LONGHORN ARMY AMMUNITION PLANT

KARNACK, TEXAS

ADMINISTRATIVE RECORD

VOLUME 1 of 4

1992

Bate Stamp Numbers
004406 - 004667

Prepared for:

Department of the Army
Longhorn Army Ammunition Plant
Marshall, Texas 75671-1059

1995

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD - CHRONOLOGICAL INDEX

VOLUME 1 of 4

1992

A. Title: Letter - Subject: Draft Schedules
Attach(s): Schedules
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U. S. Army Corps Of Engineers, Tulsa District
Author(s): Frank W. Parker, U.S. Army
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: January 17, 1992
Bate Stamp: 004406 - 004435

B. Title: Letter - Subject: Meeting On ARARs
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Department Of The Army, Longhorn Army Ammunition Plant
Author(s): Randall J. Miller, Captain, U.S. Army
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: January 27, 1992
Bate Stamp: 004436

C. Title: Letter - Subject: EPA's Comments On Draft Schedule
Attach(s): Schedules
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Environmental Protection Agency
Author(s): Ms. Lisa M. Price, Environmental Protection Agency
Recipient: Lynn Muckelrath, Longhorn Army Ammunition Plant
Date: February 5, 1992
Bate Stamp: 004437 - 004442

D. Title: Letter - Subject: TWC's Comments On Draft Schedule
Attach(s): Schedules
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Texas Water Commission
Author(s): Michael A. Moore, Texas Water Commission
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: February 6, 1992
Bate Stamp: 004443 - 004446

VOLUME 1 of 4 (Continued)

1992

E. Title: Letter - Subject: Revised Draft Schedules
Attach(s): Schedules
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U. S. Army Corps Of Engineers, Tulsa District
Author(s): Frank W. Parker, U.S. Army
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: February 19, 1992
Bate Stamp: 004447 - 004455

F. Title: Letter - Subject: Approval Of Revised Draft Schedules
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Texas Water Commission
Author(s): Michael A. Moore, Texas Water Commission
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: February 24, 1992
Bate Stamp: 004456

G. Title: Letter - Subject: Submission Of Community Relations Plan
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Environmental Protection Agency
Author(s): R. Terry Coomes, Chief, Engineering Division, U.S. Army
Recipient: Ms. Lisa Marie Price, Environmental Protection Agency
Date: February 24, 1992
Bate Stamp: 004457 - 004459

H. Title: Letter - Subject: Submission of Draft Remedial Investigation / Feasibility Study (RI / FS)
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U.S. Army Corps of Engineers, Fort Worth District
Author(s): R. Terry Coomes, P.E., Chief, Engineering Division

VOLUME 1 of 4 (Continued)

1992

Recipient: Ms. Lisa M. Price, U.S. Environmental Protection Agency
Date: February 27, 1992
Bate Stamp: 004460

I. Title: Letter - Subject: Scheduling Of First TRC Meeting
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Department Of The Army, Longhorn Army Ammunition Plant
Author(s): Robert W. Bringman, Lieutenant Colonel, U.S. Army
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: March 3, 1992
Bate Stamp: 004461 - 004463

J. Title: Progress Report - Technical Review Committee, Longhorn Army Ammunition Plant
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Company: Environmental Protection Agency
Author(s): Environmental Protection Agency
Recipient: U.S. Army
Texas Water Commission
Local Government Agencies
Date: March 10, 1992
Bate Stamp: 004464 - 004493

K. Title: Letter - Draft Initial Remedial Action / Data Quality Objectives
Group(s): 1,2, and 3
Site(s): LHAAP-1 Inert Burning Grounds
LHAAP-11 Suspected TNT Burial Site At Avenues P & Q
LHAAP-12 Active Landfill
LHAAP-13 Suspected TNT Burial Between Active Landfill & Old Landfill
LHAAP-14 Area 54 Burial Ground
LHAAP-16 Old Landfill
LHAAP-17 No. 2 Flashing Area / Burning Ground
LHAAP-18 & LHAAP-24 Burning Ground / Washout Pond & Evaporation Pond
LHAAP-27 South Test Area
LHAAP-29 Former TNT Production Area
LHAAP-32 Former TNT Waste Disposal Plant
LHAAP-54 or LHAAP-XX Ground Signal Test Area
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U.S. Army Corps Of Engineers

VOLUME 1 of 4 (Continued)

1992

Author(s): Robert W. Bringman, Lieutenant Colonel, U.S. Army
Recipient: Ms. Lisa Marie Price, Environmental Protection Agency
Date: March 13, 1992
Bate Stamp: 004494

L. Title: Response To Comments - Longhorn Army Ammunition Plant Remedial Investigation / Feasibility Study (RI / FS) Draft Work Plan
Group(s): 1,2, and 3
Site(s): LHAAP-1 Inert Burning Grounds
LHAAP-11 Suspected TNT Burial Site At Avenues P & Q
LHAAP-12 Active Landfill
LHAAP-13 Suspected TNT Burial Between Active Landfill & Old Landfill
LHAAP-14 Area 54 Burial Ground
LHAAP-16 Old Landfill
LHAAP-17 No. 2 Flashing Area / Burning Ground
LHAAP-18 & LHAAP-24 Burning Ground / Washout Pond & Evaporation Pond
LHAAP-27 South Test Area
LHAAP-29 Former TNT Production Area
LHAAP-32 Former TNT Waste Disposal Plant
LHAAP-54 or LHAAP-XX Ground Signal Test Area
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Environmental Protection Agency
Author(s): Lisa Marie Price, Remedial Project Manager, Superfund Texas Enforcement
Recipient: Lynn Muckelrath, Project Manager, Longhorn Army Ammunition Plant
Date: March 27, 1992
Bate Stamp: 004495 - 004543

M. Title: Response To Comments - Longhorn Army Ammunition Plant Community Relations Plan
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Environmental Protection Agency
Author(s): Lisa Marie Price, Remedial Project Manager, Superfund Texas Enforcement
Recipient: Lynn Muckelrath, Project Manager, Longhorn Army Ammunition Plant
Date: March 27, 1992
Bate Stamp: 004544 - 004548

N. Title: Letter - TWC's Comments On Draft Remedial Investigation / Feasibility Study Work Plan

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1992

Initial Remedial Action / Data Quality Objectives, And Community Relations Plan
Group(s): 1,2, & 3
Site(s): LHAAP-1 Inert Burning Grounds
LHAAP-11 Suspected TNT Burial Site At Avenues P & Q
LHAAP-12 Active Landfill
LHAAP-13 Suspected TNT Burial Site Between Old & Active Landfills
LHAAP-16 Old Landfill
LHAAP-17 Burning Ground No. 2 / Flashing Area,
LHAAP-18 & LHAAP-24 Burning Ground / Washout Pond & Evaporation Pond
LHAAP-27 South Test Area
LHAAP-29 Former TNT Production Area
LHAAP-32 Former TNT Disposal Plant
LHAAP-54 or LHAAP-XX Ground Signal Test Area
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Texas Water Commission
Author(s): Michael A. Moore, Texas Water Commission
Recipient: Lynn Muckelrath, Project Manager, Longhorn Army Ammunition Plant
Date: April 1, 1992
Bate Stamp: 004549 - 004578

O. **Title:** Letter - EPA's Comments On Draft Initial Remedial Action / Data Quality Objectives
Group(s): 1,2, & 3
Site(s): LHAAP-1 Inert Burning Grounds
LHAAP-11 Suspected TNT Burial Site At Avenues P & Q
LHAAP-12 Active Landfill
LHAAP-13 Suspected TNT Burial Site Between Old & Active Landfills
LHAAP-14 Area 54 Burial Ground
LHAAP-16 Old Landfill
LHAAP-17 Burning Ground No. 2 / Flashing Area
LHAAP-18 & LHAAP-24 Burning Ground / Washout Pond & Evaporation Pond
LHAAP-27 South Test Area
LHAAP-29 Former TNT Production Area
LHAAP-32 Former TNT Disposal Plant
LHAAP-54 or LHAAP-XX Ground Signal Test Area
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Environmental Protection Agency
Author(s): Lisa Marie Price, Remedial Project Manager, Superfund Texas Enforce
Recipient: Lynn Muckelrath, Project Manager, Longhorn Army Ammunition Plant
Date: April 14, 1992
Bate Stamp: 004579 - 004584

VOLUME 1 of 4 (Continued)

1992

P. **Title:** Final Plan - Longhorn Army Ammunition Plant Community Relations Plan
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U.S. Army Corps Of Engineers, Tulsa District
Author(s): U.S. Army Corps Of Engineers, Tulsa District
Recipient: U.S. Army, Longhorn Army Ammunition Plant
Date: May, 1992
Bate Stamp: 004585 - 004652

Q. **Title:** Letter - Response To Request For Extension Remedial Investigation / Feasibility Study
Group(s): 1,2, & 3
Site(s): LHAAP-1 Inert Burning Grounds
LHAAP-11 Suspected TNT Burial Site At Avenues P & Q
LHAAP-12 Active Landfill
LHAAP-13 Suspected TNT Burial Site Between Old & Active Landfills
LHAAP-14 Area 54 Burial Ground
LHAAP-16 Old Landfill
LHAAP-17 Burning Ground No. 2 / Flashing Area
LHAAP-18 & LHAAP-24 Burning Ground / Washout Pond & Evaporation Pond
LHAAP-27 South Test Area
LHAAP-29 Former TNT Production Area
LHAAP-32 Former TNT Disposal Plant
LHAAP-54 or LHAAP-XX Ground Signal Test Area
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Texas Water Commission
Author(s): Michael A. Moore, Texas Water Commission
Recipient: Lynn Muckelrath, Project Manager, Longhorn Army Ammunition Plant
Date: May 13, 1992
Bate Stamp: 004653

R. **Title:** Letter - Army's Response To Comments Remedial Investigation / Feasibility Study
Group(s): 1,2, & 3
Site(s): LHAAP-1 Inert Burning Grounds
LHAAP-11 Suspected TNT Burial Site At Avenues P & Q
LHAAP-12 Active Landfill
LHAAP-13 Suspected TNT Burial Site Between Old & Active Landfills
LHAAP-14 Area 54 Burial Ground
LHAAP-16 Old Landfill

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1992

LHAAP-17 Burnin Ground No. 2 / Flashing Area
LHAAP-18 & LHAAP-24 Burning Ground / Washout Pond & Evaporation Pond
LHAAP-27 South Test Area
LHAAP-29 Former TNT Production Area
LHAAP-32 Former TNT Disposal Plant
LHAAP-54 or LHAAP-XX Ground Signal Test Area

Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U.S. Army Corps Of Engineers
Author(s): Robert W. Bringman, Lieutenant Colonel, U.S. Army
Recipient: Lisa Marie Price, Remedial Project Manager, Superfund Texas Enforce
Date: May 14, 1992
Bate Stamp: 004654 - 004659

S. **Title:** Letter - Subject: Army's Response To Comments Revised Community Relations Plan
Attach(s) Comments
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: U. S. Army, Longhorn Army Ammunition Plant
Author(s): Robert W. Bringman, Lieutenant Colonel, U. S. Army
Recipient: Ms. Lisa Marie Price, Environmental Protection Agency
Date: May 18, 1992
Bate Stamp: 004660 - 004662

T. **Title:** Letter - Subject: Draft Revised Schedules
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Department Of The Army, Longhorn Army Ammunition Plant
Author(s): Robert W. Bringman, Lieutenant Colonel, U.S. Army
Recipient: Ms. Lisa M. Price, Environmental Protection Agency
Date: May 19, 1992
Bate Stamp: 004663 - 004665

U. **Title:** Letter - Subject: EPA's Comments On Draft Revised Schedule
Group(s): All
Site(s): General
Location: Longhorn Army Ammunition Plant, Marshall, Texas
Agency: Environmental Protection Agency
Author(s): Ms. Lisa M. Price, Environmental Protection Agency
Recipient: Lynn Muckelrath, Longhorn Army Ammunition Plant

VOLUME 1 of 4 (Continued)

1992

Date: **May 29, 1992**
Bate Stamp: **004666 - 004667**

DEPARTMENT OF THE ARMY
TULSA DISTRICT, CORPS OF ENGINEERS
POST OFFICE BOX 61
TULSA, OKLAHOMA 74121-0061

REPLY TO
ATTENTION OF

January 17, 1992

Engineering and Construction Division
Geotechnical Branch

Ms. Lisa Marie Price, 6H-ET
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Tx 75202-2733

Dear Ms. Price:

At the request of Longhorn Army Ammunition Plant (LHAAP), we are submitting the proposed deadlines for completion of the draft primary documents, as specified in the Federal Facility Agreement (FFA). The list includes deadlines for the secondary documents required by the FFA. We have also included a list of the assumptions made and the Gantt chart used to develop the proposed deadlines. Three copies of the proposed schedule, assumptions, and Gantt chart are enclosed.

Tulsa District Corps of Engineers prepared the schedule for LHAAP and will make any revisions. Please send comments to Tulsa District Corps of Engineers, P.O. Box 61, Attn: Mr. Randy Juhlin, CESWT-EC-GP, Tulsa, OK 74121-0061. Comments should be sent by February 5, 1992. We will provide the Army's project manager, Mr. Lynn Muckelrath, with a copy of the comments.

Sincerely,

Frank W. Parker

Frank W. Parker, P.E.
Chief, Engineering and
Construction Division

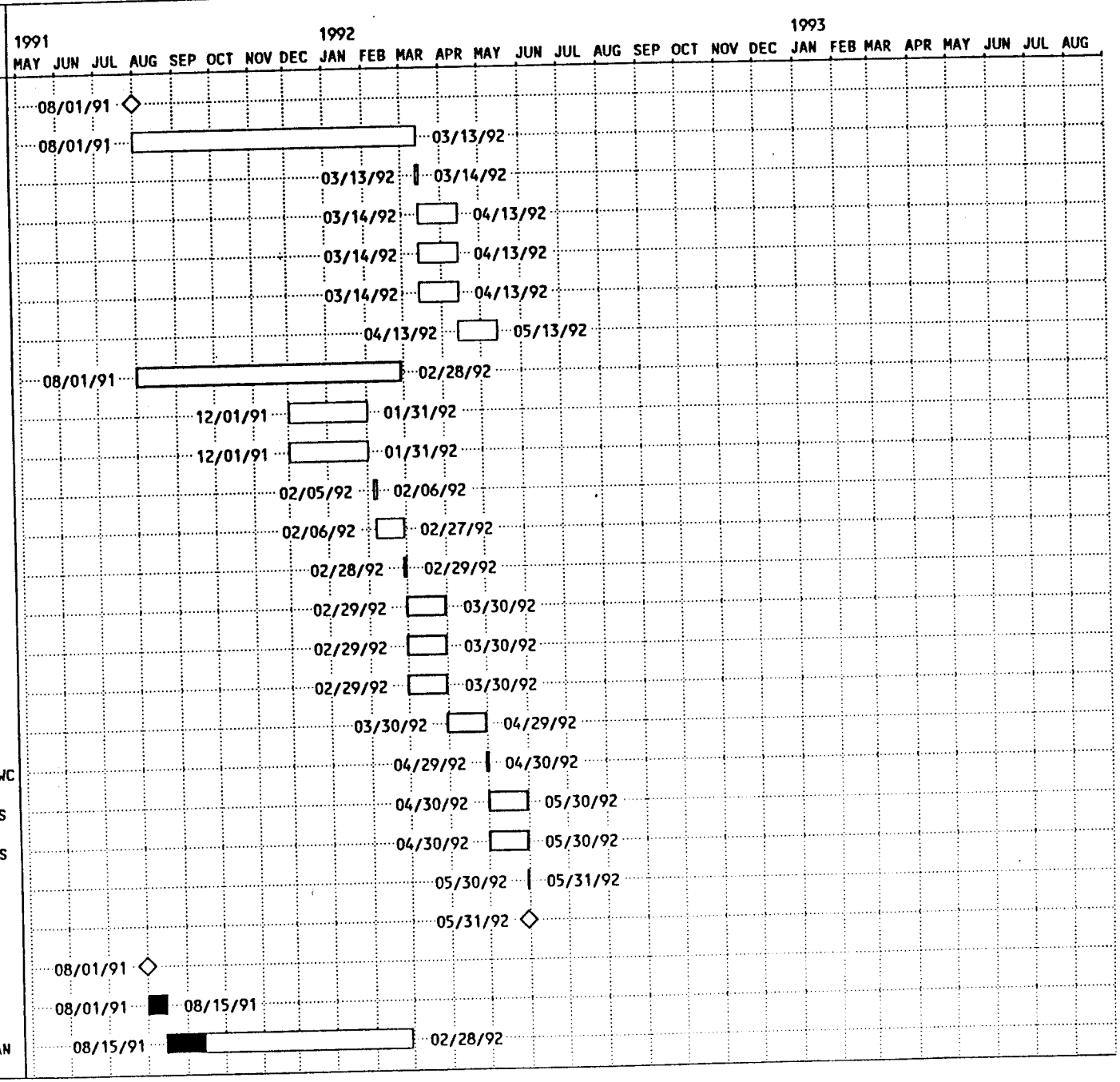
Enclosure

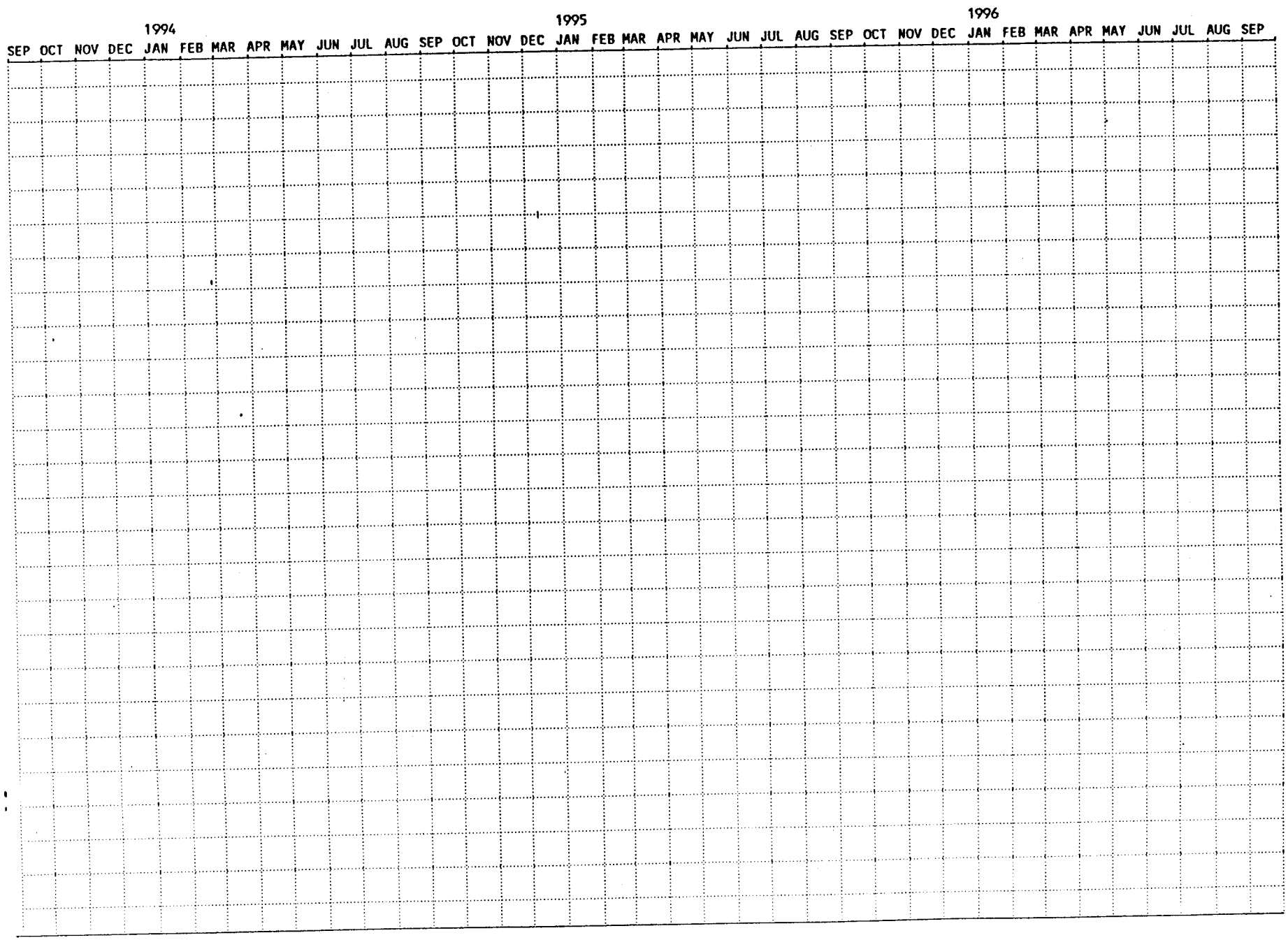
PRIMARY REPORTS AND SECONDARY DOCUMENTS AS SCHEDULED

REPORT	DATE
Initial Remedial Action/Data Quality Objectives	3-13-92
Draft Community Relations Plan	2-28-92
Draft RI/FS Workplan	2-28-92
Draft Initial Screening of Alternatives	11-4-92
Post-Screening Investigation Workplan	4-19-93
Sampling and Data Report	5-12-93
Site Characterization Summary	9-11-93
Treatability Study	3-16-94
Draft RI Report	4-16-94
Draft Risk Assessment	4-16-94
Detailed Analysis of Alternatives Discussion	12-31-94
Draft FS Report	7-22-95
Draft Proposed Plan	12-20-95
Draft ROD Responsiveness Summary	8-19-96
Draft Record of Decision	2-17-97
Draft RD Workplan	6-20-97
30% Plans and Specs	9-20-97
60% Plans and Specs	11-20-97
90% Plans and Specs	1-19-98
Draft Final Remedial Design	4-21-98
Remedial Action Workplan	4-21-98

