, or transport are difficult to obtain.

a. Open containers and remove engine starter cartridges.

b. Place cartridges in two rows with the screens facing each other.

c. Stack cartridges into three or four layers.

d. Prepare two incendiary grenades as instructed in section IV.

e. Place one grenade on opposite top ends of the stack.

f. Effect initiation as required.

6-49. METHOD 43 (LUU Series Aircraft Parachute Flares).

NOTE

Use this method when destroying large quantities or in areas where dunnage, engine oil or transport are difficult to obtain.

a. Open containers and remove flares.

b. Place flares side by side in a row with candle ends alternated.

c. Stack flares no higher than six high.

d. Prepare two incendiary grenades as instructed in section IV.

e. Place one grenade on top of each end of the stack.

f. Effect initiation as required.

6-50. METHOD 44 (BLU-107/B).

a. Place BLU-107/B in horizontal position in pit with lugs at 3 o'clock or 9 o'clock position.

b. Place not less than seven 2.5 pound (1.14 Kg) plastic explosive charges or equivalent on what is now top center line of bomb from nose to past fins as shown in figure 6-16.

c. Prime charges at both ends with detonating cord in accordance with section IV.

d. Cover BLU-107/B with at least two feet (0.61 meter) of earth.

e. Prepare for detonation using electric or nonelectric firing system in accordance with section IV.

f. Retire to proper distance.

g. Effect detonation.

6-51. METHOD 45 (LUU-10/B).

WARNING

Do not inhale signal smoke. Smoke is toxic.

a. Place signal flat on ground and stabilize.

b. Position a prepared MK7 Mod 2 shaped charge longitudinally on signal 178 millimeters (seven inches) from forward end.

NOTE

Bend long legs of shaped charge outward until shaped charge is level on signal.

c. Prepare for detonation using electric or nonelectric firing system in accordance with section IV.

d. Retire to proper distance.

e. Effect detonation.