PROJECT: Longhorn AAP
CURRENT DATE: 01/17/92
AS OF DATE: 11/18/91

GANTT CHART REPORT

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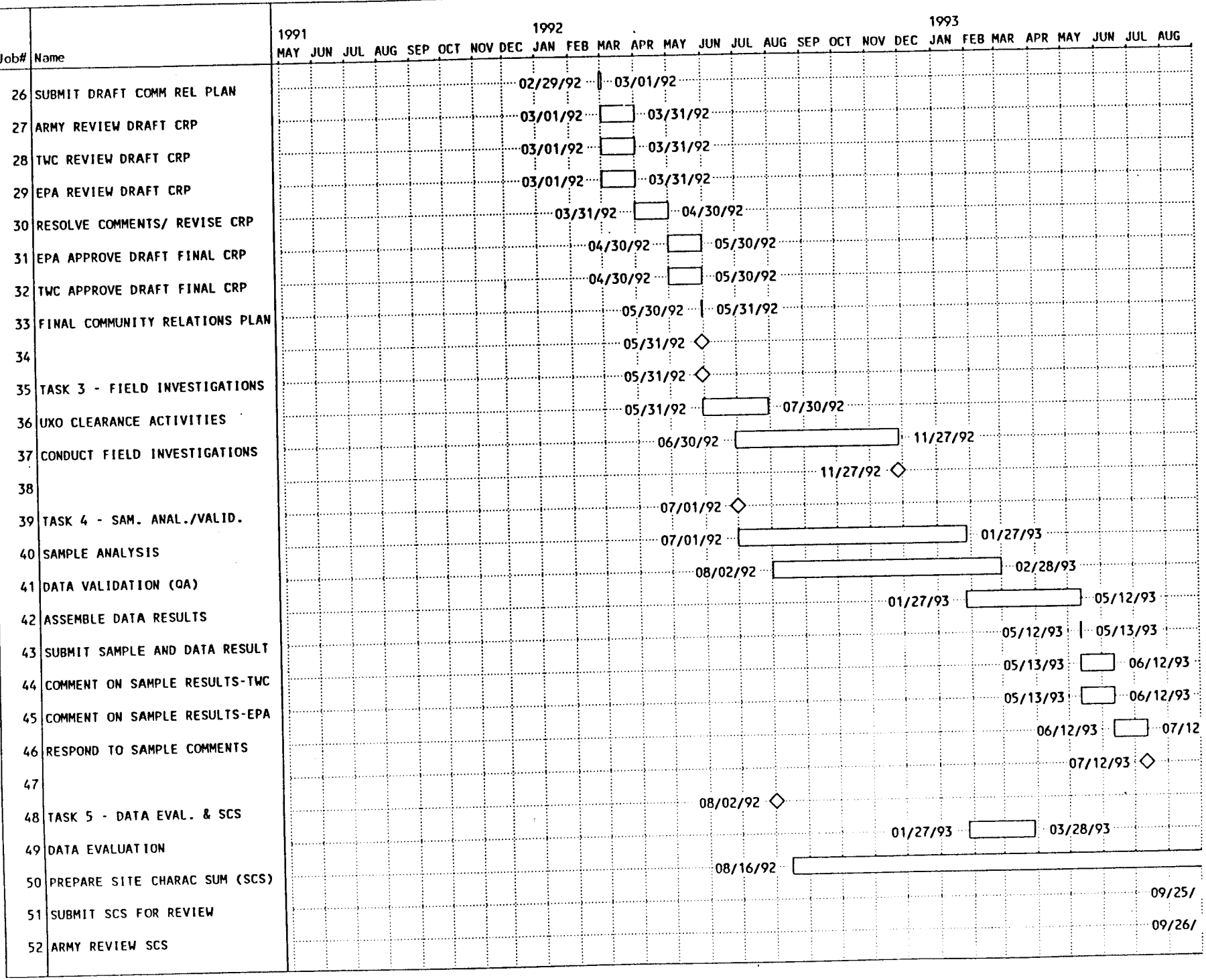
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27 ARMY REVIEW DRAFT CRP
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28 TWC REVIEW DRAFT CRP
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29 EPA REVIEW DRAFT CRP
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30 RESOLVE COMMENTS/ REVISE CRP
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31 EPA APPROVE DRAFT FINAL CRP
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32 TWC APPROVE DRAFT FINAL CRP
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33 FINAL COMMUNITY RELATIONS PLAN
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35 TASK 3 - FIELD INVESTIGATIONS
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36 UXO CLEARANCE ACTIVITIES
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37 CONDUCT FIELD INVESTIGATIONS
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39 TASK 4 - SAM. ANAL./VALID.
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40 SAMPLE ANALYSIS
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41 DATA VALIDATION (QA)
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43 SUBMIT SAMPLE AND DATA RESULT
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45 COMMENT ON SAMPLE RESULTS-EPA
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46 RESPOND TO SAMPLE COMMENTS
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48 TASK 5 - DATA EVAL. & SCS
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49 DATA EVALUATION
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03/28/93
50 PREPARE SITE CHARAC SUM (SCS)
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51 SUBMIT SCS FOR REVIEW
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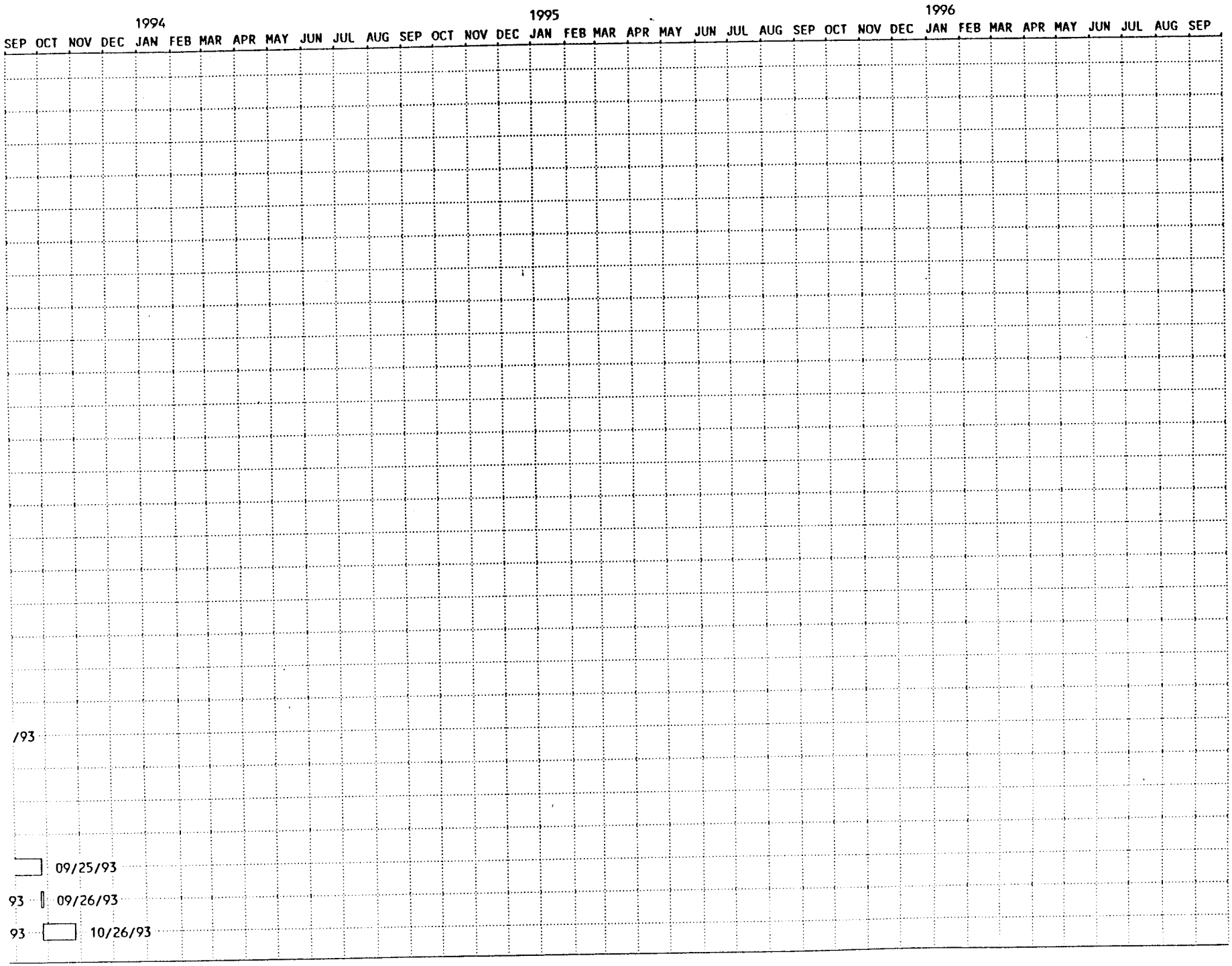
52 ARMY REVIEW SCS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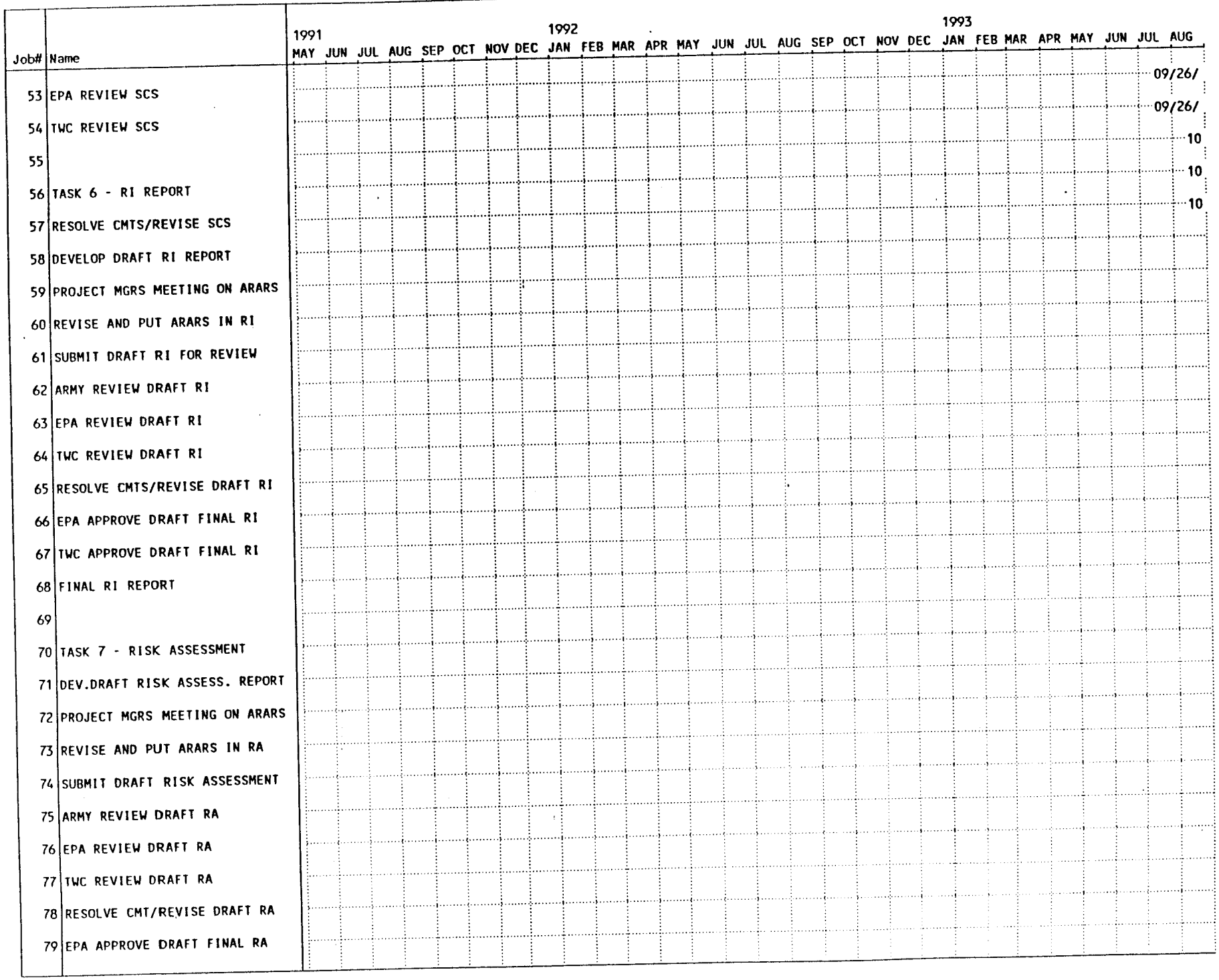
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56 TASK 6 - RI REPORT
57 RESOLVE CMTS/REVISE SCS
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59 PROJECT MGRS MEETING ON ARARS
60 REVISE AND PUT ARARS IN RI
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62 ARMY REVIEW DRAFT RI
63 EPA REVIEW DRAFT RI
64 TWC REVIEW DRAFT RI
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66 EPA APPROVE DRAFT FINAL RI
67 TWC APPROVE DRAFT FINAL RI
68 FINAL RI REPORT
69
70 TASK 7 - RISK ASSESSMENT
71 DEV.DRAFT RISK ASSESS. REPORT
72 PROJECT MGRS MEETING ON ARARS
73 REVISE AND PUT ARARS IN RA
74 SUBMIT DRAFT RISK ASSESSMENT
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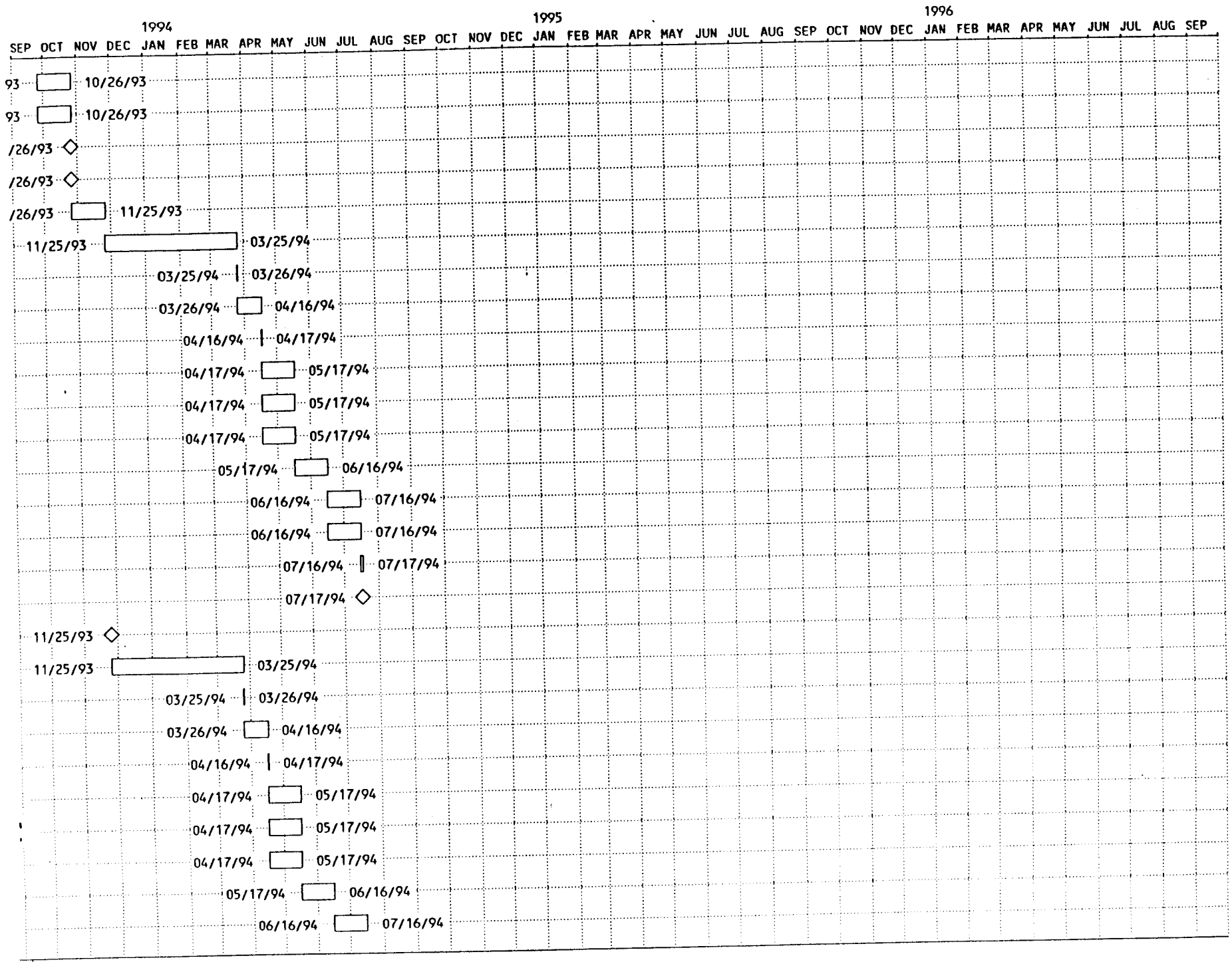
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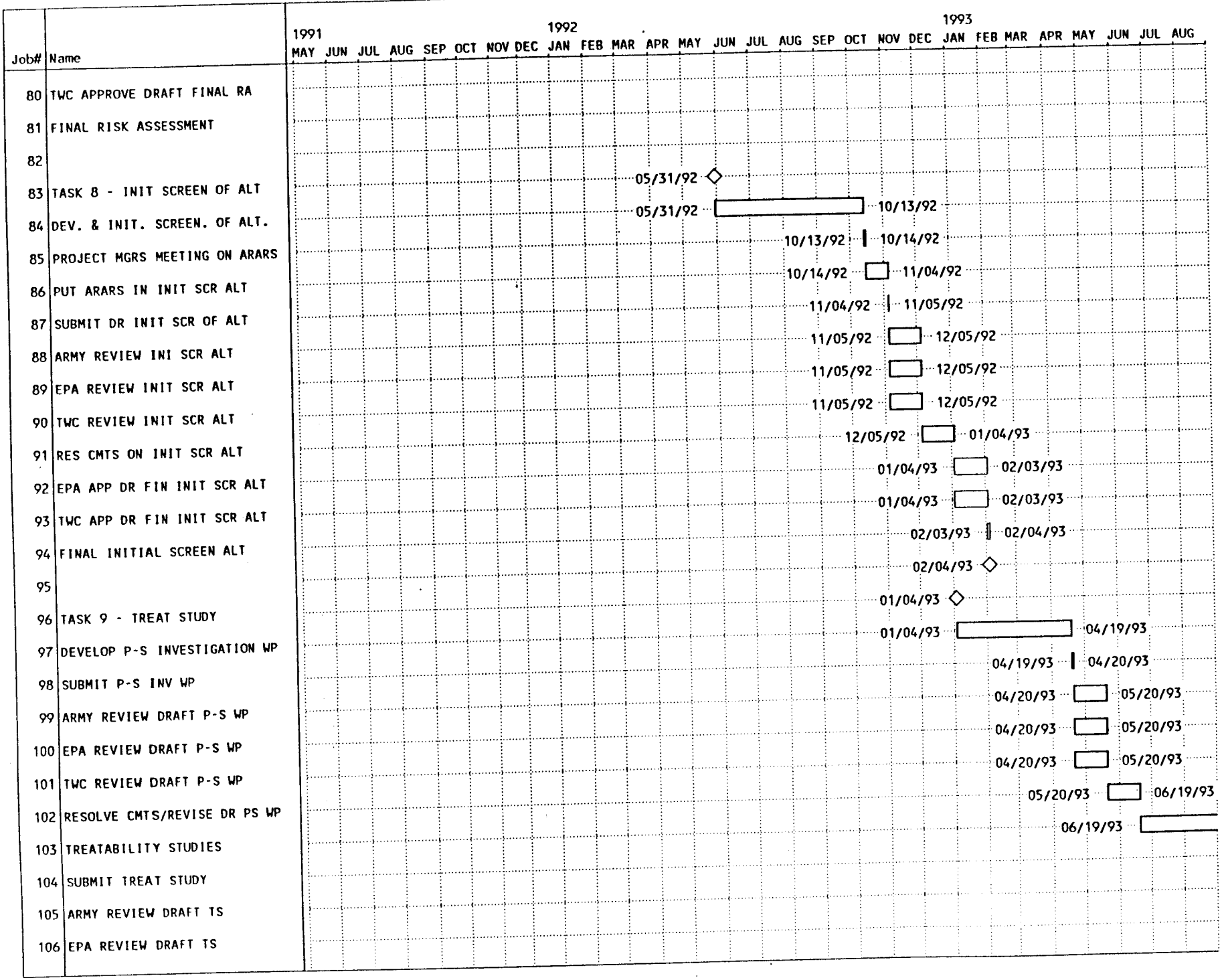
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83 TASK 8 - INIT SCREEN OF ALT
84 DEV. & INIT. SCREEN. OF ALT.
85 PROJECT MGRS MEETING ON ARARS
86 PUT ARARS IN INIT SCR ALT
87 SUBMIT DR INIT SCR OF ALT
88 ARMY REVIEW INI SCR ALT
89 EPA REVIEW INIT SCR ALT
90 TWC REVIEW INIT SCR ALT
91 RES CMTS ON INIT SCR ALT
92 EPA APP DR FIN INIT SCR ALT
93 TWC APP DR FIN INIT SCR ALT
94 FINAL INITIAL SCREEN ALT
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96 TASK 9 - TREAT STUDY
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98 SUBMIT P-S INV WP
99 ARMY REVIEW DRAFT P-S WP
100 EPA REVIEW DRAFT P-S WP
101 TWC REVIEW DRAFT P-S WP
102 RESOLVE CMTS/REVISE DR PS WP
103 TREATABILITY STUDIES
104 SUBMIT TREAT STUDY
105 ARMY REVIEW DRAFT TS
106 EPA REVIEW DRAFT TS
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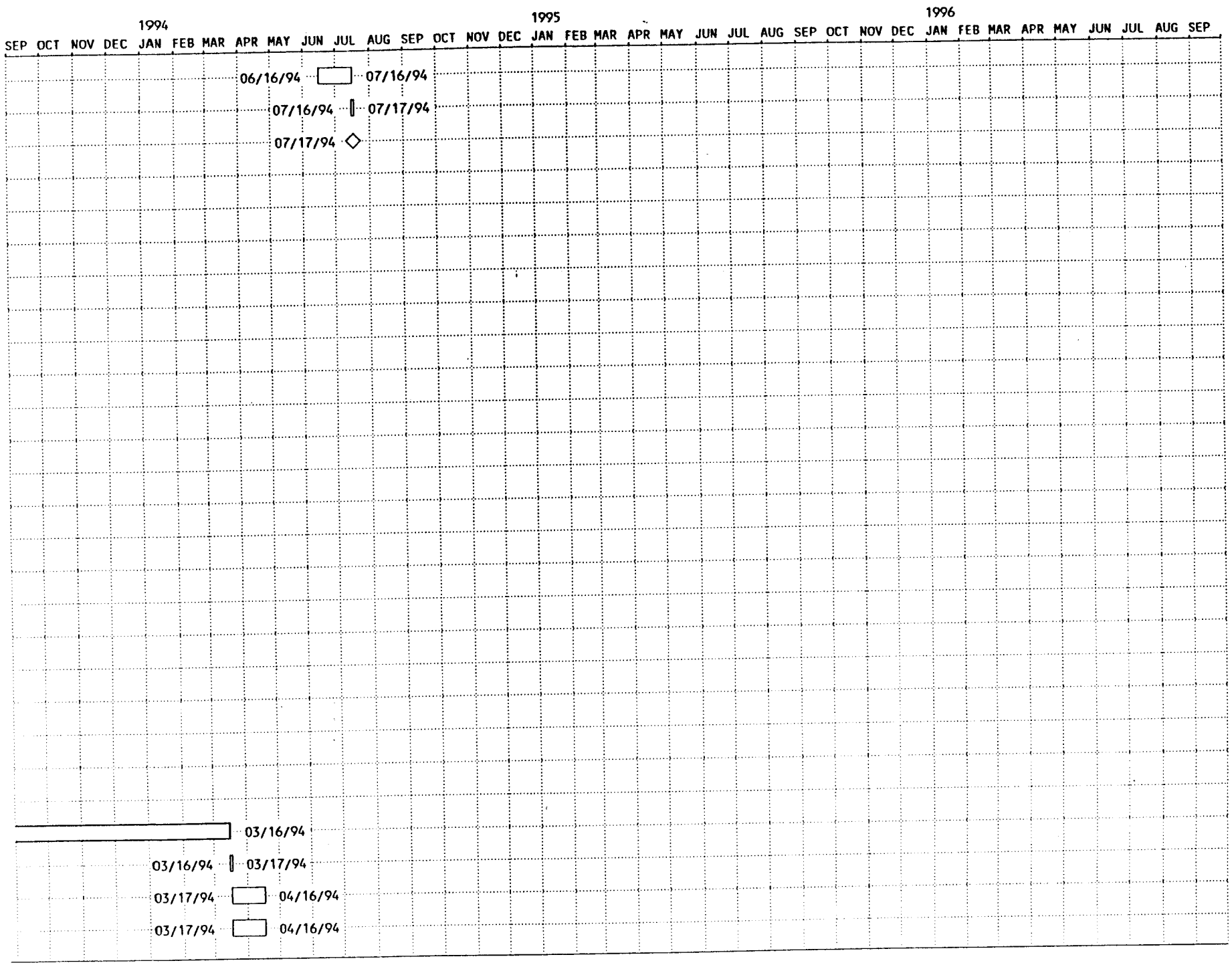
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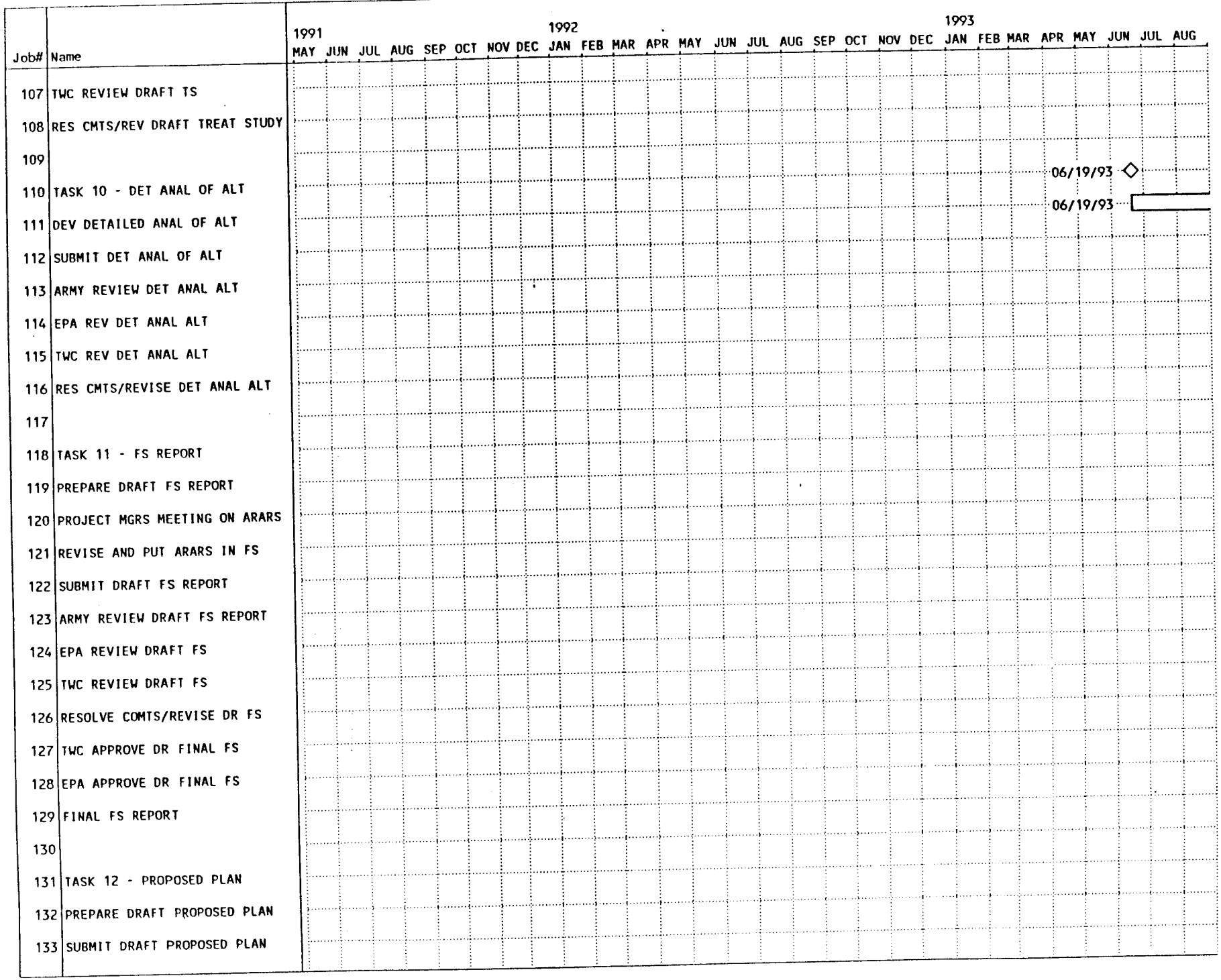
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108 RES CMTS/REV DRAFT TREAT STUDY
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110 TASK 10 - DET ANAL OF ALT
111 DEV DETAILED ANAL OF ALT
112 SUBMIT DET ANAL OF ALT
113 ARMY REVIEW DET ANAL ALT
114 EPA REV DET ANAL ALT
115 TWC REV DET ANAL ALT
116 RES CMTS/REVISE DET ANAL ALT
117
118 TASK 11 - FS REPORT
119 PREPARE DRAFT FS REPORT
120 PROJECT MGRS MEETING ON ARARS
121 REVISE AND PUT ARARS IN FS
122 SUBMIT DRAFT FS REPORT
123 ARMY REVIEW DRAFT FS REPORT
124 EPA REVIEW DRAFT FS
125 TWC REVIEW DRAFT FS
126 RESOLVE COMTS/REVISE DR FS
127 TWC APPROVE DR FINAL FS
128 EPA APPROVE DR FINAL FS
129 FINAL FS REPORT
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131 TASK 12 - PROPOSED PLAN
132 PREPARE DRAFT PROPOSED PLAN
133 SUBMIT DRAFT PROPOSED PLAN
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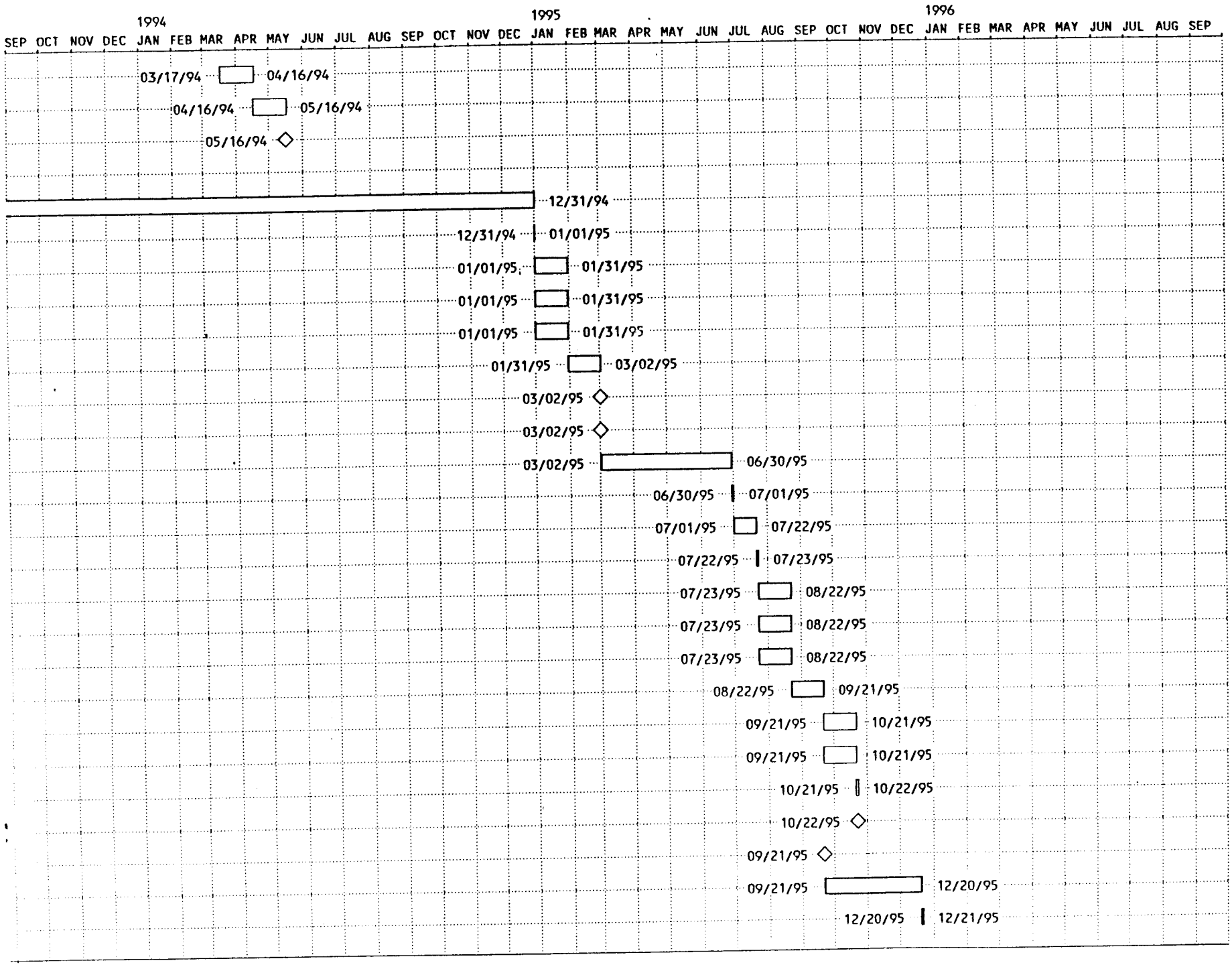
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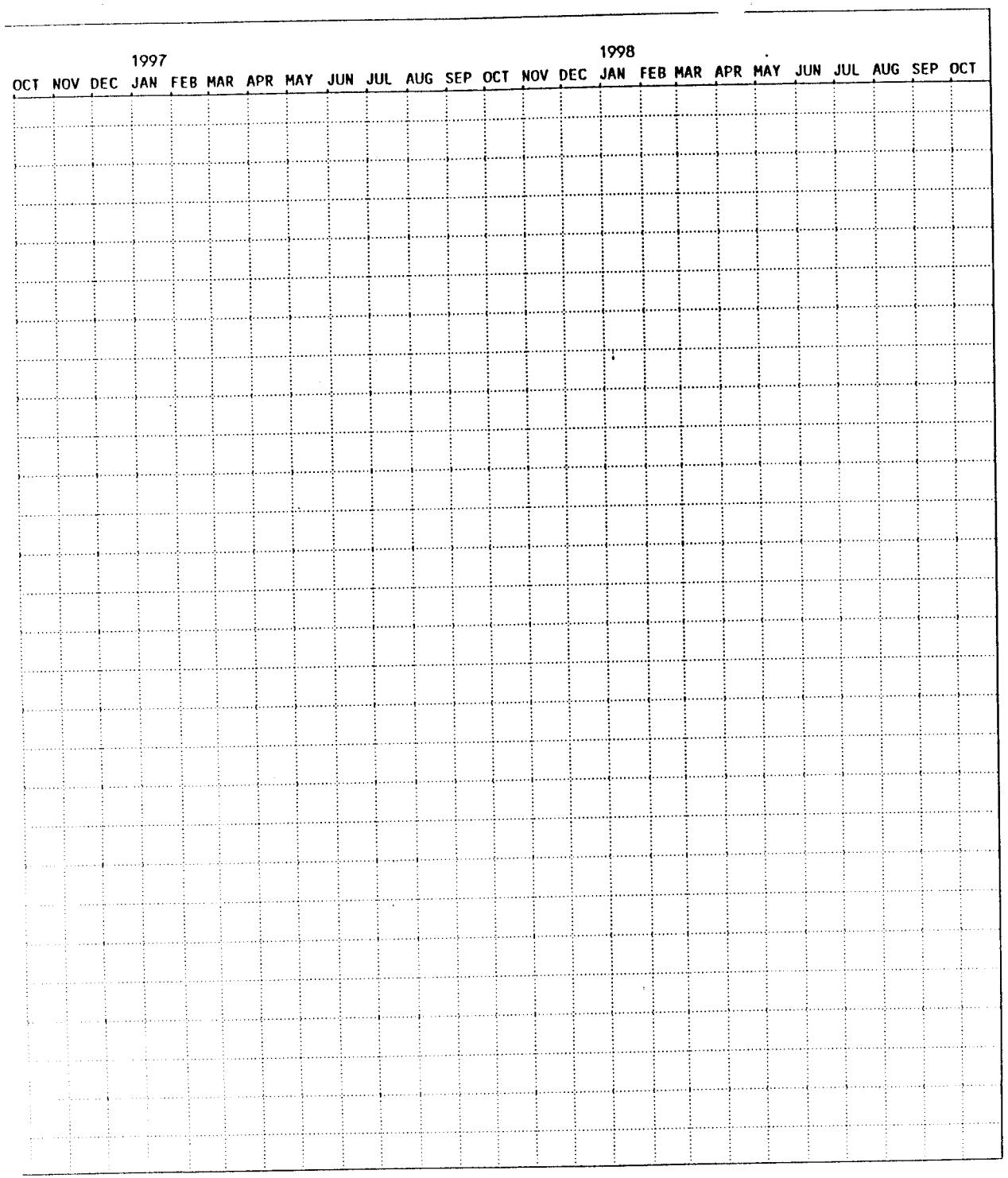
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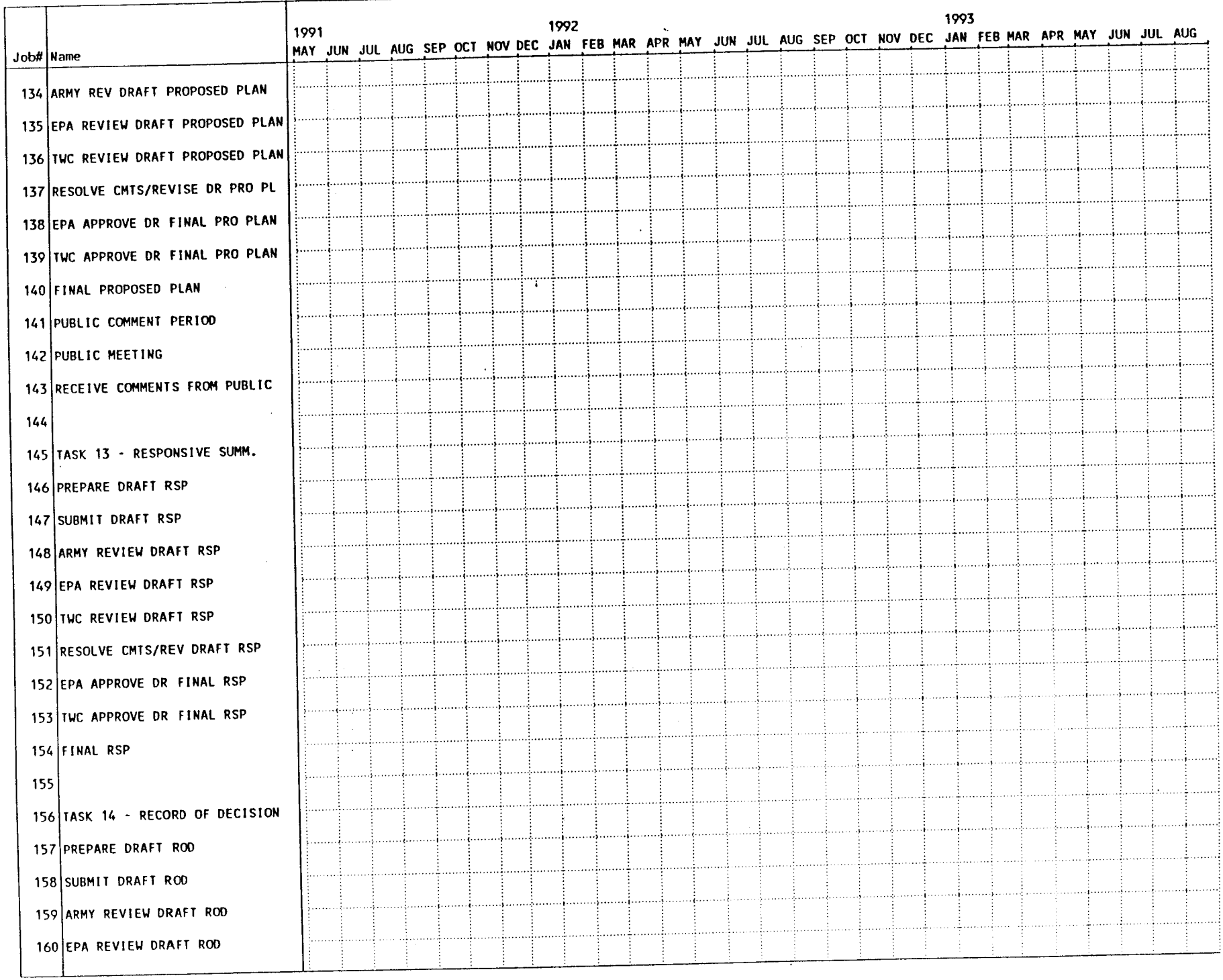
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135 EPA REVIEW DRAFT PROPOSED PLAN
136 TWC REVIEW DRAFT PROPOSED PLAN
137 RESOLVE CMTS/REVISE DR PRO PL
138 EPA APPROVE DR FINAL PRO PLAN
139 TWC APPROVE DR FINAL PRO PLAN
140 FINAL PROPOSED PLAN
141 PUBLIC COMMENT PERIOD
142 PUBLIC MEETING
143 RECEIVE COMMENTS FROM PUBLIC
144
145 TASK 13 - RESPONSIVE SUMM.
146 PREPARE DRAFT RSP
147 SUBMIT DRAFT RSP
148 ARMY REVIEW DRAFT RSP
149 EPA REVIEW DRAFT RSP
150 TWC REVIEW DRAFT RSP
151 RESOLVE CMTS/REV DRAFT RSP
152 EPA APPROVE DR FINAL RSP
153 TWC APPROVE DR FINAL RSP
154 FINAL RSP
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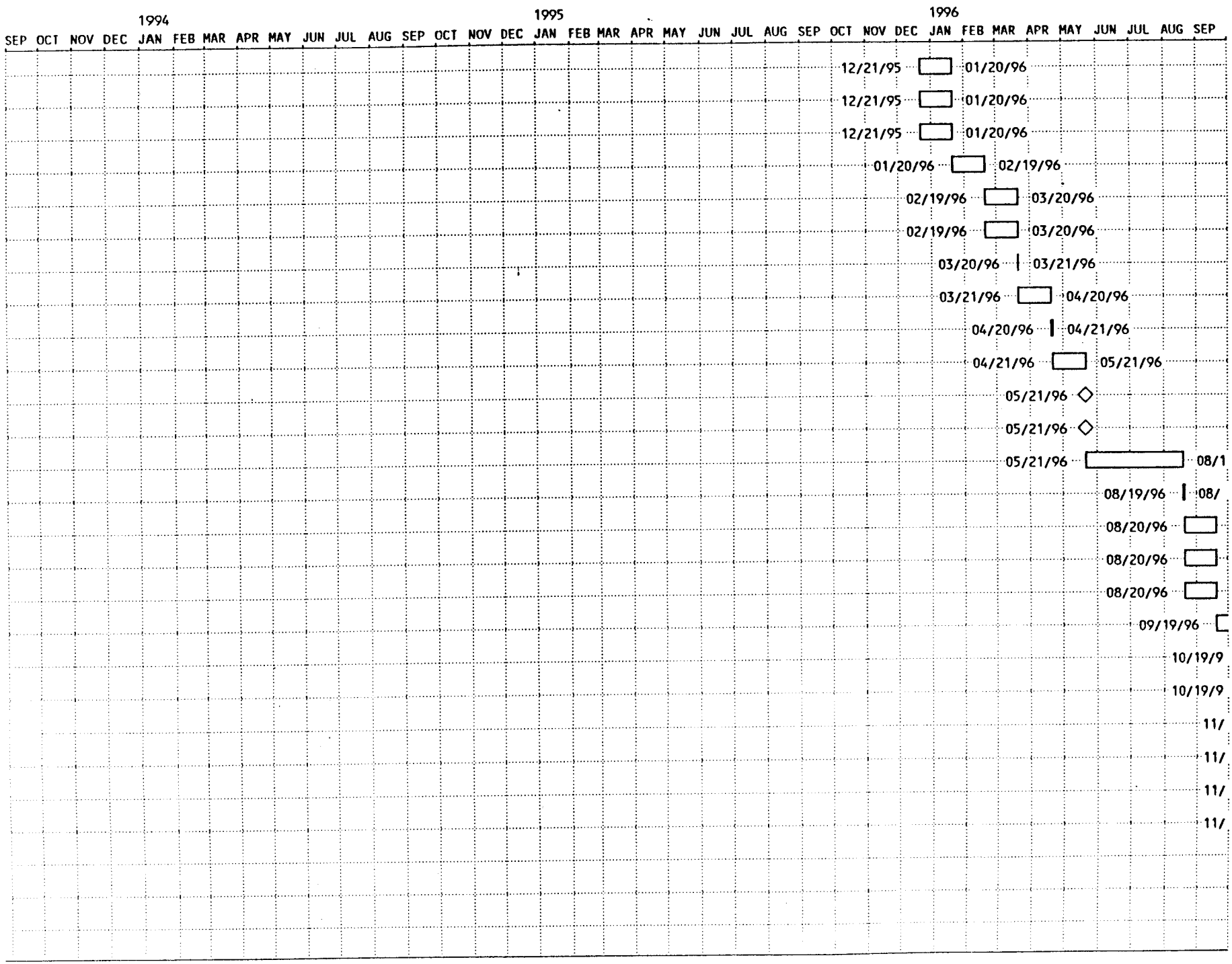
157 PREPARE DRAFT ROD
158 SUBMIT DRAFT ROD
159 ARMY REVIEW DRAFT ROD
160 EPA REVIEW DRAFT ROD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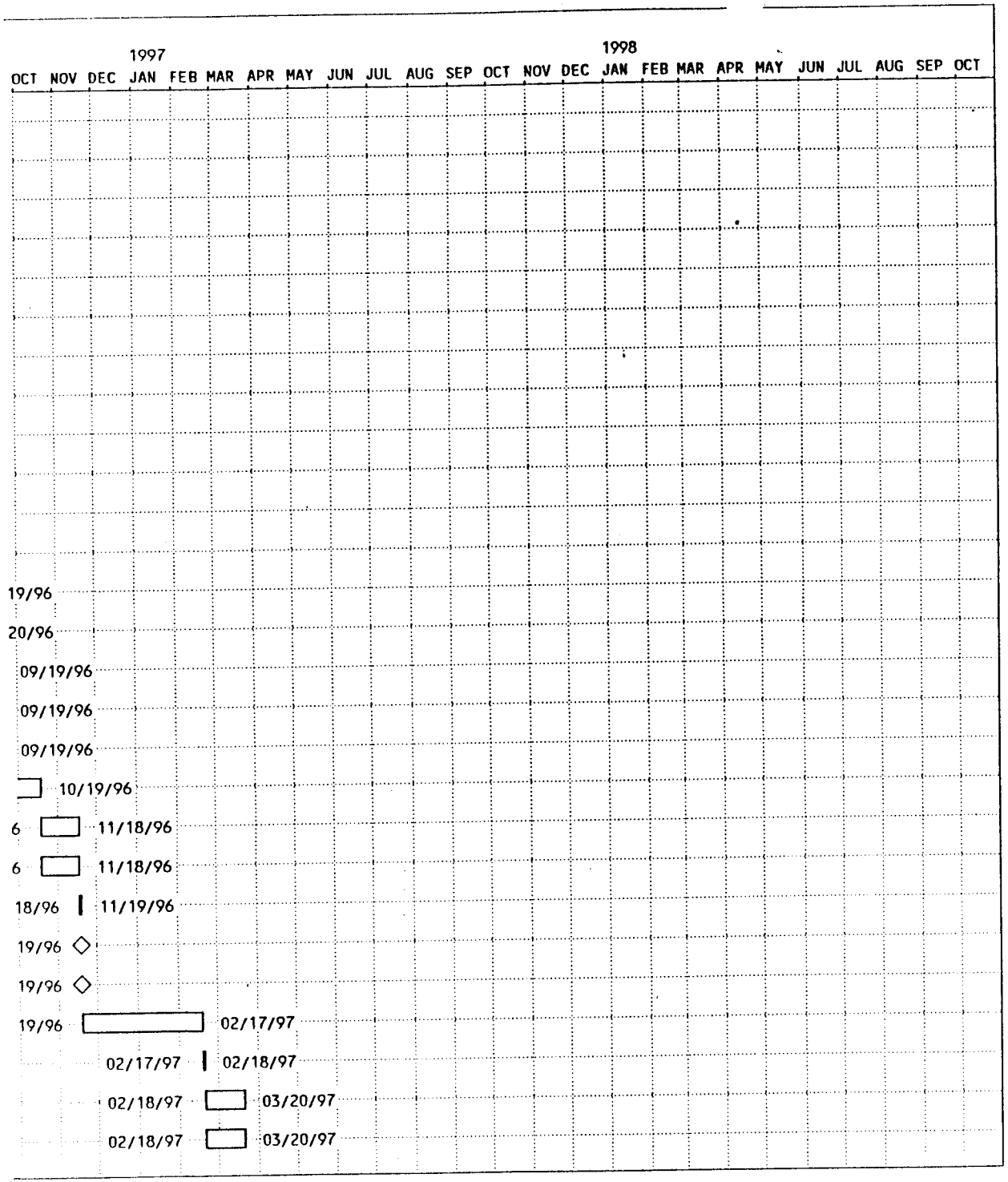
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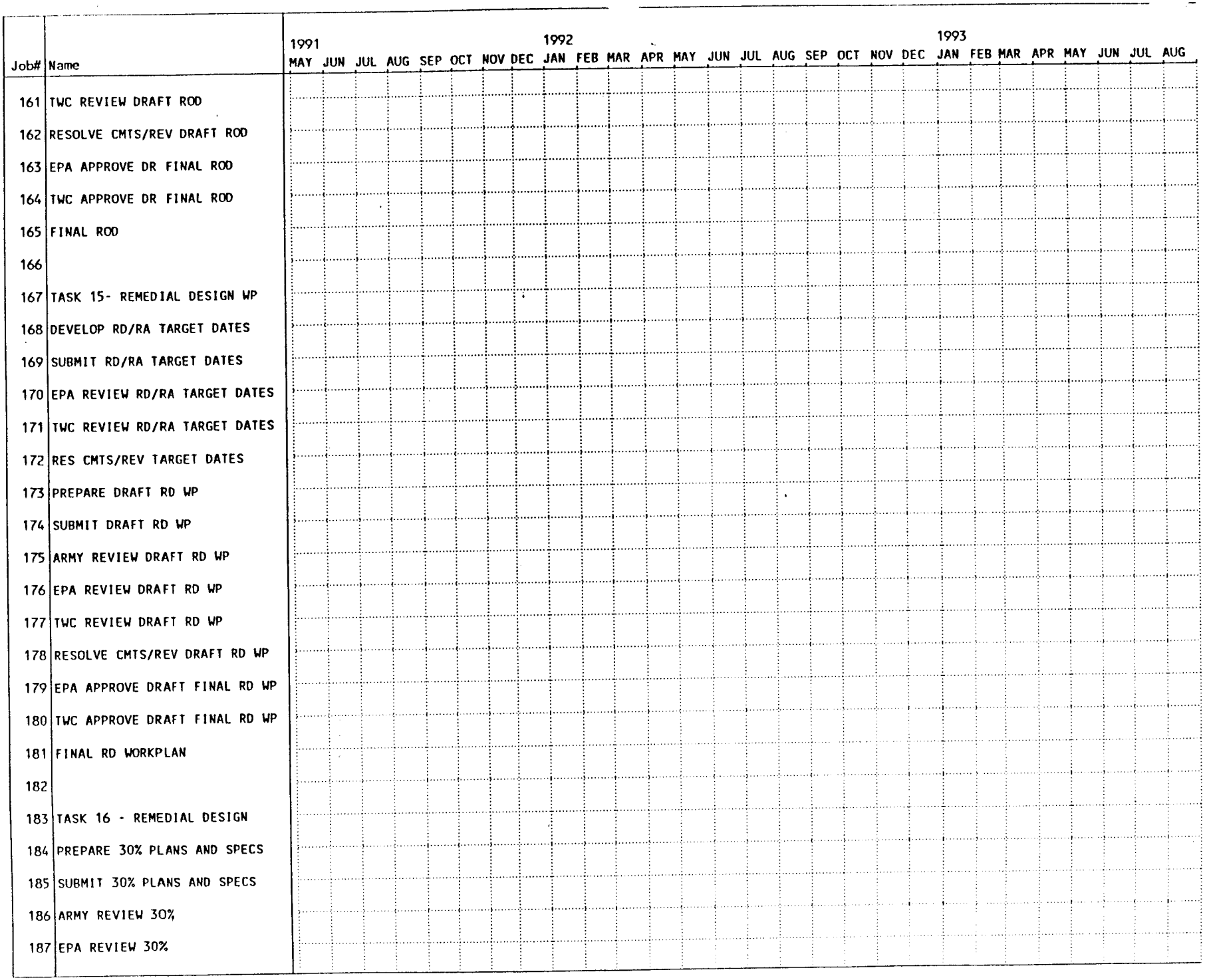
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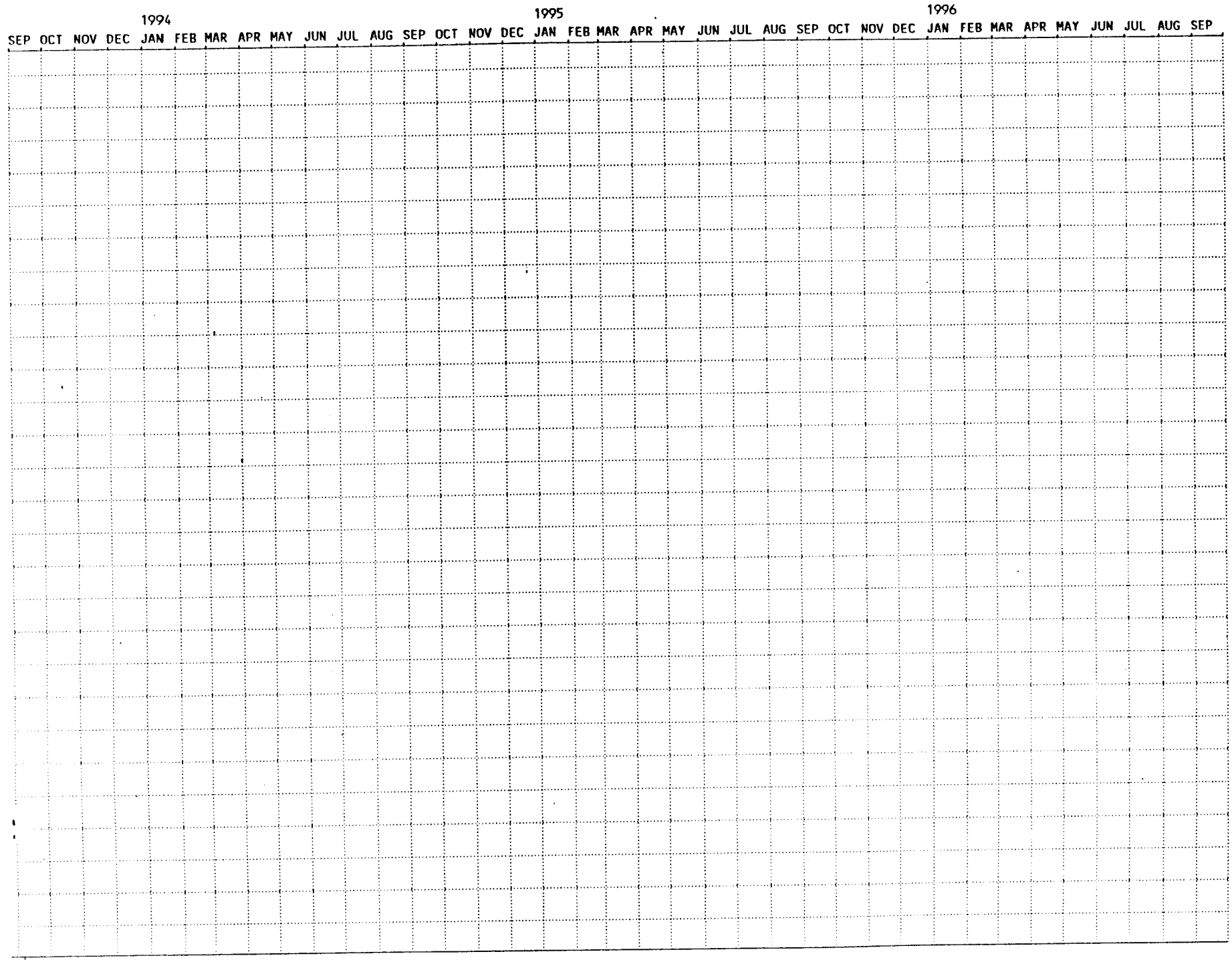
161 TWC REVIEW DRAFT ROD
162 RESOLVE CMTS/REV DRAFT ROD
163 EPA APPROVE DR FINAL ROD
164 TWC APPROVE DR FINAL ROD
165 FINAL ROD
166
167 TASK 15- REMEDIAL DESIGN WP
168 DEVELOP RD/RA TARGET DATES
169 SUBMIT RD/RA TARGET DATES
170 EPA REVIEW RD/RA TARGET DATES
171 TWC REVIEW RD/RA TARGET DATES
172 RES CMTS/REV TARGET DATES
173 PREPARE DRAFT RD WP
174 SUBMIT DRAFT RD WP
175 ARMY REVIEW DRAFT RD WP
176 EPA REVIEW DRAFT RD WP
177 TWC REVIEW DRAFT RD WP
178 RESOLVE CMTS/REV DRAFT RD WP
179 EPA APPROVE DRAFT FINAL RD WP
180 TWC APPROVE DRAFT FINAL RD WP
181 FINAL RD WORKPLAN
182
183 TASK 16 - REMEDIAL DESIGN
184 PREPARE 30% PLANS AND SPECS
185 SUBMIT 30% PLANS AND SPECS
186 ARMY REVIEW 30%
187 EPA REVIEW 30%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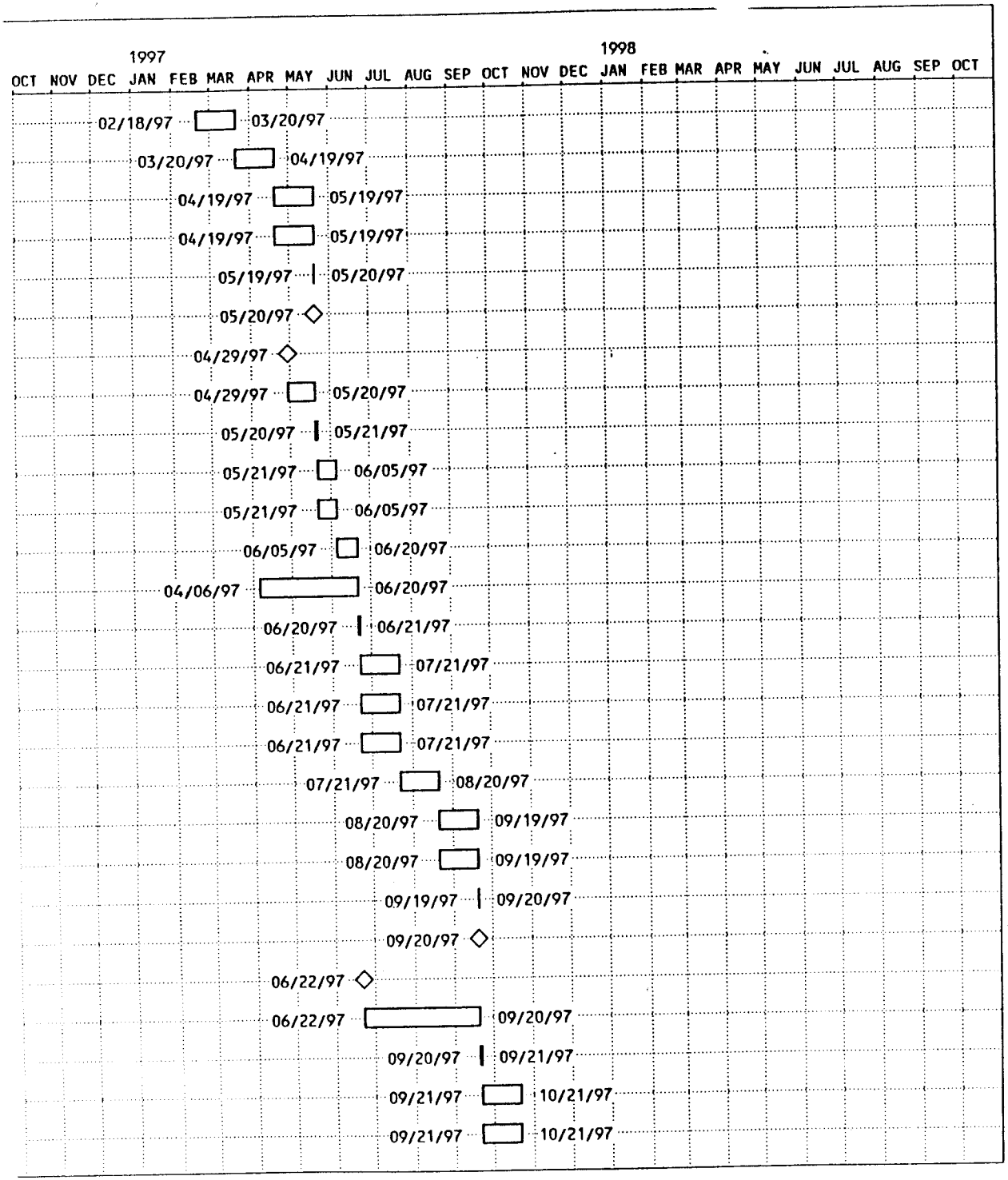
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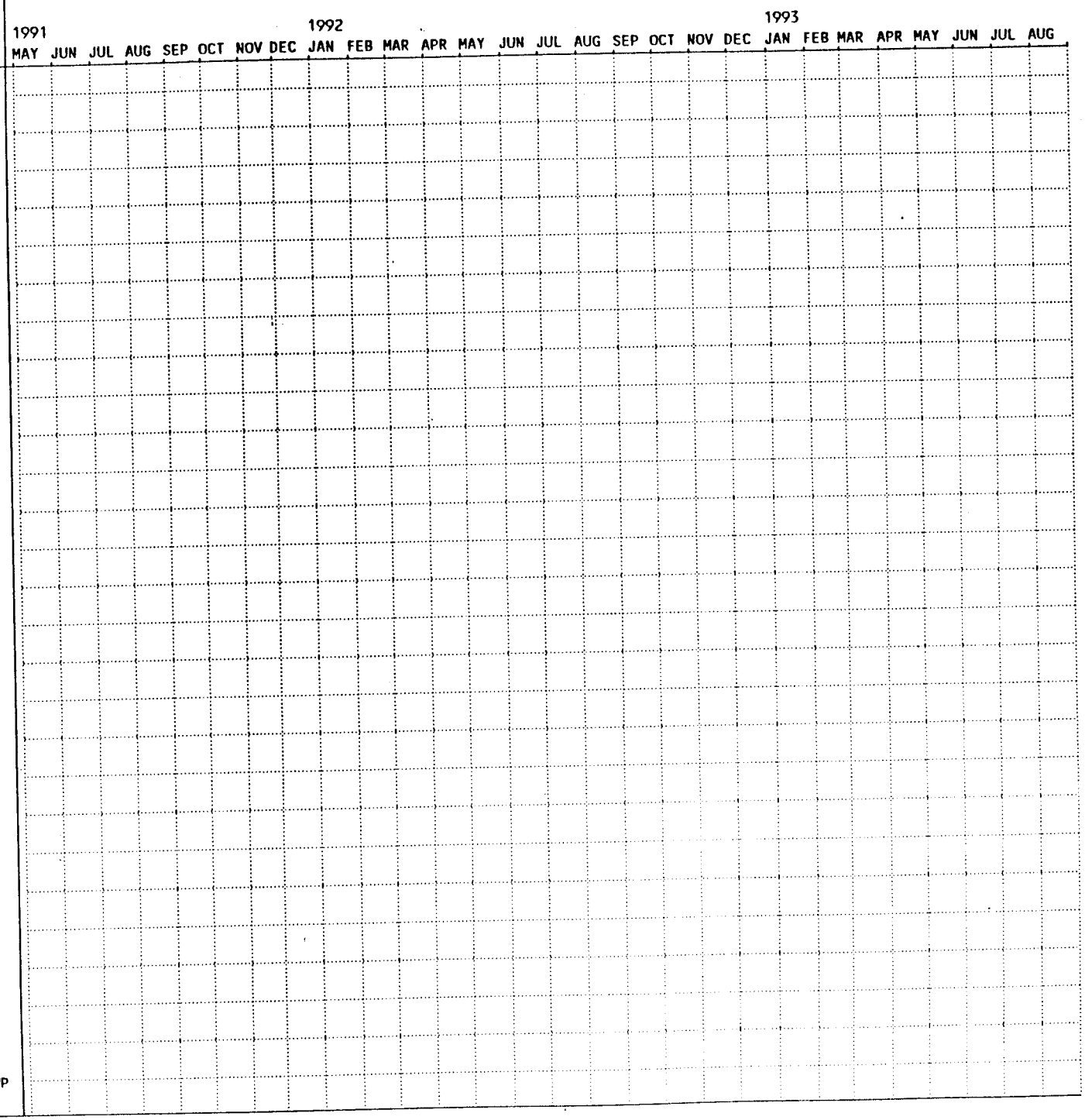
188	TWC REVIEW 30%
189	RESPOND TO COMTS ON 30%
190	PREPARE 60% PLANS AND SPECS
191	SUBMIT 60% PLANS AND SPECS
192	ARMY REVIEW 60%
193	EPA REVIEW 60%
194	TWC REVIEW 60%
195	RESPOND TO CMTS ON 60%
196	PREPARE 90% PLANS AND SPECS
197	SUBMIT 90% PLANS AND SPECS
198	ARMY REVIEW 90%
199	EPA REVIEW 90%
200	TWC REVIEW 90%
201	RES TO CMTS/REV 90%RD
202	SUBMIT DRAFT FINAL RD
203	EPA REVIEW DRAFT FINAL RD
204	TWC REVIEW DRAFT FINAL RD
205	FINAL REMEDIAL DESIGN
206	
207	TASK 17 - REMEDIAL ACTION WP
208	PREPARE REMEDIAL ACTION WP
209	SUBMIT RA WP
210	ARMY REVIEW DRAFT RA WP
211	EPA REVIEW DRAFT RA WP
212	TWC REVIEW DRAFT RA WP
213	RESOLVE CMTS/REVISE RA WP
214	EPA APPROVE DRAFT FINAL RA WP



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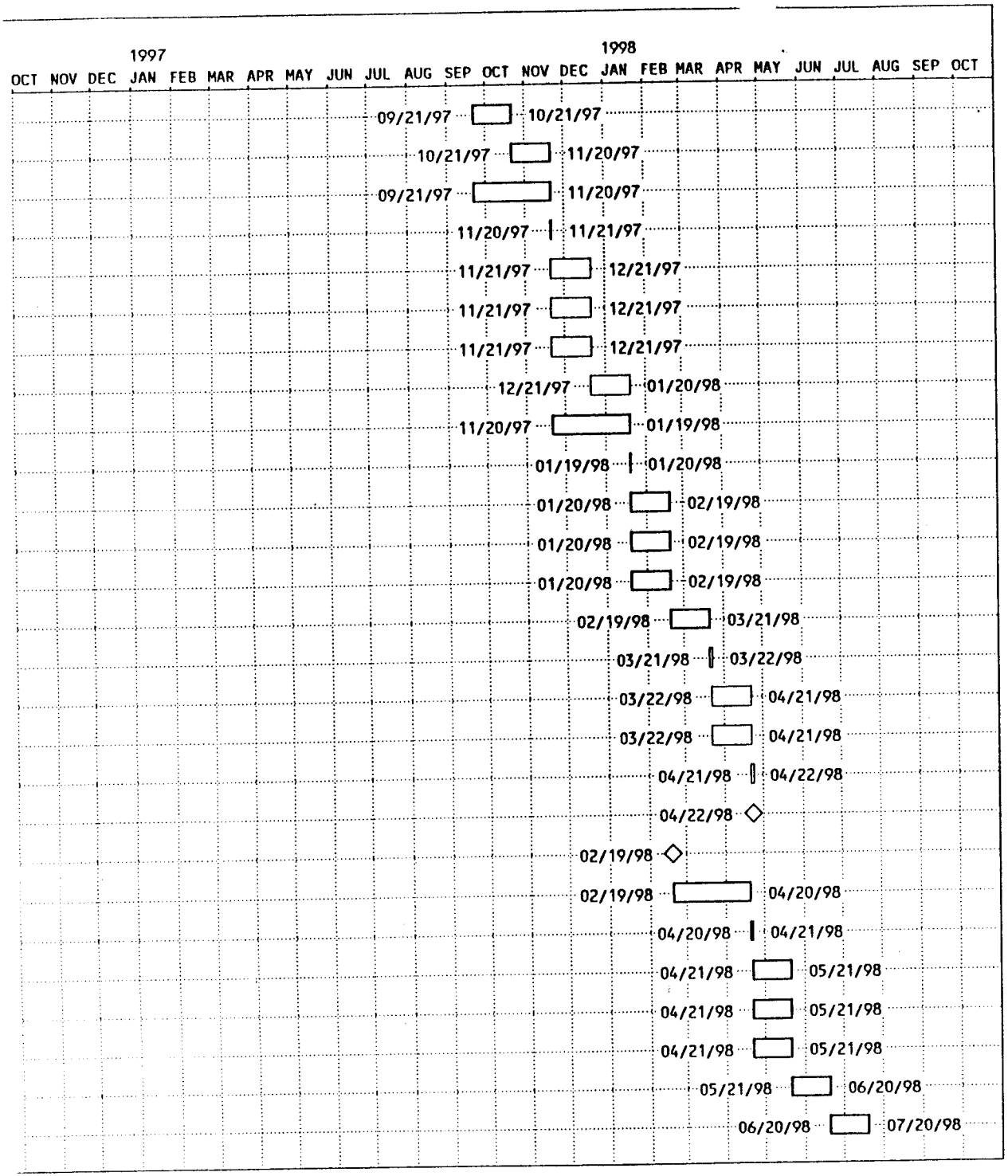
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215	TWC APPROVE DRAFT FINAL RA WP																												
216	FINAL REMEDIAL ACTION WP																												
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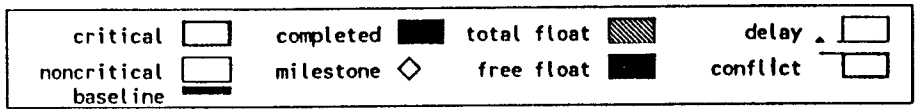
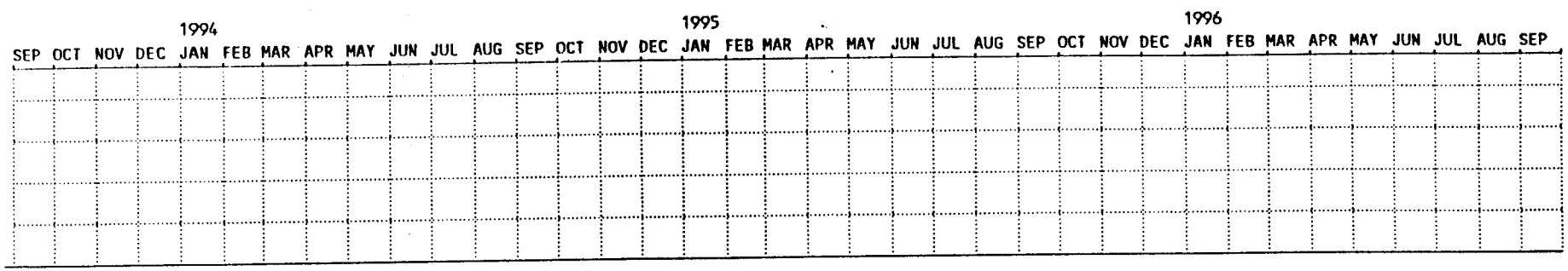
218	TASK 18 - REMEDIAL ACTION																												

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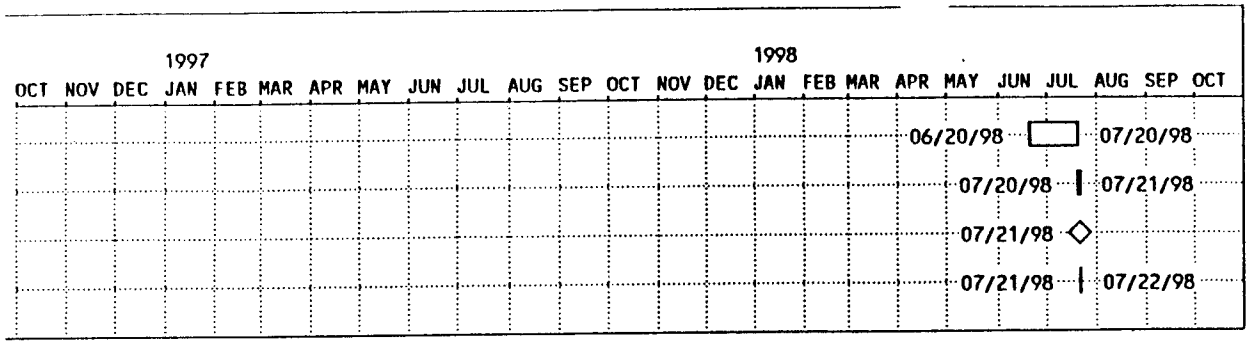
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ASSUMPTIONS USED IN LONGHORN SCHEDULE

1. Funding is available.

2. The 30 day review period is not extended.

3. Additional field work will not be required.

4. The Remedial Investigations Report will start after comments on the Site Characterization Summary are resolved.

5. Initial Screening of Alternatives will start once the Workplans are complete, using existing information.

6. Treatability Study will be completed before the Detailed Analysis of Alternatives can be completed.

7. The Record of Decision will begin once the Responsiveness Summary is complete.

8. The Remedial Design will continue while the 30% design and 60% design are under review.

9. No interim remedial action will be required.

10. Dispute resolution will not be invoked.

11. Workplans are developed in-house and all other submittals will be completed by A-E contracts. Work completed by the A-E contractor will be reviewed by the COE and revised by the A-E contractor before being submitted to EPA, TWC, and other Army agencies for review.

12. Feasibility Study activities assume all 13 sites will be one operable unit. If more than one operable unit is identified. Separate schedules will be developed for each operable unit.

13. Treatability Study must be completed before Feasibility Study is initiated.

14. Resolve comments on Post Screening Investigation Workplan before Treatability Study is completed.

15. Initial Screening must be completed before the Treatability Study begins.

16. Remedial Design Workplan will start at completion of resolved comments on Draft Responsiveness Summary, but will be submitted once Remedial Design/Remedial Action target dates are resolved.

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
MARSHALL, TEXAS 75671-1059

REPLY TO
ATTENTION OF

January 27, 1992

004436

SMCLO-EV

Subject: Federal Facility Agreement Meeting February 6, 1992

United States E.P.A.
Region 6
ATTN: Lisa Marie Price M.C. 6H-ET
1445 Ross Ave
Dallas, Texas 75202

Dear Ms. Price:

Based on your telephone conversation with Mr. Lynn Muckelrath on January 6, 1992, a meeting is scheduled at your facility on February 6, 1992.

Time:	11:00 A.M. Date: February 23, 1992
Location:	U.S. E.P.A., 1445 Ross Avenue, Dallas, Tx
Sign in:	12th Floor Library
Agenda:	Primary subject is ARARS, other items will be covered as time permits.

If you have any questions or specific items to add to the agenda, contract Mr. Lynn Muckelrath, (903)679-2980.

Sincerely,

Randall J. Miller

Randall J. Miller
Captain, U. S. Army
Acting Commander

Copy Furnished:
TWC - Michael A. Moore
AMSMC-EQ - Cyril Onewokae
CESWT-EC-GP - Randy Juhlin

004437

FEB 05 1992

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Lynn Muckelrath, Project Manager
Longhorn Army Ammunition Plant
Attn: SMCLO-EN
Marshall, Texas 75671-1059

Dear Lynn,

Pursuant to the Federal Facilities Agreement (FFA) for the Longhorn Army Ammunition Plant, EPA's comments on the schedule proposed for all primary and secondary documents are identified in this letter. Comments from the Texas Water Commission (TWC) are included under their own letterhead and are enclosed.

Enclosed find what EPA believes to be a more realistic time schedule for the CERCLA activities for the Longhorn Army Ammunition Plant. A timeline work plan (Attachment 1) as well as a list of all of the primary and secondary documents and their draft submittal date and a finalized date are included (Attachment 2).

EPA's other comments as they relate to the proposed schedule are as follows:

- Gantt chart is difficult to read; please include a written schedule in addition to the chart (i.e., something similar to EPA's timeline work plan schedule).

- There is no discussion of operable units. The identification of sites, contaminants, and/or issues that can be addressed collectively is essential given the potential number of areas at the facility that may require remediation. The identification of operable units will enable expedited actions to be implemented on less complex operable units thus shortening the overall remediation of the site. Additionally, the identification of operable units may affect the overall schedule for Longhorn AAP.

- Have you built into your schedule the review and inclusion of existing site information?

- Scoping meetings for the big documents (i.e., RI/FS, Risk Assessment, Remedial Design, etc.) are essential so that all issues are addressed in the first draft. These meetings may be held in conjunction with the meetings to discuss the ARARs for these documents.

6H-ET
HITT
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2/4/92

- Natural resource trustee issues (i.e., endangered species, critical habitats, etc.) need to be identified as soon as possible.

- Health and Safety Plan, Sampling and Analysis Plan, and Quality Assurance Project Plan (40 CFR Part 300.430 (b)(6), (b)(8), and (b)(8)(ii), respectively) are requirements of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and, therefore, must be included in the appropriate primary documents. The first primary document requiring these plans would be the RI/FS Work Plan. A suggested schedule for the submittal of these plans so that they can be included in the final RI/FS Work Plan would be the following:

Sampling and Analysis Plan Draft submitted	March 31, 1992
Health and Safety Plan Draft submitted	March 31, 1992
Quality Assurance Project Plan Draft submitted	March 31, 1992

I look forward to seeing you on February 6, 1992, here in Dallas, Texas to discuss Longhorn AAP.

If you have any questions about EPA's comments or any other matter, please contact me at (214) 655-6735 or FTS 255-6735.

Sincerely,

Lisa Marie Price
Remedial Project Manager
Superfund Texas Enforcement

Enclosure

cc: copy sent via Telefax

Tulsa District Corps of Engineers
P.O. Box 61
Attn: Mr.Randy Juhlin
CESWT-EC-GP
Tulsa, OK 74121-0061

Mike Moore, Superfund
Texas Water Commission
P.O. Box 13087
Capital Station
1700 N. Congress Avenue
Austin, TX 78711-3087

ATTACHMENT 2

Primary and Secondary Document Submittal Schedule

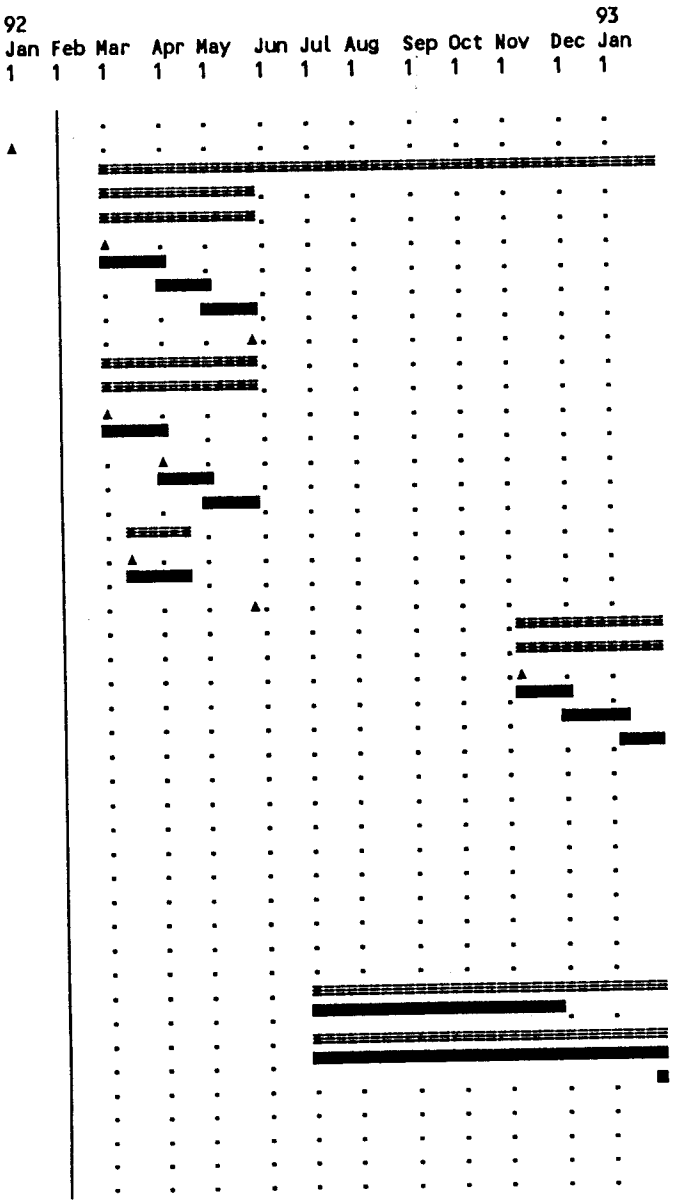
Community Relations Plan	
Draft submitted	March 1, 1992
Final	May 31, 1992
RI/FS Work Plan	
Draft submitted	February 29, 1992
Final	May 31, 1992
Initial RA/DQO	
Draft submitted	March 14, 1992
Initial Screening of Alternatives	
Draft submitted	November 5, 1992
Final	January 4, 1993
Risk Assessment	
Draft submitted	December 17, 1993
Final	March 17, 1994
Remedial Investigation	
Field Investigations	June 30, 1992 thru Nov. 27, 1992
Sampling and Data Results	
Draft submitted	May 13, 1993
Characterization Summary	
Draft submitted	September 26, 1993
Remedial Investigation	
Draft submitted	January 17, 1994
Final	April 18, 1994
Feasibility Study	
Post-Screening Investigation Work Plan	
Draft submitted	April 20, 1993
Treatability Studies	
Draft submitted	April 18, 1994
Detailed Alternative Analysis	
Draft submitted	July 16, 1994
Feasibility Study	
Draft submitted	September 15, 1994
Final	December 15, 1994
Proposed Plan	
Draft submitted	February 21, 1995
Final	April 21, 1995
Responsiveness Summary	
Draft submitted	July 27, 1995
Final	September 19, 1995

ROD		
	Draft submitted	August 27, 1995
	Final	October 31, 1995
Remedial Work Plan		
	Draft submitted	November 30, 1995
	Final	February 20, 1996
Remedial Design		
	30%	February 21, 1996
	60%	April 21, 1996
	90%	June 20, 1996
	Final RD	August 22, 1996
Remedial Action Work Plan		
	Draft submitted	August 23, 1996
	Final	November 21, 1996

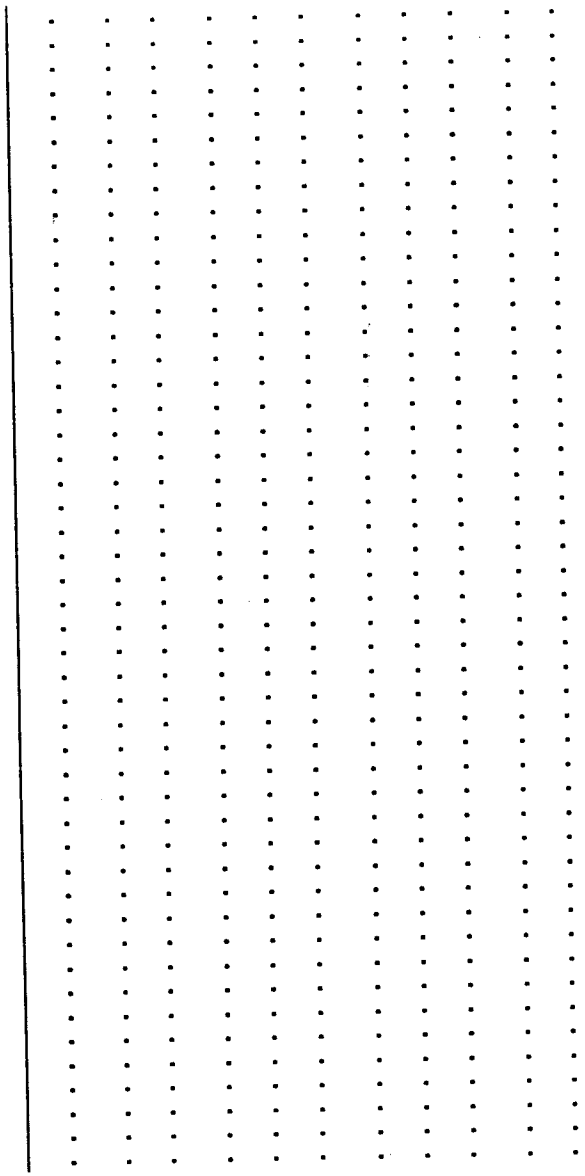
Schedule Name : LONGHORN AAP FFA
Responsible : LISA MARIE PRICE
As-of Date : 31-Jan-92 Schedule File : LHAAPEPA

FEDERAL FACILITY ENFORCEMENT

Task Name	Start Date	Duration	End Date	Start Status	End Dt Variance
EXCECUTE FFA	16-Oct-91	0.0	16-Oct-91	Done	
EFFECTIVE FFA	30-Dec-91	0.0	30-Dec-91	Done	
PRIMARY & 2ND DOCUMENTS	29-Feb-92	1,727.0 d	20-Nov-96	Future	
COMMUNITY RELAT.S PLAN	1-Mar-92	91.0 d	30-May-92	Future	
DRAFT	1-Mar-92	91.0 d	30-May-92	Future	
SUBMITTED	1-Mar-92	0.0	1-Mar-92	Future	
COMMENT & DUE	1-Mar-92	31.0 d	31-Mar-92	Future	
REVISE & RESUBMIT	31-Mar-92	31.0 d	30-Apr-92	Future	
REVIEW & APPROVE	30-Apr-92	31.0 d	30-May-92	Future	
FINAL COM. RELAT.PLN	31-May-92	0.0	31-May-92	Future	
RI/FS WORK PLAN	29-Feb-92	92.0 d	30-May-92	Future	
DRAFT	29-Feb-92	92.0 d	30-May-92	Future	
SUBMITTED	29-Feb-92	0.0	29-Feb-92	Future	
COMMENT & DUE	29-Feb-92	31.0 d	30-Mar-92	Future	
SCOPING MEETING	30-Mar-92	0.0	30-Mar-92	Future	
REVISE & RESUBMIT	30-Mar-92	31.0 d	29-Apr-92	Future	
REVIEW & APPROVE	30-Apr-92	31.0 d	30-May-92	Future	
INITIAL RA/DQO	14-Mar-92	31.0 d	13-Apr-92	Future	
SUBMITTED	14-Mar-92	0.0	14-Mar-92	Future	
COMMENT & DUE	14-Mar-92	31.0 d	13-Apr-92	Future	
FINAL RI/FS WORK PLAN	31-May-92	0.0	31-May-92	Future	
IN'TL SCREEN ALTRNTVS	5-Nov-92	91.0 d	3-Feb-93	Future	
DRAFT	5-Nov-92	91.0 d	3-Feb-93	Future	
SUBMITTED	5-Nov-92	0.0	5-Nov-92	Future	
COMMENT & DUE	5-Nov-92	31.0 d	5-Dec-92	Future	
REVISE & RESUBMIT	5-Dec-92	31.0 d	4-Jan-93	Future	
REVIEW & APPROVE	4-Jan-93	31.0 d	3-Feb-93	Future	
FINAL IN'TL SCREEN	4-Feb-93	0.0	4-Feb-93	Future	
RISK ASSESSMENT	12-Jun-93	278.0 d	16-Mar-94	Future	
SCOPING MEETING	12-Jun-93	0.0	12-Jun-93	Future	
DRAFT	17-Dec-93	90.0 d	16-Mar-94	Future	
SUBMITTED	17-Dec-93	0.0	17-Dec-93	Future	
COMMENT & DUE	17-Dec-93	31.0 d	16-Jan-94	Future	
REVISE & RESUBMIT	16-Jan-94	31.0 d	15-Feb-94	Future	
REVIEW & APPROVE	15-Feb-94	30.0 d	16-Mar-94	Future	
FINAL RISK ASSESSMENT	17-Mar-94	0.0	17-Mar-94	Future	
RI REPORT	30-Jun-92	657.0 d	17-Apr-94	Future	
FIELD INVESTIGATIONS	30-Jun-92	151.0 d	27-Nov-92	Future	
SAMP/DATA RESULTS	1-Jul-92	347.0 d	12-Jun-93	Future	
ANALYSIS & VALIDA.	1-Jul-92	243.0 d	28-Feb-93	Future	
ASSEMBLE RESULTS	27-Jan-93	106.0 d	12-May-93	Future	
SUBMIT RESULTS	13-May-93	0.0	13-May-93	Future	
COMMENT & DUE	13-May-93	31.0 d	12-Jun-93	Future	
CHARACTER SUM	26-Sep-93	31.0 d	26-Oct-93	Future	
ITTED	26-Sep-93	0.0	26-Sep-93	Future	



COMMENT & DUE	26-Sep-93	31.0 d	26-Oct-93	Future
DRAFT RI	17-Jan-94	91.0 d	17-Apr-94	Future
SUBMITTED	17-Jan-94	0.0	17-Jan-94	Future
COMMENT & DUE	17-Jan-94	31.0 d	16-Feb-94	Future
REVISE & RESUBMIT	16-Feb-94	31.0 d	18-Mar-94	Future
REVIEW & APPROVE	18-Mar-94	31.0 d	17-Apr-94	Future
FINAL RI REPORT	18-Apr-94	0.0	18-Apr-94	Future
FS REPORT	20-Apr-93	604.0 d	14-Dec-94	Future
POST-SCREEN WKPLN	20-Apr-93	31.0 d	20-May-93	Future
SUBMITTED	20-Apr-93	0.0	20-Apr-93	Future
COMMENT & DUE	20-Apr-93	31.0 d	20-May-93	Future
TREATABILITY	19-Jun-93	334.0 d	18-May-94	Future
STUDIES CONDUCTED	19-Jun-93	304.0 d	18-Apr-94	Future
SUBMITTED	18-Apr-94	0.0	18-Apr-94	Future
COMMENT & DUE	18-Apr-94	31.0 d	18-May-94	Future
ALT. ANALYSIS	16-Jul-94	31.0 d	15-Aug-94	Future
SUBMITTED	16-Jul-94	0.0	16-Jul-94	Future
COMMENT & DUE	16-Jul-94	31.0 d	15-Aug-94	Future
DRAFT FS	15-Sep-94	91.0 d	14-Dec-94	Future
SUBMIT	15-Sep-94	0.0	15-Sep-94	Future
COMMENT & DUE	15-Sep-94	31.0 d	15-Oct-94	Future
REVISE & RESUBMIT	15-Oct-94	31.0 d	14-Nov-94	Future
REVIEW & APPROVE	14-Nov-94	31.0 d	14-Dec-94	Future
FINAL FS	15-Dec-94	0.0	15-Dec-94	Future
PROPOSED PLAN	21-Feb-95	59.0 d	20-Apr-95	Future
DRAFT	21-Feb-95	0.0	21-Feb-95	Future
FINAL PROPOSED PLAN	21-Apr-95	0.0	21-Apr-95	Future
PUBLIC COMMENT	28-Apr-95	60.0 d	26-Jun-95	Future
MEETING	5-May-95	0.0	5-May-95	Future
COMMENTS	28-Apr-95	60.0 d	26-Jun-95	Future
RESPONSIVENESS SUMMARY	28-Apr-95	144.0 d	18-Sep-95	Future
DRAFTING	28-Apr-95	90.0 d	26-Jul-95	Future
DRAFT	27-Jul-95	0.0	27-Jul-95	Future
FINAL	19-Sep-95	0.0	19-Sep-95	Future
ROD	27-Aug-95	65.0 d	30-Oct-95	Future
DRAFT	27-Aug-95	0.0	27-Aug-95	Future
FINAL ROD	31-Oct-95	0.0	31-Oct-95	Future
RD WORK PLAN	30-Nov-95	82.0 d	19-Feb-96	Future
DRAFT	30-Nov-95	0.0	30-Nov-95	Future
FINAL	20-Feb-96	0.0	20-Feb-96	Future
FINAL RD	21-Feb-96	183.0 d	21-Aug-96	Future
30%	21-Feb-96	0.0	21-Feb-96	Future
60%	21-Apr-96	0.0	21-Apr-96	Future
90%	20-Jun-96	0.0	20-Jun-96	Future
FINAL RD	22-Aug-96	0.0	22-Aug-96	Future
RA WORK PLAN	23-Aug-96	90.0 d	20-Nov-96	Future
DRAFT	23-Aug-96	0.0	23-Aug-96	Future
FINAL	21-Nov-96	0.0	21-Nov-96	Future



Detail Task Summary Task Baseline
(Progress) (Progress) Conflict
(Slack) (Slack) Resource delay
Progress shows Percent Achieved on Actual Milestone
Scale: 56 hours per character

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

February 6, 1992

Ms. Lisa Marie Price (6H-ET)
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Longhorn Army Ammunition Plant
Proposed Schedule for Submittal of Documents

Dear Ms. Price:

This letter transmits Texas Water Commission staff's comments on the Army's proposed schedule for submittal of primary and secondary documents. As discussed in today's meeting, our comments were very similar to those of EPA. If you have any questions regarding our comments, please contact me at 512/463-7797.

Sincerely yours,

Michael A. Moore
RI/FS II Unit
Superfund Investigation Section
Pollution Cleanup Division

MM:

Enclosure

Comments on particular items in Gantt Chart:

Job#/Item	Proposed Submittal or Completion Date	Comments
3/Initial Remedial Action/Data Quality Objectives	3-13-92	These should be developed before the RI workplan is be written; if this task has already been accomplished, please submit DQO's concurrently with the RI workplan.
13/Draft RI/FS Work Plan	2-28-92	OK, but should include DQO's.
33/Final Community Relations Plan	5-30-92	Will there be any opportunity for public involvement/comment on development of the RI workplan, or is such involvement not necessary?
37/Conduct Field Investigations	11-27-92	Will 5 months be sufficient time to complete field work? This seems a bit ambitious, unless there is expected to be a heavy reliance on previously developed data.
43/Submit Sample and Data Results	5-12-93	It appears that it will only take 5 months to collect the data (field work), but 10½ months to analyze, validate, assemble & submit them; these time frames probably should be reversed.
49/Data Evaluation	3-28-93	It appears that Data Evaluation will be completed before sample results have been submitted and reviewed; this may need to be extended until EPA & TWC have commented on sample results (6-12-93).

51/Site Characterization Summary	9-25-93	Too long; can be completed as soon as data have been analyzed; should be submitted by 6-1-93.
61/Draft RI Report	4-16-94	Should be ready by 1-1-94, if data evaluation and site characterization are completed sooner.
98/Post-screening Investigation Workplan	4-19-93	Too long; if additional investigation is required, workplan should be submitted by 1-1-93.
104/Results of Treatability Studies	3-16-94	Most requirements for treatability studies should already be known from past knowledge of site activities and materials handled, and from previous investigations at other ammunition plants; therefore, treatability studies, if required, can start sooner, and completion dates can be extended if new site data or treatment technologies become available in the future which warrant different or additional studies.

Comments on particular Assumptions:

Assumption #4. The Remedial Investigations Report will start after comments on the Site Characterization Summary are resolved.

Comment: Most of the RI Report should be finished by then; it shouldn't take longer than 6 months to complete the draft report, unless EPA or TWC has major problems with the RI/SCS. Also, the SCS is a secondary document, and resolution of EPA and TWC comments can be made in the RI Report.

Assumption #6. Treatability Study will be completed before the Detailed Analysis of Alternatives can be completed.

Comment: Only if treatability studies are deemed necessary due to discovery of new (unanticipated) site conditions, or treatment technologies.

Assumption #13. Treatability Study must be completed before Feasibility Study is initiated.

Comment: The Feasibility Study can be initiated almost immediately; treatability studies may be required before the FS can be completed. Also, treatability studies may begin now, if enough information about the types of waste at the site is available.

Assumption #15. Initial Screening must be completed before the Treatability Study begins.

Comment: This would only necessarily be true for "new" wastes or treatment technologies, as discussed above.

Assumption #17. 30% Design of the Plans and Specs will start during completion of Draft Remedial Design Workplan and will be submitted once the Final Remedial Design Workplan is completed.

Comment: We have no objection to this, but it will be done at the Army's own risk.

Assumption #19. Project managers meeting on Applicable, or Relevant and Appropriate Requirements is not required for the Proposed Plan and Record of Decision. Applicable, or Relevant and Appropriate Requirements used in the Feasibility Study Report will be used.

Comment: Agreed: In fact, I see no need for special ARAR's meetings at all, unless something unexpected and/or of a time-critical nature comes up; these discussions can normally take place during the monthly project managers meetings.

DEPARTMENT OF THE ARMY
TULSA DISTRICT, CORPS OF ENGINEERS
POST OFFICE BOX 61
TULSA, OKLAHOMA 74121-0061

REPLY TO
ATTENTION OF

February 19, 1992

Engineering and Construction Division
Geotechnical Branch

Ms. Lisa Marie Price, 6H-ET
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, TX 75202-2733

Dear Ms. Price:

At the request of Longhorn Army Ammunition Plant (LHAAP), we are submitting the revised deadlines for completion of the draft primary and secondary documents. The list includes anticipated dates for the final documents. We have also included a list of the assumptions made, a listing of project activities and durations for the activities, and responses to the Environmental Protection Agency's (EPA) and the Texas Water Commission's (TWC) comments on the proposed deadlines.

The revised deadlines generally agree with those proposed by the EPA and the TWC. Where the revised deadlines do not agree, an explanation is provided. The schedule assumes one operable unit for all of LHAAP. When separate operable units are identified in the Initial Screening of Alternatives Report, separate schedules will be developed.

Sincerely,

Frank W. Parker

Frank W. Parker, P.E.
Chief, Engineering and
Construction Division

Enclosures

Deadlines for Primary and Secondary Documents 004448

Longhorn Army Ammunition Plant

Initial Activities:

Community Relations Plan: (primary document)	
Draft submitted	February 29, 1992
Final	May 31, 1992
RI/FS Work Plan: (primary document)	
Draft submitted	February 29, 1992
Final	May 31, 1992
Initial RA/DQO: (secondary document) submitted	March 14, 1992

Remedial Investigation Activities:

Field Investigations	June 30 - Nov. 27, 1992
Sampling and Data Results: (secondary document) submitted	May 13, 1993
Site Characterization Summary: (secondary document) submitted	September, 10, 1993
Remedial Investigation Report: (primary document)	
Draft submitted	January 10, 1994
Final	April 10, 1994

Feasibility Study Activities:

Initial Screening of Alternatives Report: (primary document)	
Draft submitted	October 29, 1992
Final	January 28, 1993
Post-Screening Investigation Work Plan: (secondary document) submitted	April 13, 1993
Treatability Study Report: (secondary document) submitted	March 10, 1994
Detailed Analysis of Alternatives Report: (secondary document) submitted	July 9, 1994
Feasibility Study Report: (primary document)	
Draft submitted	November 7, 1994
Final	February 6, 1995

Deadlines for Primary and Secondary Documents

Longhorn Army Ammunition Plant

Risk Assessment Report: (primary document)	
Draft submitted	December 10, 1993
Final	March 11, 1994
Proposed Plan: (primary document)	
Draft submitted	March 8, 1995
Final	June 7, 1995
Responsiveness Summary: (primary document)	
Draft submitted	September 7, 1995
Final	December 7, 1995
Record of Decision: (primary document)	
Draft submitted	October 7, 1996
Final	January 6, 1996
Remedial Design Work Plan: (primary document)	
Draft submitted	February 7, 1996
Final	May 8, 1996
Remedial Design Activities:	
30% Remedial Design: (secondary document) submitted	May 9, 1996
60% Remedial Design: (secondary document) submitted	July 9, 1996
90% Remedial Design: (secondary document) submitted	September 9, 1996
Remedial Design: (primary document) Final	December 8, 1996
Remedial Action Work Plan: (primary document)	
Draft submitted	December 7, 1996
Final	March 8, 1997

Assumptions Made to Develop the Schedule of Remedial Activities

Longhorn Army Ammunition Plant

1. Funding is available and remedial activities will not be delayed because of lack of funding.

2. The 30 day review period and 30 day comment resolution/ revision period is not extended.

3. Additional field work will not be required.

4. Initial Screening of Alternatives will start immediately after the RI/FS Work Plan is final. Existing information will be used for the initial development and screening.

5. Treatability studies, if required, will be completed before the Detailed Analysis of Alternatives is completed.

6. The Remedial Design will continue while the 30% design and 60% design are under review.

7. No interim remedial action will be required.

8. Dispute resolution will not be invoked.

9. The RI/FS Work Plans are being developed in-house. All other submittals will be completed by A-E contractors. Work completed by the A-E contractors will be reviewed by the COE and revised by the A-E contractor before being submitted to EPA and TWC.

10. Feasibility Study activities assume all 13 sites will be one operable unit. Operable units will be identified in the Initial Screening of Alternatives Report. When additional operable units are identified, a schedule will be developed for each.

11. A special project managers meeting on Applicable, or Relevant and Appropriate Requirements (ARARs) is not required. Discussion on ARARs will be done during the monthly project managers meetings.

12. A minimum of 90 days is required from submittal of a draft primary document to a final document. This applies to all primary documents.

Assumptions Made to Develop the Schedule of Remedial Activities

Longhorn Army Ammunition Plant

13. For work done by A-E contractors, a minimum of 90 days is required after receipt of comments on a secondary document to submit a subsequent primary or secondary document. The 90 days consists of 30 days for resolution of EPA and TWC comments and incorporation by an A-E into the subsequent document, 30 days for COE review of the subsequent document, and 30 days for incorporation of COE comments into the document. This applies to documents in the RI/FS phase of remedial activities.

Response to EPA Comments on the Schedule of Remedial Activities

Longhorn Army Ammunition Plant

Reference the letter dated Feb 05, 1992 from Ms. Lisa Marie Price, U.S. EPA, Region 6, to Mr. Lynn Muckelrath, Project Manager, Longhorn Army Ammunition Plant (attached).

Comment #1. A list of project activities is being included that displays the project activities in a form more easily read.

Comment #2. Operable units will be identified in the Initial Screening of Alternatives Report. A schedule for remediation of each operable unit will then be developed.

Comment #3. The review and inclusion of existing site information is being included the RI/FS Work Plans.

Comment #4. We agree that scoping meetings are necessary. We suggest that they be done at one of the monthly project managers meetings. We also suggest that ARARs discussion be done at the monthly project managers meetings. The ARARs meetings were deleted from the schedule to reduce the time required for document submittal.

Comment #5. Natural resource issues are addressed in the RI/FS Work Plans. We also agree that people involved with natural resource issues should be involved in scoping meetings.

Comment #6. The RI/FS Work Plan scheduled for submittal February 29, 1992 will consist of three volumes. Volume I is the general information about the investigations to be done. Volume II is a Chemical Data Acquisition Plan (CDAP). The CDAP will contain all the information in a Sampling and Analysis Plan and a Quality Assurance Project Plan. Volume III is the Site Safety and Health Plan (SSHP). The SSHP is equivalent to a Health and Safety Plan.

Comments on Submittal Dates:
General Comment. A minimum of 90 days is required from submittal of a draft primary document to when the document becomes final. The 90 days consists of 30 days for EPA and TWC to review and comment on a draft document, 30 days for the Army to revise the draft document and submit a draft final document, and 30 days for the EPA and TWC to review and approve the draft final document. This applies to all primary documents. The EPA proposed 60 days from submittal of the draft to the document becoming final on the Proposed Plan, the Responsiveness Summary, and the Record of Decision. We have scheduled 90 days for these documents.

Response to EPA Comments on the Schedule of Remedial Activities

Longhorn Army Ammunition Plant

Comments on Submittal Dates (continued):
General Comment. For work done by A-E contractors, a minimum of 90 days is required after receipt of comments on a secondary document to submit a subsequent primary or secondary document. The 90 days consists of 30 days for resolution of EPA and TWC comments and incorporation by an A-E into the subsequent document, 30 days for COE review of the subsequent document, and 30 days for incorporation of COE comments into the document. This time period applies to documents in the RI/FS phase of remedial activities and accounts for the difference in proposed deadlines on the Feasibility Study Report.

Response to TWC Comments on the Schedule of Remedial Activities

Longhorn Army Ammunition Plant

Reference the letter dated February 6, 1992, from Mr. Michael Moore, Texas Water Commission, to Ms. Lisa Marie Price, U.S. Environmental Protection Agency, regarding Longhorn Army Ammunition Plant Proposed Schedule for Submittal of Documents (attached).

Comment #1. The Initial Remedial Action/Data Quality Objectives (RA/DQO) will be included in the RI/FS Work Plan. The RA/DQO Report will be submitted on March 14, 1992.

Comment #2. The RI/FS Work Plan will include Initial Remedial Action/Data Quality Objectives.

Comment #3. There will not be any involvement of the community in development of the RI/FS Work Plan.

Comment #4. The Army feels that 5 months is adequate for the field work proposed in the RI/FS Work Plan. More than 5 months may be required if a substantial amount of additional field work is required because of the review and revision of the RI/FS Work Plan.

Comment #5. Propose leaving the date the same as originally proposed. The 10 1/2 months for analysis, validation, assembly of results and submission includes the 5 months of field work.

Comment #6. Concur. The duration of the work item "data evaluation" has been extended until the Army responds to comments on the sample results.

Comment #7. The secondary document "Sampling and Data Results Report" is a feeder document to the "Site Characterization Summary." The Army requires 90 days after receipt of comments on a document to submit the subsequent document. Assumption #13 of the Remedial Activities Schedule explains the 90 days.

Comment #8. The Army proposes submitting the Draft RI Report on January 10, 1994.

Comment #9. Do not concur, propose a draft submittal date of April 13, 1994. The plan will be prepared by an A-E contractor. The 105 duration for preparation of the plan includes 60 days for review by the COE and revision by the A-E contractor before submittal to EPA and TWC.

Comment #10. Do not concur, propose starting treatability

studies, if needed, on June 12, 1993. The Post-Screening Investigation Work Plan will include a work plan for any required treatability studies. The treatability studies cannot start until the Post-Screening Investigation Work Plan has been completed.

Comments on Assumptions:
Comment on Assumption #4. Concur, changes have been made in the revised schedule.

Comment on Assumption #6. Concur.

Comment on Assumption #13. Concur.

Comment on Assumption #15. Treatability study will only be necessary for new treatment technologies. However, initial screening of techniques must be completed to determine if a treatability study is necessary.

Comment on Assumption #17. These activities must go on concurrently in order to meet the 15 months from Final ROD to start of remedial action.

Comment on Assumption #19. Concur. Special meetings just for ARARs have been eliminated from the schedule.

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

February 24, 1992

Ms. Lisa Marie Price (6H-ET)
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Longhorn Army Ammunition Plant
Schedule for Submittal of Documents

Dear Ms. Price:

Texas Water Commission (TWC) staff have reviewed the Army's responses to EPA and TWC comments on the proposed schedule for submittal of primary and secondary documents, and its revised schedule for submittal of these documents. We find the Army's responses to our comments, and its revised schedule satisfactory.

Also, as we discussed via telephone this morning, I will be unable to attend the monthly project manager's meeting on April 8th. We will try to arrange for our alternate project manager to attend the meeting and discuss TWC's comments on the Army's draft RI workplan.

If you have any questions or comments regarding this matter, please contact me at 512/463-7797.

Sincerely yours,

Michael A. Moore
RI/FS II Unit
Superfund Investigation Section
Pollution Cleanup Division

MM: is

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

004457

REPLY TO
ATTENTION OF

February 24, 1992

Geotechnical Branch
Engineering Division

Ms. Lisa Marie Price, 6H-ET
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Ms. Price:

At the request of Longhorn Army Ammunition Plant, we are submitting the Community Relations Plan as required by the Federal Facility Agreement.

The Corps of Engineers prepared the Community Relations Plan and will make all revisions. Please send all comments to Longhorn Army Ammunition Plant by March 28, 1992.

Sincerely,

Melvin D. Green

for R. Terry Coomes, P.E.
Chief, Engineering Division

Enclosures

004458

FEB 24 1992

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Lynn Muckelrath, Project Manager
Longhorn Army Ammunition Plant
Attn: SMCLO-EN
Marshall, Texas 75671-1059

Dear Lynn,

Pursuant to the Federal Facilities Agreement (FFA) for the Longhorn Army Ammunition Plant, EPA approves the schedule of proposed deadlines for the primary and secondary documents that was submitted to EPA on February 19, 1992. The Texas Water Commission also reviewed the submitted schedule. Their approval of the proposed schedule is included under their own letterhead and is enclosed.

I look forward to seeing the draft Community Relations Plan and the draft Remedial Investigation/Feasibility Study Work Plan on February 29, 1992.

If you have any questions this or any other matter, please contact me at (214) 655-6735 or FTS 255-6735.

Sincerely,

Lisa Marie Price
Remedial Project Manager
Superfund Texas Enforcement

Enclosure

cc: copy sent via Telefax

Tulsa District Corps of Engineers
P.O. Box 61
Attn: Mr.Randy Juhlin
CESWT-EC-GP
Tulsa, OK 74121-0061

Mike Moore, Superfund
Texas Water Commission
P.O. Box 13087
Capital Station
1700 N. Congress Avenue
Austin, TX 78711-3087

6H-ET
HITT

6H. 2/24/92

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

February 24, 1992

Ms. Lisa Marie Price (6H-ET)
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Longhorn Army Ammunition Plant
Schedule for Submittal of Documents

Dear Ms. Price:

Texas Water Commission (TWC) staff have reviewed the Army's responses to EPA and TWC comments on the proposed schedule for submittal of primary and secondary documents, and its revised schedule for submittal of these documents. We find the Army's responses to our comments, and its revised schedule satisfactory.

Also, as we discussed via telephone this morning, I will be unable to attend the monthly project manager's meeting on April 8th. We will try to arrange for our alternate project manager to attend the meeting and discuss TWC's comments on the Army's draft RI workplan.

If you have any questions or comments regarding this matter, please contact me at 512/463-7797.

Sincerely yours,

Michael A. Moore
RI/FS II Unit
Superfund Investigation Section
Pollution Cleanup Division

MM:

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

004460

REPLY TO
ATTENTION OF:

February 27, 1992

Geotechnical Branch
Engineering Division

U.S. Environmental Protection Agency
ATTN: Ms. Lisa Marie Price
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Price:

At the request of Longhorn Army Ammunition Plant, we are submitting the Draft Remedial Investigations/Feasibility Study Work Plan as required by the Federal Facility Agreement. The work plan is concurrently being reviewed by Longhorn Army Ammunition Plant and its command. It consists of three volumes. Volume 1 contains the general information about the investigations to be performed. Volume 2 is the Chemical Data Acquisition Plan. Volume 3 is the Site Safety and Health Plan.

The Corps of Engineers prepared the Draft Remedial Investigation/ Feasibility Study Work Plan and will make all revisions. Please send all comments to Longhorn Army Ammunition Plant by March 28, 1992.

Sincerely,

for R. Terry Coomes, P.E.
Chief, Engineering Division

Enclosures

DEPARTMENT OF THE ARMY
LONGHORN/LOUISIANA ARMY AMMUNITION PLANTS
MARSHALL, TEXAS 75671-1059

March 3, 1992

REPLY TO
ATTENTION OF

SMCLO-EV

Subject: Meeting, Longhorn Army Ammunition Plant, for Technical Review Committee (TRC) and Program Managers

Ms. Lisa M. Price
(6H-ET) Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202

Dear Ms. Price:

Enclosed is a tentative agenda for the TRC and Program Manager's Meetings. This will be the first meeting for the TRC, and we hope that you will be able to attend.

If you have any questions or suggestions regarding the meeting or agenda, contact Mr. Lynn Muckelrath, (903) 679-2980.

Robert W. Bringman
Lieutenant Colonel, U. S. Army
Commanding Officer

Enclosures

LONGHORN ARMY AMMUNITION PLANT MEETING AGENDA

MEETING: Technical Review Committee (TRC)

LOCATION: Longhorn Army Ammunition Plant - Karnack, Texas Bldg 703

TIME: March 10, 1992, 1:00 P.M.

SIGN IN: At entrance of LHAAP there is a gate house where you can sign in. The guard will issue a temporary badge and vehicle permit. If you bring a camera please request a camera permit.

AGENDA

I. INTRODUCTION - The what, why and who of the TRC

II. Introduction to CERCLA - background and effect on Longhorn Army Ammunition Plant.

III. Tour sites listed on federal facility agreement.

LONGHORN ARMY AMMUNITION PLANT MEETING AGENDA

MEETING: Project Managers

LOCATION: LHAAP

TIME: March 11, 1992, 8:00 A.M.

AGENDA

I. Status of Actions

II. Primary emphasis on discussion or evaluation of 13 listed sites.

III. Overview of workplan

004464

LONGHORN

ARMY AMMUNITION PLANT

TECHNICAL REVIEW COMMITTEE

MARCH 10, 1992

LONGHORN ARMY AMMUNITION PLANT
TECHNICAL REVIEW COMMITTEE

Technical Review Committee (TRC)

Members of the TRC will include the Army representatives, Environmental Protection Agency (EPA) Project Manager, Texas Water Commission (TWC) Project Manager, representatives from local government agencies, and representatives from the local community and associations.

The purpose of the TRC is to allow the Army, EPA, and TWC to communicate with the local officials and citizens. The TRC provides a mechanism to provide information and address any concerns of local officials and citizens regarding the remedial activities at Longhorn Army Ammunition Plant. TRC meetings will be held approximately every 3 months.

COMPREHENSIVE ENVIRONMENTAL, RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)

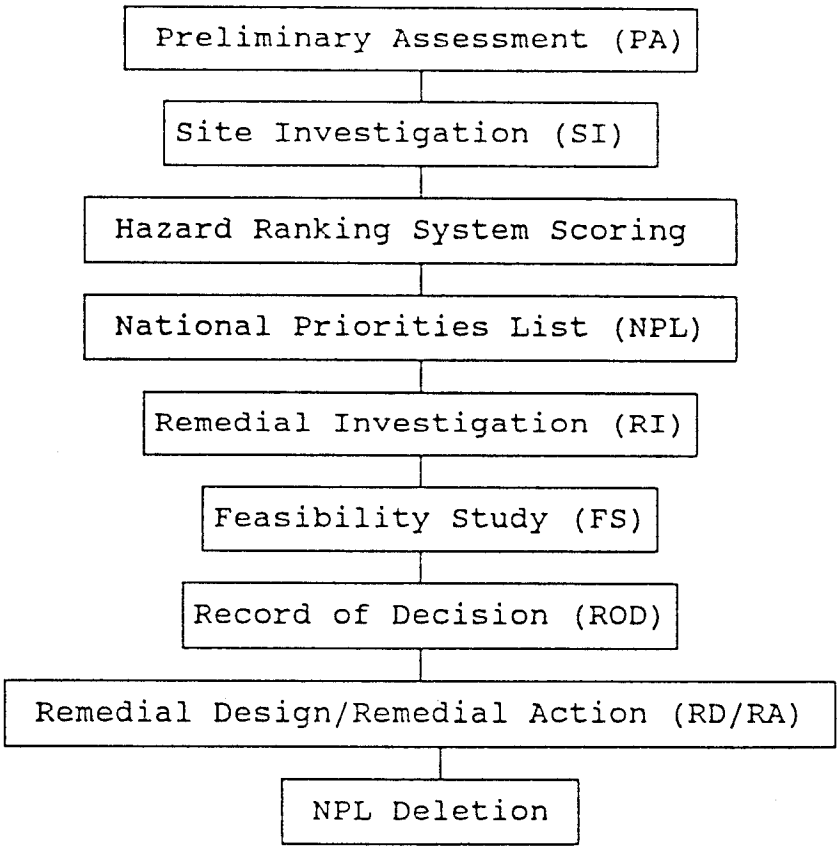
CERCLA (also known as Superfund) was enacted by Congress in 1980. The main purpose of CERCLA is to:

- establish a program to set priorities for cleaning up the nation's worst hazardous waste sites, and

- require clean up of abandoned hazardous waste sites.

CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). Section 120 of SARA requires all federal facilities to comply with CERCLA. CERCLA required the development of a National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The NCP describes the response procedures for releases of hazardous waste to the environment.

The CERCLA process involves several steps. A flow chart of the process is shown below.



PRELIMINARY ASSESSMENT - PA

- Review of Available Information
- Interview of Employees/Others
- Potential for Contamination
- Hazardous Materials Use/Storage Disposal

SITE INVESTIGATION - SI

- Sampling
- Survey/Testing
- Site Characterization
- Environmental Risks

Once the Site Investigation is complete, a Hazardous Ranking System (HRS) Score will be developed for the site. The HRS considers the magnitude of contamination, and the potential threat to public health or the environment. If the score equals or exceeds the EPA-established threshold of 28.5, the site is placed on the National Priorities List (NPL). The HRS score for Longhorn Army Ammunition Plant is 39. Once a site is placed on the NPL, the CERCLA process must be completed.

REMEDIAL INVESTIGATION - RI

- Extensive Sampling
- Computer Modeling
- Source & Extent of Contamination

FEASIBILITY STUDY - FS

- Alternatives for Clean-Up
- Cost
- Constructability

RECORD OF DECISION - (ROD)

- Nature of Remediation

- Who, What, When and How Much

Once the ROD is signed by the EPA and TWC, the Remedial Design will begin. The Remedial Design is the details of the engineering and construction required to implement the remediation selected in the Record of Decision. Following completion of the Remedial Design, the selected remedy will be implemented as the Remedial Action. Once Remedial Action is complete, the EPA will delete the site from the National Priorities List.

LONGHORN ARMY AMMUNITION PLANT HISTORY AND BACKGROUND

Longhorn Army Ammunition Plant (LHAAP) is a government-owned, contractor-operated industrial facility under the jurisdiction of the U.S. Army Armament, Munitions, and Chemical Command (AMCCOM). The primary mission of LHAAP is to load, assemble, and pack pyrotechnic and illuminating/signal ammunition and solid propellant rocket motors. The Longhorn Division of Thiokol Corporation is the current operating contractor. LHAAP has also been responsible for the static firing and elimination of Pershing I and II rocket motors in compliance with the

Intermediate Nuclear Force (INF) Treaty in effect between the United States and the former U.S.S.R..

The primary mission of LHAAP has varied over the years of operation. In the past, the plant has been responsible for the production of TNT, photo flash bombs, simulators, hand signals, tracers, and rocket motors.

LHAAP was placed on the National Priority List (NPL) on August 9, 1990. After being listed on the NPL, LHAAP, the EPA, and the TWC entered into an agreement for remediation of the facility. This agreement, referred to as the Federal Facility Agreement (FFA), became effective on December 30, 1991. The FFA requires the completion of the CERCLA process at 13 areas on LHAAP. The general location of the 13 sites with the corresponding site names are shown on Figure 1.

SITE DESCRIPTIONS

LHAAP 11 - Suspected TNT Burial Site at Avenues P & Q

This Suspected TNT Burial Site is an undocumented location where it is suspected the TNT may have been disposed of during the 1940s. Contamination by TNT and other waste explosives is suspected at this site. Figure 2 shows a site map of the Suspected TNT Burial Site and the proposed sample locations.

LONGHORN ARMY AMMUNITION PLANT MEETING AGENDA

MEETING: Technical Review Committee (TRC)

LOCATION: Longhorn Army Ammunition Plant - Karnack, Texas Bldg 703

TIME: March 10, 1992, 1:00 P.M.

SIGN IN: At entrance of LHAAP there is a gate house where you can sign in. The guard will issue a temporary badge and vehicle permit. If you bring a camera please request a camera permit.

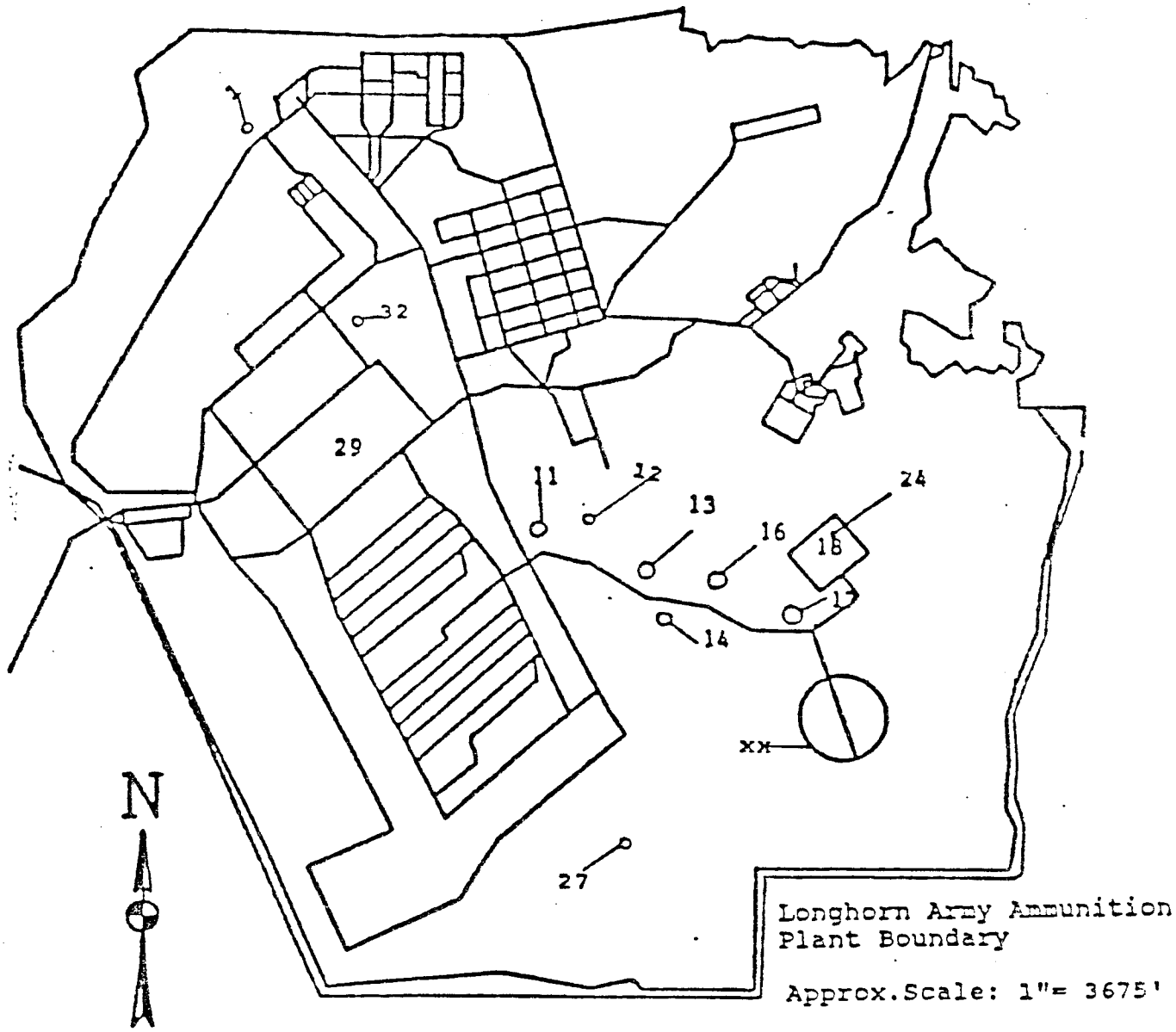
AGENDA

I. INTRODUCTION - The what, why and who of the TRC

II. Introduction to CERCLA - background and effect on Longhorn Army Ammunition Plant.

III. Tour sites listed on federal facility agreement.

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



11. Suspected TNT Burial Site at Avenues P and Q
13. Suspected TNT Burial Site between Old and Active Landfills/Acid Dump
14. Area 34 Burial Ground
16. Old Landfill
17. Burning Ground No.2/Flashing Area
18. Burning Ground No.3
24. Unlined Evaporated Pond/Rocket Motor Washout Lagoon
29. Former TNT Production Area
12. Active Landfill
32. Former TNT Disposal Plant
1. Inert Burning Grounds
xx. Ground Signal Test Area
27. South Test Area

Figure 1

LEGEND

- GROUND WATER FLOW DIRECTION
- S5 SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
- B1 SOIL BORING AND NUMBER (PREVIOUS)
- BG BACKGROUND SAMPLE
- SOIL BORING (PROPOSED)
- SURFACE WATER / SEDIMENT SAMPLE (PROPOSED)
- SURFACE WATER FLOW DIRECTION

HEAVY TIMBER
AVE. P
S7
BORROW AREA
S8
S9
SMALL PINE TREES
5' HIGH MOUND
BG
20' WIDE
S6
HEAVY TIMBER
S4
SUSPECTED LIMIT OF TNT BURIAL SITE (PRELIMINARY SITE BOUNDARY)
S5
ASPHALT (GOOD)
BG
0801
B1
S2
S3
S1
0802
0803
AVE. O
20'WIDE
ASPHALT (FAIR)
HEAVY TIMBER
GATE

N

50 0 50 100
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 11
SUSPECTED TNT BURIAL SITE
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 2

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LHAAP 13 - Suspected TNT Burial Site Between Old and Active Landfills/Acid Dump

This Suspected TNT Burial Site is an undocumented location where it is suspected that TNT or waste acid may have been disposed. TNT and acid waste are the suspected contaminants at this site. Figure 3 shows a map of the Burial Site and the proposed sample locations.

LHAAP 14 - Area 54 Burial Ground

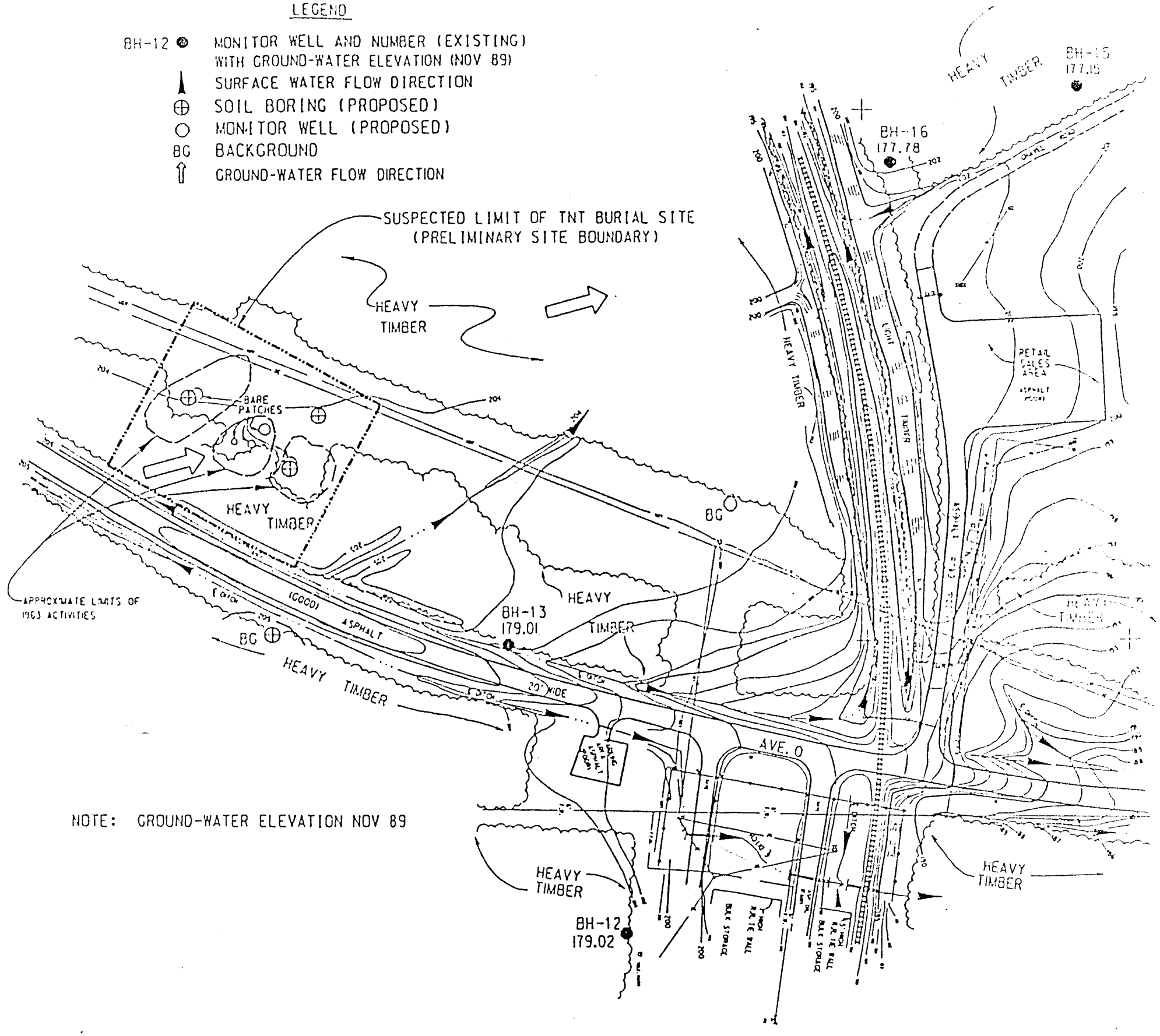
The Area 54 Burial Ground is an undocumented location where it is suspected that demolition debris, building rubble, explosives, and acidic wastes were disposed of in the 1940s and early 1950s. Figure 4 shows a site map of the Area 54 Burial Ground and the proposed sample locations.

LHAAP 16 - Old Landfill

The Old Landfill was originally used for disposal of products generated from the TNT Waste Disposal Plant. But, a variety of waste were disposed of in the landfill until the 1980s. Burned rocket motor casings, substandard TNT, barrels of chemicals, oil, paint, scrap iron, and wood may have been disposed of in the Old Landfill. Contamination from explosives, solvents, and metals are suspected in and around the Old Landfill. Figure 5 shows a map of the area and the proposed sample locations.

LEGEND

- BH-12 ⊕ MONITOR WELL AND NUMBER (EXISTING) WITH GROUND-WATER ELEVATION (NOV 89)
- SURFACE WATER FLOW DIRECTION
- ⊕ SOIL BORING (PROPOSED)
- ○ MONITOR WELL (PROPOSED)
- BG BACKGROUND
- ⇧ GROUND-WATER FLOW DIRECTION



NOTE: GROUND-WATER ELEVATION NOV 89

N

50 0 50 100
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 13
TNT BURIAL SITE
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 3

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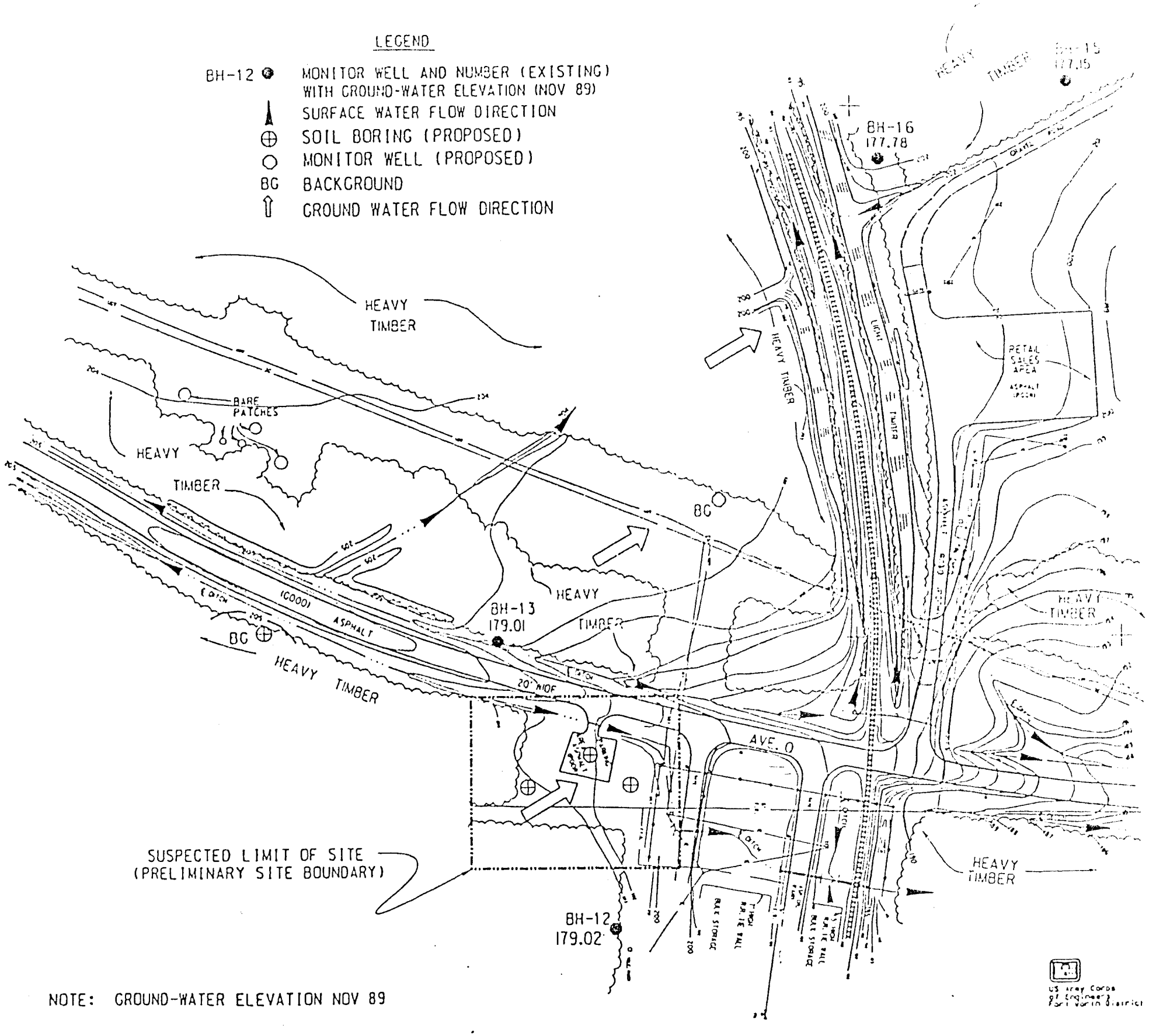
LEGEND

- BH-12 ● MONITOR WELL AND NUMBER (EXISTING) WITH GROUND-WATER ELEVATION (NOV 89)
- SURFACE WATER FLOW DIRECTION
- ⊕ SOIL BORING (PROPOSED)
- ○ MONITOR WELL (PROPOSED)
- BG BACKGROUND
- ⇧ GROUND WATER FLOW DIRECTION



NOTE: GROUND-WATER ELEVATION NOV 89

50 0 50
SCALE IN FEET

US Army Corps of Engineers Fort Worth District

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 14
TNT BURIAL SITE
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 4

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004477

LEGEND

- GROUND WATER FLOW DIRECTION
- SURFACE WATER FLOW DIRECTION
- BH-14 176.53 — MONITOR WELL, NUMBER, AND GROUND-WATER ELEVATION (EXISTING)
- SOIL BORING (PREVIOUS) SEE NOTE
- 017 — SURFACE WATER / SEDIMENT SAMPLE AND NUMBER (PREVIOUS)
- SOIL BORING (PROPOSED)
- SURFACE WATER/SEDIMENT SAMPLE (PROPOSED)
- MONITOR WELL (PROPOSED)
- BG — BACKGROUND SAMPLE LOCATION
- ..... — APPROXIMATE LIMITS OF DISPOSAL SITES
- (P) — MONITOR WELL TO BE PLUGGED
- DEEP STRATIGRAPHIC TEST BORING (PROPOSED)

BH-14 (P) 176.53
BH-15 (P) 177.15
BH-16 (P) 177.78
BH-13 (P) 179.01
BH-12 (P) 179.02
BG
701
702
703
704
705
122 173.55
017
HEAVY TIMBER
APPROXIMATE LIMITS OF INACTIVE LANDFILL SITE
AVE. O
30' WIDE
RETAIL SALES AREA
ASPHALT PLANT
BULK STORAGE
GRAVEL ROAD
ASPHALT (GOOD)

NOTES:
1. GROUND-WATER ELEVATION NOV 89
2. SEE FIG. 3-4-4 FOR DISPOSAL SITE DETAILS
3. SEE FIG. 6-4-2 FOR ADDITIONAL PROPOSED SAMPLE LOCATIONS

SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 16
OLD LANDFILL
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 5

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LHAAP 17 - Burning Ground No. 2/ Flashing Area

The Flashing Area was used for burning TNT, photo flash powder, and rejected materials in the 1950s. The area was also used to burn materials removed from the TNT Production Area and Disposal Plant in 1959. Metal by-products were also decontaminated here until 1980. Low concentrations of explosives and waste solvents have been detected at this site in previous investigations. Figure 6 shows a map of the site and the proposed sample locations.

LHAAP 18 - Burning Ground No. 3 and LHAAP 24 - Unlined Evaporation Pond

Burning Ground No. 3 has been in operation since 1955. It has been used for the treatment, storage, and disposal of solid and liquid explosive, pyrotechnic, and combustible solvent waste by open burning, incineration, evaporation, and burial. The Unlined Evaporation Pond was constructed in 1963 in Burning Ground No. 3. Various types of waste have been disposed in the Unlined Evaporation Pond since 1963. Explosive waste, solvents, metallic materials, and nitrogen and phosphorous compounds are the suspected contaminants. In 1986, the waste from the pond was removed and the pond was capped. Burning of waste is still conducted in the Burning Ground area. Figures 7 and 8 show the Burning Ground No. 3 area and the proposed sample locations.

004479

APPROXIMATE LIMIT
OF BURNING GROUND
NO. 2/FLASHING AREA

HEAVY TIMBER

016

130
170.69

SWAMP

BURN PITS

SCATTERED

BRUSH

BURN PITS

2'FW

SURFACE BURN AREA

BURNING & FLASHING AREA #2

FORMER TNT TOWER PACKING & FILTERS

BURN PIT

6'FW

CLUSTER PITS

BG

AVE. Q

20' ASPHALT (FAIR)

C-7 BG
172.43

TELE. POLES

LEGEND

- GROUND WATER FLOW DIRECTION
- 130 / 170.69 MONITOR WELL, NUMBER, AND GROUND-WATER ELEVATION (EXISTING
- 016 SURFACE WATER/SEDIMENT SAMPLE AND NUMBER (PREVIOUS)
- 5 SOIL BORING AND NUMBER (PREVIOUS)
- SURFACE WATER FLOW DIRECTION
- APPROX. LIMITS OF BURN PITS/TRENCHES
- SOIL BORING (PROPOSED)
- SURFACE WATER/SEDIMENT SAMPLE (PROPOSED)
- BG BACKGROUND SAMPLE LOCATION

NOTES:

1. GROUND-WATER ELEVATIONS NOV 89
2. PREVIOUS SAMPLE LOCATIONS ARE APPROXIMATE

N

50 0 50 100
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLAN
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 17
BURNING GROUND NO. 2/FLASHING A
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 6

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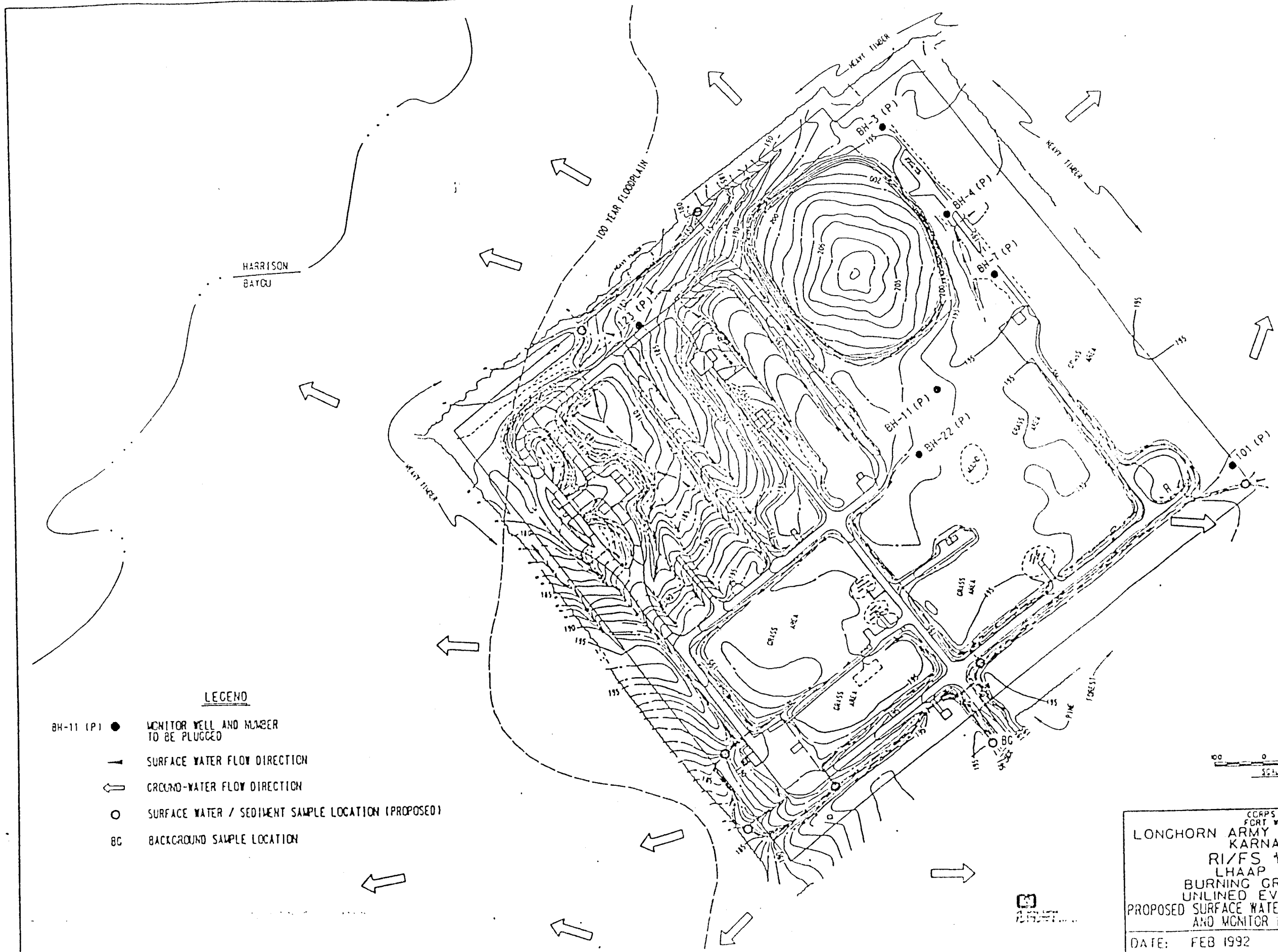
004480



CORPS OF ENGINEERS
FORT WORTH DISTRICT

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

RI/FS WORK PLAN
LHAAP - 18 AND 24
BURNING GROUND NO. 3 AND
UNLINED EVAPORATION POND
PROPOSED SURFACE WATER/SEDIMENT SAMPLE LOCA
AND MONITOR WELLS TO BE PLUGGED

DATE: FEB 1992 | Figure 7

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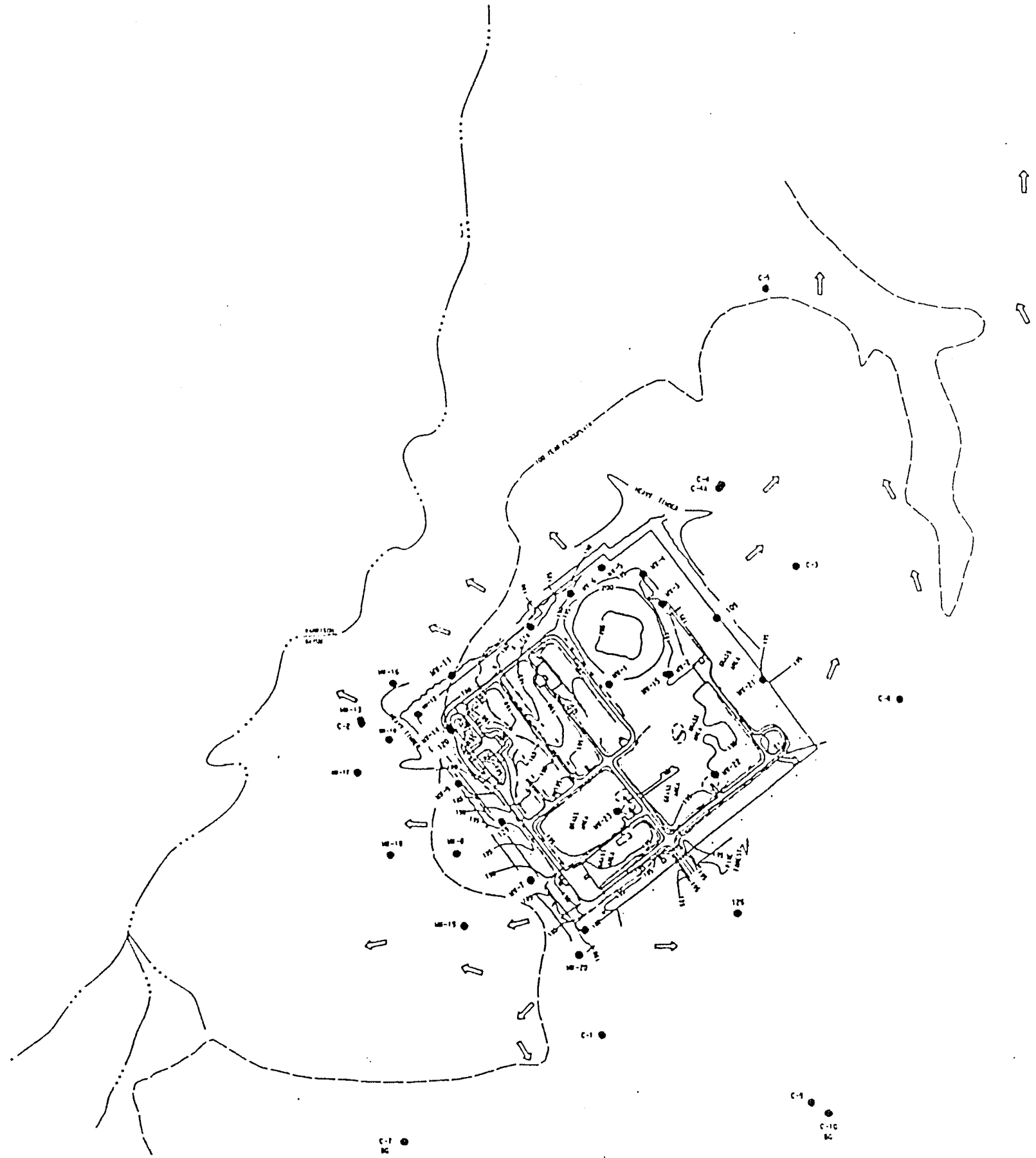

LEGEND

- ⇧ GROUND-WATER FLOW DIRECTION
- MW-14 ● MONITOR WELL AND NUMBER
- ↓ SURFACE WATER FLOW DIRECTION
- BG BACKGROUND SAMPLE LOCATION

NOTE:

ONLY WELLS TO BE SAMPLED ARE SHOWN.

250 0 250 500
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLAN
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 18 AND 24
BURNING GROUND NO. 3 AND
UNLINED EVAPORATION POND
PROPOSED GROUND-WATER
SAMPLING LOCATIONS

DATE: FEB 1992 | Figure 8

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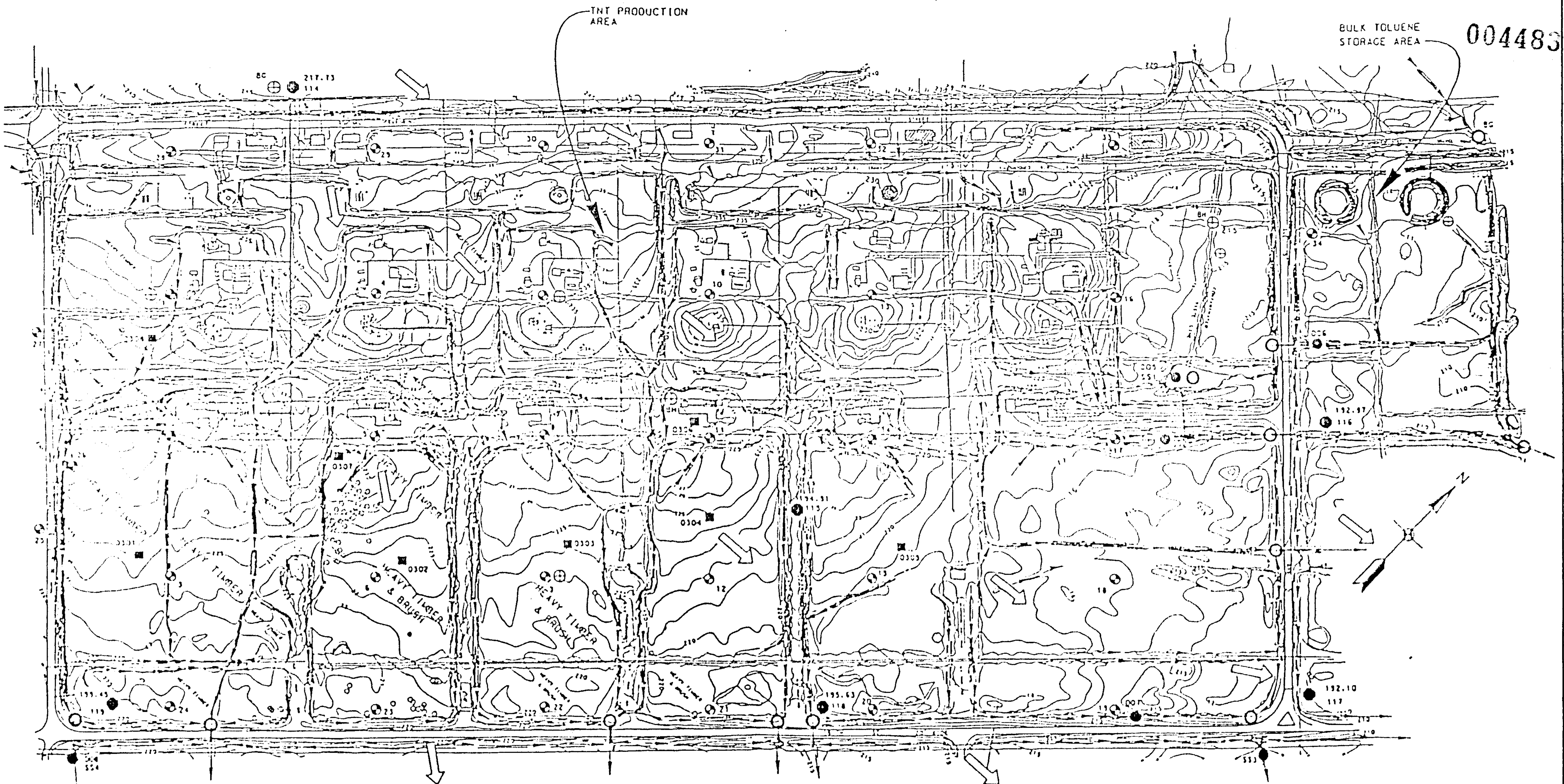
LHAAP 29 - Former TNT Production Area

The Former TNT Production Area was operated from April 1943 to August 1945 as a six line plant with a supporting acid plant. The plant produced 180 million kilograms of TNT throughout the period of operation. A bulk toluene storage area, servicing the TNT Production Area, was located adjacent to the production area. TNT wastewater (red water) from the production of the TNT was sent through wooden pipelines to a storage tank and pumphouse, and then to the TNT Waste Disposal Plant. Cooling water (blue water) from the production area ran through main lines and into an open ditch. Acidic waste were neutralized and discharged into the drainage ditch. The entire site was demolished and removed, except for the foundations, in 1959. Waste explosive compounds were detected in surface soils, drainage ditch sediments, and surface water drainage during previous investigations. Figure 9 shows a map of the TNT Production Area and the proposed sample locations.

LHAAP 12 - Active Landfill

The Active Landfill is currently being used for disposal of non-hazardous industrial solid waste. The Active Landfill has been used intermittently since 1963. Continuous use of the Active Landfill began in approximately 1978. Previous investigations discovered contamination or probable contamination by metals, explosive compounds, and some volatile organic compounds. Figure 10 shows a map of the Active Landfill and the proposed sample locations.

004483



NOTE:

1. GROUND-WATER ELEVATION NOV 89
2. PREVIOUS SAMPLING LOCATIONS ARE APPROXIMATE
3. SEE FIGURE 6-7-2 FOR ADDITIONAL SAMPLE LOCATIONS

300 150 0 300
SCALE IN FEET

LEGEND

118 ● 195.63	MONITOR WELL AND NUMBER(EXISTING) WITH GROUND-WATER ELEVATION (SEE NOTE)
0303 ■	SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
21	SOIL BORING AND NUMBER (PREVIOUS)
SS4	SURFACE WATER/SEDIMENT SAMPLE AND NUMBER (PREVIOUS)
⇦	GROUND-WATER FLOW DIRECTION
	SURFACE WATER FLOW DIRECTION
○	SURFACE WATER/SEDIMENT SAMPLE (PROPOSED)
⊕	SOIL BORING (PROPOSED)
BG	BACKGROUND SAMPLE
BH ⊕	BACKHOE SAMPLE (PROPOSED)

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP-29
FORMER TNT PRODUCTION AREA
PROPOSED SAMPLE LOCATIONS
DATE: FEB 1992

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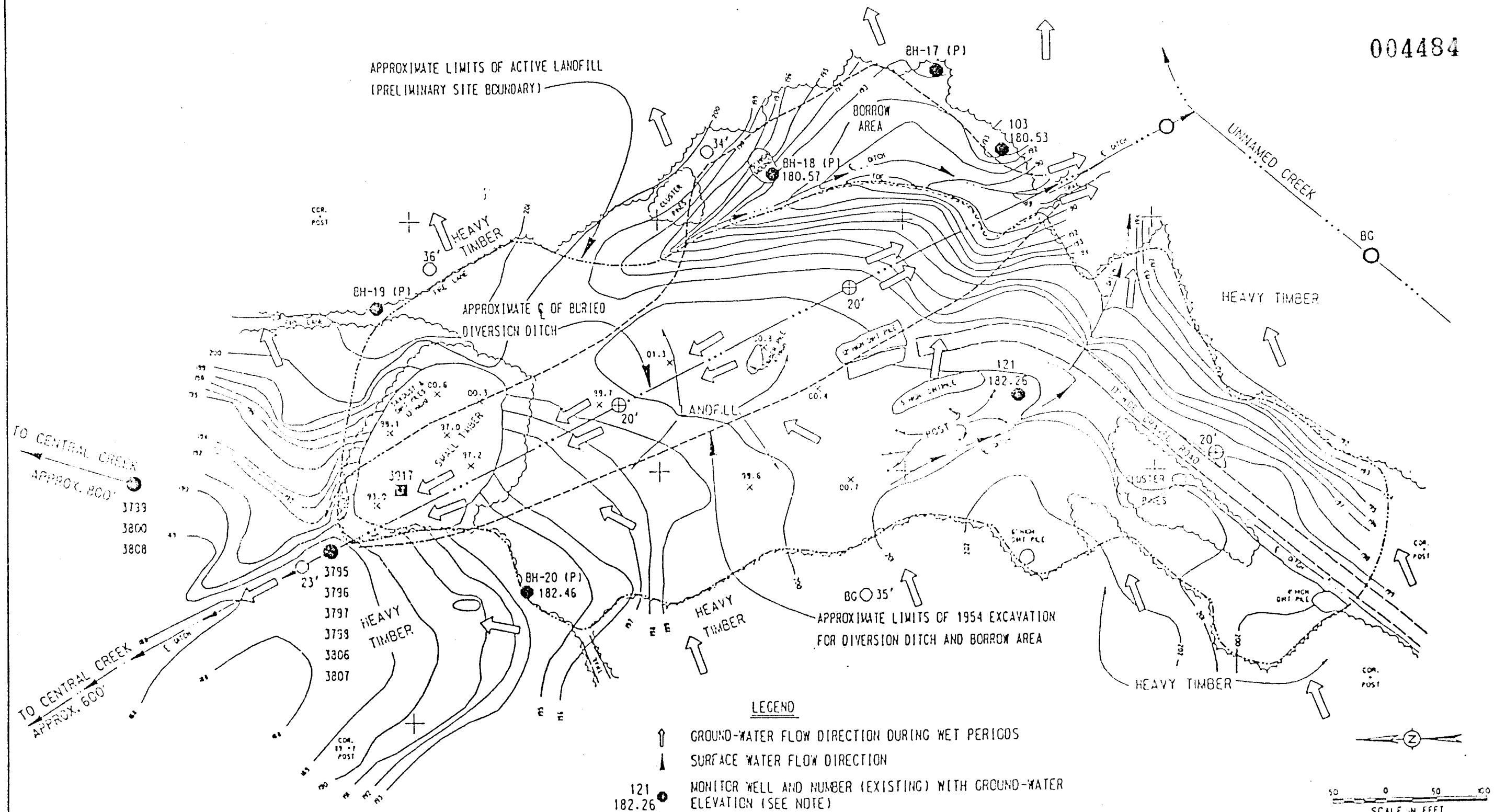

NOTE:

GROUND-WATER ELEVATION NOV 89.

LEGEND

⇧	GROUND-WATER FLOW DIRECTION DURING WET PERIODS
	SURFACE WATER FLOW DIRECTION
121 / 182.26 ●	MONITOR WELL AND NUMBER (EXISTING) WITH GROUND-WATER ELEVATION (SEE NOTE)
3917 ▣	SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
3799 ◉	SURFACE WATER / SEDIMENT SAMPLE AND NUMBER (PREVIOUS)
O	SURFACE WATER / SEDIMENT SAMPLE (PROPOSED)
35'O	MONITOR WELL AND DEPTH (PROPOSED)
23'⊕	SOIL BORING AND MINIMUM DEPTH (PROPOSED)
BG	BACKGROUND SAMPLING LOCATION
(P)	MONITOR WELL TO BE CLOSED BY PLUGGING

50 0 50 100
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 12
ACTIVE LANDFILL
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992

LHAAP 32 - Former TNT Waste Disposal Plant

The TNT Waste Disposal Plant was constructed in 1942 to treat and dispose of wastewaters generated at the TNT Production Area. The plant was operated from April 1943 until August 1945. In 1959, most of the facilities at the Disposal Plant were removed. The suspected contaminants at the site are explosive compounds and metals contained in explosive manufacturing residues. Figure 11 shows a map of the Former TNT Waste Disposal Plant and the proposed sample locations.

LHAAP 32 - Inert Burning Grounds

The Inert Burning Grounds were originally used during World War II to burn trash, ashes, scrap lumber,and waste from burned TNT. Photo flash powder may have been burned at the site in the 1950s. It is also suspected that waste may have been dumped at the site and not burned. Previous investigations have discovered contamination by metallic compounds. Explosive compounds are also suspected at the site. The Inert Burning Grounds site map with the proposed sample locations is shown in Figure 12 .

LHAAP XX - Ground Signal Test Area

The Ground Signal Test Area is currently used for aerial and on-ground testing of pyrotechnic, illuminant, and signal devices manufactured at this facility. Since 1988, burn-out of Pershing missiles has been conducted at this site, in accordance with the Intermediate Nuclear Forces Treaty. The site has been used intermittently since 1963 for various types of testing and

LEGEND

- GROUND WATER FLOW DIRECTION
- SURFACE WATER FLOW DIRECTION
- 0201 ■ SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
- 004 ● SURFACE WATER/SEDIMENT SAMPLE AND NUMBER (PREVIOUS)
- 113 / 198.78 ● MONITOR WELL AND NUMBER (EXISTING) WITH GROUND-WATER ELEVATION (SEE NOTE)
- 15' ⊕ SOIL BORING AND DEPTH (PROPOSED)
- ⊠ SHALLOW SOIL SAMPLE (PROPOSED)
- ○ SURFACE WATER/SEDIMENT SAMPLE (PROPOSED)
- BG BACKGROUND SAMPLE LOCATION
- BH ⊖ BACKHOE SAMPLE LOCATION (PROPOSED)

60 30 0 60 120
SCALE IN FEET

NOTE:
GROUND-WATER ELEVATION NOV 89.

GOOSE PRAIRIE CREEK
003
APPROXIMATE LIMIT OF FORMER TNT WASTE DISPOSAL PLANT (PRELIMINARY SITE BOUNDARY)
HEAVY FOREST
HEAVY TIMBER & BRUSH
FORMER "BLUE WATER" (COOLING WATER) DITCH
COOLING WATER NEUTRALIZATION PLANT (ABANDONED)
FORMER EVAPORATOR BUILDING FOUNDATION W/ PARTIAL BASEMENT
BARE AREA
113 3313
FORMER INCINERATOR FACILITY FOUNDATIONS
CONCRETE ROOFED EQUALIZATION TANKS
0201
0202
0203
004 3318
DETENTION POND
CONCRETE STRUCTURES
"RED AND YELLOW LIQUOR" WASTEWATER PIPELINE
WET WELL
TANK SUPPORT PADS
FORMER CHANGE HOUSE FOUNDATION
BG
BH
AVE. "C"
AVE. "D"
1ST STREET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 32
FORMER TNT WASTE DISPOSAL PLANT
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 11

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LEGEND

- GROUND-WATER FLOW DIRECTION
- 104 ● MONITOR WELL AND NUMBER (EXISTING)
- 0103 ■ SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
- ⊕ SOIL BORING (PROPOSED)
- ○ SURFACE WATER / SEDIMENT SAMPLE (PROPOSED)
- BG BACKGROUND SAMPLE
- SURFACE WATER FLOW DIRECTION

SUSPECTED LIMIT OF
INERT BURNING GROUNDS
(PRELIMINARY SITE BOUNDARY)

BG
BG
HEAVY TIMBER
GRAVEL ROAD
HEAVY TIMBER
HEAVY TIMBER
0101
0103
0102
32nd ST.
HEAVY TIMBER
ASPHALT (FAIR)
HEAVY TIMBER
AVE. P
20' ASPHALT
104
HEAVY TIMBER
HEAVY TIMBER

50 0 50 100
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 1
INERT BURNING GROUNDS
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 12

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destruction of many explosive devices. Suspected contaminant are metals and residues from the testing and destruction. A site map is shown in Figure 13 with the proposed sample locations.

LHAAP 27 - South Test Area

The South Test Area was constructed in 1954 for testing of photo flash bombs. During the late 1950s, illuminating signal devices were also demilitarized within pits at the site. In the early 1980s, photo flash cartridges were demilitarized in the area. Various types of contamination has been discovered in previous investigations and are suspected at this site. Figure 14 shows a map of the area and the proposed sample locations.

INVESTIGATION METHODS

Monitoring Wells

Groundwater samples will be taken from monitoring wells and analyzed to determine if groundwater contamination exist. Monitoring wells are very similar to water supply wells. They are usually not as large and are not required to produce large amounts of water. The monitoring wells will be drilled by a drilling rig and constructed as shown in Figure 15.

004489

APPROXIMATE LIMITS OF GROUND SIGNAL TEST AREA (PRELIMINARY SITE BOUNDARY)

TO HARRISON BAYOU (APPROX. 2000')

TO SANDERS BRANCH (APPROX. 1000')

OBSERVATION STATIONS

EARTHEN-WOODEN BUNKER (ABANDONED)

128 173.84

24'

HAND SIGNAL LAUNCHER

0501

0502

0503

CONCRETE BUNKERS (ABANDONED)

ROCKET MOTOR STAND

CLEARING FOR ROCKET BLAST

CLEARING FOR LINE-OF-SIGHT OBSERVATION

SANDERS BRANCH WATERSHED

HARRISON BAYOU WATERSHED

ROCKET MOTOR BLAST AREA

APPROXIMATE DRAINAGE DIVIDE

TO HARRISON BAYOU (APPROX. 1300')

127

FORMER MORTAR TEST AREA (1970'S)

ROCKET MOTOR STAND (NEVER USED)

37' BG

LEGEND

- GROUND WATER FLOW DIRECTION
- 0501 — SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
- 128 173.84 — MONITOR WELL AND NUMBER (EXISTING) WITH GROUND-WATER ELEVATION (SEE NOTE)
- SURFACE WATER FLOW DIRECTION
- SURFACE WATER/SEDIMENT SAMPLE (PROPOSED)
- SHALLOW SOIL SAMPLE (PROPOSED)
- 24' — SOIL BORING AND DEPTH (PROPOSED)
- BG — BACKGROUND SAMPLE LOCATION

NOTE: GROUND-WATER ELEVATION NOV 89

N

250 0 250 500

SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - XX
GROUND SIGNAL TEST AREA
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 13

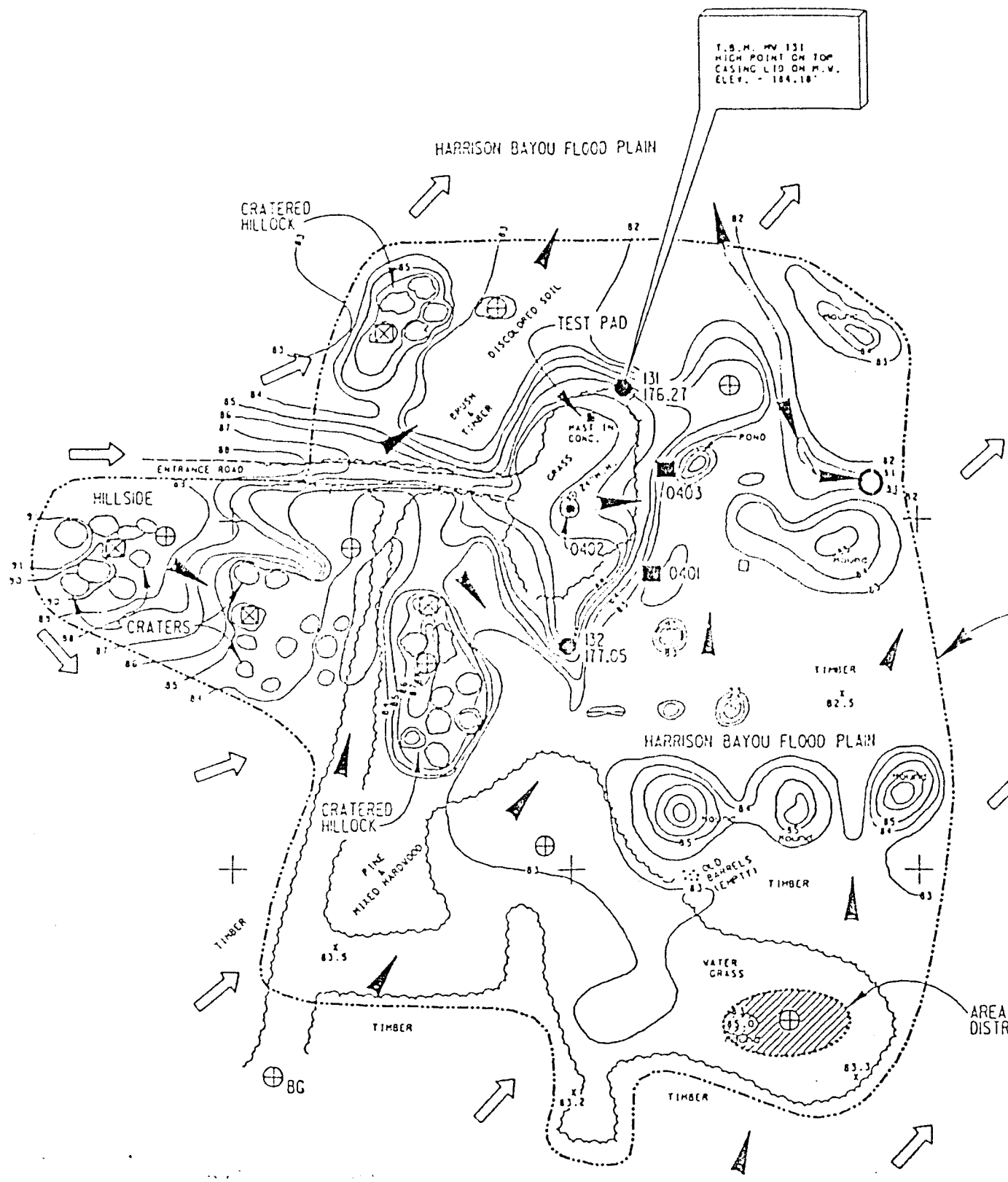
drawing/longhorn/xxsampl.dgn Feb. 4, 1992 10:04:12

004430

LEGEND

- ⇧ GROUND WATER FLOW DIRECTION
- 131 / 176.27 ⊕ MONITOR WELL AND NUMBER (EXISTING) WITH GROUND-WATER ELEVATION (SEE NOTE)
- SURFACE WATER FLOW DIRECTION
- 0403 ▪ SHALLOW SOIL SAMPLE AND NUMBER (PREVIOUS)
- ⊕ SOIL BORING (PROPOSED)
- ○ SURFACE WATER / SEDIMENT SAMPLE (PROPOSED)
- ⊠ SHALLOW SOIL SAMPLE (PROPOSED)
- BG BACKGROUND SAMPLE LOCATION

NOTE:
GROUND-WATER ELEVATION NOV 89.



HARRISON BAYOU

APPROXIMATE LIMIT OF SOUTH TEST AREA (PRELIMINARY SITE BOUNDARY)

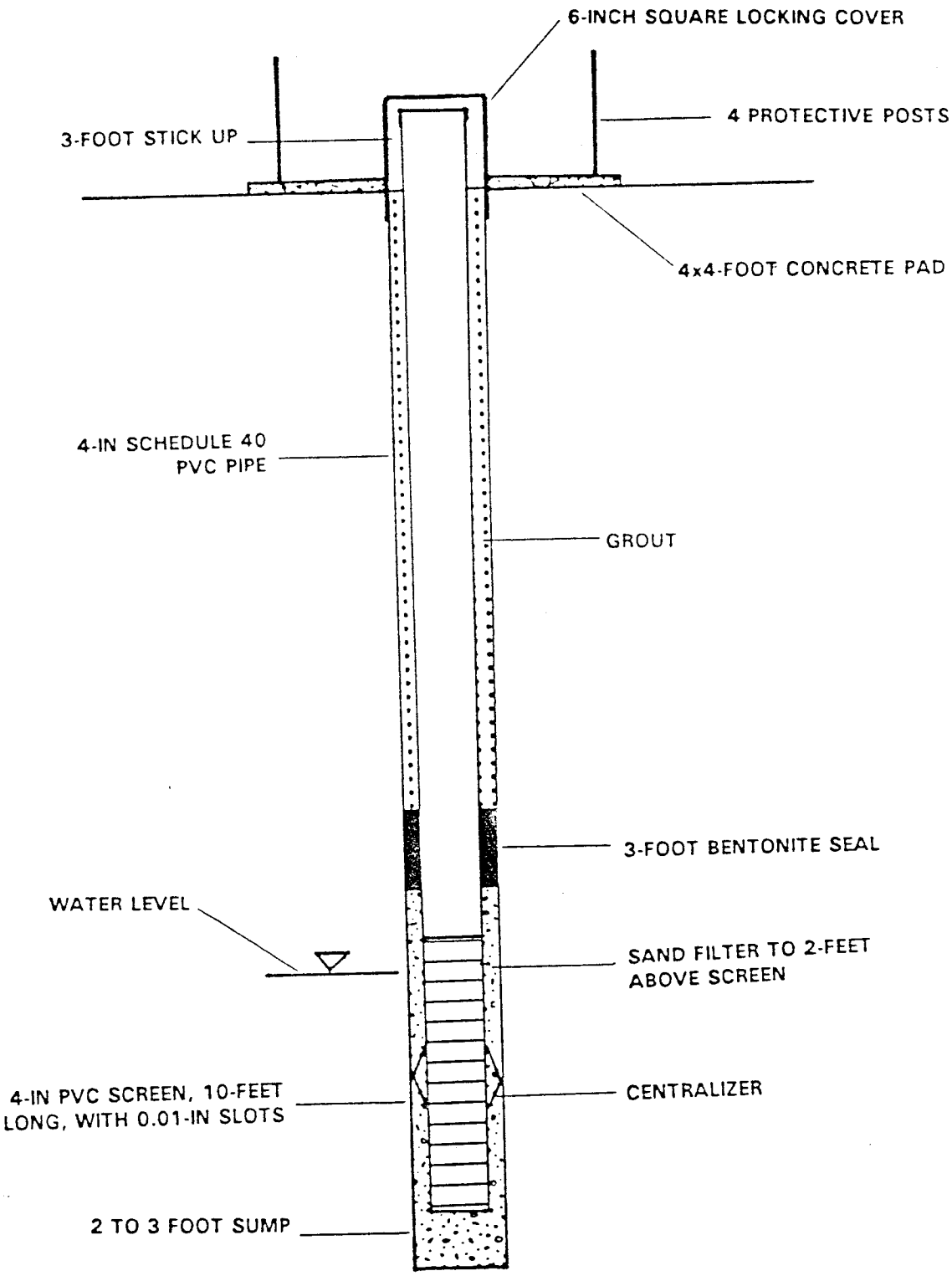
N

50 0 50 100
SCALE IN FEET

CORPS OF ENGINEERS
FORT WORTH DISTRICT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
RI/FS WORK PLAN
LHAAP - 27
SOUTH TEST AREA
PROPOSED SAMPLE LOCATIONS

DATE: FEB 1992 | Figure 14

awing/longhorn/27sample.dg Jan. 30, 1992 14:27:14



Typical well schematic.

Figure 15

Soil Sampling

Shallow soil samples will be taken to determine the soil type and soil contamination. Deep soil borings will be conducted to determine the geology of the area. A drilling rig will be used to obtain soil samples below the surface.

Surface Water and Sediment Sampling

Surface water and sediment samples will be taken from drainage ditches in or near the potentially contaminated sites. Surface water samples will determine if contamination is currently leaving the site. While, sediment samples will give information on surface water drainage in the past.

SCHEDULE

A schedule of 67 months has been developed for remedial activities at the 13 sites described above. The schedule includes all activities for project planning through the completion of the remedial design. A list of the remedial activities with the corresponding scheduled start and finish dates are given below.

SCHEDULE

Item	Start	Finish
Planning	August 1991	May 1992
Remedial Investigations	June 1992	April 1994
Feasibility Study	June 1992	February 1995
Selection of Remediation	February 1995	June 1995
Record of Decision	June 1995	January 1996
Remedial Design	January 1996	December 1996
Remedial Action	January 1997	Completion

DEPARTMENT OF THE ARMY
LONGHORN/LOUISIANA ARMY AMMUNITION PLANTS
MARSHALL, TEXAS 75671-1059

REPLY TO
ATTENTION OF

March 13, 1992

SMCLO-EV

U.S. Environmental Protection Agency
ATIN: Ms. Lisa Marie Price
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Price:

We are submitting the Initial Remedial Actions/Data Quality Objective Report for your review as required by the Federal Facility Agreement. To expedite our response time, please send all comments to Longhorn Army Ammunition Plant by April 13, 1992 with an information copy forwarded to the U.S. Army Corps of Engineers, Tulsa District, ATIN: Mr. Wade Anderson, CESWT-EC-GR, P. O. Box 61, Tulsa, OK 74121.

For further information, please contact Mr. Lynn Muckelrath, 903-679-2980.

Sincerely,

Robert W. Bringman
Lieutenant Colonel, U. S. Army
Commanding Officer

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

004495

MAR 27 1992

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Lynn Muckelrath, Project Manager
Longhorn Army Ammunition Plant
ATTN: SMCLO-EN
Marshall, Texas 75671-1059

Dear Lynn,

Pursuant to the Federal Facility Agreement (FFA) for the Longhorn Army Ammunition Plant (AAP), EPA's comments on the draft RI/FS Work Plan are identified in this letter, in the four (4) enclosures from EPA, in the enclosed letter from Metcalf & Eddy, and in the enclosed letter from RMC Environmental and Analytical Laboratories.

EPA's general comments are listed below, however, specific document comments are identified in the enclosure.

General comments on RI/FS Work Plan for Longhorn AAP:

1) It would be helpful to provide a list for each of the sites that would provide the following information:

* identification of all wells in the area that monitor that specific site, identifying background wells and wells shared between different sites
* elevation of ground surface at the well locations
* finished depth of the wells
* depth at which ground water was encountered
* ground water zone being monitored
* a map of the facility identifying each site and the well locations; the map should also identify background wells and wells shared between sites; an additional map should be generated to identify wells to be closed and those proposed (show proposed depths) during the RI activities

2) The approach taken in the draft RI/FS Work Plan appears to be a phased approach to the RI, i.e., going back and installing monitoring wells if ground water contamination is found. This is an acceptable and prudent approach given the number of potential sites at the LHAAP facility, however, no mention of the decision to phase the RI was made in the schedule that EPA approved on February 24, 1992. Therefore, EPA requests that a proposed schedule incorporating the additional field studies and their affect on the overall schedule at the site should be submitted and discussed in a letter to EPA and TWC and should be discussed in the RI/FS Work Plan.

3) EPA is concerned that the RI may be ignoring potential deeper ground water problems, however, in light of the phased approach to the RI, EPA's concerns may be addressed.

4) For all of the sites where it has been determined either that there is a ground water contamination problem or that there is a potential ground water problem, EPA believes that to dismiss the potential threat to water supply wells as "negligible" is premature.

5) The FFA for Longhorn AAP is to address the corrective action obligations that are required under the RCRA permit issued for the facility. RCRA Subpart F (40 CFR 264.9) addresses the releases from solid waste management units. Specifically, section 264.95 addresses the point of compliance at which the ground water protection standard of Section 264.92 (Ground-water Protection Standard) applies and at which monitoring must be conducted. The point of compliance is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated units. In the absence of the point of compliance being specifically identified in the RCRA permit, the point of compliance shall be established at the vertical surface located at the hydraulically downgradient limit of each of the individual sites identified for investigation and potential remediation under the FFA.

Careful consideration of the components necessary to completely characterize a the site, to completely characterize the problem, and to initiate a corrective action or remediation must be made. Although the FFA supersedes the corrective action requirements of the RCRA permit issued to the Longhorn AAP, the intent of the RCRA permit must be followed. Therefore, the ground water monitoring system should consist of a minimum of one background well located hydraulically updragient of the unit, removed a sufficient distance so as not to be affected by the unit, and at least three wells located on the downgradient perimeter of the unit.

6) The draft RI/FS Work Plan states that operable units will be identified and proposed in the FS. As EPA suggested in its February 5, 1992, letter regarding the proposed schedule for site activities, the early identification of sites, contaminants, and/or issues that can be addressed collectively is essential and could result in expedited remedial actions on less complex operable units. EPA requests that you reconsider delaying the identification of operable units. During the field activities and resultant data evaluation for the RI, operable units could be identified and steps toward remedial action could be taken.

7) During meeting held between EPA, DoD, and TWC, the potential for additional sites that might require investigation pursuant to the FFA have been eluded to by DoD. When will these sites be

formally identified? Will they be addressed in an addendum to the RI/FS Work Plan?

8) No where in the Site Safety and Health Plan does it identify specific indicators that would cause the immediate stoppage of work e.g., large metal objects being encountered in a boring, odd-colored materials identified in drilling tailings, etc. This is a critical issue given the unknown nature of most of the sites and the potential for buried explosives.

I look forward to meeting with you on April 9 and 10, 1992, here in Dallas, Texas to discuss the draft RI/FS Work Plan and other issues relating to Longhorn AAP.

If you have any questions regarding the comments, the meeting dates, or any other matter, please contact me at (214) 655-6735 or FTS 255-6735.

Sincerely,

Lisa Marie Price
Remedial Project Manager
Superfund Texas Enforcement

Enclosure

cc: copy sent Federal Express

Tulsa District Corps of Engineers
P.O. Box 61
Attn: D. Wade Anderson
CESWT-EC-GP
Tulsa, OK 74121-0061

Mike Moore, Superfund
Pollution Cleanup Division
P.O. Box 13087
Capital Station
1700 N. Congress Avenue
Austin, Texas 78711-3087

EPA ENCLOSURE 1

COMMENTS ON DRAFT RI/FS WORK PLAN VOLUME 1:

SECTION	PAGE/ PARA.	COMMENT
3.4.4	3-38/ 3	Vinyl chloride detected in Old Landfill is missing the unit, i.e., .22 what?
3.4.4 and 4.4.2.3	3-43/ 3 and 4-18/ 1	Will the surface water/sediment samples collected around the toe of the Old Landfill serve to verify or deny the existence of explosives in the sediments of Harrison Bayou downstream of the site? Wasn't 2,6 DNT detected in surface water/sediment sample 017? There aren't any proposed sample locations near 017.
3.4.5.4	3-46	What water zone does Well 122 monitor? The well log on page 3-33 shows it monitoring the shallow water zone. Please state this in this section, it will help the reader understand the "vertical" picture.
3.4.6	3-47/ 2	You cannot dismiss the potential threat to ground water so easily. With very limited ground water data at this area, it is too premature to assume that any threat posed is "negligible."
3.5.4	3-55/ 1	"Results for the surface water and sediment sample taken... No contaminants were found in either the surface water or sediment sample." This is not an accurate statement. Table 3-5-2 shows elevated levels of nitrate, sulfate, chloride, nickel, and the presence of phenol.
3.6.4	3-92/ 1	"The deeper well MW-15 at the MW-2 location..." Which "deeper" zone is MW-15 monitoring?
3.6.4	3-92/ 2	"Other shallow wells installed..." Which zone are these "shallow wells" monitoring?
3.6.6	3-98/ 2	Based on information presented in sections 3.6.2, 3.6.3, and 3.6.4, the potential threat to ground water and water supplies cannot be dismissed so easily. It is too premature to assume that any threat posed is "negligible."

SECTION	PAGE/ PARA.	COMMENT
3.6.7	3-100	EPA disagrees that there is no need for an initial remedial action at this site. With almost 2% methylene chloride in the shallow ground water, the need for immediate attention must be evaluated. In fact, an early action could be initiated at this site before the risk assessment has been completed.
3.6.7	3-100	typos "iitial" should be "initial"; "awy" should be "away"
3.8.3	3-136/ 2 and 3	What zones are being monitored by the BH wells and wells 103 and 121?
3.8.6	3-147/ 2	Since ground water behavior has not been adequately characterized, do not prematurely dismiss the potential threat that the site poses to the ground water.
3.9.3	3-115/ 1	Which water zone does well 113 monitor?
3.10.2	3-167	Based on the onsite visit conducted on 3/11/92, what are the mounds located immediately to the northwest of this site? Are they the result of some disposal practice? Are they naturally occurring? Will they be included in the investigation?
3.11.4	3-186	Which water zones do wells 127 and 128 monitor?
4.1.1	4-2/ 1	"Therefore, soil borings located randomly across the site and taken to depths..." Is the a safe approach to the trying to locate a suspect burial site? What about a soil gas survey or a form on non-intrusive preliminary screening method before subsurface borings are drilled?
4.3.2	4-10	EPA requests that an additional boring be drilled into the center area with the three bare patches that are close together (Figure 4-2-1).
4.4.2	4-14	Given the potential for deeper migration of the contaminated ground water, EPA requests that you put in additional monitoring wells to monitor the deeper (>35') water zones.

SECTION	PAGE/ PARA.	COMMENT
4.5.2	4-22	Based on statements made on page 4-21 about their being no way to monitor the ground water down gradient of the burn pits, EPA requests that a soil boring be drilled north-northwest (along the flow of the shallow ground water as identified on Figure 4-5-1 page 4-23) of the burn pits for the purpose of obtaining a downgradient ground water sample.
4.6.1	4-25/ 2	How many ground water zones are currently being monitored?
4.6.2	4-26/ 1	Will your investigation include trying to verify and quantify additional sources of contamination in the burning ground (i.e., more trenches containing solvent soaked sawdust, etc.)
4.7.1 and 4.7.2.4	4-32/ 2 and 4-37	What ground water zones are currently being monitored?
4.7.2.2	4-33	Why are you going to analyze only for explosive compounds? EPA request that you include organic compounds associated with the production of explosives in the analysis.
4.7.2.2	4-36/ 1	Do soil boring locations correlate with previous sample locations that have detected contamination? If not, why were these locations chosen?
4.8.2	4-38	EPA requests that you resample the sawdust piles located on the northern portion of the landfill for contamination. EPA also requests that you sample any leachate seeps detected around the landfill for contamination.
4.9.2 and Figure 4-9-1	4-44 and 4-45	The soil borings in the text are identified as 10-foot soil borings. The figure identifies the soil borings as 15-foot borings. The text (section 4.9.2.3) states that the borings will be drilled to ground water. Be consistently precise or consistently vague.

SECTION	PAGE/ PARA.	COMMENT
4.9.2.5	4-51	EPA requests that ground water grab samples be collected from the two shallow (5-foot) borings if ground water is encountered.
4.10.2	4-52	Given that contaminants have been detected in well 104, EPA requests that soil borings with ground water grab samples or monitoring wells be installed along the downgradient edge of the inert burning grounds to determine if contamination is leaving the site.
4.11.2	4-57	EPA requests that additional ground water sampling be conducted at this site given the contamination that has been detected in well 128.
4.12.2	4-64	EPA requests that soil borings with ground water grab samples or monitoring wells be installed along the downgradient edge of the area to determine if contamination is leaving the site.
5.0	5-1/ 1	Instead of "recommend" a more appropriate term is "identify"
5.0 and 5.1.3	5-1/ 3 and 5-5	See EPA's general comment regarding the delay of the identification of operable units until the FS.
5.2	5-6/ 1	"The results of the treatability study may be used during the remedial design if the technology tested is the selected technology." In what way will the treatability study information be used? Treatability study information, although very useful in the selection of a remedial technology, should not replace additional full-scale pilot testing during the remedial design phase of activities.
5.2.1	5-6	Please add "schedule" as an item in the areas to be addressed in a treatability study work plan.
5.2.2	5-8	Add "...if appropriate." to the end of the 1st sentence in this section.

SECTION	PAGE/ PARA.	COMMENT
5.3.2	5-9	The nine individual evaluation criteria should be identified as primary balancing, thresold, or modifying criteria pursuant to the NCP (40 CFR 300.430(f)(1)(i)).
8.2	8-1	See EPA's general comment regarding the impact of a phased RI on the overall schedule of the activities at the Longhorn AAP.

EPA ENCLOSURE 2

COMMENTS ON DRAFT RI/FS WORK PLAN VOLUME 2: CHEMICAL DATA ACQUITISTION PLAN

SECTION	PAGE/ PARA.	COMMENT
4.2.1.6	13	The text states that a two-foot thick bentonite seal will be placed in the well, while Figure 4-1 shows a three-foot bentonite seal. Which is correct?
4.2.2	13	What is the minimum volume of water that will be removed from the newly installed monitoring wells?
4.4.1.1	14	Will the contaminants cause interference with the instrumentation used to measure ground water levels?
4.5.1.1	15	How many volumes of water will be purged from the wells?
4.5.1.5	17	Two types of sampling methods are identified to collect ground water samples where no wells are installed. What will determine which method will be used?
B-4		Does this analysis detect the decomposition products of explosives? See enclosure from Dr. R. Soundararajan of RMC Environmental and Analytical Laboratories.

EPA ENCLOSURE 3

COMMENTS ON DRAFT RI/FS WORK PLAN VOLUME 3: SITE SAFETY AND HEALTH PLAN

SECTION	PAGE/ PARA.	COMMENT
1.0	1/ 3	typo "devekoped" should be "developed"
4.3	30	Will be the SSHO be onsite whenever field activities are being conducted?
7.1	37	In addition to air-purifying respirators with the appropriate cartridges, EPA suggests that 5-minute escape packs be provided to the workers. Will Level B be provided for a back-up in the event of an emergency?
9.1	45	Exposure via inhalation is just as dangerous as the potential for exposure via skin contact/absorption because of the subsurface investigations that are to take place at the facility.
9.1	45	EPA suggests that 5-minute escape packs be provided to the workers because of the potential for a vapor release during the drilling activities.
12.0	51	Add EPA Region 6 emergency number 214-655-2222
12.0	52	Add EPA and TWC Project Coordinators to the Non Emergency contacts

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

004505

EPA ENCLOSURE 4

March 27, 1992

MEMORANDUM

Subject: Comments on the Risk Assessment for the Longhorn Army Ammunition Plant Superfund site

FROM: Jon Rauscher, Toxicologist
Texas Remedy Section (6H-SR)

TO: Lisa Price, Remedial Project Manager
Texas Section (6H-ET)

This memorandum provides the following general comments on the Risk Assessment for the Longhorn Army Ammunition Plant Superfund site:

Site Conceptual Model: The risk assessment introduction should use provide a Conceptual Model of the site. The Conceptual Model is a depiction and discussion of the current understanding of the extent of contamination, the sources of release to the environment, transport pathways, exposure pathways and receptors at risk.

Contaminants of Concern: Selection of contaminants of concern (COCs) should use the procedures discussed in Chapter 5 - Data Evaluation of the Risk Assessment Guidance for Superfund, Volume 1 - Human Health Evaluation Manual, Part A (RAGS). The risk assessment should provide a clear justification for the elimination of COCs. Procedures discussed in Section 5.9 of RAGS should be used only after approval of the EPA Remedial Project Manager (RPM).

Exposure Assessment: The risk assessment should provide a clear justification of the land use scenarios selected for the exposure assessment. The risk assessment should consider future land use as residential in many cases. Residential areas should be assumed to remain residential and undeveloped areas should be assumed to be residential in the future unless sites are in an areas where residential land use is unreasonable. The exposure assessment should utilize the exposure parameters specified in the RAGS Supplemental Guidance "Standard Default Exposure Factors" (OSWER Directive 9285.6-03).

The data set of contaminant concentrations should be assumed to be log normally distributed and should be log transformed before calculating the exposure point concentration. The exposure point concentration should be the 95% upper confidence limit of the arithmetic average unless this value is higher than the maximum

detected concentration. If the data set is thought to be normally distributed, it should be tested for normality using the Shapiro and Wilk test or the W-test.

Toxicity Assessment: The EPA RPM should be consulted regarding chemicals for which no reference dose (RfD) or cancer slope factor (CSF) are available from the Integrated Risk Information System (IRIS) or Health Effects Assessment Summary Table (HEAST).

Risk Characterization: This section should provide a written characterization of the risk(s) presented by the site. It should state which COCs and exposure pathways exceed EPA acceptable risk criteria for carcinogenic and noncarcinogenic effects.

Ecological Risk Assessment: The baseline risk assessment should include an Ecological Risk Assessment. The Risk Assessment Guidance for Superfund, Volume 2 - Environmental Evaluation Manual should be followed when conducting the Ecological Risk Assessment. In addition, Region 6 Biological Technical Assistance coordinators, Susan Roddy and Jon Rauscher (214-655-2198), should be consulted regarding the planning of the Ecological Risk Assessment.

Copy:

Don Williams (6H-SR)

METCALF & EDDY
DRAFT RI/FS WORK PLAN COMMENTS

Metcalf & Eddy

004508

March 24, 1992

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Attention: Ms. Lisa Price (6H-ET)
Superfund Enforcement Division - Texas Section

Reference: Longhorn Army Ammunition Plant (LHAAP)
Draft RI/FS Work Plan

Dear Lisa:

In accordance with your request of March 3, 1992, Metcalf & Eddy, Inc. (M&E) has reviewed the draft work plan submitted by the U.S. Army Corps of Engineers (USACOE) for the Longhorn Army Ammunition Plant (LHAAP).

The comments are provided in two parts. The first part is a list of significant findings, and the second part is the detailed report.

The following significant comments are provided:

- All monitoring wells to be plugged should be noted on each drawing where they are shown.
- A separate background sample location should be selected for soil, groundwater, and sediment (run-off). Many previous background samples showed some contamination.
- A sample matrix should be prepared showing by area the estimated number of soil, groundwater, and sediment samples, the QA/QC samples, and other required samples (i.e., rinsate and field blanks).
- Sites with known contamination should be provided with at least one monitoring well on the downstream side to be drilled to the base of the Wilcox group, and sampled for VOC's, free-phase DNAPLs, SVOC's, PCB/Pesticides, Metals, and explosives at both the top of the water-bearing sand and the bottom of the Wilcox group.
- Sites with known DNAPL contamination should be investigated for the presence of free-phase liquids at the bottom of the aquifer (top of aquiclude).

- Separate, site specific Health and Safety Plans will include an evaluation of each task and the suspected or known contaminants. (See detailed report for additional Health and Safety concerns).

- Costs are the last items used in the evaluation of remedies for a superfund site.

- The current RI/FS does not include any specific monitoring well (MW) installations, but many existing MWs are being plugged. Based on the analysis of the initial boreholes (flow direction, and chemical quality) points of compliance should be defined and three downgradient monitoring wells installed at each site requiring monitoring.

All of these comments and other comments are detailed in the enclosed report.

If any additional information is needed, please call me.

Sincerely,

METCALF & EDDY, INC.

Ronald C. Catchings, P.E.
Contractor Project Manager

RCC/dn

cc: Mr. Phil Smith - M&E, Houston
Longhorn File

Metcalf & Eddy

004510

MEMORANDUM

FILE: 260067-0001 DATE: March 24, 1992

TO: Ms. Lisa Price, USEPA Region 6, Work Assignment Manager OFFICE: Dallas

FROM: Ronald C. Catchings, P.E. COMPANY: Inc.

SUBJECT: Review of Draft RI/FS Work Plan and Supporting Documents for the Longhorn Army Ammunition Plant (LHAAP).

In accordance with your request, the draft work plan for the RI/FS at the Longhorn Army Ammunition Plant has been reviewed. The comments submitted herein are divided into two area: (1) general, and (2) specific .

Volume I:

General Comments

- Much of the time required to include comments from the regulatory agencies is predicated on the use of contractors by the COE. Will the integration of regulatory review comments be shortened if contractors are not used?

- All drawings that show monitoring wells should be reviewed. Monitoring wells may be noted on one drawing as being plugged, but the same well shown on a different site drawing may not be so noted.

- One background boring location should be selected in an area of the LHAAP property that has had no major activities in recent years. Specifically, a background sample should be collected in one of the storage igloo areas. The sample should be for soil, groundwater (full depth), and surface water run-off should be collected in one of the areas. Many of the previous background samples showed the presence of contaminants of concern.

- All borings should be continued to two (2) feet below detected groundwater level.

- In areas where previously identified solvents, TOX, VOC's, herbicides, pesticides, or any chlorinated organic compounds occur, soil borings and sampling should be continued through the groundwater until an aquiclude is reached. Chlorinated chemicals (e.g., TCE) are likely to be heavier than water (DNAPLs, "sinkers") and will tend to pass through the groundwater until reaching an aquiclude. LHAAP-16, 17, 18, 24, and 12 are likely candidates for this approach, but other areas should be added if chlorinated organics are detected in this investigation.

- Where shallow borings are indicated, (e.g., 5 feet), sampling intervals should be revised to show at least three samples; surface, mid-point and near-bottom.

Volume I:

Specific Comments

Section 1.0

Page 1-3, Section 1.1

- Add "...remediation of each area. Individual areas can be combined into "Operable units" and a remedy selected for the operable unit. Change: The decision selection criteria for each unit or operable unit will be based on the nine factors specified in CERCLA.

Page 1-3, Table 1-2

- Add a note for tasks that are completed.

Page 1-6, Section 1.3.1, Line 9

- As reads "...Identification of operable units will be done during the initial stages of the FS and presented in the secondary document 'Initial Screening of Alternatives'" , should read "...Identification of operable units will be made as soon as possible. Specifically, based on initial field sampling, areas that do not require additional testing or treatment studies will be formed into initial operable units. Other operable units may be formed at later times for other areas. All known or proposed operable units will be identified in the secondary document 'Initial Screening of Alternatives'."

Page 1-6, Section 1.3.1, Lines 19 and 20

- As reads: "Section 8.0 of the work plan gives the schedule and estimated budget for all RI/FS tasks." Comment: No budget items are included in Section 8.0. For long lead times, the budget estimates are very preliminary. Budget estimates, if included, should be only for activities through FY93.

Page 1-6, Section 1.3.1, Lines 23-25

- It appears from the RI/FS work plan that identification of operable units will extend throughout the total schedule.

Page 1-7, Section 1.3.2

- Add a table of all sampling required to include a QA/QC, field blanks, rinsate, trip blanks, etc. to Vol. 2 and list the table as part of Vol. 2.

Page 1-8, Section 1.3.3

- Add: Separate Site-Specific Health and Safety Plans will be developed by all COE field teams and contractors prior to beginning field work.

Page 1-8, Section 1.4

- The location of the LHAAP project manager should be stated to include a mailing and office address.

Section 2.0

Page 2-1, Section 2.2

- Note whether the communities of Uncertain and Karnack are incorporated or non-incorporated.

Page 2-3, Section 2.3

- Change to: "...United States and the former USSR"

Page 2-5, Figure 2-2

- Add notes to the Legend identifying the nearest RI/FS sites to the Ponds (e.g., Pond P-3, Sites 18&24).

Page 2-12, Table 2-1

- Add: Depth of well below ground level.

Page 2-18, Section 2.4.8, Line 12

- Change: "Skinks" to "Skunks".

Page 2-20

- Does the Texas Parks and Wildlife have an updated list? Is 1987 the latest list?

Section 3.0

Table 1 lists groundwater samples that exceed a primary drinking water standard maximum contaminant level (MCL) for metals, organics, pesticides/PCB's, and nitrates. No TCLP tests were performed on the soils, sediments, or surface water samples; therefore, no table was made for these constituents.

The presence of many of the constituents of concern, including explosives and derivatives of explosives, indicates that additional samples should be collected at locations where constituents of concern have been detected.

For a discussion of analyses of explosives and by-products, see report at Tab A. The following phrase is presented: "...metals do not exceed their respective MCL's, but do exceed the TDH primary drinking water standards for..." (Page 3-91) If a contaminant exceeds the TDH (now TWC) primary drinking water standards, the same results exceed the MCL's promulgated by the EPA under the SDWA.

Section 3.6. Areas 18&24.

The main sources of inorganic and organic contamination are the UEP and the ACD. The highest concentration of TCE was in MW-2. (See Table 1).

Page 3-92. Section 3.6.4. Areas 18&24.

- Several times, two monitoring wells are listed with the first one stating "...MW-15 at the MW-2 location...". Are these two wells and other similar wells in the same borehole and completed at different depths?

Page 3-93. Section 3.6.4. Areas 18&24.

- Do the separate point sources (UEP & ACD) define the single plume? What other explanation could cause the "ridge"?

Page 3-100. Section 3.6.7. Areas 18&24.

- Spelling error: should be "initial".

TABLE 1

Groundwater Samples Exceeding the SDWA MCL's[1]

Parameter	Well Location	MCL (mg/l)	Value (mg/l)
LHAAP #1			
Lead[2] (1982)	MW-104	0.015	0.0343
LHAAP # 12			
Lead (1982)	BH17	0.015	0.0189
Lead (1982)	BH18	0.015	0.044

Parameter	Well Location	MCL (mg/l)	Value (mg/l)
Lead (1982)	BH19	0.015	0.0544
Lead (1982)	BH103	0.015	0.0158
Lead (1982)	BH121	0.015	0.0157
LHAAP #16			
Chromium	BH12 (1984)	0.05	0.0558
Mercury	BH12 (1984)	0.002	0.0032
Lead (1984)	BH12 (1984)	0.015	0.0496
Lead (1988)	BH12	0.015	0.035
Cadmium (1988)	BH12	0.01	0.020
Vinyl Chloride (1988)	MW-122	0.005	0.0105
Lead (1988)	BH13	0.015	0.031
Lead (1988)	BH16	0.015	0.066
Vinyl Chloride (1988)	Well 122	0.002	0.0105
LHAAP #17			
Lead Samples Well #130 (1984) detection limit is above regulatory limit.			
Lead (1988)	Well 130	0.015	0.038
Cadmium (1988)	MW-130	0.01	0.020
Lead (1988)	MW-130	0.015	0.038
LHAAP #18 & #24			
Lead (1988)	MW-2	0.015	0.016
Lead (1988)	MW-3	0.015	0.016
Lead (1988)	MW-4	0.015	<0.190 (Duplicate)
Lead (1988)	MW-6	0.015	0.017
Lead (1988)	MW-8	0.015	0.016
1,2-Dichloroethane (1988) - all well samples except for MW4, MW5, MW13, C-2, C-3, C-4, C-5, 123 and 124 were above the regulatory limit of 2 ppb.			
Lead (1998)	MW-10	0.015	0.020
Cadmium (1988)	MW-10	0.010	0.024
Lead (1988)	MW-12	0.015	0.020
Cadmium (1988)	MW-12	0.01	0.024
Cadmium (1988)	MW-14	0.01	0.020
Lead (1988)	MW-15	0.015	0.028
Cadmium (1988)	MW-15	0.01	0.015

Parameter	Well Location	MCL (mg/l)	Value (mg/l)
Lead (1988)	MW C-2	0.015	0.070
Cadmium (1988)	MW C-2	0.01	0.029
Lead (1988)	MW C-3	0.015	0.028
Cadmium (1988)	MW C-3	0.01	0.024
Cadmium (1988)	MW C-4	0.01	0.020
Cadmium (1988)	MW C-5	0.01	0.021
Cadmium (1988)	MW 109	0.01	0.018
Cadmium (1988)	MW 120	0.01	0.034
Cadmium (1988)	MW 124	0.01	0.047
Cadmium (1988)	MW 125	0.01	0.020
Cadmium (1988)	MW 129	0.01	0.031
TCE (1988)	MW-1	5 mg/l	200,000
TCE (1988)	MW-1	5 mg/l	165,000 (Duplicate)
TCE (1988)	MW-2	5 mg/l	1,400,000
TCE (1988)	MW-3	5 mg/l	550
TCE (1988)	MW-4	5 mg/l	1,100
TCE (1988)	MW-5	5 mg/l	150
TCE (1988)	MW-6	5 mg/l	91
TCE (1988)	MW-7	5 mg/l	7,600
TCE (1988)	MW-8	5 mg/l	13,000
TCE (1988)	MW-9	5 mg/l	11,000
TCE (1988)	MW-10	5 mg/l	61
TCE (1988)	MW-11	5 mg/l	770
TCE (1988)	MW-12	5 mg/l	1,100
TCE (1988)	MW-14	5 mg/l	250
TCE (1988)	C-2	5 mg/l	17
TCE (1988)	C-4	5 mg/l	9
TCE (1988)	C-5	5 mg/l	77
Nitrates (1988)	MW-120	45	590
Nitrates (1988)	MW-120	45	735 (Duplicate)
Barium (1988)	MW-1	1.0	2.2
Barium (1988)	MW-2	1.0	3.6
Barium (1988)	MW-3	1.0	1.9
Barium (1988)	MW-5	1.0	2.0
Barium (1988)	MW-6	1.0	1.8
Barium (1988)	MW-14	1.0	1.3
Barium (1988)	MW-109	1.0	1.5

Note: Well No. 120, the detection limit for 1,2-Dichloroethane was <13,000 ppb. The regulatory limit is 2 ppb.

Parameter	Well Location	MCL (mg/l)	Value (mg/l)
LHAAP # 27			
Lead (1982)	GW-132	0.015	0.0163

[1]Safe Drinking Water Act (1974), MCL's Maximum Contaminant Level.

[2]Lead is an action level and for Public Drinking Water Systems would require specific action based on these levels.

Section 4.0

General Comments.

- o All borings should be continued to 2 feet below detected groundwater level.
- o In any areas where previously identified solvents, TOX, VOCs, herbicides, pesticides, PCB's, or any chlorinated organic compound occur, soil borings should be continued through the groundwater until an aquiclude is reached. Chlorinated organics (i.e., TCE) are likely to be heavier than water (DNAPLs, "sinkers"), and will tend to pass through the groundwater until reaching an aquiclude. LHAAP-16,17, 18&24, & 12 are likely candidates for this approach, but other areas should be added if chlorinated organics are detected in this investigation.
- o Where shallow borings are indicated, (e.g. 5 ft), sampling intervals should be revised to show at least three samples; surface, mid-point, and near-bottom.
- o Sites 11, 13, 14, 1, XX and 27 will be investigated for similar site characterization data - common characteristics are:

  - No previous investigations (13 & 14)
  - Only suspected TNT burial (11 & 13)
  - Only surface activities (Test areas XX & 27)
  - Non-hazardous activities (Inert burning-Site 1)

  These sites may be a candidates for an operable unit.

  The data requirements include:

  - Location and nature of explosive wastes and herbicides/pesticides on the surface and in the shallow subsurface.
  - Borings to groundwater (plus two feet) to determine groundwater flow and sample analysis for vertical and horizontal migration.
  - Surface water and sediment sample analysis for determining extent of migration downstream and downgradient of the site.

- Characterization of the soils and geologic conditions.
- Background conditions for comparison.

The plans for site investigation include:

- Soil borings (new and existing) to groundwater depth.
- Soil samples for physical and chemical analysis.
- Groundwater samples.
- Monitor wells - no new MWs will be installed (unless significant contamination is found) - however, existing MWs will be sampled for analysis.

Above notes concerning depth of borings, sampling intervals and DNAPLs apply to all six sites.

The current RI/FS does not include any specific monitoring well (MW) installation, but many existing MW are being plugged. Based on the analysis of the initial boreholes (flow direction, and chemical quality) points of compliance should be defined and three downgradient monitoring wells installed at each site requiring monitoring. The downgradient wells should be installed after evaluating shallow groundwater flow under both wet and dry seasons conditions.

Specific Comments.

Page 4-7, Section 4.2.2.1, 5th sentence

o "...will be the same as that drilled..." should be: "..will be common with the boring to be drilled".

Page 4-11, Section 4.3.2, 2nd line

o Sentence - "The background..." is a repeat of sentence on page 4-10.

Page 4-53, Figure 4-10-1, Site 1

o Unidentified mounds in the northern part of site (observed on field trip) should be included in the investigation plan.

Site 16

Page 4-13, Section 4.4.1, 1st sentence

o Figure should be 4-4-1, not 6-4-1.

First paragraph, last sentence

- Add: No subsurface geotechnical data...

Page 4-18, Section 4.4.2.2

- See general comment regarding DNAPLs.

Page 4-19, Section 4.4.2.4.1, 3rd paragraph

- Delete: Second and third sentences.

- Add: Since TCE, DCE, Vinyl Chloride and 1,1-DCA (DNAPLs) have previously been identified, monitor well borings will be extended to the bottom (aquiclude or base of the Wilcox) of the upper shallow aquifer. The completed wells will be screened across the aquifer. Sampling will be performed to detect the possible presence of free-phase DNAPLs in the bottom of the aquifer or concentrations in the bottom water (indicating DNAPLs sinking to the bottom). Although it is highly unlikely that free-phase DNAPLs will be found, the level of concentration in the bottom water will indicate the proximity of pools or mounds.

Site 17

Page 4-20, Section 3.5.1, 1st paragraph

- If VOCs which were found are chlorinated solvents (DNAPLs - TCE, DCE, DCA, etc.), monitoring wells and soil borings will be treated as detailed in comments for Site 16.

Sites 18 and 24

- As discussed in A-5, Section 4.0 General Comments, the high concentrations of TCE and Methylene Chloride indicate the possibility of free-phase DNAPLs reaching the clay layer at 155 MSL (underlying the UEP area) or the bottom of the Wilcox. The deep monitor well (MW), C-4A, is outside the area where this is possible. At least two deep borings should be made to the bottom of the upper shallow aquifer (about 155 MSL) and the bottom of the Wilcox. Sampling should be conducted to recover any free-phase DNAPLs "perched" on the aquicludes. Water samples at this level should be taken to test for indications of the proximity of free-phase DNAPLs. One boring in the vicinity of MW-15 and another near MW-14 should satisfy this part of the investigation.

Site 29

Page 4-32, Section 4.7.2, 1st paragraph

- If VOCs are found and analyzed to be chlorinated organics, consideration should be given to additional borings to investigate DNAPLs as discussed for Sites 16, 17, and 18/24.

Site 12

- No Comment.

Site 32

- Since this site is essentially an extension of Site 29, the same comment applies.

Section 5.0.

Page 5-1, Section 5.0, Lines 20 and 21

- Add the following: Areas to be combined into operable units will be identified to the EPA as early as possible in the RI/FS process.

Page 5-2, Section 5.1, Lines 9 and 10

- Should read: There will be an Initial Screening of Alternatives Report for each identified operable unit and on Initial Screening of Alternatives for the remaining sites or parts of site.

Page 5-2, Section 5.1.1, Line 6

- Delete: Permanent.

Page 5-4, Section 5.1.2, Line 4

- Change to read: "...based on the nine factors listed in 40 CFR 300.430(e)(9).

Section 6.0

- The types of models used for the Risk Assessment for each area or operable units were not discussed.

Section 7.0.

Page 7-6, Table 2-2

- All drinking water activities were transferred from the TDH to the TWC and is 31 TAC 290.

Volume II:

General Comments.

- It appears that there is no mention in the workplan to record bottle lot numbers for the bottles used in the sampling. Does the U.S. Army Corps of Engineers require and document bottle lot numbers from the supplier of sample bottles used?

- In order to fully assess the analytical procedures of the work plan, the U.S. Corps of Engineers needs to furnish an example of a Tulsa District QA validation report, a laboratory QA summary report by Engineers Southwestern Division Laboratory (SWD Lab), and a copy of the U.S. Army Corps of Engineers, January, 1990, ER-11110-263 reference.

SPECIFIC COMMENTS

Section 1.0

Page 1, Section 1.1

- Add a section on site history and background.

Page 1, Paragraph 1, Line 13

- Is there a possible mistake on the listing of this reference? On page 29, there is no mention of SW-846 in reference 2.

Section 2.0.

Page 2, Section 2.1.

Specify that both the COE and all contractor field personnel will have completed hazardous waste training as required by OHSA, 29CFR 1910.120.

Page 2, Paragraph 5, Line 6

- The field QC is discussed in Section 4.8, but not in Section 4.9.

Page 3, Section 2.4.

- Specify that all labs must meet the CLP procedures.

Page 3, Paragraph 3, Lines 1 through 3

- Is there a potential for quality control error(i.e., sample breakage, loss of samples, exceeding holding times) by shipping all samples initially to the U.S. Army Corps SWD Lab and then on to a contract lab?

Page 3, Paragraph 5, Lines 1 through 5

- Is the validation process review totally based on the U.S. Army Corps of Engineers document listed on page 29, reference 3-U.S. Army Corps of Engineers, January, 1990, "Chemical Data Quality Management for Hazardous Waste Remedial Activities, " ER-1110-1-263? Does this document stand on its own or are there other references for the document? If there are other references, does the other include a U.S. EPA reference? Does the U.S. Army Corps of Engineers reference document used by the MRD lab follow and meet the U.S. EPA Contract Lab Program (CLP) Statement of Work for organic analysis OLM01.8 (3/90, revised August, 1991) and the U.S. EPA Contract Lab Program Statement of Work for inorganic analysis ILM021.1 (3/90, revised September, 1991).

Pages 3 - 8, Sections 2.3 - 3.6; Page 20, Paragraph 2, Lines 4 and 5; Page 26, Paragraph 2, Lines 1 - 13 and Page 27, Table 8.1

- Will the quality assurance and quality control performed by the analytical laboratories, by the SWD Lab, MRD Lab and the Tulsa District meet all of the requirements (i.e., the surrogate spike percent recovery limits, the instrument performance check ion abundance criteria and percent recovery for the initial and continuing calibration verifications) in the U.S. EPA CLP Statement of Work OLM01.8 and ILM02.1 as mentioned in the above comment. If these requirements are not met, will a decision be made by the U.S. Army Corps of Engineers to determine if the data is useable or not?

Section 3.0

Page 3, Section 3.0, 10th Line.

- Add Tables B.5, B.6, B.7, & B.8.

The information on chemical, physical, and toxicologic properties in the Longhorn Army Ammunition Plant safety and health plan is general in nature, chiefly by categories such as metals, solvents, and explosives, with additional statements about a relatively few specific substances included in paragraphs discussing the class of substances. This text-oriented treatment appears not to meet the standard. A master table should be provided to convey the relevant properties of each specific substance.

RMC ENVIRONMENTAL AND ANALYTICAL LABORATORIES
DRAFT CHEMICAL DATA ACQUISITION PLAN COMMENTS

RMC Environmental and Analytical Laboratories

214 W. Main Plaza — West Plains, Mo. 65775

Phone
(417) 256-1101
(417) 256-1103 Fax

March 19, 1992

Mr. Ron Catchings
METCALF AND EDDY, INC.
5600 N.W. Central, Suite 102
Houston, TX 77092

Dear Mr. Catchings:

Please find the review of the analytical data in the RI/FS for the Longhorn Ammunition Plant Project. I have also provided some analytical techniques that can be used to determine the presence of byproducts in the waste.

Should you have any questions, please feel free to contact me. I am sending the originals under separate cover. Please let me know where I should submit my invoice for this assignment.

Thank you very much.

Very truly yours,

Dr. R. Soundararajan

RS/fi

Enclosures

RMC Environmental and Analytical Laboratories
214 W. Main Plaza — West Plains, Mo. 65775
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A REVIEW OF ACQUIRED CHEMICAL ANALYSES DATA
FOR THE LONGHORN ARMY AMMUNITION PLANT
RI/FS WORK PLAN

A review of the RI/FS work plan data reveals the following facts and points of concern:

1.The analytical data from Tables 3.10.1, 3.9.2, 3.7.3, and 3.7.4 reveal positively the presence of compounds such as Nitrobenzene, Trinitrobenzene, Trinitrotoluene, and Dinitrobenzene. Although the concentrations are rather low, it should be remembered that these compounds undergo a variety of reactions during ageing. These reactions include photolysis, hydrolysis, thermolysis etc. The byproducts are more reactive than the primary explosives themselves. It is essential to determine whether such decomposition products are still present in the soil, groundwater, and specifically in the sediment. There are several methodologies available to determine these products (please see attachment) in an explosives waste site.

2.The second point of concern is the presence of substantial levels of Aluminum in most of the samples. It is imperative that we determine the nature of Aluminum (i.e.) whether it is in the metallic state or in the form of a compound. It is well known that finely divided Aluminum powder is an additive in many primary explosive formulations. This powder can react violently with water on contact. Some of the analytical data indicate the presence of Aluminum up to 40.0 millimoles. This determination should be made as soon as possible.

3. It is likely that the leaching would continue especially when the explosives are present from 0-6 feet deep. Table 3.7.4 indicates that TNB and TNT are found between 3-6 feet. Analysis for the byproducts would further help to determine the migration behavior of these compounds.

The Loss of a Hydroxyl Group from the Molecular Ions of Alkylnitrobenzenes

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It is confirmed that the loss of HO· from the molecular ion of *o*-nitrotoluene involves exclusively a hydrogen from the methyl group. However, in higher homologues hydrogen atoms from non-benzylic sites are also implicated. With such compounds this fragmentation mode is shown not only by the *ortho* but, to a lesser extent, by the *meta* and *para* isomers as well. The proportion of the total ion current borne by the $[M-17]^+$ ion follows the order *ortho* > *meta* > *para*, which is attributed to substituent migration around the ring with a hydroxyl radical only being lost when the groups are on adjacent ring atoms. Other ions present in the spectra point to interaction between substituents to form a new heterocyclic ring.

INTRODUCTION

The direct interaction between substituents in aromatic compounds often enables the *ortho* isomer to be differentiated by mass spectrometry from its *meta* and *para* analogues.[1] One of the best known examples of such an '*ortho* effect' is exemplified by the nitrotoluenes where the primary fragmentation of the *ortho* compound is loss of a hydroxyl radical from the molecular ion, the other two isomers showing no such reaction.[2] This loss of 17 mass units is considered to be a general phenomenon of compounds possessing, in a position adjacent to a nitro group, a substituent bearing an α-hydrogen atom.[2-4]

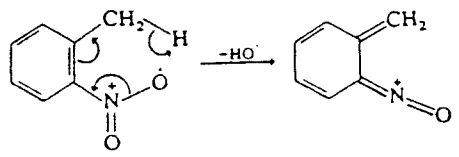
Some years ago we showed that, in the case of the nitrophenyl(phenyl)methanes, the *meta* and *para* isomers too underwent significant loss of a hydroxyl radical,[5] and that the hydrogen atom involved originated from the aromatic ring bearing the nitro group. Other reports have appeared where fragmentation by loss of 17 mass units occurs in compounds where direct interaction between substituents appears not to be possible.[6,7] Again direct abstraction by the nitro group of a hydrogen from the aromatic ring was postulated.[6] In the course of other work in this laboratory we have come across further instances of ejection of a hydroxyl radical from *meta* and *para* substituted nitrobenzenes including alkylnitrobenzenes, and it seemed that a more detailed investigation of the phenomenon was warranted. Therefore we looked at the fragmentation of a number of alkylnitrobenzenes, some of them partially deuterated, and the results are presented in this paper.

RESULTS AND DISCUSSION

Nitrotoluenes

In their detailed paper on the spectra of nitroarenes, Meyerson *et al.* showed that, whereas *o*-nitrotoluene gives a strong $[M-17]^+$ peak, this is all but non-existent in the spectra of the other two isomers.[3] They suggested the abstraction mechanism in Scheme 1 could account for this difference. More recently it has been claimed[6] that the molecular ion of *m*-nitrotoluene (and *m*-nitroaniline) *does* eliminate HO·. However, the table accompanying this statement lists the intensity of the fragment as zero, i.e. less than 1% of the molecular ion and thus less than 0.5% of the base peak. Our results for the three isomers are in good agreement with the first report: in particular $[M-OH]^+$ was absent from the spectra of the *meta* and *para* isomers. Meyerson then demonstrated that α-d_1-*o*-nitrotoluene loses both 17 and 18 mass units, the non-statistical loss being attributed to a kinetic isotope effect. The magnitude of this effect, 2.11, is not unreasonable for a primary process but it is nevertheless dangerous to claim, as has been done on a number of occasions since, that this result *proves* that the hydrogen atom originates exclusively from the methyl group.

To establish this last point α,α,α-d_3-*o*-nitrotoluene was synthesized and its mass spectrum recorded. The relative intensities of the ions in the *m/z* 119–124 region of this compound and its undeuterated analogue are set out in Table 1, from which it can be seen that good agreement is obtained between observed and calculated intensities assuming that hydrogen abstraction occurs exclusively from a benzylic site rather than a ring carbon atom. Even better agreement results if allowance is made for the kinetic isotope effect that will discriminate against DO· loss from the d_2-impurity. We can say then that loss of a hydroxyl radical does involve exclusively the hydrogen atoms on the methyl group.



Scheme 1

† Author to whom correspondence should be addressed.

CCC-0030-493X/79/0014-0448$03.50

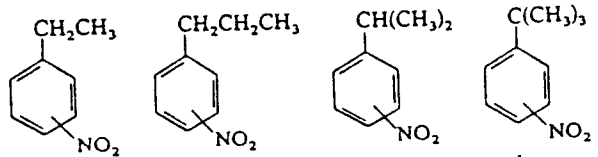
Table 1. Relative intensities of the *m/z* 119–124 region of the spectrum of *o*-nitrotoluene and its α,α,α-d_3-derivative[a]

m/z	119	120	121	122	123	124
Observed for o-nitrotoluene	0.9	100	8.5	0.6	—	—
Observed for α,α,α-d_3-o-nitrotoluene[a]	—	0.4	3.5	100	8.0	1.5
Calculated for exclusive abstraction from CD_3 group	—	0.1	5.2	100	8.1	1.9
Calculated for exclusive abstraction from CD_3 group (kinetic isotope effect allowed for[b])	—	0.1	4.0	100	8.1	1.9

[a] 93.7% d_3, 6.3% d_2. Allowance made for incomplete deuteration in the calculations.
[b] Assumed to be 2.1 on the basis of the results in Ref. 3.

Other alkylnitrobenzenes

The fragmentations of the three isomers of four other alkylnitrobenzenes (**1**–**4**) were investigated. The alkyl groups selected were considered to be representative examples of the class and the principal ions in their spectra are listed in Table 2. (The full spectra have been deposited at the Mass Spectrometry Data Centre.) Of these twelve compounds the mass spectra of three, the *m*- and *p*-ethyl and *p*-*n*-propyl compounds, have been recorded previously,[8] but that study was concerned solely with the nature of the ion resulting from benzylic cleavage. No mention was made of an $[M-OH]^+$ fragment.



1 **2** **3** **4**

Let us consider first the ethylnitrobenzenes. The spectrum of the *ortho* isomer has a relatively weak molecular ion, low intensity ions resulting from the normal nitro group fragmentation ($[M-O]^{+\cdot}$, $[M-NO]^+$, $[M-NO_2]^+$), but an intense peak from the expected loss of a hydroxyl radical. Perhaps more surprisingly benzylic cleavage is virtually non-existent. All the evidence points to ejection of the hydroxyl radical via the *ortho* effect route being a highly favourable process with which other fragmentations are unable to compete effectively. Not only is $[M-OH]^+$ the principal primary fragment of the *ortho* isomer but the *meta* and *para* compounds too show such a decomposition mode. The alternative breakdown routes are much more in evidence for these two compounds but nevertheless this unexpected 'neighbouring group abstraction' is pronounced, despite the lack of proximity of the two substituents.

The nitro-*n*-propylbenzenes (**2**) are similar, a very strong $[M-OH]^+$ ion being produced by the *ortho* isomer (in this case it is the base peak) with the formation of which other ions cannot compete, whilst the *meta* and *para* compounds show weaker but, nevertheless, moderately intense ions of the same

Table 2. Relative intensities of the principal ions in the spectra of the three isomers of compounds 1–4 ($R{\cdot}C_6H_4{\cdot}NO_2$)

m/z	R o-Et	m-Et	p-Et	o-Pr	m-Pr	p-Pr	o-iPr	m-iPr	p-iPr	o-tBu	m-tBu	p-tBu
179	—	—	—	—	—	—	—	—	—	32	19	20
165	—	—	—	4	46	64	—	32	32	13	14	15
164	—	—	—	—	—	—	—	—	—	100	100	100
162	—	—	—	—	—	—	—	—	—	7	5	—
151	12	100	100	—	—	—	1	9	9	—	2	—
150	—	—	—	—	—	3	8	100	100	—	—	—
148	—	—	—	100	24	7	40	17	6	3	2	2
136	13	45	18	3	100	76	—	1	—	2	44	25
134	87	72	9	1	—	—	5	—	—	36	12	10
130	—	—	—	25	—	—	18	—	—	9	2	—
128	—	—	—	—	—	—	—	—	—	11	2	—
121	3	9	15	3	2	1	6	1	3	3	—	2
120	4	—	—	26	25	11	25	10	27	10	2	—
119	4	—	—	5	21	24	4	6	18	32	5	4
118	4	—	—	14	8	5	11	8	7	24	26	23
117	8	—	—	12	9	8	13	5	5	26	27	17
115	—	—	—	20	9	10	25	5	6	37	25	13
106	42	14	21	16	4	53	16	1	—	21	8	17
105	18	95	82	10	3	3	19	6	5	14	7	6
104	27	32	15	11	9	7	25	49	40	8	3	1
103	45	54	27	10	10	9	28	28	26	16	14	8
92	33	—	3	51	73	10	14	7	40	19	5	3
91	21	27	12	53	81	100	70	27	51	73	26	22
89	15	27	16	19	38	44	8	3	6	10	12	5
77	100	95	86	21	32	39	86	31	39	37	22	13
65	18	14	12	21	26	32	27	9	14	23	15	6
63	27	23	19	11	27	33	18	8	13	10	16	5
57	—	—	—	11	2	—	4	1	—	7	8	4
51	51	32	36	7	33	40	44	17	31	17	23	8
50	27	27	18	3	18	21	21	10	19	9	16	6
43	95	—	—	—	3	7	100	51	6	7	4	1

mass. The nitrocumenes (**3**) also fit this pattern. However, the *tert*-butylnitrobenzenes, lacking an α-hydrogen atom, differ in that none exhibits a significant $[M-OH]^+$ ion. There is a weak $[M-17]^+$ ion in the spectra of both the *ortho* and *meta* isomers of **4** but high resolution measurements show this to be a composite ion, only part of which is $[M-OH]^+$, the remainder being $[M-CH_5]^+$, i.e. loss of H_2 from $[M-Me]^+$, the base peak in all three spectra. The intensities of the $[M-OH]^+$ ions, as a function of total ion current, for all 15 compounds studied are set out in Table 3.

We have then a situation in which the nitrotoluenes fit the accepted pattern of a clear-cut difference between the *ortho* and the other two isomers. The *tert*-butylnitrobenzenes too, to all intents and purposes, conform in that the absence of a benzylic hydrogen precludes loss of a hydroxyl radical. But the other three trios are obviously anomalous. However, they

Table 3. Intensity (% total ion current) of $[M-OH]^+$ ions in the spectra of alkylnitrobenzenes ($R{\cdot}C_6H_4{\cdot}NO_2$)

R	CH_3	CH_2CH_3	$CH_2CH_2CH_3$	$CH(CH_3)_2$	$C(CH_3)_3$
ortho	16.0	9.1	11.5	7.6	<0.7
meta	0	7.5	3.3	3.0	<0.6
para	0	1.3	1.3	1.6	0

do agree amongst themselves in that the intensity of the $[M-OH]^+$ ion decreases consistently in the series *ortho* > *meta* > *para*. One obvious possibility was that the compounds were not isomerically pure, but gas chromatographic analysis showed that such impurities made up less than 0.2% of the samples used, generally substantially less.

In order to investigate this anomalous loss of a hydroxyl radical in more detail, samples of α,α-d_2-*n*-propylbenzene and α-d_1-cumene were prepared, nitrated, and the isomers separated by preparative gas chromatography. All except α,α-d_2-*m*-nitropropylbenzene were obtained sufficiently pure (< 0.4% of other isomers) for our purposes. The exception, present in the nitrated mixture in very small quantities in any case, was inhomogeneous after isolation and no further work was carried out on it. *n*-Propylbenzene was chosen as the example of a straight chain alkylbenzene, rather than ethylbenzene, since benzylic cleavage in **1** complicates analysis of the $[M-OH]^+$ region. This problem still remains with the nitrocumenes but some allowance can be made for it.

Measurements of the molecular ion region of the deuterated *o*- and *p*-nitro-*n*-propylbenzenes showed the samples to be 97.8% d_2 and 2.2% d_1. Similar calculations on monodeuterated *m*- and *p*-nitrocumenes gave figures of 91.0% d_1 for the *meta* and 89.8% d_1 for the *para* isomer. The molecular ion of *o*-nitrocumene is of negligible intensity and the extent of deuteration cannot be determined directly. However, since the deuterated sample was obtained from the same nitration mixture as the *meta* and *para* isomers it should have the same deuterium content. It was assumed to be 90.4% d_1, the average of the other two figures.

If Scheme 1 is an adequate representation of the ejection of HO· from a molecular ion then α,α-d_2-*o*-nitro-*n*-propylbenzene should show exclusive loss of DO·. It does not do so. The ratios of peak intensities in the region *m/z* 146–152 are set out in Table 4, together with values calculated for loss of both HO· and DO·, due allowance being made for incomplete deuteration. The best fit between calculated and observed results is obtained for 73% loss of DO· and 27% loss of HO·.

It might be argued that randomization of hydrogen atoms in the molecular ion precedes ejection of a hydroxyl radical, but no randomization scheme will give rise to values in agreement with those calculated. Ratios for complete randomization over the molecule and for randomization in the sidechain alone are included in Table 4, no kinetic isotope effect being allowed for. Any such effect will further increase the ratio of *m/z* 150 : 149. We must assume then that either there are two competitive processes by which a hydroxyl group can be lost or that partial randomization occurs followed by abstraction of a hydrogen atom exclusively from the benzylic site. Since *o*-nitrotoluene shows exclusive loss of hydrogen from the methyl group, ring hydrogens seem unlikely to be implicated. We believe that partial randomization in the sidechain is the most likely explanation, abstraction occurring solely from the benzylic carbon atom, though it must be emphasized that there is no way of distinguishing this process from direct abstraction from other positions in the chain. Allowing a kinetic isotope effect similar to that calculated from Meyerson's results for nitrotoluene[3] the ratio of abstraction of hydrogens originally on the α-carbon atom to those originating elsewhere in the molecule changes from 73 : 27 to 85 : 15.

Table 4. Relative intensities of the *m/z* 146–152 region of the spectra of *o*-nitro-*n*-propylbenzene and its α,α-d_2-derivative[a]

m/z	146	147	148	149	150	151	152
Observed for *o*-nitro-*n*-propylbenzene	2.6	1.1	100	10.3	1.0	—	—
Observed for α,α-d_2-*o*-nitro-*n*-propylbenzene[a]	0.7	1.9	1.7	100	47.0	5.5	0.7
Calculated for 100% loss of ·OD	—	2.3	2.2	100	10.3	10	—
Calculated for 100% loss of ·OH	—	0.1	2.6	3.3	100	10.3	1.0
Calculated for 73% loss of ·OD and 27% loss of ·OH	—	2.6	3.1	100	46.7	4.7	0.4
Complete randomization of hydrogen atoms	—	0.6	3.1	25.2	100	10.3	1.0
Randomization of hydrogen atoms in the sidechain alone	—	1.1	3.4	42.0	100	10.2	1.0

[a] 97.8% d_2, 2.2% d_1. Allowance made for incomplete deuteration in the calculations.

Table 5 shows that loss of HO· competes effectively with loss of DO·. Calculations of relative intensities are complicated by the presence of an $[M-Me]^+$ ion but accommodation can be made for this. The best fit between observed and calculated results is obtained for 45% DO· loss and 55% HO· loss, due allowance being made for incomplete deuteration. After applying a correction for the kinetic isotope effect we find that 64% of the hydrogens in the hydroxyl radicals originate from the α-carbon atom and 36% elsewhere. It is again clear, then, that randomization of any hydrogens within the molecule cannot be complete. If exchange does occur to the extent of 36% in this case, then for *o*-nitropropylbenzene, where one of the original atoms will still be present on the α-carbon, we would expect only 18% of the hydrogens lost to originate elsewhere, in good agreement with the figure of 15% obtained. Direct abstraction from the β-position of the sidechain might give a similar result based on the number of

Table 5. Relative intensities of the *m/z* 146–152 region of the spectra of *o*-nitrocumene and its α-d_1-derivative[a]

m/z	146	147	148	149	150	151	152
Observed for 2-nitrocumene	3.2	2.2	100	10.2	19.7	1.9	—
Observed for α-d_1-2-nitrocumene[a]	4.6	4.7	92.8	100	14.6	29.6	3.1
Calculated for 100% loss of ·OD	3.2	2.2	100	10.2	1.8	18.0	1.7
Calculated for 100% loss of ·OH	0.3	3.4	12.7	100	12.2	19.7	1.9
Calculated for complete randomization[b]	0.7	3.6	23.4	100	18.1	16.2	1.5
Calculated for sidechain randomization[b]	0.9	3.7	30.4	100	21.9	13.9	1.3
Calculated for 45% ·OD loss and 55% ·OH loss	2.8	4.9	92.2	100	12.7	32.6	3.2

[a] Assumed to be 90.4% d_1; see text.

[b] Allowance made for appropriate loss of $\cdot CH_3$ and $\cdot CH_2D$.

available hydrogen atoms, but the absence of a significant $[M-OH]^+$ peak in the spectrum of *o*-*tert*-butylnitrobenzene suggests that such abstraction is most unlikely.

It is the *meta* and *para* isomers, though, which are truly anomalous in producing an $[M-OH]^+$ fragment. Measurements on deuterated analogues of **2** and **3** show that DO·, as well as HO·, is lost, demonstrating that, despite the distance between the two substituents, the alkyl group does interact in some way with the nitro function. For both **2** and **3** analysis of the results is complicated by the presence, in the undeuterated compounds, of weaker ions of *m/z* 149 and 150 corresponding to loss of an oxygen atom and a methyl group respectively. Since hydrogen atoms are not involved in the first process it poses no difficulty but methyl loss is more of a problem. It is assumed, for simplicity, that the methyl group is the terminal function of the sidechain and that no randomization of its hydrogen atoms occurs.

In Table 6 we set out the observed and some calculated relative intensities for the relevant region in the mass spectrum of α,α-d_2-*p*-nitro-*n*-propylbenzene. Best agreement is obtained if 18% of the loss is DO· and 82% HO·, which is close to complete randomization over the whole molecule. However, it must be remembered that a kinetic isotope effect will discriminate against loss of a deuterated hydroxyl radical. Therefore, complete randomization can be ruled out, though sidechain randomization followed by exclusive loss of hydrogen from that sidechain would not be inconsistent.

The $[M-Me]^+$ fragment is much more of a problem in dealing with the *meta* and *para* isomers of α-d_1-nitrocumene since it is so much more intense than the $[M-17]^+$ and $[M-18]$ ions. However, it cannot contribute directly to the intensities of these fragments and the ratios of *m/z* 148 : 149 should be a measure of the relative losses of HO· and DO·. In Table 7 are set out the observed and the predicted intensities of the peaks in the *m/z* 148–153 region for the two compounds. The observed relative intensities of *m/z* 148 and 149 are obtained if the ratio of $[M-OD]^+ : [M-OH]^+$ is 0.23 : 0.77 for the *meta* isomer and 0.20 : 0.80 for the *para* compound. These two figures are similar and might suggest that some common randomization process was occurring. However, this conclusion is incompatible with the result for α,α-d_2-*p*-nitro-*n*-propylbenzene where a very similar figure is obtained.

Table 6. Relative intensities of the *m/z* 148–154 region of the spectra of *p*-nitro-*n*-propylbenzene and its α,α-d_2-derivative[a]

m/z	148	149	150	151	152	153	154
Observed for *p*-nitro-*n*-propylbenzene	100	62.0	30.0	3.1	0.3	—	—
Observed for α,α-d_2-*p*-nitro-*n*-propylbenzene[a]	3.3	23.9	100	70.9	29.4	3.4	0.3
Calculated for 100% ·OD loss	1.1	100	11.4	52.4	29.0	2.4	0.2
Calculated for 100% ·OH loss	—	2.2	100	61.9	30.7	2.4	0.2
Calculated for 18% ·OD loss and 82% ·OH loss	0.2	23.5	100	71.6	36.1	2.9	0.2
Calculated for complete randomization	0.2	23.8	100	71.7	36.2	2.8	0.2
Calculated for sidechain randomization	0.2	40.4	100	79.2	40.5	3.2	0.3

[a] 97.8% d_2, 2.2% d_1.

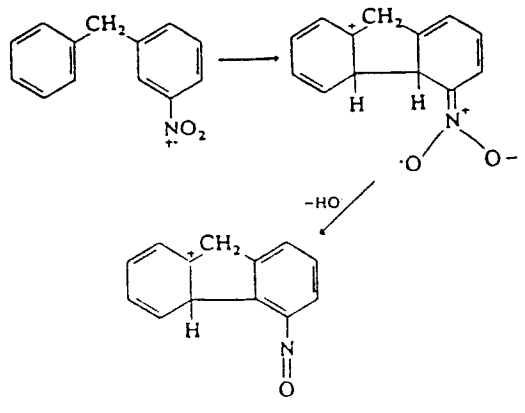
Table 7. Relative intensities of the *m/z* 148-154 region of the spectra of *m*- and *p*-nitrocumenes and their α-d_1-derivatives[a]

m/z	148	149	150	151	152	153
Observed for *m*-nitrocumene	16.0	3.5	100	8.7	0.8	—
Observed for α-d_1-*m*-nitrocumene[a]	3.3	8.3	10.7	100	8.7	0.8
Calculated for 100% ·OD loss	17.4	2.0	11.8	100	9.2	0.9
Calculated for 100% ·OH loss	1.6	16.1	13.3	100	9.3	0.9
Calculated for 23% ·OD loss and 77% ·OH loss	5.2	12.9	12.9	100	9.3	0.9
Observed for *p*-nitrocumene	6.4	3.1	100	8.7	0.8	–
Observed for α-d_1-*p*-nitrocumene[a]	1.7	4.6	13.1	100	8.9	0.8
Calculated for 100% ·OD loss	7.1	0.9	13.7	100	9.3	0.8
Calculated for 100% ·OH loss	0.7	6.6	14.3	100	9.3	0.8
Calculated for 20% ·OD loss and 80% ·OH loss	2.0	5.5	14.2	100	9.3	0.8

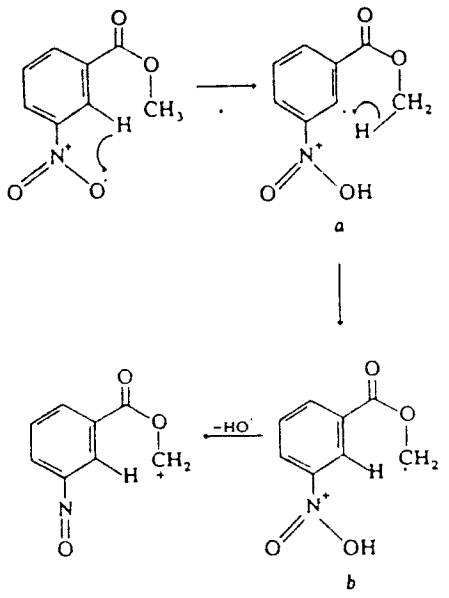
[a] For *meta* isomer 91.0% d_1, for *para* isomer 89.8% d_1.

We need then an explanation as to how *meta* and *para* isomers of alkylnitrobenzenes can lose a hydroxyl radical. In a previous paper we have suggested that the similar phenomenon observed with nitrophenyl-(phenyl)methanes originated in the activation of a ring hydrogen atom by the neighbouring phenyl group (Scheme 2)[5] but the process would appear to be of more general significance than that. More recently it has been suggested that the loss of a hydroxyl radical from the molecular ion of nitrobenzenes possessing a distant substituent occurs as in Scheme 3.[6] Initial hydrogen abstraction may take place with any substituted nitrobenzene, but it is only when the substituent bears suitably positioned hydrogen atoms able to convert (*a*) to (*b*) that fragmentation by loss of HO· is observed. Unfortunately, some compounds studied, which appear to meet this criterion, fail to show the appropriate ion.

Scheme 3 cannot adequately explain the results obtained above. First, only nitro-*n*-propylbenzenes are able to transfer a hydrogen from a γ sidechain atom, yet **1** and **3** show equally strong $[M-17]^+$ peaks. It could be argued that a 6-membered transition state is unnecessary and that a 5-membered one



Scheme 2

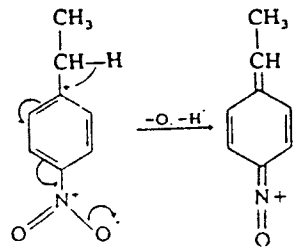


Scheme 3

will serve equally well. However, *tert*-butylnitrobenzenes show a negligible loss of a hydroxyl radical. Second, a process such as that in Scheme 3 cannot result in loss of a deuterium from the benzylic carbon atom in the labelled compounds.

An alternative means by which the elements of a hydroxyl radical might be lost is shown in Scheme 4. Here direct interaction between the substituents is not necessary. Loss of an oxygen atom from nitrobenzenes and a hydrogen atom from benzylic sites of alkylbenzenes are both well documented. They are simply concerted in Scheme 4. The objection to this is that, whilst it is attractive for *para* (and *ortho*) isomers, on the basis of ion structures and electron flow, it should be much less likely for *meta* compounds. Yet the order of loss of hydroxyl radicals is *ortho* > *meta* > *para*. One might also expect with, say, 4 the concerted loss of methyl and oxygen. The extent of any such reaction is trivial.

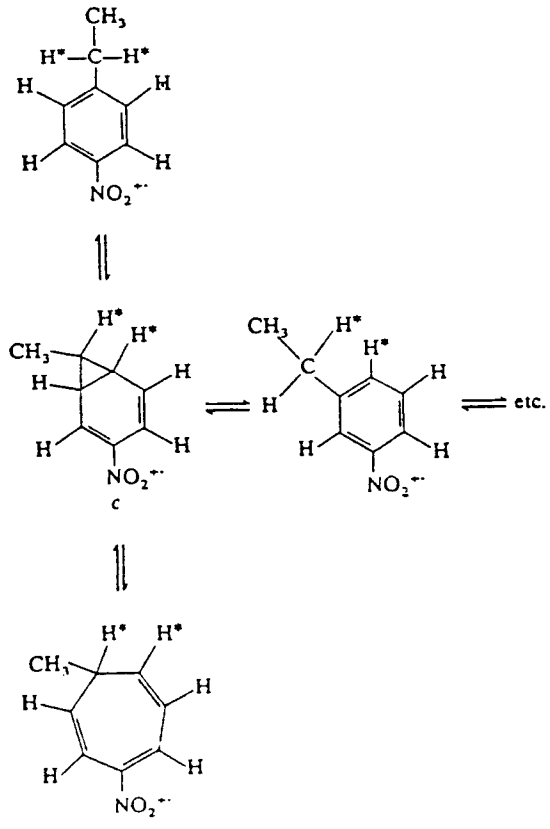
We believe the most likely explanation is that the positional relationship of the nitro and the alkyl groups is not fixed in the molecular ion and that isomerization can occur. It is only after rearrangement to the *ortho* structure that a hydroxyl group can be lost. On this basis the order *ortho* > *meta* > *para* would be expected since no rearrangement is necessary in the first case, in the second one or other substituent needs to move by only one position, whereas, for the *para* compound, migration over two atoms is necessary presumably via the intermediacy of the *meta* isomer.



Scheme 4

The greater the distance over which migration must occur, the longer it will take and the greater the extent of randomization of the hydrogens in the sidechain. This would account for the lower specificity of deuterium loss in the *meta* and *para* isomers. Cooks *et al.* suspected, in similar systems undergoing metastable decompositions, that *meta*–*para* isomerization might be occurring[6] though they ruled out rearrangement to the *ortho* compound.

There remains the problem of how rearrangement occurs and why it is absent from nitrotoluenes. The theory we favour is one of ring formation and cleavage (Scheme 5). This has the added advantage that exchange of hydrogens between the benzylic and the ring positions occurs, providing an alternative route to randomization. It does not explain why nitrotoluenes fail to undergo the same reaction, since the presence of an alkyl group on species such as *c* would not appear to be critical. It might be that, instead of the hydrogen shift in Scheme 5, an alkyl shift occurs, but this would require accompanying hydrogen shifts if positional isomerism is to be effected. Against the concept outlined in Scheme 5 can be set the view[7,8] that $[C_7H_6NO_2]^+$ ions generated from *m*-alkylnitrobenzenes have different structures to those derived from the *para* isomer, i.e. that the molecular ions do not reversibly interconvert. However, we are not suggesting such a process is a rapid one. Indeed, since the $[M-17]^+$ ions from *meta* and *para* isomers are not particularly strong, the reaction is likely to be slow and other fragmentations may well occur primarily from unrearranged molecular ions.

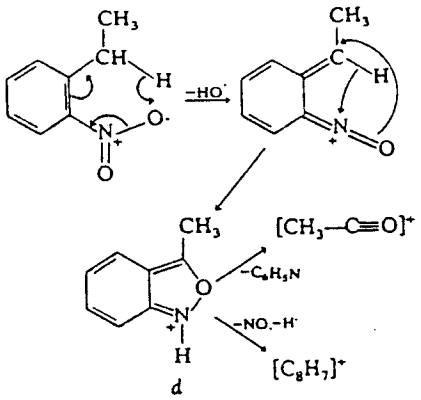


Scheme 5

Other fragmentation processes

In the spectrum of *o*-ethylnitrobenzene an ion is found at *m/z* 106 which appears to arise from the $[M-OH]^+$ species (metastable ion observed at *m/z* 83.9). Accurate mass measurement shows this to result from loss of carbon monoxide. *o*-Nitro-*n*-propylbenzene and *o*-nitrocumene behave similarly. These ions would appear to be analogous to the similar $[M-OH-CO]^+$ sequence of *o*-nitrotoluene where the carbon atom involved has been shown to originate in the methyl group.[9] Therefore, the process must involve rearrangement of at least two hydrogen atoms.[3,9] For the other alkylnitrobenzenes migration of an alkyl group would have to occur, yet such processes are much less common than hydrogen atom shifts.

Evidence that cyclization of the nitro group onto the α-carbon atom, the process supposed to result in production of the $[M-OH-CO]^+$ ion from *o*-nitrotoluene, does occur with *o*-ethylnitrobenzene is provided by the presence of a relatively strong $[CH_3—C\equiv O]^+$ ion which could arise as in Scheme 6. An analogous ion is found in the spectrum of *o*-nitro-*n*-propylbenzene.



Scheme 6

The other unusual ion in the spectra of all three ethylnitrobenzenes has *m/z* 103 and the composition C_8H_7. There is no metastable evidence that it originates either from $[M-NO]^+$ or $[M-OH]^+$ but the latter seems more likely. It is not easy to see why the former ions should lose water. Loss of NO and a hydrogen atom from *d* is then competitive with formation of the acetylium ion. Again equivalent, though weaker ions, are apparent in the spectra of the higher homologues.

CONCLUSION

This study has demonstrated that, for *o*-nitrotoluene, loss of a hydroxyl radical involves exclusively a hydrogen on the methyl group. For higher homologues the equivalent loss, whilst primarily implicating the benzylic site, also involves hydrogens from other positions though it is believed these have first migrated to the α-carbon atom. Nor, for larger alkyl groups, is this fragmentation restricted solely to the *ortho* isomer. It also occurs to a lesser extent with the *meta* and *para* compounds. The decreasing proportion of the total ion current borne by the $[M-17]^+$ ion in the series *ortho*, *meta*, *para* is attributed to substituent migration with the hydroxyl radical being lost only when the substituents are adjacent.

EXPERIMENTAL

Mass spectra were recorded on an AEI MS 30 spectrometer operating at 70 eV and a source temperature of 140–160 °C. Samples were introduced via a heated inlet system,[10] and were checked for purity by gas chromatographic analysis. Relative intensities discussed in the text are taken from the average of six scans.

The nitrotoluenes, *o*- and *p*-ethylnitrobenzenes and *o*- and *p*-nitrocumenes were commercial samples. The *ortho* and *para* isomers of nitro-*n*-propylbenzene and *tert*-butylnitrobenzene were separated by preparative gas chromatography from a mixture of isomers obtained as follows. A nitrating solution, made by adding ethanoic anhydride (9 g) dropwise to fuming nitric acid (6 g) cooled in ice, was added, with stirring, over a period of 1 h to 0.12 mol of the appropriate ice-cold alkylbenzene. After standing for 1 h the resultant solution was diluted with cold water (50 cm^3) and extracted with ether. The extracts were washed with dilute sodium carbonate solution and water and dried ($MgSO_4$). Removal of the solvent and distillation of the residue gave a pale yellow mixture suitable for preparative gas chromatography.

m-Alkylnitrobenzenes

o-Ethylnitrobenzene (30.2 g) was added in small portions over a period of 30 min to iron filings (15 g) in water (20 cm^3) and conc. hydrochloric acid (1.25 cm^3) maintaining the temperature at 80–90 °C. The reaction mixture was made alkaline with sodium carbonate and steam distilled. *o*-Ethylaniline was extracted from the distillate with ether, the solution dried (K_2CO_3) and the ether removed. The crude amine (12.1 g) was added slowly to ethanoic anhydride (65 cm^3), the mixture cooled to 12–13 °C in an ice-salt bath and 70% nitric acid (12.5 cm^3) added at such a rate as to maintain that temperature. After 1 h the solution was poured into ice-cold water, the pale yellow precipitate filtered off, washed and partially dried. The acetanilide was added to conc. hydrochloric acid (30 cm^3) and boiled to effect hydrolysis before the mixture was steam-distilled. 2-Amino-3-ethylnitrobenzene separated from the cooled distillate as orange-red needles.

The amine (8.3 g) in conc. sulphuric acid (12.5 g) was cautiously added to ethanol (25 cm^3), the solution was cooled to 10 °C and sodium nitrite (4.5 g) dissolved in the minimum amount of water was added slowly with stirring. The resultant diazonium salt was gently warmed until evolution of gas had ceased. The ethanol was distilled off and the residual oil extracted with benzene and dried ($CaCl_2$). Removal of the solvent

and distillation of the residual oil gave *m*-ethylnitrobenzene as a pale yellow oil, b.p. 127–128 °C at 14 Torr (lit.,[11] b.p. 242–243 °C).

m-Nitro-*n*-propylbenzene, *m*-nitrocumene and *m*-*tert*-butylnitrobenzene were prepared similarly.

Deuterated alkylbenzenes

α,α,α-d_3-*Toluene* was prepared by a method analogous to that of Traficante and Maciel.[12] Methyl benzoate (4.3 g) in dry ether (15 cm^3) was added to a suspension of lithium aluminium deuteride (1 g) in the same solvent (15 cm^3) and the mixture refluxed for 12 h. After cooling, a solution of sodium tartrate was added dropwise until the vigorous reaction subsided. The ether layer was separated and the aqueous layer extracted with the same solvent. The combined extracts were dried ($MgSO_4$) and the ether removed on the rotary evaporator. The crude α,α-d_2-benzyl alcohol (4.5 g) in benzene (5 cm^3) was added to thionyl chloride (6 g) in benzene (5 cm^3) containing pyridine (2 drops). The mixture was refluxed for $\frac{1}{2}$ h, allowed to stand for 3 h and the benzene removed. The residue distilled at 82–86 °C at 13 Torr to give α,α-d_2-benzyl chloride. The chloride (1.6 g) in dry ether (10 cm^3) was added slowly to magnesium turnings (1.1 g) in the same solvent (20 cm^3). The mixture was stirred for 30 min and warmed gently for a further 15 min. Deuterium oxide (3 cm^3) was added dropwise to the cooled mixture and stirred for a further 30 min. The ether layer was separated, the extracts dried ($MgSO_4$), and the solvent carefully removed using a fractionating column. Distillation of the residue gave α,α,α-d_3-toluene (0.7 g) b.p. 109–112 °C (lit.[11] for toluene b.p. 111 °C).

α,α-d_2-n-*Propylbenzene* was prepared as follows. α,α-d_2-Benzyl chloride (1.6 g) was added slowly to magnesium turnings (1.0 g) in dry ether and, when reaction had subsided, stirred for 30 min. Diethyl sulphate (3.5 g) in ether (10 cm^3) was added and the solution, which became warm and opaque, stirred for 6 h. Saturated ammonium chloride solution was added and the ether layer separated and dried ($MgSO_4$). Careful removal of the solvent and fractionation of the residue gave α,α-d_2-*n*-propylbenzene (0.9 g), b.p. 65–66 °C at 13 Torr (lit.[11] for *n*-propylbenzene, b.p. 159 °C).

α-d_1-*Cumene* was prepared by a published method[13] from 2-methoxy-2-phenylpropane and had b.p. 58–61 °C at 13 Torr (lit.[11] for cumene, b.p. 152–153 °C).

The deuterated alkylbenzenes were then nitrated by the method described above and the isomeric deuterated alkylnitrobenzenes isolated by preparative gas chromatography.

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Reduction of Trinitroaromatic Compounds in Water by Chemical Ionization Mass Spectrometry

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A reduction process was found to occur in the ion source when observing the chemical ionization mass spectra of a series of trinitroaromatic compounds, using water as reagent. The $[MH-30]^+$ ions in the CI mass spectra were due mainly to the reduction of the compounds to their corresponding amines. This was proved by using D_2O as reagent: the $[MH-30]^+$ ions were shifted to $[MD-28]^+$ ions. The trinitroaromatic compounds investigated included 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, 2,4,6-trinitro-m-cresol, 2,4,6-trinitroaniline (picramide) and 2,4,6-trinitrophenol (picric acid).

INTRODUCTION

During our work on the analysis of explosives in water by direct injection chemical ionization (CI) mass spectrometry,[1] we observed in the mass spectra of the trinitroaromatic compounds highly abundant peaks at *m/z* corresponding to loss of 30 u from the $[MH]^+$ ion. Such ions had been observed previously at lower abundances in the CI mass spectra of 2,4,6-trinitroaromatic compounds using isobutane and methane as reagent gases.[2] $[MH-30]^+$ ions were also observed in the CI mass spectra of the DNT isomers, using methane as reagent[3] and in the CI mass spectrum of 2,4-DNT, using isobutane as reagent gas.[4]

$[M-NO]^+$ ions have been observed in the electron impact (EI) mass spectra of aromatic nitro compounds.[5–7] In the EI mass spectra of trinitroaromatic compounds loss of NO was observed[8] in 2,4,6-trinitrophenol (picric acid) and in 2,4,6-trinitroaniline (picramide), containing the strong electron-donating substituents OH and NH_2 respectively. The electron-donating substituent in the *para* position enhances the loss of NO due to resonance stabilization of the product.[6] From analogy with EI mass spectra it was assumed that the $[MH-30]^+$ ions in CI were due to the loss of NO from the $[MH]^+$ ions.[2,9]

Brophy *et al.*[10] studied the CI mass spectra of a series of aromatic nitro and nitroso compounds using hydrogen and a 1:10 D_2O/D_2 mixture as reagents. They claimed that the $[MH-30]^+$ ions in the CI mass spectra might be due to their initial reduction to corresponding amines within the ion source. Their results with aromatic nitro compounds showed that when using the D_2O/D_2 mixture, the $[MH-30]^+$ ions were shifted to $[MD-28]^+$, $[MD-29]^+$ and $[MD-30]^+$. The relative abundance of these shifted ions was much lower than the abundance of the $[MH-30]^+$ ions when using hydrogen as reagent. In addition, the abundances of the $[MD-28]^+$, $[MD-29]^+$ and $[MD-30]^+$ ions were in the same order of magnitude for most compounds. Their results indicated that some of the $[MD-30]^+$ ions might originate from a reduction process in the ion source.

A similar reduction process was suggested by Maquestiau *et al.*[11] after observing the CI mass spectra of several aromatic nitro compounds, using methane as reagent gas. They compared the collision induced dissociation (CID) spectra of the $[MH-30]^+$ ions with CID spectra of the corresponding aromatic amines and found them to be similar.

Harrison *et al.*[12] observed a reduction of the nitro group to the amine in *m*-nitrobenzoic acid using CH_4, H_2 and D_2 as CI reagents. The extent of the reduction was dependent on the ion source temperature and on the presence of water in the system.

In order to determine more definitively the origin of these $[MH-30]^+$ ions, we recorded the CI mass spectra of a series of trinitroaromatic compounds with H_2O and D_2O as reagents.

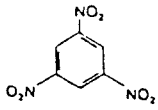
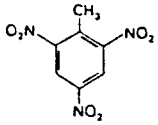
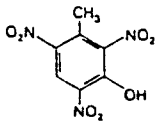
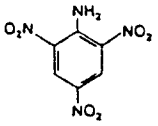
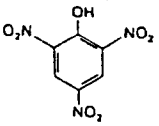
EXPERIMENTAL

Mass spectra were recorded with a Varian MAT CH7 mass spectrometer previously modified for CI operation.

Samples were dissolved in distilled H_2O and in D_2O (99.75%, Merck, Darmstadt). Trinitroaromatic compounds were obtained in pure form from the analytical laboratory of the Israel Police Headquarters. A special probe made of quartz was built[1] to fit the entrance port of the solid probe. The probe was heated and had a septum seal through which samples were injected into the ion source. The concentrations of the samples in the water solutions were in the range of 0.01–0.1 $\mu g\ \mu l^{-1}$. One-μl samples were injected into the probe. Source and probe temperatures were in the range of 80–130 °C. Source pressure at these conditions of amount of water and temperature, was in the range of 0.05–0.1 Torr.[13,14]

CCC-0030-493X/81/0016-0264$01.50

Table 1. Ions from the CI (H_2O and D_2O) of some trinitroaromatic compounds*

Compound	H_2O		D_2O					
	$[MH]^+$	$[MH-30]^+$	$[MD]^+$	$[M^*D]^+$	$[MD-28]^+$	$[M^*D-28]^+$	$[MD-30]^+$	$[M^*D-30]^+$
TNB Mol. wt 213 	100	20	100	15	35	17	15	12
TNT Mol. wt 227 	80	100	100	95	40	18	12	10
TNC Mol. wt 243 	100	60	70	30	100	52	8	17
Picramide Mol. wt 228 	100	15	100	20	—	—	18	—
Picric acid Mol. wt 229 	90	100	5	90	12	100	—	15

M is a molecule in which a hydrogen atom has been exchanged by a deuterium atom, and has therefore an *m/z* higher than M by one mass unit.

RESULTS AND DISCUSSION

The $[MH-30]^+$ ion can be produced by one (or both) of the following pathways: (1) loss of NO from the protonated molecular ion, that is $[MH-NO]^+$; (2) reduction of the nitro group to the corresponding amine, as follows:

$$R-NO_2 \xrightarrow{\text{Reagent gas}} [RNH_2]^+$$

When using D_2O instead of H_2O as a reagent gas, the shift in the ions should indicate to what extent each of the above-mentioned processes contributes to the formation of the $[MH-30]^+$ ions.

Loss of NO from the protonated molecular ion should produce a peak at $[MD-30]^+$, while a reduction process to the corresponding amine should produce a peak at $[MD-28]^+$ as follows:

$$R-NO_2 \xrightarrow{D_2O} [R-ND_2]^+ \Longrightarrow [MD-28]^+$$

Table 1 shows the results obtained with the following compounds: 1,3,5-trinitrobenzene (TNB), 2,4,6-trinitrotoluene (TNT), 2,4,6-trinitro-*m*-cresol (TNC), 2,4,6-trinitroaniline (picramide) and 2,4,6-trinitrophenol (picric acid).

As there was a strong isotope exchange (H by D) in some of the compounds, ions resulting from isotope exchange have also been listed in Table 1. Although source and probe temperatures were kept constant for the analysis of each compound with both H_2O and D_2O, and the same amount of sample/water solution was injected, small variations in temperatures and in amount of injected solution caused large variations in the relative ion intensities. These fluctuations were much larger in compounds in which strong reduction processes occurred.

Variations in reduced ion abundances were also observed by Brophy *et al.*[10] and by Harrison, *et al.*[12]

Results indicate clearly the occurrence of a strong reduction process in TNB, TNT, TNC and picric acid. In TNC and in picric acid the reduced ion is the base peak. In all these four compounds low abundance ions are observed corresponding to the loss of NO from the protonated molecular ion, indicating that this process is also occurring.

In picramide, no reduced ions were observed, and therefore loss of NO is the only process involved in the formation of the $[MH-30]^+$ ion in this compound.

Acknowledgements

The research reported herein has been sponsored in part by the US Army through its Research & Standardization Group (Europe).

004536

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6. M. M. Bursey and F. W. McLafferty, *J. Am. Chem. Soc.* **88**, 5023 (1966).
7. P. Brown, *Org. Mass Spectrom.* **4**, 533 (1970).
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12. A. G. Harrison and R. K. M. R. Kallury, *Org. Mass Spectrom.* **15**, 284 (1980).
13. J. Yinon, American Society for Mass Spectrometry, 22nd Annual Conference on Mass Spectrometry and Allied Topics, Philadelphia, Pennsylvania (1974) Proceedings, p. 514.
14. J. Yinon, *Biom. Mass Spectrom.* **1**, 393 (1974).

Received 16 January 1981; accepted 24 March 1981

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Metcalf & Eddy

April 20, 1992

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Attention: Ms. Lisa Price (6H-ET)
Superfund Enforcement Division - Texas Section

Reference: **TES X Work Assignment C060067**
Longhorn Army Ammunition Plant (LHAAP)
Information Request - Monthly Project Managers Meeting

Dear Lisa:

On April 9, 1992, the Army Corps of Engineers (COE) requested a list of TNT derivatives to be sampled and analyzed. The list is attached.

The COE also requested clarification of a comment from Dr. Sounderararajon concerning the safety issue of the quantity of aluminum (up to 40 millimoles). According to Dr. Sounderarajon, the aluminum (if oxidized) will not be a safety issue; however, some powdered aluminum may be protected by linseed oil to prevent oxidation. If the linseed oil is removed, an explosion may result if the aluminum contacts water. The aluminum may also be a safety concern in landfills if the aluminum is packaged, and not in an oxidized form.

If any additional information is needed, please call me.

Sincerely,

METCALF & EDDY, INC.

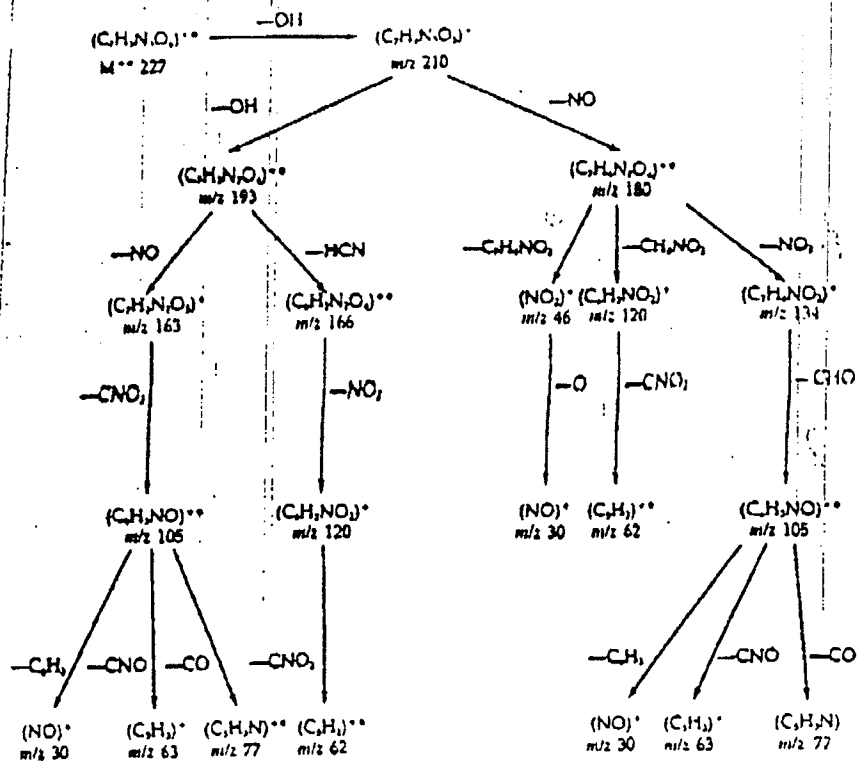
Ronald C. Catchings, P.E.
Contractor Project Manager

RCC/dn

Attachment

cc: Mr. Michael A. Moore - TWC, Austin
RPMO File
Fort Worth Dist. COE
Tulsa Dist. COE

TNT


(C7H5N5O6)+·
M+· 227
−OH
(C7H4N5O5)+
m/z 210
−OH
−NO
(C7H3N4O5)+·
m/z 193
(C7H4N4O6)+·
m/z 180
−NO
−HCN
−C2H2NO2
−CH2NO2
−NO2
(C7H3N3O4)+
m/z 163
(C7H3N3O5)+·
m/z 166
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(C7H4NO4)+
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m/z 105
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−CO
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m/z 77
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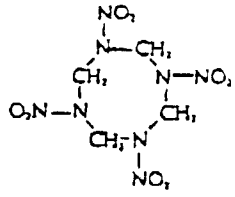
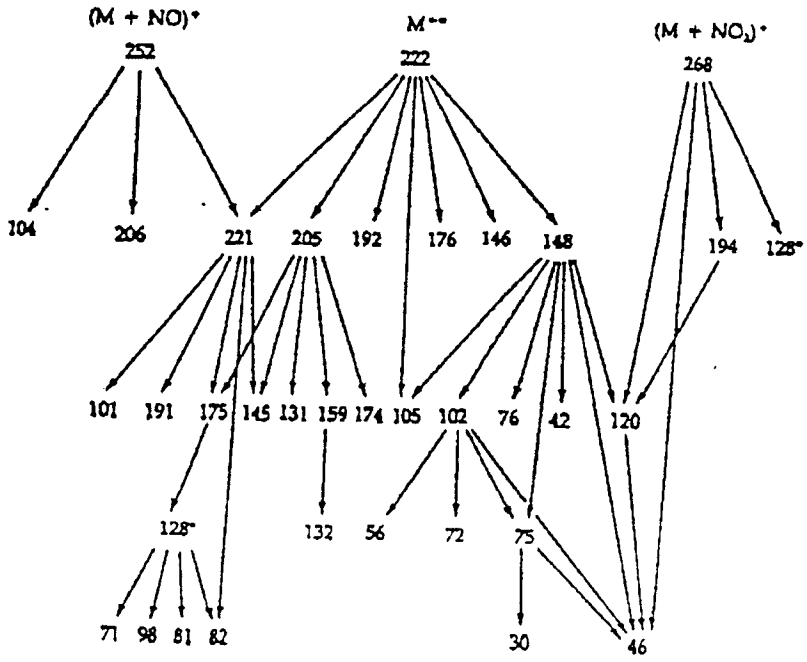
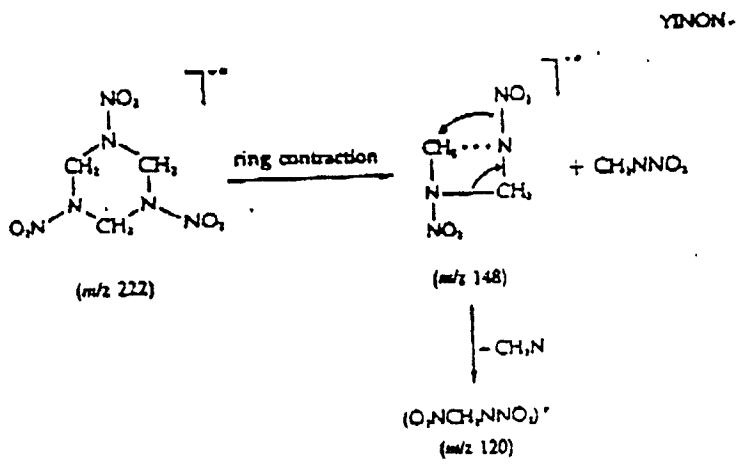
(C5H3)+
m/z 63
(C6H4N)
m/z 77

BY-PRODUCTS OF HMX





BY-PRODUCTS OF RDX



Metcalf & Eddy

May 6, 1992

U. S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Attn: Ms. Lisa Price
References: Work Assignment C060067

Dear Lisa:

In accordance with your request, M&E has investigated the degradation products of Trinitro-toluene (TNT). These compounds may be found in areas where TNT has been buried or otherwise introduced into the soils. Existing protocols include the analysis of samples for compounds: 1,3,5 Trinitro-Benzene; 1,3 Dinitro-Benzene; 2,4-Dinitro-Toluene; 2,6-Dinitro-Toluene; and Nitrobenzene.

Although the attached diagram (provided by Dr. Sounderararajan) does not specifically identify these compounds, our chemist confirms that the pathways can be followed by a qualified chemist. The analysis for the chemical ions shown on the pathway chart would be beneficial for research purposes but the search for identifiable compounds is prudent at this site. The rates of formation of the ions and the life span of the ions is unknown.

If you need further information on this subject, please let me know.

Sincerely,

METCALF & EDDY, INC.

Ronald C. Catchings, P.E.
Contractor Project Manager

RCC/cmg

Enclosure

cc: COE/Tulsa
COE/Ft. Worth
c:\longhorn\epa\tntltr

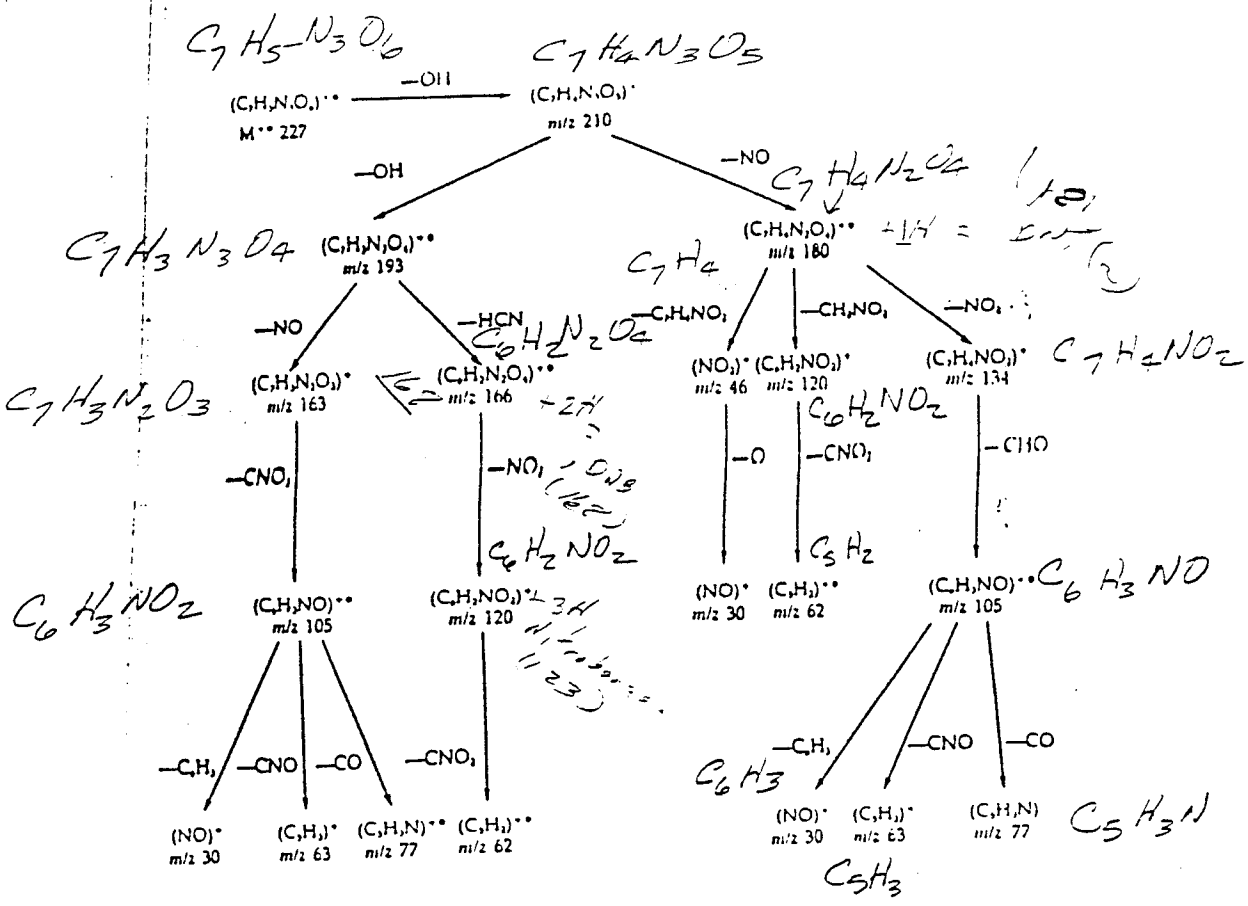
5600 Northwest Central Drive, Suite 102
Houston, TX 77092

TNT Degradation

The degradation products of TNT are 1,3 Dinitro-Benzene (1,3-DNE), 2,4 Dinitro-Toluene (2,4-DNT), 2,6 Dinitro-Toluene (2,6-DNT), Nitrobenzene, and 1,3,5 Trinitro-Benzene (1,3,5-TNB).

The reaction pathways of the degradation are known. However, the exact pathways at these sites are unknown, but would be affected by pH, temperature, soil type and other factors. The rates of the reaction and the distribution of the products are also unknown.

Based on the TNT degradation chart proposed by Dr. Sounderarajan, several possible pathways are identified for compounds currently in the test protocol.



NOTES:

$C_7H_4N_2O_4 + 1H^+ = DNT$

$C_6H_2N_2O_4 + 2H^+ = DNB$

$C_6H_2NO_2^+ + 3H^+ = Nitrobenzene$

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

004544

MAR 27 1992

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Lynn Muckelrath, Project Manager
Longhorn Army Ammunition Plant
ATTN: SMCLO-EN
Marshall, Texas 75671-1059

Dear Lynn,

Pursuant to the Federal Facility Agreement (FFA) for the Longhorn Army Ammunition Plant (AAP), EPA's comments on the draft Community Relations Plan are identified in this letter and in the enclosed letter from Metcalf & Eddy.

EPA's comments are as follows:

1) The Community Relations Plan (CRP) needs to identify the local and area media (i.e., newspapers and local or area television stations). Include addresses and phone numbers for the local and area media. This information can be included as an appendix.

2) The CRP needs to identify local and area elected or appointed officials and federal, state, and local agencies. This information can be included as an appendix.

3) page 10, section 3.3 para. 2: typo "reenforce" should be "reinforce"

4)page 17, section 4.2.6: The Administrative Record should be accessible to the public at another location in addition to LHAAP. A good location is always the public library.

5)page 18, section 4.2.8: The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300) indicates that public comment is only required for the selection of a remedy (300.430(f)(2)), not on the RI/FS itself. However, the administrative record that has been compiled for the site will contain the RI/FS, and the administrative record is available for public comment (300.800) during the public comment period on the proposed plan. Furthermore, the NCP requires that a minimum of "...30 calendar days be established for the submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS. Upon timely request, the lead agency will extend the public comment period by a minimum of 30 additional days" (300.430 (f)(3)(i)(C)).

6)page 18,section 4.2.8: The ROD requires EPA's approval of the remedy selection. Although concurrence by the state is sought by EPA and DoD, the state's concurrence with the remedy is not necessary for the implementation of a remedial action at a federal facility. However, concurrence is ultimately necessary for the deletion of a site from the NPL.

I look forward to meeting with you on April 9 and 10, 1992, here in Dallas, Texas to discuss the draft RI/FS Work Plan and other issues relating to Longhorn AAP.

If you have any questions regarding the comments, the meeting dates, or any other matter, please contact me at (214) 655-6735 or FTS 255-6735.

Sincerely,

Lisa Marie Price
Remedial Project Manager
Superfund Texas Enforcement

Enclosure

cc: copy sent Federal Express

Tulsa District Corps of Engineers
P.O. Box 61
Attn: D. Wade Anderson
CESWT-EC-GP
Tulsa, OK 74121-0061

Mike Moore, Superfund
Pollution Cleanup Division
P.O. Box 13087
Capital Station
1700 N. Congress Avenue
Austin, Texas 78711-3087

METCALF & EDDY
DRAFT COMMUNITY RELATIONS PLAN COMMENTS

March 24, 1992

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Attention: Ms. Lisa Price (6H-ET)
Superfund Enforcement Division - Texas Section

Reference: Longhorn Army Ammunition Plant (LHAAP)
Community Relations Plan

Dear Lisa:

Pursuant to your request of March 3, 1992, the Longhorn Army Ammunition Plant Community Relations Plan to support the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation/Feasibility Study Work Plan has been reviewed. The following comments are provided.

Section 3.0

Page 7, Section 3.1:

- In addition to the many federal and state organizations, at least one non-profit water supply corporation (Karnack) should be included.

Page 14, Table 3.2:

- "Serving on Independent Citizens Advisory Committee" should match Section 4.2.3 heading "Independent Environmental Advisory Group", page 19 (4.2.9), and Table 4-1.

Section 4.0

Page 18, Section 4.2.8:

- There will probably be several ROD's for the installation, and each ROD will require public notice. The U.S. EPA Regional Administrator will sign the ROD, and the decision will meet the requirements of the CERCLA.

Page 19, Section 4.2.9:

- The list of items to be filed in the repository should be listed in either planned order of production or from "A to Z".

Page 21, Table 4-1:

- For the Fact Sheet, mark "X" in each activity area (RI/FS, Response Summary, and ROD) instead of * "Activity if needed". Also, Fact Sheet should be published for the beginning of the field work and for each proposed ROD.

- The Citizens Advisory Group should be formed to obtain citizen's involvement as early as possible.

If any additional information is needed, please call me.

Sincerely,

METCALF & EDDY, INC.

Ronald C. Catchings, P.E.
Contractor Project Manager

RCC/dn

cc: Mr. Phil Smith - M&E, Houston
Longhorn file

004549

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

April 1, 1992

CERTIFIED MAIL
P 688 246 502
RETURN RECEIPT REQUESTED

Lynn Mucklerath, Project Manager
Longhorn Army Ammunition Plant
Attn: SMCLO-EN
Marshall, Texas 75671-1059

Re: Longhorn Army Ammunition Plant
Remedial Investigation/Feasibility Study (RI/FS) Work Plan

Dear Mr. Muckelrath:

Pursuant to Section VIII. G. of the Federal Facility Agreement for the Longhorn Army Ammunition Plant, Texas Water Commission (TWC) staff have reviewed the Army's draft RI/FS Work Plan and Initial Remedial Action/Data Quality Objectives and offer the enclosed comments. We have also reviewed the draft Community Relations Plan, which we have found to be acceptable.

As previously discussed by telephone, Wesley Newberry (alternate project manager) and Tim Dobbs (Team Leader, RI/FS II Unit) will attend the monthly project managers' meeting at EPA Region VI on 9-10 April 1992 to discuss the project and TWC's comments on the draft documents. I understand that the meeting is presently scheduled to begin at 10:30 A.M., and that you will contact Mr. Newberry or Mr. Dobbs in the event that the meeting time is changed.

Sincerely yours,

Michael A. Moore
RI/FS II Unit
Superfund Investigation Section
Pollution Cleanup Division

Enclosure

MM:

cc: D. Wade Anderson, COE Tulsa District
Deborah Fitzgerald, COE Ft. Worth District
Lisa Price (6H-ET), EPA Region VI

Appendix II. List of TWC and EPA Technical Guidance Documents

The following guidance documents will be used by State Superfund Project Managers to evaluate the acceptability of a RI/FS or similar study. The TWC may not be limited to the use of the following guidance documents during the evaluation process. This list will be updated periodically to reflect revisions or replacement of the existing guidance documents and/or the addition of future guidance documents.

1. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, EPA/540/G-89/004.

2. Data Quality Objectives for Remedial Response Activities-Development Process, EPA/540/G-87/003.

3. Data Quality Objectives for Remedial Response Activities-Example Scenario: RI/FS Activities at a Site With Contaminated Soils and Ground Water, EPA/540/G-87/004.

4. Compendium of Superfund Field Operations Methods, EPA/540/P-87/001.

5. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, U.S. EPA OSWER Directive 9950.1

6. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells, EPA/600/4-89/034.

7. Quality Assurance Program Plan for the Texas Water Commission, Fiscal Year 1991, (updated annually).

8. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80.

9. Test Methods for Evaluating Solid Waste, Volumes IA, IB, and IC: Laboratory Manual Physical/Chemical Methods, and Volume II Field Manual Physical/Chemical Methods, SW-846.

10. Risk Assessment Guidance for Superfund-Volume 1: Human Health Evaluation Manual, EPA/540/1-89/002.

11. Superfund Exposure Assessment Manual, EPA/540/1-88/001.

12. Superfund Risk Assessment Information Directory, EPA/540/1-86/061.

13. Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual, EPA/540/1-89/001.

14. Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference, EPA/600/3-89/013.

15. Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, EPA/540/G-88/003.

16. Guidance on Oversite of Potentially Responsible Party Remedial Investigations and Feasibility Studies, Volume 1, EPA/540/G-91/010a.

17. Guidance on Oversite of Potentially Responsible Party Remedial Investigations and Feasibility Studies, Volume 2, EPA/540/G-91/010b.

NOTE: These manuals may be purchased from the following:

National Technical Information Service (NTIS)
Springfield, Virginia 22161
Telephone: 703-487-4650
Fax: 703-321-8547

General comments on RI/FS Work Plan Volume 1 (General):

Comment #	Comment
1	Maps include too many details: please break out surface vs subsurface features into separate maps; include surface structures such as buildings, slabs, and other landmarks as points of reference on both surface and subsurface illustrations.
2	Can we get copies of the aerial photographs which were used as a basis for the work plan?
3	Equipment and personnel decontamination stations must be set up at each site.
	Hydrogeology/Geology/Subsurface Stratigraphy
4	Discussions regarding surface and subsurface investigations should be kept in separate sections in the work plan.
5	How was it determined that ground water at LHAAP occurs under unconfined conditions?
6	Were the assumptions regarding hydraulic conductivity and other characteristics of the Wilcox formation based on actual data, literature review, or another source?
7	Even if ground water occurs under unconfined conditions, it cannot automatically be assumed that all contaminants will discharge to surface water, especially considering the assumption that the various strata of the Cypress aquifer are hydraulically interconnected.

8	The proposed method for collecting "grab" samples of ground water may not be used for making a definitive determination whether waste management activities have impacted ground water quality. If the proposed method is intended to be used as a screening method to determine direction of potential ground water movement across a site (i.e. potentiometers) in order to determine proper positioning of monitor wells to be installed during a subsequent phase of investigation, this should be clearly stated in the work plan, and the second phase should be identified in the schedule (Table 8-3). Describe procedure to determine water level elevations in boreholes. If direction of ground water movement at a site can be determined from previous investigations, it is recommended that monitoring wells be installed during the first phase investigation. At least two sampling events, separated by two to three months (and preferably four quarterly sampling events to evaluate effect of seasonal water level fluctuations) will be required to determine impact on water quality at a site.
9	All borings (including monitor wells) should be sampled continuously using core barrel, split spoon or Shelby tube. TWC recommends that discrete samples be collected for chemical analysis at 2 foot intervals from at least the upper 10 feet. Samples for geotechnical analysis may be collected as proposed.
10	Delete the statement "... if ground water is contaminated ..." as it appears under the **Data Requirements for Site Characterization** section for various sites. Monitor wells will be required at a site if any surface or subsurface contamination is detected at that site.
11	Borings should be advanced 2 to 3 feet into the confining layer beneath the uppermost saturated zone, and monitor wells should be screened through the saturated zone and approximately 6 inches into the confining layer. The screen in an individual well shall not exceed 20 feet. If the interval to be screened exceeds 20 feet, cluster wells shall be installed to screen the desired interval.

12	How will cross-contamination between strata be prevented during drilling efforts? TWC requires the use of surface casing when drilling through a potentially contaminated zone to ground water. Surface casing is required by 31 Tex. Admin. Code §§287.45 and 287.46 for wells which penetrate contaminated water zones. All borings must be drilled in such a manner so as to prevent vertical cross-contamination. Please provide specific methods by which these requirements will be met.
13	Development procedures for monitor wells need to state that the well will be purged until clarity of the water is achieved and temperature, pH and conductivity have stabilized (three consecutive readings of ±1 °C temperature, ±0.5 units pH and ±10 % conductivity). TWC requires at least 3 borehole volumes to be purged for proper development.
14	Prior to each sampling event, wells must be purged until temperature, pH, and conductivity have stabilized (see comment #13 above), with a minimum of 3 well casing volumes. Samples should be collected after 85% volume recovery, and no longer than 2 hours after proper recovery has been attained.
	Soil, Surface Water, and Sediment Samples
15	Need to include the specific depths (ie. 0-2 ft.) soil samples will be collected. Sediment samples should be collected in areas of deposition at no deeper than 1-3 inches. No composites.
	Identification of Potential Receptors
16	Identify the nearest public supply well for each site. Have any of these wells been tested for contaminants of concern?
17	What is the source of the statement that "Caddo Lake...supplies about 16,600 Louisiana residents..."? Do the cities of Marshall, Texas and Shreveport, Louisiana use Caddo Lake water? If so, the estimated population using the lake for drinking water should be much larger.
18	What is the basis for the statement used in the site descriptions that "there is low probability that any endangered or threatened species occur in the suspected contaminated area"?

19	The statements that "The existing site is of relatively low ecological value" should be deleted, as should statements regarding suitability of the site(s) as habitat for endangered or threatened species. It is unlikely that these relatively small areas can be separated ecologically from the nearly 8,500 acres of LHAAP property which surrounds them. The ecological importance of the sites, as well as the potential ecological impact posed by contaminants present at the sites (and any remedial actions which may eventually be proposed) will be evaluated during the ecological assessment of the site.

Specific comments on RI/FS Work Plan Volume 1 (General):

Comment #	Page #	Paragraph #	Comment
1	2-15	2	Has the Army ever sampled any of the public water supply wells which are located near LHAAP?
2	2-15	2	Need to include more information on Well 602 (ie. depth, is it plugged, etc.)
3	2-17	3-	What was the source of the information included in the **Ecological Conditions** discussion?
4	2-19	3	The fountain darter is *Etheostoma fonticola*.
5	2-21	1	What is the source of the belief that the fish originally identified as fountain darter were actually cypress darters?
6	3-1	--	Please include a map of the entire plant, showing relative locations of each site, such as Figure 2 in the Site Safety and Health Plan.
7	3-4	3-	What are the correct units for soil samples from 1988 investigation? Text indicates µg/g, Table 3-1-2 indicates µg/kg.
8	3-7	2	We agree that the investigation should be focused on a depth of 5+ feet.

9	3-77	1	Data from slug tests alone are not adequate for making the assumption that two geologic zones are hydraulically connected. At a minimum, a 72 hour continuous pump test would be required as a basis for this conclusion.
10	3-77	1	How were ground water velocities and hydraulic gradients determined? Where are the data which were used to make these calculations?
11	3-93	2	Have contaminant concentration gradient maps been drawn for any of the other contaminants detected in this area? They might be useful for determining what additional work is needed here.
12	3-107	3-	How were previous sampling locations determined? It seems that samples should at least have been collected at previous loading/unloading areas.
13	3-123	4	As in previous comment, were sampling locations correlated to production activities?
14	3-129	3	A limited immediate removal of waste and contaminated soils should be considered if such are discovered during the backhoe investigation of the wastewater lines.
15	3-141	3	The holding times were exceeded for the samples collected by TWC; therefore, the samples were not analyzed.
16	3-143	Table	The columns in the table in the center of the page don't seem to line up properly.

17	3-157	2	See comment #15.
18	4-1	1-	After reviewing Table 5-1 in the Data Quality Objectives document, and the discussion in Section 4.0 of the work plan, it is difficult to determine exactly what contaminants will be analyzed at each site. Please include a separate table for each site listing the number of samples, types of samples, the chemical parameters to be analyzed for in each sample, and the method(s) to be used to analyze samples for each parameter. Also, include all QA/QC samples to be used.
19	4-2	1	Need to develop a method to screen the site to help detect possible disposal areas and to determine sample locations (i.e. geophysical survey such as an EM-31).
20	4-3	2	We recommend that 3 monitoring wells also be installed, to include a background well in the probable upgradient direction, and two wells in the probable downgradient direction.
21	4-5	2	List or reference where the sampling procedures and methods are described. TWC recommends samples to be discrete and at every 2 foot interval for at least the upper 10 feet.
22	4-7	1	See comment #20.

23	4-9	2	We do not agree with the statement that "The chances of encountering the exact burial location are low" at this site. The size of the site is very small, and previous information seems to indicate that the disposal area is beneath the asphalt parking lot; therefore, if waste is present, it should be detected in samples from soil borings in that location. Alternately, a geophysical survey could be conducted to located potential disposal locations.
24	4-10	3	If soil borings cannot be used to determine the presence or absence of waste in this area, we recommend installing three monitor wells, as in comment #20.
25	4-10	3	Twenty-four feet should be considered the minimum depth for borings (and monitor wells) if this is the depth at which the saturated zone is expected to be encountered.
26	4-15	2	Give detailed description of methods and procedures for drilling the 3 deep stratigraphic test borings. How will "drilling be performed in such a manner to prevent downward movement of ground water from one water-bearing zone to another"? At least one of the deep borings should be sampled continuously for visual logging and characterization, and samples should be collected for chemical analysis in at least the upper 50 feet of one of the deep borings to be conducted inside the landfill area.

27	4-15	2	Provide details for well plugging procedures. It is recommended that all well construction materials be removed and the borehole be overdrilled, then pressure-grouted with a tremmie pipe through the auger from the bottom of the borehole to the surface.
28	4-19	2-	The purpose of the RI is to determine the nature and extent of contamination; thus a RCRA type detection monitoring system is not adequate. The first set of monitor wells should be located as close to the source or sources of contamination as possible, and subsequent well locations then be expanded outward as necessary.
29	4-19	1	It is recommended that an aquifer pump test be conducted to characterize hydrogeologic conditions at this site.
30	4-19	4	What criteria will be used to determine bottom elevations of monitor wells? Drilling should be advanced 2 to 3 feet into the underlying confining layer, and screens should be set approximately 6 inches into the confining layer to ensure that any dense non-aqueous phase liquids which might be present are detected.

31	4-21	4	We do not believe that previous investigations have been thorough enough to show that ground water has not been impacted at this site. The one downgradient monitor well appears to be downgradient of only the northeastern corner of the flashing area, which we would expect to have a lesser potential impact on ground water than the burn pits. We recommend that a minimum of two additional wells be added downgradient from the burn pits.
32	4-22	2	Additional surface soil samples should be proposed.
33	4-22	3	Are all of the wells located around LHAAP 17, 18 and 24 completed in the same transmissive zone? If not, use of the same background well will result in erroneous results. Also, the designated background well for these sites (C-7) appears to be downgradient from the Ground Signal Test Area; if contaminants are detected in this well, a new background well location will need to be established.
34	4-24	4	Due to past sample results indicating possible ground water contamination and since soil contamination does exist, additional monitor wells will be required at this site.

35	4-30	1	TWC requires monitor wells to be installed in the next deeper aquifer if ground water contamination has been documented in the upper aquifer. Also, a pump test is preferred over slug tests to determine the aquifer characteristics and communication between the two aquifers or transmissive zones.
36	4-32	2	Additional monitor wells should be placed downgradient from areas which are determined to have the highest concentrations of contaminants. In order to determine the best locations for wells, it is recommended that the wells be installed after results from soil borings have been reviewed. (It is recommended that a thorough geophysical survey, such as a soil gas survey, be conducted at this site before plans for additional field work be finalized.) Soil borings should be drilled in each of the three toluene storage tank areas to determine whether any spills or leaks occurred while the tanks were in use. Also, additional soil borings should be drilled in the production area where TNT handling could have caused releases onto the ground, such as around the conveyor systems and other loading and unloading areas.

37	4-36	1	How many soil borings are proposed for this area? The list at the bottom of page 4-32 indicates 6, I count 7 on Figure 4-7-1 (is the one which is located between previous soil boring no. 17 and previous surface water/sediment no. 552 a boring or a backhoe sample?), and the text indicates 7.
38	4-37	2	Need to state that monitor wells will be installed during second phase RI.
39	4-39	2	Surface casings are required if drilling through waste into the ground water. Also, three soil borings are not adequate to determine the extent of contamination at this site.
40	4-41	1	The approximate location for this surface water/sediment sample should be indicated on Figure 4-8-1.
41	4-41	3-	Since monitor wells are proposed for this site, it is recommended that monitor wells also be installed in the three soil borings instead of trying to collect "grab" samples of ground water. Results from ground water grab samples will not be accepted by TWC as a basis for determining presence or absence of ground water contamination.

42	4-42	2	What are the criteria to be used in determining in the field where well screens will be set? Borings should be advanced 2 to 3 feet into the underlying confining layer and screens should be placed approximately 6 inches into this layer to ensure that any dense contaminants which might be present are detected.
43	4-44	2	It is recommended that at least 2 (and probably 5 or 6) monitor wells be placed around this site. Also, more soil samples are needed, and all soil samples should be collected from at least the upper 5 feet.
44	4-46	3	I don't find this soil sampling location on Figure 4-9-1; there appears to be a proposed 15 foot soil boring in this area.
45	4-48	2	I don't find a paragraph 4.9.3.
46	4-52	1	The need for further ground water monitoring has already been established because contaminants of concern have been detected in previous ground water samples.
47	4-52	3	At least two monitor wells should be added.
48	4-53	2	Not enough sample locations are proposed for this site. The entire western corner of the site is left out of the sampling scheme.
49	4-52	4	What criteria will be used to determine actual boring depths?

50	4-55	2	The pit which was used for disposal of the rocket motor should be located (use magnetometer or other geotechnical method) and sampled.
51	4-55	3	A monitor well should be installed in the boring located north-northwest of the Mortar Test Area.
52	4-57	4	It is recommended that one or two monitor wells and five to ten shallow soil samples be added to this list.
53	4-63	2-	Not enough sample locations; no mention of monitor wells to be installed during the second phase.
54	5-1	--	I didn't find any specific mention of using the results of the risk assessment during the feasibility study.
55	Table 7-2	--	Add Industrial Solid Waste and Municipal Hazardous Waste Rules (31 Tex. Admin. Code Chapter 335) (Solid waste notification and classification requirements) and Texas Water Code (Requirements for discharge of waste into or adjacent to waters in the state) to Chemical-Specific ARAR's list, and Texas Water Code to Action-Specific ARAR's list.

Comments on RI/FS Work Plan Volume 2 (Chemical Data Acquisition Plan):

Comment #	Section	Comment
1	4.1	How will cross-contamination between strata be prevented during drilling efforts? TWC requires the use of surface casing when drilling through a potentially contaminated zone to ground water. Surface casing is required by 31 Tex. Admin. Code §§287.45 and 287.46 for wells which penetrate contaminated water zones.
2	4.1 & 4.1.1.3	Collecting soil samples directly from auger flights is not acceptable. Use of a core barrel pushed slightly ahead of the lead auger is an additional acceptable method for collecting soil samples from borings.
3	4.1.2	All borings (including monitor wells) should be sampled continuously using core barrel, split spoon or Shelby tube.
4	4.2.2	Development procedures for monitor wells need to state that the well will be purged until clarity of the water is achieved and temperature, pH and conductivity have stabilized (see general comment #13). TWC requires at least 3 borehole volumes to be purged for proper development.
5	4.4.1.2	Formation water should not be reintroduced into the aquifer as proposed in this section. Reintroduction of contaminated water would constitute a violation of RCRA and/or the Texas Water Code. Use of a mechanical slug is recommended as an alternative slug test method.

6	4.5.1.2	TWC ground water sampling procedures require that samples be collected no sooner that 48 hours after development. Prior to each sampling event, wells must be purged until temperature, pH, and conductivity have stabilized (three consecutive readings of ±1 °C temperature, ±0.5 units pH and ±10 % conductivity), with a minimum of 3 well casing volumes. Samples should be collected after 85% volume recovery, and no longer than 2 hours after purging. For wells with slower recovery rates, samples can be collected as soon as recovery has occurred provided a sufficient volume of water is available for the required analyses.
7	4.5.1.3	Samples must be collected in such a manner so as to ensure that samples are representative of the total water column.
8	4.5.1.5	Neither method described in this section provide any assurance that samples collected will be representative of ground water in the transmissive zone(s) beneath the sites.
9	4.7	Equipment and personnel decontamination stations must be set up at each site.
10	4.7.1	Describe the how equipment decontamination stations will be constructed and operated (e.g. how will contaminated water be contained and collected, how will heavy equipment such as drill rigs be decontaminated, how will augers and sampler be decontaminated, etc.).

11	4.9	How will "potentially hazardous wastes" be determined? TWC believes that any investigation-derived waste from a Superfund site must be considered to be potentially contaminated and managed as hazardous waste until documentation is available to indicated that the waste is not hazardous, and has been properly classified by TWC.
12	Appendix B	Some of the parameters in the tables are not included in Table 5-1 of the Data Quality Objectives document. Need to include method for asbestos.

Comments on RI/FS Work Plan Volume 3 (Site Safety and Health Plan):

Comment #	Section	Comment
1	Table of Contents	Page numbers are incorrect for Appendix B.
2	7.3	SOP 3 is in Appendix "B" vice "C".
3	8.2.4	Reference should be made to SOP 3 of Appendix B.
4	9.1	Why are higher levels of personal protection not considered?
5	10.2	Give construction details and equipment to be used in personnel decontamination stations (how control zones will be designated or roped off, how decon wastes will be collected and managed, what decon agents will be used to clean equipment, etc). Decon stations must be provided for each site.

RESPONSE TO COMMENTS
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)
WORK PLAN (DRAFT)

EPA

General Comments on RI/FS Work Plan for Longhorn AAP

1) Concur. Table 2-1 has been revised to identify all wells in the area that monitor each site, to identify background wells and to identify wells shared between different sites. The elevation of ground surface at each well location is shown on Table 2-1. The depths of screened intervals have been added to Table 2-1. Depth of ground water, as recorded 14 and 15 November 1989, is shown on Table 2-1. Because ground-water zones at LHAAP have not been identified as such, screened intervals show the depths currently being monitored relative to the ground-water surface. Figure 2-2 has been revised to show site locations at LHAAP. Well locations for each site are shown on individual site maps; background wells are designated as such. Wells shared between sites have been identified on Figures 4-2-1, 4-3-1, 4-5-1 and 4-6-2. Wells to be closed (plugged) are shown on proposed sampling plans for each site in Section 4. Table 2-1 has been revised to show these wells. The strategy for determining proposed monitoring well depths has been added and is discussed for each site in Section 4.

2) Concur. A proposed schedule incorporating additional field studies was submitted to EPA and TWC on 19 May 1992 and is contained in Section 8.0 of the RI/FS Work Plan. The phased approach for investigating each site has been added and discussed in the appropriate sections of the Work Plan.

3) Concur. Phased approach will address these concerns.

4) Concur. These statements have been deleted or reworded so as not to imply that a conclusion has been reached before proper data collection and analyses have been performed.

5) Exception. RCRA Subpart F (40 CFR 264.101) requires that LHAAP must institute corrective action for any release from a Solid Waste Management Unit (SWMU). This requirement does not specify ground-water monitoring, but implies that releases will be addressed on a site-by-site basis. Corrective action ground-water monitoring, as addressed under 40 CFR 264.90 (a)(2), is required only for surface impoundments, land treatment units and landfills that received hazardous waste after July 26, 1982. The Unlined Evaporation Pond (UEP), LHAAP 24, was the only regulated unit for which it is known that hazardous waste was received after July 26, 1982. The Old Landfill, LHAAP 16, was no longer active by this date, and the Active Landfill, LHAAP 12, was

receiving only industrial solid waste at this time. Therefore, LHAAP 24 is the only candidate requiring corrective action ground-water monitoring under RCRA Subpart F at this time. Other units addressed under the RI may require corrective action ground-water monitoring should it be determined that a release has occurred and ground water is threatened or has been impacted. For this reason, a point of compliance has been established for each site and is shown on all revised site maps in Sections 3 and 4. Should ground-water monitoring be necessary, the point of compliance will be used to determine proper siting of upgradient and downgradient wells.

6) Concur. Operable units will be identified as early as possible.

7) Concur. These sites will be identified and addressed in an addendum to the RI/FS Work Plan. Funding has been requested to develop plans for the sites.

8) Concur. An OEW Officer will conduct initial training of field personnel on the recognition and hazards associated with the OEW. The OEW Officer will also inspect and grant clearance to each site before field operations begin. Contingency procedures for contacting the OEW Officer, if OEW items are encountered, will be set up during site specific training.

EPA ENCLOSURE 1

COMMENTS ON DRAFT RI/FS WORK PLAN VOLUME 1

Text and Figures have been edited to reflect changes made in response to the Comments. New Figures added to the Work Plan are designated with an alphabetical suffix to the preceding Figure number to preclude renumbering subsequent Figures.

SECTION	PAGE/ PARA.	RESPONSE
3.4.4	3-38/3	Concur. Unit "mg/kg" has been added.
3.4.4 and 4.4.2.3	3-43/3 and 4-18/1	2,6-DNT was detected in surface water/sediment sample 017 located downslope from and adjacent to the site. A fifth surface water/sediment sampling location has been added to the sampling plan. This location will be in the Bayou, directly east of the easternmost proposed monitoring well. The surface water/sediment sampling plan will serve to verify if LHAAP 16 is a source of explosives in these sediments of Harrison Bayou.
3.4.5.4	3-46	The screen setting for Well 122 is 8.5 to 23.5 feet, which is shallow ground water. This comment is now addressed under paragraph 3.4.3.
3.4.6	3-47/2	Concur. Text revised.
3.5.4	3-55/1	Concur. Text revised.
3.6.4	3-92/1	Cluster well and monitoring depths at LHAAP 18 & 24 have been clarified in paragraph 3.6.3.
3.6.4	3-92/2	Shallow wells are monitoring the base of the suspected uppermost saturated zone underlying Burning Ground No. 3 area, as addressed in paragraph 3.6.3.
3.6.6	3-98/2	Concur. Text revised.
3.6.7	3-100	Concur. The need for initial remedial action will be evaluated and is now addressed in paragraphs 3.6.7, 4.6.1, and 4.6.2.
3.6.7	3-100	Concur. Revised.

3.8.3	3-136/2 and 3	The screen setting for Well 103 is 9.5 to 24.5 feet. The screen setting for Well 121 is 19 to 34 feet. Both wells monitor shallow ground water. Text revised.
3.8.6	3-147/2	Concur. Text revised.
3.9.3	3-155/1	The screen setting for Well 113 is 14 to 29 feet, which is shallow ground water. Text revised.
3.10.2	3-167	As a result of the comment, another site visit was performed, installation personnel were interviewed, and aerial photographs were reexamined. It was determined from the information gathered that the limits of the site appear to encompass an additional area approximately twice as large as the site is currently defined. The area extends to the west and northwest of the current site and contains mounds of debris and trenches believed to be associated with the Inert Burning Grounds operations. Figures 3.10.2 and 4.10.1 are revised to show new suspected limits. An addendum to the Work Plan will be prepared to address the full extent of the site and is addressed in paragraph 3.10.2.
3.11.4	3-186	The screen setting for Well 127 is 10 to 25 feet. The screen setting for Well 128 is 17.5 to 32.5 feet. Both wells monitor shallow ground water. Text revised.
4.1.1	4-2/1	Concur. A non-intrusive site screening survey has been added to the work plan.
4.3.2	4-10	Concur. A monitoring well will be drilled in the center area and is addressed in paragraph 4.2.2 and on Figure 4-2-1.
4.4.2	4-14	Concur. All proposed monitoring wells will be cluster wells and will monitor two zones. Revised.
4.5.2	4-22	Exception. As requested by TWC, a monitoring well will be installed in the center of the burn pit area to determine if the burn pits have impacted ground water. Revised.
4.6.1	4-25/1	The two ground-water zones being monitored at LHAAP 18 & 24 are now addressed in more detail in Section 3.6.3.

4.6.2	4-26/1	No. No additional sources are suspected other than those previously investigated. Quantifying sources will be part of evaluating the need for initial remediation. Quantifying sources will also be a requirement of the Feasibility Study.
4.7.1 and 4.7.2.4	4-32/2 and 4-37	The shallow ground-water zone being monitored at LHAAP 29 is now addressed in more detail in Section 3.7.3.
4.7.2.2	4-33	Do not concur. Process information indicates that explosives (TNT) are the only likely contaminant of concern expected in the waste lines.
4.7.2.2	4-36/1	The plan for site investigation has been revised.
4.8.2	4-38	Concur. Revised.
4.9.2 and Figure 4-9-1	4-44 and 4-45	Concur. Revised.
4.9.2.5	4-51	Concur. Revised.
4.10.2	4-52	Concur. Additional soil borings have been added.
4.11.2	4-57	Concur. Placement of wells will depend on the direction of ground-water flow and the location of sources for the elevated concentrations of contaminants identified. These data will be gathered during the first phase of investigations. Wells will then be added during the second phase of investigations. Text revised.
4.12.2	4-64	Exception. Two soil borings are already proposed downgradient of the activities performed in this area. Grab samples of the ground water from these borings will determine if contamination is leaving the site.
5.0	5-1/1	Concur.
5.0 and 5.1.3	5-1/3 and 5-5	Concur.

5.2	5-6/1	Treatability Studies will not replace full-scale pilot testing if required for the remedial design. But, information gained from the Treatability Study will be very useful in the scale-up for design of the pilot study and any treatment used in the remedial action.
5.2.1	5-6	Concur.
5.2.2	5-8	Concur.
5.3.2	5-9	Concur.
8.2	8-1	The revised schedule has been included which accounts for all previously granted extensions and additional field work required for any Phase 2 investigations. The final Record of Decision has only been delayed by 40 days.

EPA ENCLOSURE 2

COMMENTS ON DRAFT RI/FS WORK PLAN VOLUME 2: CHEMICAL DATA ACQUISITION PLAN

SECTION	PAGE/ PARA.	RESPONSE
4.2.1.6	13	Concur. Figure 4.1 will be changed to 2 feet.
4.2.2	13	The text will be modified to state that at least 5 casing volumes will be removed during well development.
4.4.1.1	14	No. Fuel layers which would cause problems with water level indicators are not anticipated. Text revision is not necessary.
4.5.1.1	15	Five casing volumes will be purged from the wells as discussed in 4.5.1.2. The text will be revised to state that Ph, conductivity, and temperature must have stabilized in three consecutive readings before purging will be completed.
4.5.1.5	17	Either method may be used. Ground-water sampling from open boreholes will be performed as a field screening method only, with analyses to be used as a tool for developing additional investigation at a site. Two methods are specified to give the contractor an option. Either method is a valid means for obtaining ground-water samples for their intended use.
B-4		No. Table B-4 is for volatile organics by Method 8240. Table B-7, Method 8330, detects explosives. Three of the most common decomposition products of explosives (2-Am-DNT, 4-Am-DNT, and 1,3,5-TNB) are all compounds detected by Method 8330 and are listed in Table B-7. No text change is necessary.

EPA ENCLOSURE 3

COMMENTS ON DRAFT RI/FS WORK PLAN VOLUME 3: SITE SAFETY AND HEALTH PLAN

SECTION	PAGE/ PARA.	RESPONSE
1.0	1/3	Concur.
4.3	30	The SSHO will be on-site at all times during investigative activities.
7.1	37	Action levels will ensure that the site is evacuated or PPE is upgraded prior to any potential overexposure, therefore 5 minute escape packs will not be necessary. Work will not be performed in an IDLH atmosphere.
9.1	45	Concur. Proper use of PPE will ensure employees are protected from exposure via all pathways.
9.1	45	Refer to response above.
12.0	51	Concur.
12.0	52	The COE project manager will be responsible for contacting EPA and TWC project coordinators as necessary.

EPA ENCLOSURE 4

Risk Assessment

General Comments (from Jon Rauscher, Toxicologist)

Site Concept Model: Concur. See Section 6 for discussion on Site Conceptual Model.

Contaminants of Concern: Concur. See Section 6 for discussion referencing RAGS Manual for procedures in identifying Contaminants of Concern.

Exposure Assessment: Concur. See Section 6 for discussion on development of land use scenarios, the use of the RAGS Supplemental Guidance, and data evaluation.

Toxicity Assessment: Concur. See Section 6 for statement on consulting the EPA RPM concerning chemicals having no RfD of cancer slope factor.

Risk Characterization: Comment Noted. See Section 6 for statement on the identification of COCs after proper data evaluation.

Ecologic Risk Assessment: Concur. An Ecological Risk Assessment will be included in the baseline risk assessment. RAGS, Vol 2, will be used to prepare the Ecological Assessment. In addition, EPA Region 6 Biological Technical Assistance coordinators will be consulted regarding the planning of the Ecological Risk Assessment. See Section 6 for discussion.

APR 14 1992

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Lynn Muckelrath, Project Manager
Longhorn Army Ammunition Plant
ATTN: SMCLO-EN
Marshall, Texas 75671-1059

Dear Lynn,

Pursuant to the Federal Facility Agreement (FFA) for the Longhorn Army Ammunition Plant (AAP), EPA's comments on the draft Initial Remedial Action/Data Quality Objectives (IRA/DQO) are identified in this letter and in the enclosed letter from Metcalf & Eddy.

As a general comment, EPA requests that it be kept in mind that the purpose of the Remedial Investigation/Feasibility Study (RI/FS), of which the IRA/DQO is a feeder document, is to present relevant information so that an appropriate remedy can be selected.

EPA's specific comments are as follows:

COMMENT #	SECTION	PAGE/ PARA.	COMMENT
1	2.0	2-1	Is a duplicate of Section 2.0 of draft RI/FS Work Plan Volume 1; see comments on draft RI/FS Work Plan.
2	3.0	3-1	Is a duplicate of Section 3.0 of draft RI/FS Work Plan Volume 1; see comments on draft RI/FS Work Plan.
3	4.0	4-1	Is a duplicate of Section 4.0 of draft RI/FS Work Plan Volume 1; see comments on draft RI/FS Work Plan.
4			See TWC's comments submitted 4/1/92.

6lt-ET
Hit 5 4/14/92

If you have any questions regarding the comments or any other matter, please contact me at (214) 655-6735.

Sincerely,

Lisa Marie Price
Remedial Project Manager
Superfund Texas Enforcement

Enclosure

cc: copy sent Federal Express

Tulsa District Corps of Engineers
P.O. Box 61
Attn: D. Wade Anderson
CESWT-EC-GP
Tulsa, OK 74121-0061

Ft.Worth District Corps of Engineers
ATTN: CESWF-ED-GH (Deborah Fitzgerald)
P.O. Box 17300
819 Taylor Street Room 7A 37
Ft. Worth, TX 76102-0300

Mike Moore, Superfund
Pollution Cleanup Division
P.O. Box 13087
Capital Station
1700 N. Congress Avenue
Austin, TX 78711-3087

Cyril O. Onewokae
HQ, AMCCOM
AMSMC-EQE
Rock Island, IL 61299-6000

Metcalf & Eddy

April 9, 1992

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Attention: Ms. Lisa Price (6H-ET)
Superfund Enforcement Division - Texas Section

Reference: **TES X Work Assignment C060067**
Longhorn Army Ammunition Plant (LHAAP)
Review of Draft Initial Remedial Actions/Data Quality Objectives

Dear Lisa:

Metcalf & Eddy (M&E) has reviewed the report prepared by the U.S. Army Corps of Engineers (COE) on the Initial Remedial Actions/Data Quality Objectives for the Remedial Investigation/Feasibility Study at the Longhorn Army Ammunition Plant. The review was performed as a task under Technical Enforcement Support - X Contract 68-W9-0007, for work assignment C060067. The reviewers were Ronald C. Catchings and Phil Smith of the Houston, Texas office (Initial Remedial Actions) and Larry Landry of the Dallas, Texas M&E office for the Data Quality Objectives.

Although the COE report concludes that initial remedial action is not necessary at any of the sites, additional investigations should be started to determine the source of the methylene chloride and the TCE at Sites 18 and 24. The investigations can determine the movement or lack of movement of these two compounds. If the new analysis indicates significant movement of the TCE or methylene chloride to the point of compliance or past the point of compliance, a release under 40 CFR 300.400 (a)(1) may have occurred. The additional investigation should be performed under 40 CFR 300.420 (c), and a removal site evaluation under 40 CFR 300.410 in support of a possible removal action under 40 CFR 300.415.

The report by the COE presented some of the data requested in our review of the draft RI/FS workplan. The sample table (Table 5-1) does not include the number of samples per site, but at least is a compilation of the planned site sampling.

004582

The Data Quality Objectives review is attached.

If any additional information is needed, please call me.

Sincerely,

METCALF & EDDY, INC.

Ronald C. Catchings, P.E.
Contractor Project Manager

RCC/dn

Attachment

cc: Mr. Phil Smith - M&E, Houston
RPMO File

Review of Longhorn Army Ammunition Plant Initial Remedial Action/ Data Quality Objectives

Prepared for
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared by
U.S. Army Corps of Engineers
March 1992

The Data Quality Objectives (DQOs) were reviewed by Larry Landry of the M&E Dallas, Texas office. Comments on the Initial Remedial Action portion are separately covered. The DQOs should have been a feeder report to the draft RI/FS workplan, but was submitted to the EPA after the workplan (Our comments on the draft workplan submitted on March 24, 1992) could not have been considered in the IRA/DQO.

The DQOs will support the following:

a) Site characterization
b) Risk assessment (individual site and total facility)
c) Evaluation of alternatives

The DQOs submitted by the COE also states that the RI/FS data will be used for the remedial design. This data will probably require supplemental engineering data to perform the remedial design. The purpose of the RI/FS is to determine if specific action is warranted and to determine feasible treatment techniques. The RI/FS data actually supports the Record of Decision (ROD).

The additional comments based on these DQOs are as follows:

Many of our comments on the draft RI/FS workplan were related to DQOs and will not be repeated in this review. Table 5-1 of the IRA/DQO listed the detection limits for the constituents of concern and summarized the organization of the sampling. The following comments are based on the DQOs:

General Comments:

1. What is the criteria and minimum level of concentration for a chemical to be included in Table 5-1 (Data Quality Objectives)?

2. What was the rationale for consistently analyzing for nitrates, arsenic, barium, cadmium, chromium, lead, mercury, silver, antimony, nickel, thallium, volatile organic carbon, and explosives but not analyzing for aluminum, copper, magnesium, manganese, strontium, zinc, chlorides and sulfates?

Specific Comments:

Page 5-9, Table 5-1.

What is the rationale for analyzing for VOCs at site 29 (former TNT production area) but not for VOCs at sites 13 and 14? Since the contamination at Site 13 & 14 is unknown, the investigation should include the TCL (VOC's and BNA) and TAL-metals.

Page 5-9, Table 5-1 and Page 3-117. Table 3-7-2.

What is the rationale for analyzing for lead at Site 29, but not the other standard Target Analyte List (TAL) Metals? The detection level (0.02 mg/l) for lead is above the SDWA action level of lead in water of 0.015 mg/l.

Page 5-10, Table 5-1.

What is reason for listing the individual parameters for Site 18, 24, and 29 of carbon tetrachloride, styrene, benzene, toluene, ethylbenzene and xylene since they are already listed as VOCs on Page 5-9?

Page 5-10, Table 5-1.

What is the bases for the asbestos sampling at the XX site? No mention of asbestos was found in Section 3.12.

Page 5-9, Table 5-1.

Should the detection limits be lower (at or < SDWA) for silver in water?

LONGHORN ARMY AMMUNITION PLANT

COMMUNITY RELATIONS PLAN

PREPARED FOR:
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

PREPARED BY:
U.S. ARMY CORPS OF ENGINEERS

May 1992

EXECUTIVE SUMMARY

Longhorn Army Ammunition Plant (LHAAP), located near Marshall, Texas, is undergoing field investigations and clean-up activities under the Comprehensive Environmental Restoration, Compensation and Liability Act. A Federal Facility Agreement regarding such action has been finalized and became effective on December 30, 1991. This Community Relations Plan (CRP) was developed to inform and involve the community and interested public officials, agencies, groups and individuals. Initial activity for the development of this CRP was a community interview to solicit public comments.

Key factors associated with environmental conditions at LHAAP include the potential for groundwater contamination off the plant, surface water contamination of creeks running through LHAAP and draining into nearby Caddo Lake and the economic role that LHAAP plays in Harrison County.

The community is composed of individuals and groups having an interest in the plant based on the above factors. Consequently, the community is made up of landowners and users of the groundwater, residents in rural areas and surrounding cities, elected and government officials and users of Caddo Lake.

Preliminary interviews revealed several concerns regarding environmental conditions at LHAAP. Past practices of burning and burying waste materials, groundwater contamination, contamination associated with TNT production areas and economic effects if the plant is closed were some key concerns.

The CRP describes numerous community relations activities that will be conducted. These activities will provide the public with accurate and understandable information about environmental conditions and clean-up activities, establish two-way communication between government agencies and the various communities and provide opportunities for the communities to be involved with the environmental efforts at LHAAP.

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ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Restoration, Compensation and Liability Act
COE	Corps of Engineers
CRP	Community Relations Plan
EPA	Environmental Protection Agency
INF	Intermediate-Range Nuclear Forces
LHAAP	Longhorn Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TRC	Technical Review Committee
TWC	Texas Water Commission
UEP	Unlined Evaporation Pond

1.0 OVERVIEW OF COMMUNITY RELATIONS PLAN

1.1 Introduction. This Community Relations Plan (CRP) was developed to inform and involve the public in environmental investigations and clean-up activities at the Longhorn Army Ammunition Plant (LHAAP) located near Marshall, Texas. The U.S. Army Corps of Engineers (COE) conducted a community interview program to solicit public comments so community relations activities outlined in the plan would be tailored to the needs and desires of the public. Corps of Engineers and LHAAP personnel also conducted in-depth communications with the Environmental Protection Agency (EPA), Region VI; agencies of the state of Texas; county and city officials; and representatives of other governmental entities. This plan is designed to inform and involve the community and interested public officials, agencies, groups and individuals. This plan can be amended to provide additional community relations activities in the future, if necessary.

Inquiries concerning environmental investigations and clean-up activities can be directed to:

Ms. Dorothy Grant
Community Relations Coordinator
Public Affairs Office
Longhorn Army Ammunition Plant
Marshall, Texas 76671-1059
Phone: (903) 679-2228

Information can also be obtained from:

Ms. Betty Williamson
Community Relations Coordinator
EPA Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202
Phone: (214) 655-6705

Other persons to contact for information are listed in Appendix A.

1.2 **Regulatory Involvement.** LHAAP was listed on the National Priorities List, as defined in the Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA), on 30 August 1990. The Texas Water Commission (TWC) issued a Resource Conservation and Recovery Act (RCRA) Part B permit, Permit No. HW-50195, to LHAAP. The permit became effective in February 1992. A Federal Facility Agreement has been negotiated between the U.S. Department of Army, the EPA and the TWC in order to meet regulatory requirements of both acts. The purpose of the agreement is to describe guidelines and procedures to implement the CERCLA response obligations. Consequently, all investigations and clean-up activities will adhere to the CERCLA process while:

(1) satisfying the corrective action requirements under RCRA for a RCRA permit,

(2) meeting requirements for interim status facilities,

(3) meeting or exceeding all applicable or relevant and appropriate requirements (ARAR), and

(4) complying with all Federal and State laws and CERCLA requirements. The Federal Facility Agreement became effective on December 30, 1991.

Community relations activities will specifically adhere to guidance set forth in the following:

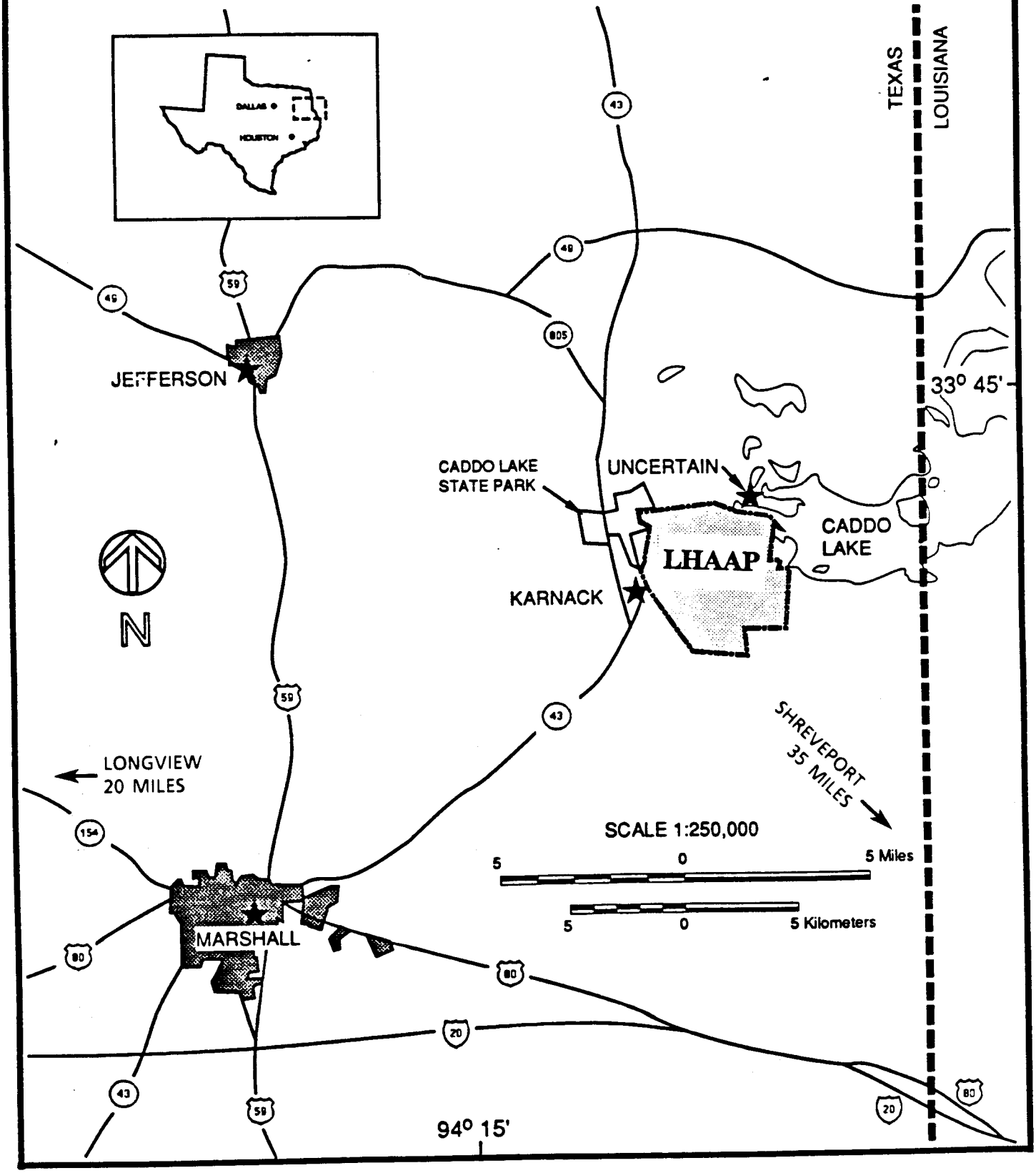
(1) The EPA publication, Community Relations in Superfund (OSWER), Directive Number 9230.0-3B, June 1988.

(2) Army Regulation 200-1, dated April 12, 1990, Subject: "Environmental Protection and Enhancement."

2.1 Description of Site Location. LHAAP is located in central east Texas near the Louisiana border. The plant is situated in the northeast corner of Harrison County, approximately 14 miles northeast of Marshall, Texas, and approximately 35 miles northwest of Shreveport, Louisiana (Figure 2.1). The installation occupies 8,483 acres between State Highway 43 and the western shore of Caddo Lake. Four creeks flow through LHAAP and into Caddo Lake.

2.2 History of Human Habitation. The area in and around Harrison County was originally populated by Native American groups, including those of Caddo tribal origins. People of European descent began migrating to the area during the early 19th century. These people were primarily cotton planters who came from the southern areas of the United States accompanied by black slaves. Marshall, the county seat of Harrison County, was the third most populous city in Texas in 1861. After the Civil War, the rate of population growth in Harrison County decreased. Timber and oil and gas production became important economic activities in the late 19th and early 20th centuries, supporting a more gradual rate of population increase. Though the county experienced a population decline from the 1930's through the 1960's, the county's population has increased since 1970. Currently, Harrison County has an estimated population of 60,000 people. Most of the current residents live in larger communities, such as Jefferson, Marshall and Longview. The remaining population lives in rural areas and in communities of 2,500 people or less.

FIGURE 2-1
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
VICINITY MAP



2.3. History of LHAAP.

2.3.1 Plant Activity History. LHAAP was established in October 1942; its primary purpose was the production of TNT. Production continued through World War II; after August 1945, the plant ceased production. From 1952 through 1956, LHAAP produced photo flashes, simulators, hand signals and ammunition tracers. Thiokol Corporation began production of rocket motors in 1955 and assumed full responsibility for plant operation in 1956. Currently, LHAAP is a government-owned, contractor-operated industrial facility under the jurisdiction of the U.S. Army Armament, Munitions and Chemical Command. The plant's current mission is to load, assemble and pack out pyrotechnic and illuminating/signal ammunition and solid propellant rocket motors. The Longhorn Division of Thiokol Corporation is the current operating contractor.

2.3.2 History of Relationship with Environment. Production activities at the plant required disposal of various materials, including demolition debris, explosives and acids. A variety of burning grounds and pits were used for disposal of solvents, solid and liquid explosives and other materials. Other locations on the plant were used as landfills for the disposal of paints, chemicals, oils and other inert and hazardous wastes.

2.3.3 Nature of Plant's Environmental Problems. Thirteen areas have been identified under the Federal Facility Agreement as having potential environmental problems. Because of past disposal practices, soils and groundwater within LHAAP are contaminated.

The contaminants include explosive compounds, trichloroethene, methylene chloride, heavy metals and other organic compounds. Soil contamination due to explosives has been verified to depths of 15 feet. Groundwater monitoring wells on the installation have detected organic and inorganic compounds, but groundwater contamination outside the installation has not been detected at this time. Four creeks flow through LHAAP and drain to Caddo Lake on the eastern boundary of the installation. While surface water is contaminated in some areas within the installation, surface water contamination has yet to be detected outside the installation.

2.4 Previous Environmental Studies. The following information describes previous environmental clean-up activities at LHAAP.

LHAAP 11 - Suspected TNT Burial Site at Avenues P and Q. Investigations were conducted at this site in 1984 and 1988. The investigations consisted of surface and subsurface soil sampling. Trace to low levels of explosive contamination were detected in both investigations.

LHAAP 13 - Suspected TNT Burial Site between Old Landfill and Active Landfill. Previous investigations were not conducted.

LHAAP 14 - Area 54 Burial Ground. Previous investigations were not conducted at this site.

LHAAP 16 - Old Landfill. Investigations were conducted at this site in 1980, 1982, and 1988. Five monitoring wells were installed in 1980. One well installation, well sampling, sediment and surface water sampling, and soil sampling were conducted in 1982. In 1988, wells were sampled and additional soil sampling was conducted. Explosive contamination was detected in the groundwater, sediments, and soil samples. Vinyl chloride was also detected in one well.

LHAAP 17 - Burning Ground No. 2/Flashing Area. Investigations were conducted at this site in 1984 and 1988. Construction and sampling of one well and a surface water/sediment sample were conducted in 1984. Soil sampling to 5 feet was conducted in 1988. Two volatile organic compounds were detected in the monitoring well in 1984. In 1988, explosives and chlorinated organic compounds were detected in the soil samples.

LHAAP 18 & 24 - Burning Ground No. 3 and Unlined Evaporation Pond/ Rocket Motor Washout Facility. Several investigations have been conducted at this site. Thirteen monitoring wells were completed in 1980. In 1981, samples were collected to characterize the waste in portions of the site. Nine additional wells were installed in 1982. Explosive, metals, and organic solvents contamination was detected in groundwater at the site. In 1984, the Unlined Evaporation Pond (UEP) was formally closed by removal of all waste and capping of the UEP. Eight additional wells were installed around the UEP in 1984. To further characterize contamination by the UEP, 10 additional wells were installed

around the area. In 1987, a soil gas survey, soil sampling, installation and sampling of 15 new groundwater wells, and sampling of 10 existing wells were conducted to identify additional contamination sources in the area. Contamination by volatile organic compounds, metals, chlorides, nitrates, and some explosives was found in the area. Additional wells were completed, along with soil and surface water sampling, in 1989 to determine the extent of the groundwater contamination. Quarterly monitoring has been conducted at the site since closure of the UEP. The latest groundwater samples detected metals and volatile organic compounds contamination.

LHAAP 29 - Former TNT Production Area. Six groundwater wells were completed and sampled in 1984 along with surface water/sediment samples from four locations. In 1988, the 6 wells, additional surface water, and 35 soil borings were sampled. Explosive contamination was detected in soil and surface water/sediment samples.

LHAAP 12 - Active Landfill. Four groundwater wells were installed in 1980 and two in 1982. Groundwater sample analyses showed some metals, chlorides, and one explosive compound. In 1991, surface water and sediment samples were collected from one location near the landfill. These samples contained elevated levels of metals and trace amounts of some explosive and volatile organic compounds.

LHAAP 32 - Former TNT Waste Disposal Plant. One groundwater well was completed and sampled in 1982. Surface water and sediment samples were also

collected in the area. One explosive compound was detected along with some elevated levels of metals. A surface water sample was collected in 1991, and the analyses detected low levels of explosive compounds.

LHAAP 1 - Inert Burning Ground. In 1982, investigations at this site included completion and sampling of one groundwater well and three surface soil samples. Contamination by metals, anions, and two explosive compounds was detected.

LHAAP XX - Ground Signal Test Area. In 1982, investigations included installation and sampling of two groundwater wells and three surface soil samples. Elevated levels of some metals were detected in the soil and groundwater. Elevated levels of chloride and sulfate were detected in the groundwater.

LHAAP 27 - South Test Area. In 1982, investigations included installation and sampling of two wells and three surface soil samples. Metals above background levels and explosives were detected in the soil samples. Metals, chloride, and sulfate were detected above background levels in the groundwater.

3.0 COMMUNITY BACKGROUND

3.1 Factors Determining the Community. The environmental conditions at LHAAP affect diverse groups. These groups include all those who share an interest in the operation of LHAAP and those affected by its operation. These groups are termed "the community" and include public officials; agencies; groups and individuals in the Federal, State and local governments; as well as numerous private interests. Several key factors associated with LHAAP environmental conditions have a direct bearing on this community. Those factors are discussed below.

3.1.1 Groundwater Contamination. Existing environmental problems at LHAAP may threaten the quality of groundwater, whose depth ranges from 4 to 30 feet below ground elevation. The groundwater serves as the water supply for several surrounding communities and rural residents. Groundwater monitoring wells on the installation have detected organic and inorganic compounds. Presently, there is no contamination of the groundwater outside the installation, although this risk exists.

3.1.2 Surface Water Contamination. There is potential for contamination of surface water as a result of the environmental problems at the installation. The most significant surface water adjacent to LHAAP is Caddo Lake which is immediately east of the installation. Caddo Lake is a popular recreation lake and is used for a variety of water-based recreation. The lake also serves as a water supply source for about 16,000 Louisiana

residents. Four creeks flow through LHAAP and drain into Caddo Lake. Some of the creeks are in proximity to sites under investigation and may receive contaminated surface runoff from the sites while others may experience contamination due to the contaminated shallow groundwater discharging to surface drainage. Although no contamination of surface water outside the installation has been detected, the risk for such contamination exists.

3.1.3 Economic Role of LHAAP. LHAAP employs approximately 850 people and is a major employer in Harrison County. Residents in surrounding counties in Texas and Louisiana also work at the installation. The installation is a major purchaser of locally produced goods and services. Although no workers will have unprotected exposure to any contaminated areas, environmental conditions at the installation affect its operations which in turn affect regional economic conditions.

3.2 Elements of the Community. The community is made up of five elements composed of individuals and groups having an interest in the plant on the basis of the factors listed in Section 3.1. The following paragraphs identify each of the community elements.

3.2.1 Landowners and Users of the Groundwater. Land adjacent to LHAAP is used for cattle grazing. The groundwater is used for a variety of reasons, including irrigation of gardens, watering of livestock and domestic consumption.

3.2.2 Residents in Rural Areas and Surrounding Cities. A number of rural residences surround LHAAP. The average number of persons residing in these rural areas is approximately 30 people per square mile. The community of Marshall, with an estimated population of 25,000, is the largest city in Harrison County and is located approximately 15 miles southwest of the plant. The town of Karnack, with a population of approximately 500 residents, is located just outside the south gate of the plant. Adjacent to the northwest boundary of the plant is the city of Uncertain, with a population of approximately 200.

3.2.3 Elected Officials and Government Officials. Historically, elected local, State and Federal officials have been interested in the operation at LHAAP. Representatives of State and Federal agencies having regulatory authority over portions of the plant's operations have also expressed interest in plant activities. The TWC is directly involved in the clean-up activities at LHAAP. Lists of elected and appointed officials are contained in Appendix D.

3.2.4 Users of Caddo Lake. Caddo Lake is used for recreational and water supply purposes, both of which may be directly affected by any water quality changes in the lake. Recreationists have access to the lake via a State park located adjacent to the lake. Residents living near the lake often have private access. Fishing, boating, swimming and water skiing are a few of the activities conducted on Caddo Lake. Caddo Lake is also used for water supply purposes. The lake provides water to approximately 16,000 individuals in the state of Louisiana.

3.3 Community Involvement with LHAAP. Because LHAAP is a major employer in the area, the installation maintains high visibility in the community. Many employees of the contractor and of the Department of the Army participate in a variety of civic capacities by serving as volunteers or members of city councils, chambers of commerce, civic clubs and charitable organizations.

In 1988, LHAAP was selected as the first site for elimination of the Pershing Rocket Motors under the terms of the Intermediate-Range Nuclear Forces (INF) Treaty between the United States and the Union of Soviet Socialist Republics. Because of the high public interest in this treaty, the LHAAP role in the treaty received international and national press coverage. This attention helped reinforce the existing ties between the installation and the community.

The media covered the August 1990 listing of LHAAP on the National Priority List. Although articles appeared in local newspapers, the coverage was far less extensive than coverage associated with the INF actions.

3.4 Community Interviews. In February 1991, Corps of Engineers personnel conducted interviews with community leaders and citizens who have expressed interest in LHAAP. The interviews had two purposes:

(1) To identify the concerns of the community regarding environmental conditions at LHAAP, and

(2) To identify the best way to communicate information about these conditions to the various communities.

In order to select a sample of persons who could provide an indication of the community's concerns and what they considered as the most desirable methods of communication, names of individuals were initially selected from a list of people who participate in meetings and in writing letters to LHAAP staff. In addition, the LHAAP staff identified other people who had expressed an interest in the facility. These individuals, as well as county commissioners, mayors, chambers of commerce representatives and water supply district staffs, were interviewed. A total of ten respondents participated in the initial community interviews. During the course of the interview, each respondent was asked to provide the names of organizations and individuals that he or she thought could provide insight into environmental conditions at the facility. The names they provided were added to the list of potential people to be interviewed.

The interviews were based on an interview schedule, with a list of specific questions (Appendix B). The interview consisted of questions about environmental conditions at LHAAP. Some questions were structured whereby the interviewer was asked to select an answer from a response set. (For example, the respondent was asked to answer the question

with a yes or no type response). Other questions were open-ended, with the respondent having the option to express his or her views. Respondents were encouraged to elaborate on any structured questions they felt needed explanation.

3.5 Key Community Concerns. The respondents were generally aware of environmental conditions at LHAAP. However, only three respondents could identify a specific problem linked to current clean-up activities. One respondent stated that he was aware of problems associated with past practices of burning and burying waste materials. Another respondent mentioned groundwater contamination and the relatively shallow water table, while a third respondent specifically mentioned contamination associated with the former TNT production areas.

Two respondents expressed concern about environmental conditions at LHAAP, particularly regarding groundwater contamination. Three respondents expressed concern about the economic effects of closing the installation, which had been discussed as part of the Department of Defense Base Realignment and Closure program. Two respondents did not express any key concerns about LHAAP. None of the respondents mentioned any problems in past communication with LHAAP officials or with other agencies involved with cleanup-related activities.

Respondents were shown a list of 14 methods for officials to disseminate information addressing the community's environmental concerns. The respondents were given the

opportunity to add other methods to the list. The interviewer asked the respondents to rank the top five methods of disseminating information according to their preference and experience. Table 3.1 summarizes the respondents' top five rankings.

TABLE 3.1

TOP FIVE METHODS OF DISSEMINATING INFORMATION AS DEFINED IN COMMUNITY INTERVIEWS

Briefings or Presentations
Fact Sheets
Independent Citizens Advisory Group
Television Commercials
Press Releases

Respondents were also shown a list of methods the public can use to communicate their concerns about environmental issues regarding LHAAP. As with the question about disseminating information, the respondents were asked to rank the five most effective methods for the public to communicate their concerns. Table 3.2 summarizes the respondents' top five rankings.

TABLE 3.2

TOP FIVE METHODS OF COMMUNICATING PUBLIC CONCERNS AS DEFINED IN COMMUNITY INTERVIEWS

Participating in Formal Public Hearings
Establishing an Independent Citizens Advisory Committee
Communicating with an LHAAP "Contact" Person
Attending Government-Sponsored Small Group Meetings
Writing Letters to the Newspaper Editor

4.0 COMMUNITY RELATIONS ACTIVITIES AND TECHNIQUES. This section outlines the objectives and activities that compose the CRP. The community's concerns and needs regarding environmental conditions at LHAAP were defined during the community interviews. The activities listed below are designed to reflect those concerns and needs.

4.1 Objectives. The community relations activities outlined in this plan are intended to meet the following objectives:

(1) Provide the public with accurate and understandable information on environmental investigations and follow-up at LHAAP,

(2) Establish two-way communication between government agencies and the various communities with concerns and problems being mutually understood, and

(3) Provide opportunities for the community to be involved in environmental efforts at LHAAP.

4.2 Activities. There are many different types of community-related activities that may be utilized as part of a CRP. The following subsections discuss activities that are applicable to clean-up actions at LHAAP.

4.2.1 Fact Sheets and Brochures. Fact sheets which provide summaries of environmental investigations and technical reports will be prepared and distributed. Fact sheets describing the Interagency Agreement will also be prepared. Non-technical brochures will be prepared and distributed to give the public a better understanding of the environmental issues at LHAAP. This information will also be provided to the news media. All fact sheets will be on file in a public repository. Fact sheets will be distributed for the beginning of the field work for each proposed Record of Decision (ROD).

4.2.2 Technical Review Committee. A Technical Review Committee (TRC) will be established by LHAAP and will include EPA and TWC representatives. Representatives from the local government and a public representative of the local community will also serve as members of the TRC. The purpose of the TRC will be to review progress under the Remedial Investigation/Feasibility Study (RI/FS) and/or the Remedial Design/Remedial Action (RD/RA) and to discuss other matters of interest to LHAAP personnel, regulators and concerned local officials and citizens. It is suggested that an LHAAP representative be appointed chair of the TRC. The TRC will schedule regular meetings approximately every 3 months or more frequently as the need arises.

4.2.3 Independent Environmental Advisory Group. If public concern about environmental restoration increases, the TRC may appoint an Independent Environmental Advisory Group. This group should be composed of community leaders who represent the elements of the community identified in Section 3.2. In order to minimize any

perceived conflict of interest, the group shall be composed of persons who have no direct affiliation with the Department of the Army or its contractors.

4.2.4 Briefings and Discussions. The LHAAP staff, with assistance from the COE, will conduct briefings, presentations or discussions with interested individuals, groups, organizations and agencies, when necessary, to communicate information about developments in the environmental cleanup process. A public meeting and a briefing will be held early in the process to inform the various communities about the environmental investigations and clean-up activities. This meeting will also provide members of the community an opportunity to express their concerns. The TRC may hold separate presentations/discussions or co-sponsor activities with LHAAP.

4.2.5 Press Releases. Periodic press releases will be made to update information about the environmental conditions on and adjacent to LHAAP. The releases will be made as developments occur in the environmental cleanup process and to announce any related meetings. The media will be informed of the completion of milestones, such as the findings of the RI/FS or the issuance of the Record of Decision (ROD).

4.2.6 Administrative Record. An administrative record containing all information used in the decision-making process for the investigation and any clean-up activities will be maintained at LHAAP and at the City of Marshall Public Library. Public

comments regarding the environmental activities will be entered into the administrative record. The Administrative Record will have an index identifying all pertinent documents. The documents will be arranged in chronological order.

4.2.7 Employee Communications. The community relations activities described in this plan are available to Department of the Army personnel and their contractors. LHAAP employees will be kept informed via the employee newsletter, as well as via management-sponsored presentations.

4.2.8 Public Comments. Notice of public comment periods will be announced in the media, and the notice will describe procedures for submitting comments. A public comment period will be held for 30 calendar days for the submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS. Upon timely request, the public comment period will be extended by a minimum of 30 additional days.

A public meeting will be held in conjunction with the comment period and prior to final selection of a cleanup alternative for each site. Verbal comments received during the public meeting will be considered in the selection of a cleanup alternative. Transcripts of the public meeting will be prepared and made a part of the administrative record. Suggested sites for meetings are listed in Appendix F.

Because of the nature of the clean-up, there may be more than one ROD for this installation. Following the public comment period, each ROD, a document which specifies the selected cleanup alternative, will be prepared by the Department of the Army. The ROD will be issued following EPA approval. If the selected remedial or corrective action is different from the alternatives listed in the RI/FS, the differences will be explained in the ROD. An additional public comment period will be provided if the selected alternative is significantly different from the alternative in the final ROD.

After the public comment period, comments will be compiled and a response to each comment will be documented in a Responsiveness Summary. Valid comments will be incorporated into the ROD.

4.2.9 Public Information Repositories. The Department of the Army will coordinate with the City of Marshall Public Library in establishing a repository for LHAAP-related environmental materials to be made available to the public. This includes a copy of the CRP, technical and non-technical documents and any documents generated by the Independent Environmental Advisory Committee or the — lirector of the library system indicates that shelf s ntain the collection. Provisions will be made to terials is achieved to accommodate the special coll contain the following items:

Pages replaced following minimal comments on Draft Final.

Wade

Administrative Order
Brochures and fact sheets about the site
CERCLA legislation
Community Relations Plan
Draft and Final FS Report
FS Report
Interagency Agreement
National Contingency Plan
Proposed Plan
Remedial Action Work Plan
Remedial Design
Remedial Design Workplan
Responsiveness Summary
RI Report
RI/FS Work Plan
Risk Assessment
Signed ROD

The address of the City of Marshall Public Library is:

Marshall Public Library
300 S. Alamo
Marshall, TX 75607
Phone: (903) 935-4465

Hours:	Monday, Wednesday, and Friday	10-6
	Tuesday and Thursday	10-8
	Saturday	10-4

4.2.10 Mailing Lists. Existing public affairs mailing lists for the news media, elected officials and interested public will be updated periodically in order to distribute news releases, fact sheets and brochures. Mailing lists for media, elected officials and citizens groups are listed in Appendices C, D and E, respectively.

4.2.11 Revision of the CRP. The CRP may be revised at any time to incorporate new information, to reflect changes in the community's concerns, or to prepare for community activities during RD and RA. Once the ROD is completed, it may be necessary to re-evaluate the nature and extent of the community's concerns which may result in a new community relations activities schedule.

4.3 Community Relations Activities Schedule. Due to the diversity of environmental conditions being evaluated, clean-up activities will be in varying stages of remediation. Table 4.1 lists the schedule of events that will be conducted during the investigation and cleanup process.

TABLE 4.1

COMMUNITY RELATIONS ACTIVITIES SCHEDULE

		CRP Start	RI/FS	Response Summary	Record of Decision
1.	Fact Sheet	X	X	X	X
2.	Technical Review Committee	X	--	--	--
3.	Independent Environmental Advisory Group	*			
4.	Briefings & Discussions	X	--	--	--
5.	Press Releases	X	X	X	X[1]
6.	Administrative Record	--	--	--	--
7.	Employee Communications	--	--	--	--
8.	Public Comments	--	--	--	X[2]
9.	Public Information Repository	--	--	--	--
10.	Mailing Lists	--	--	--	--
11.	Revisions to the CRP	*	*	*	*

Notations: X Projected Activity; -- Continuing Activity; * Activity if needed; ** Formal Comment Solicitation

1 A formal public notice will also be issued at this point.
2 Includes formal solicitation of comments.

4.4 Techniques for Agencies, the General Public and the Media, and Installation Employees. The various elements of the community have unique requirements for information and involvement in the CRP process. All elements within the community may be involved in the activities identified in this CRP. However, particular attention is given to each element with specific needs. Federal, State, and local agencies; the general public, including the media; and installation employees are identified in terms of relevant community relations activities.

4.4.1 Techniques for Agencies. The Federal Facilities Agreement outlines the requirements for interagency coordination (local, State, and Federal government) during the clean-up activities. The CRP coordinator will also ensure that agencies listed in Appendix D receive copies of all fact sheets, brochures, press releases, notification of meetings associated with the CRP and other relevant information. The CRP coordinator will make telephone calls as needed to inform agencies of CRP activities.

4.4.2 Techniques for the General Public and the Media. The CRP Coordinator will mail fact sheets, brochures, notification of meetings associated with the CRP and other relevant information to those persons listed in Appendix E and media representatives listed in Appendix C. The CRP Coordinator will also mail presses releases to media representatives listed in Appendix C. The CRP will also respond to inquiries from the media and the general public regarding clean-up activities.

4.4.3 Technique for Installation Employees. The CRP Coordinator will provide news releases, fact sheets, brochures, notification of meetings to editors of the employee newsletters at the installation. The CRP coordinator will provide information to any union representatives on the installation. If appropriate for the type of information, the CRP coordinator will also use employee bulletin boards, electronic mail or other installation-specific modes of communication to disseminate information regarding this CRP. The CRP coordinator will also help facilitate employee briefings regarding this CRP. Though the CRP coordinator shall function as a first contact for community relations activities, other Army points of contact and office responsibilities are listed in Appendix G.

LIST OF APPENDICES

APPENDIX A

LIST OF AGENCY CONTACTS

FEDERAL AGENCIES

Department of Army, Longhorn Army Ammunition Plant

Dorothy Grant
Public Affairs Office
Longhorn Army Ammunition Plant
Marshall, TX 76671-1059
Phone: (903) 679-2228

Environmental Protection Agency

Betty Williamson
Community Relations Coordinator
EPA Region VI
1445 Ross Avenue, Suite 1200
Dallas, TX 75202
Phone: (214) 655-6705

STATE AND LOCAL AGENCIES

Texas Water Commission

John W. Witherspoon
District Manager
Texas Water Commission, District 5
2016 Teague Drive
Tyler, TX 75701
Phone: (903) 595-5466

COUNTY

Jerry Taylor
County Commissioner
Marion County
102 W. Austin, Room 207
Jefferson, TX 75657
Phone: (903) 665-3261

William D. Power
County Commissioner
Harrison County
4804 Karnack Highway
Marshall, TX 75607
Phone: (903) 935-4809

APPENDIX B

COMMUNITY RELATIONS INTERVIEW SCHEDULE

Introductory Remark. This interview has two purposes. The first purpose is to find out how best to inform the public about environmental conditions in and around the LHAAP plant. The second purpose is find the best ways for the Department of Army to understand the public's concerns regarding environmental issues at the plant. At this time, the Environmental Protection Agency, the Department of Army, and the Corps of Engineers are evaluating environmental conditions in the vicinity of the plant. Specific information about the exact nature of those conditions is yet to be determined. Your individual responses to the questions will be strictly confidential. Your answers will help provide community involvement in protecting the environment.

Screening Question: Do you know what the LHAAP near Marshall is?

___ No; if no, ask if they have heard about the munitions facility in the area. If they have not, terminate the interview. If they have, mention that the facility is called LHAAP.

___ Yes; if yes, go to question 1.

1. Date: ___-___-____ 2. Time: _____ AM PM

3. Name of Respondent: _____

4. Affiliation (if any): _____

5. Address: _____ Phone: _____
_____
_____

(Note that the address and phone number are for potential future correspondence only.)

6. Are you aware of any environmental problems at the LHAAP Plant?

___ No.
___ Yes; if yes, go to 6a.

6a. When did you first become aware of the problems?
_____ (record verbatim).

6b. Please describe the nature of the problem as you understand it? (summarize carefully)

_____
_____
_____
_____
_____
_____

7. Do you rent or own property near the LHAAP?

___ No; if no, go to 8.
___ Yes; if yes, go to 7a.
___ Not Applicable; go to 8.

7a. Have you had any problems with this property that you think are attributable to operations at LHAAP?

___ No; if no, go to 8.
___ Yes; if yes go to 7b.
___ Not sure (probe).

7b. What sort of problems have you had? (summarize carefully)

_____
_____
_____
_____
_____

8. Do you use water from wells or lakes in or around the plant?

___ No; if no, go to 9.
___ Yes; if yes, go to 8a.
___ Not Applicable, go to 9.

8a. Do you use water from:
___ Wells ___ Lakes ___ Both

8b. Do you use the water for:
___ Drinking ___ Irrigation ___ Both

8c. Have you had any problems with your water that you think are attributable to the operations at LHAAP?

___ No; if no, go to 9.
___ Yes; if yes, go to 8b.
___ Not Sure (probe).

8d. What sort of problems have you had? (summarize carefully)

_____
_____
_____
_____
_____

9. Have you had any contact with government officials regarding environmental issues related to operation of the plant?

___ No; if no, go to 10.
___ Yes; if yes, go to 9a.

9a. What government agency(ies) did you contact? (list each one and date of contact if given)

_____
_____
_____
_____

9b. Overall, how would you characterize your feelings about the responsiveness of government officials to your concerns? Would you say they were:

___ Not Responsive
___ Somewhat Responsive
___ Very Responsive

9c. What sort of problems, if any, have you had in getting government officials to respond to your concerns? (summarize carefully)

_____
_____
_____
_____
_____

10. Do you know of anyone who is or has been involved with the operation of the LHAAP?

___ No; if no, go to 11.
___ Yes; if yes, go to 10a.

10a. Of the people you know who are involved with the plant, how would you describe the nature of this person's or these persons' involvement with the plant?

___ An employee working at LHAAP.
___ A contractor working on jobs at the plant.
___ A person working off the plant site, but providing goods or services for the plant.
___ A person living adjacent to the plant
___ A person who has actively expressed environmental concerns about the plant.
___ Other (please list)_____
_____

11. What are your concerns, if any, about the operation of the LHAAP Plant? (summarize carefully)

_____
_____
_____
_____
_____
_____
_____
_____

12. Have you participated in any activities (meetings, telephone calls, letter writing, or gatherings) concerning LHAAP?

___ No; if no, go to 13.
___ Yes; if yes, go to 12a.

12a. What activities have you participated in?

_____
_____
_____
_____

12b. Were any of these activities government sponsored?

___ No.
___ Yes.

13. Would you like to be involved in future activities?

___ No.
___ Yes.

The next two questions deal with ways information can be distributed to the public and ways the public can express its environmental concerns regarding operation of the plant.

14. This card (show respondent a Card I) shows various methods of getting information to the public about environmental issues. Based on your needs for information about LHAAP, rank 10 of the following methods for getting information to the public with 1 being the most desirable way for you to get information and 10 being the least desirable method.

CARD I will have the following list on it.

___ Briefings or presentations.
___ Non-technical brochures/pamphlets.
___ Release of technical documents.
___ LHAAP sponsored newsletter.
___ Press releases.
___ Video tape presentations.
___ Fact sheets.
___ Information repositories at public library.
___ Telephone hotline.
___ School-based programs.
___ Independent citizens advisory group which monitors environmental issues and releases information.
___ Television commercials.
___ Mailing out a list of available documents.
___ Newspaper advertisement.
___ Other (please identify)_____
_____

15. The following is a list (show Card II) of ways in which you can communicate your concerns to government officials about environmental issues related to LHAAP. Please rank 10 of the following methods of communicating your concerns with 1 being the most effective way for you to communicate your concerns and 10 being the least effective method.

Card II will have the following information.

___ Participating in formal public hearings.
___ Writing letters to federal agencies.
___ Making telephone calls to federal agencies.
___ Attending Government sponsored small group meetings.
___ Participating in local environmental group activities.
___ Writing letters or making telephone calls to elected officials.
___ Writing letters to the newspaper editor.
___ Communicating with a LHAAP "contact" person.
___ Establishing an independent citizens technical advisory committee which monitors and reports public concerns about the environmental issues associated with LHAAP.
___ Supporting the local chamber of commerce.
___ Informally discussing issues with friends and relatives.
___ Participating in activities of civic groups which discuss community issues.
___ Other (please list)_____
_____

16. What kind of information do you desire in terms of environmental issues at the LHAAP?

___ None.
___ Non-technical summary of the issues.
___ Technical summarization of the issues.
___ Detailed Technical Documents.
___ Other (please list)_____
_____

17. How frequently would you like to be updated on environmental issues at LHAAP?

___ Monthly ___ Quarterly ___ Semi-Annually ___ Yearly
___ Other (please list)_____

18. Can you suggest other individuals or groups that should be contacted regarding environmental issues at LHAAP? (get telephone numbers and address if possible)

_____
_____
_____
_____

19. Is there anything else you would like to add about how information is communicated in regards to environmental issues at LHAAP?

___ No.
___ Yes; if yes, please list.

_____
_____
_____
_____
_____
_____

Thank them for their time!

APPENDIX C

MEDIA MAILING ADDRESSES

1. **KLTV-TV-ABC**
   1100 Judson Road, Suite 7222
   Longview, TX 75601

2. **KSLA-CHANNEL 12-CBS**
   1812 Fairfield
   Shreveport, LA 71101

3. **KTAL-CHANNEL 6-NBC**
   711 North High
   Longview, TX 75601

4. **KTBS-CHANNEL 3-ABC**
   312 Kings Hwy.
   Shreveport, LA 71103

5. **KYKX-FM**
   1618 Judson Road
   Longview, TX 75606

6. **RADIO KCUL**
   P.O. Box 1326
   Marshall, TX 75670

NEWSPAPERS

1. **MARSHALL NEWS MESSENGER**
   Box 730
   Marshall, TX 75670

2. **LONGVIEW NEWS JOURNAL**
   316 Methvin
   Longview, TX 75601

3. **SHREVEPORT TIMES**
   Box 30222
   222 Lake Street
   Shreveport, LA 71130

4. **TEXARKANA GAZETTE**
317 Pine Street
Texarkana, TX 75501

5. **JIMPLECUTE**
Jefferson, TX 75657

APPENDIX D

HARRISON COUNTY ELECTED OFFICIALS
1990 - 1991

1. **COUNTY CLERK - GLENN LINK**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4858

2. **COUNTY COURT-AT-LAW JUDGE - MAX SANDLIN, JR.**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4838

3. **COUNTY JUDGE - RODNEY GILSTRAP**
   Room 313
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4805

4. **COUNTY TREASURER - BETTY ANDERSON**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4820

5. **DISTRICT ATTORNEY - RICK BERRY**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4840

6. **DISTRICT CLERK - BETTY CAWOOD**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4845

7. **SHERIFF - BILL OLDHAM**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4888

8. **TAX ASSESSOR-COLLECTOR - MARIE NOLAND**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4850

9. **MAYOR - BILL MAUTHE**
   Town of Uncertain
   Uncertain, TX 75661

JUSTICES OF THE PEACE

1. **PRECINCT #1 - PATSY PUGH**
   Rt. 1 Box 800
   Marshall, TX 75670
   903/679-2282 (Office) or 903/938-8585 (Home)

2. **PRECINCT #2 - RICHARD SALMON**
   P.O. Box 872
   Waskom, TX 75692
   903/687-3374

3. **PRECINCT #3 - MARY COLE**
   P.O. Box 394
   Hallsville, TX 75650
   903/668-2050 (Office) or 903/668-2423 (Home)

4. **PRECINCT #4 - MELBA ONEY**
   P.O. Box 762
   Harleton, TX 75651
   903/777-3232

5. **PRECINCT #5, PL. 1 - PEARL SCHNORBUS**
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4854

6. **PRECINCT #5, PL. 2 - ALPHONZO WILLIAMS**
   Harrison County Courthouse
   Marshall, tX 75670
   903/935-4856

7. **PRECINCT #6 - FAYE SUMMERS**
   Rt. 2 Box 112
   Karnack, TX 75661
   903/679-3059 (Office) or 903/679-3576

CONSTABLES

1. **PRECINCT #1 - TOMMY WEAVER**
   Rt. 1 Box 273-J
   Marshall, TX 75670
   903/633-2346

2. **PRECINCT #2** - ROBERT CAIN
   P.O. Box 614
   Waskom, TX 75692
   903/687-3516

3. **PRECINCT #3 - DON WELCH**
   P.O. Box 27
   Hallsville, TX 75650
   903/668-3611

4. **PRECINCT #4 - DANNY LOVETT**
   P.O. Box 365
   Harleton, TX 75651
   903/777-4032

5. **PRECINCT #5 - RICK BELL**
   508 Duncan Road
   Marshall, TX 75670
   903/938-5627 or 903/938-9674

6. **PRECINCT #6 - TOM SMITH**
   P.O. Box 82
   Karnack, TX 75661
   903/679-3060 (Store) or 903/789-3478 (Home)

COUNTY COMMISSIONERS

1. **PRECINCT #1 - JAMES D. MOONEY**
   Room 313
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4808

   Home: Rt. 3 Box 307
   Marshall, TX 75670
   903/935-7609

2. PRECINCT #2 - WILLIAM D. POWER
   Room 313
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4809

   Home: 4804 Karnack Hwy.
   Marshall, TX 75670
   903/935-3742

3. **PRECINCT #3 - MIKE ADKISSON**
   Room 313
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4810

   Home: Rt. 9 Box 517N, Cerliano Road
   Longview, tX 75601
   903/758-0194

4. **PRECINCT #4 - H. W. McCOY**
   Room 313
   Harrison County Courthouse
   Marshall, TX 75670
   903/935-4811

   Home: Rt. 2 Box 382
   Diana, TX 75640
   903/968-8182

CYPRESS VALLEY NAVIGATION DISTRICT BOARD MEMBERS

1. WILLIAM D. POWER, CHAIRMAN
   P.O. Box 8463
   Marshall, TX 75670

2. T. D. "RUSTY" HOWELL
   Howell & Sandlin
   P.O. Box 1896
   Marshall, TX 75670

3. DOTTIE RUSSELL
   Rt. 2 Box 66B
   Uncertain, TX 75661

4. SCOTT BALDWIN, SR.
   Baldwin & Baldwin
   P.O. Box 1349
   Marshall, TX 75670

5. DOROTHY P. GRANT, SECRETARY/TREASURER
   Rt. 2 Box 66
   Karnack, TX 75661

6. TOM TANNER
   Rt. 1 Box 2307
   Jefferson, TX 75657

7. ORVELL LEE HAYES
   Rt. 4 Box 414
   Jefferson, TX 75657

8. JERRY TAYLOR, VICE-CHAIRMAN
   P.O. Box 507
   Harleton, TX 75651

9. JESSE M. DEWARE, IV
   P.O. Box 668
   Jefferson, TX 75657

10. MARTIN E. WHELAN
    404 South Friou
    Jefferson, TX 75657

APPENDIX E

CONCERNED CITIZENS GROUPS

1. CYPRESS VALLEY NAVIGATION DISTRICT (List Enclosed)

2. GREATER CADDO LAKE ASSOCIATION
   GEORGE WILLIAMSON
   BIG PINES LODGE
   RT. 2
   KARNACK, TX 75661

3. ELECTED OFFICIALS (List Enclosed)

APPENDIX F

SUGGESTED SITE FOR COMMUNITY MEETING

MARSHALL PUBLIC LIBRARY
300 South Alamo
Marshall, TX 75670
Phone: (903) 935-4465

Hours:	Monday, Wednesday, and Friday	10-6
	Tuesday and Thursday	10-8
	Saturday	10-4

APPENDIX G

U.S. ARMY POINTS OF CONTACT

U.S. ARMY CONTACTS

1. Department of the Army
   Office of the Chief of Public Affairs
   Room 2E637
   ATTN: SAPA-PPD
   Washington, DC 20310-1509

2. Commander
   U.S. Army Materiel Command
   ATTN: AMCPA
   5001 Eisenhower Avenue
   Alexandria, VA 22333-0001

3. Commander
   U.S. Army Armament, Munitions and Chemical Command
   ATTN: AMSMC-IN (Mr. Raymond Gall)
   Rock Island, IL 61299-6000
   309/782-5838

4. U.S. Army Toxic and Hazardous Materials Agency
   ATTN: CETHA-PA (Mr. Hankus)
   Aberdeen Proving Ground, MD 21010-5401

5. U.S. Army Corps of Engineers
   Southwestern Division
   ATTN: CESWD-PA (Ms. Christie)
   1114 Commerce Street
   Dallas, TX 75242

6. U.S. Army Corps of Engineers
   Tulsa District
   ATTN: CESWT-PA (Mr. Adkins)
   P.O. Box 61
   Tulsa, OK 74121-0061

TECHNICAL CONTACTS

004637

1. Department of the Army
   Environmental Office
   ATTN: CEHSC-E
   Washington, DC 20310-2600
   202/694-1163

2. Commander
   U.S. Army Materiel Command
   ATTN: AMCEN-A
   5001 Eisenhower Avenue
   Alexandria, VA 22333-0001

3. Commander
   U.S. Army Armament, Munitions and Chemical Command
   ATTN: AMSMC-ISE-E
   Rock Island, IL 61299-6000
   309/782-1435

4. Commander
   U.S. Army Corps of Engineers, Tulsa District
   ATTN: CESWT-EC-G (Mr. John Roberts)
   P.O. Box 61
   Tulsa, OK 74121-0061
   918/581-7845

RESPONSIBILITIES

Following is a list of the responsibilities for implementing the LHAAP Community Relations Plan:

1. Office of the Chief of Public Affairs (OCPA), Headquarters Army

a. Coordinates media statements, releases of information, or visits concerning the LHAAP environmental studies that have nation significance.

b. Acts as the point of contact for responding to and providing all national and policy type information questions.

2. Office of the Chief of Legislative Liaison (OCLL), Headquarters Army

a. Coordinates with OCPA on notification of appropriate Congressional delegations prior to national release of LHAAP studies, as well as other Congressional notification, as necessary.

3. U. S. Army Materiel Command Public Affairs (AMCPA)

a. Coordinate release of any information or contacts with Congressional or gubernatorial delegations of any LHAAP information with other Army offices.

b. Provide additional guidance and assistance in support of the community relations plan.

c. Updates lists of Congressional members and appropriate candidates for use in distributing information (list includes members of appropriate Congressional committees who have an interest in LHAAP environmental studies).

4. U.S. Army Armament, Munitions and Chemical Command Public Affairs

a. Assists and supports the Community Relation Coordinator in implementing the plan throughout all stages of the LHAAP environmental.

b. Refers to AMC for clearance and/or coordination of a all material intended for public release not previously cleared.

c. Informs Army offices listed above of queries, release, medias visits to LHAAP as appropriate.

d. Assumes the duties of Community Relations Coordinator, as required.

5. Community Relations Coordinator (Longhorn Army Ammunition Plant Public Affairs).

a. Serves as spokesperson and community point of contact for environmental effort.

b. Coordinates information releases, visits, queries, briefings and other with Army Offices listed above.

c. Coordinated responses to queries concerning the LHAAP that require release of information not previously cleared for release.

d. Coordinates, immediately upon receipt, Freedom of Information Act requests with appropriate agencies and Army offices.

e. Refers queries pertaining to regulatory agencies such as the Environmental Protection Agency or the Texas Water Commission to the appropriate agency point of contact.

EPA Comments

Comment 1. Page 21, Section 4.2.8: Although the response to comments states that EPA's comment has been addressed, it has not. This section should read: Notice of public comment periods will be announced in the media, and the notice will describe procedures for submitting comments. A public comment period will be held for 30 calendar days for the submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS. Upon timely request, the public comment period will be extended by a minimum of 30 additional days.

Response: Concur. Language as suggest by EPA has been incorporated into the document.

Comment 2. Page 23, Section 4.2.9: EPA concurred with Metcalf & Eddy's comment about listing the documents in the Community Relations Plan in alphabetical order, however, the administrative record index identifying these and the other pertinent documents and the administrative record itself must be arranged in chronological order.

Response: Concur. The following has been added to the section on the Administrative record (Section 4.2.6): The administrative record will be indexed identifying all pertinent documents and listed in chronological order.

CETHA-PA Comments

Comment 3a. Page 2 paragraph 1.2 line 5: "The permit should become effective in February 1992." Did it? If so, state so. If not, please change the month.

Response: Concur. Clarification made.

Comment 3b. Page 6 paragraph 2.3.3, line 1: "Thirteen areas have been identified...problems." "Point of clarity: According to the February 1992 Annual Report to Congress for Fiscal Year 1991, 595 sites were identified. Of those 59, 13 are listed in the Interagency Agreement as areas that will be included in the remedial investigation/feasibility study (RI/FS). (Recommend you verify that number with the Longhorn AAP Environmental Office, Ms. Lynn Muckelrath, who should have received a Defense Environmental Restoration Program Management Information System (DERPMIS) printout of those sites (the number must match the DERPMIS)). The only reason this point is being clarified is that some reporters as well as congressional members review this

report, and questions could be raised if they compare the report with subject document.

Response: Concur. The first sentence in section 2.3.3 now reads: Thirteen areas have been identified under the Federal Facility Agreement.

Comment 3c. Page 6, paragraph 2.3.3, line 2: "Because of past disposal practices...future." Wording suggests the Army is still polluting and that the Army is not sure if contamination exists. Prefer the sentence to read, "Because of past disposal practices, soil and groundwater within Longhorn AAP is contaminated."

Response: Concur. Suggested language incorporated.

Comment 3d. Page 7, paragraph 2.3.3 line 6: "Although surface water contamination...Caddo Lake." Sentence seems misleading. Prefer the sentence to read, "Four creeks flow through Longhorn AAP and drain to Caddo Lake on the eastern boundary of the installation. While surface water is contaminated in some areas within the installation, surface water contamination has yet to be detected outside the installation."

Response: Concur. Suggested language incorporated.

Comment 3e. Page 7, paragraph LHAAP 27, line 2: "...three shallow soil samples." If these were surface soil samples, use "surface" instead of "shallow" to be consistent.

Response: Concur. The word "surface" is used.

Comment 3f. Page 24, Table 4.1, Item 8: Correct this to reflect that public comments are solicited at the record of decision (ROD) stage, not RI/FS.

Response: Concur. Formal solicitation of comments is noted in table.

Comment 3g. Page 24, Table 4.1, Item 5: Public Notice is issued at ROD stage, not a press release. There is a big difference.

Response: Concur. There is a big difference between press releases and Public Notices. Table reflects the fact that a Public Notice is issued at the ROD stage as well as press release.

Comment 3h. Page G-1: Army Points of Contact should include Public Affairs Office' Points of Contact (this is a Public Affairs document). The U.S. Army Toxic and Hazardous Materials Agency, (USATHAMA); U.S. Army Engineer Division, Southwestern; and U.S. Engineer District, Tulsa, Public Affairs Offices should be included.

Response: Concur. All suggested Public Affair Offices and location are included.

Comment 4. The January 1992 Community Relations is Superfund Handbook states that, "Agency staff should conduct interviews with at least 15-25 residents to obtain input from a variety of community residents." Therefore, our comment that not enough people were interviewed still stands.

Response. The data for this Community Relations Plan was collected prior to the release of the January 1992 Superfund Handbook.... The community relations plan adheres to the guidance in the 1988 Handbook, the guidance regulators requested to be used in developing this CRP. Additional interviews may be conducted at a later time if necessary. However, not releasing the Plan until more interviews are conducted would only impede implementing the intent of the plan.

Comment 5. We are also well aware the the Privacy Act prohibits the release of interviewees names. However, it is always a matter of course for DRAFT Community Response Plans (CRP) to contain the interviewee list so that regulators and Army public affairs offices can place the list in their files BEFORE it is removed from the FINAL document.

Response. All those interviewed have been place on appropriate mailing lists. It not clear what "files" to which the comment makes reference. It is not a matter of course to be cavalier with protecting the privacy of those who volunteered their time to participate in the interview. Identifying the respondent in either a DRAFT or FINAL document as an interview participant is not needed to insure they are placed on future mailing lists. Besides professional ethics, the Privacy Act along with several other pieces of Federal legislation requires careful treatment of any list of interview respondents.

Comment 6. The other suggestions we had for the CRP were to make it more presentable for the reader. True, the regulators may not have asked for the CRP to incorporate everything we suggested, but USATHMA always strives to put more in our documents than the minimum required.

Response. No response necessary.

Comment 7. Please ensure that the installation commander sees the CRP before it is released so that he/she can be aware of the activities that are required at Longhorn AAP.

Response. Concur.

EPA Comments:

1. The Community Relations Plan (CRP) needs to identify the local and area media (i.e., newspapers and local or area television stations). Include addresses and phone numbers for the local and area media. This information can be included as an appendix.

Response: Concur, see Appendix C.

2. The CRP needs to identify local and area elected or appointed officials and Federal, State, and local agencies. This information can be included as an appendix.

Response: Concur, see Appendix D.

3. Page 10, Section 3.3, Para. 2: typo "reenforce" should be "reinforce".

Response: Concur.

4. Page 20, Section 4.2.6: The administrative record should be accessible to the public at another location in addition to LHAAP. A good location is always the public library.

Response: Concur.

5. Page 18, Section 4.2.8: The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300) indicates that public comment is only required for the selection of a remedy (300.430(f)(2)), not on the RI/FS itself. However, the administrative record that has been compiled for the site will contain the RI/FS, and the administrative record is available for public comment (300.800) during the public comment period on the proposed plan. Furthermore, the NCP requires that a minimum of "...30 calendar days be established for the submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS. Upon timely request, the lead agency will extend the public comment period by a minimum of 30 additional days" (300.430(f)(3)(i)(C)).

Response: Add paragraph using the content and language in the above para 4.

6. Page 18, Section 4.2.8: The ROD requires EPA's approval of the remedy selection. Although concurrence by the State is sought by EPA and DOD, the State's concurrence with the remedy is not necessary for implementation of a remedial action at a Federal facility. However, concurrence is ultimately necessary for the deletion of a site from the NPL.

Response: Delete the work "state" in Section 4.2.8, Para 2.

EPA Comments (cont. from Metcalf & Eddy)

Section 3.0 (page 7)

Comment In addition to the many federal and state organizations,. at least one non-profit water supply corporation (Karnack should be included.

Response: Concur. Several water supply entities are listed in the mailing list appendices.

(page 14 table 3.2)

Comment: "Serving on Independent Citizen Advisory Committee" should match Section 4.2.3 heading "Independent Environmental Advisory Group, page 19 (4.2.9)

Response: The wording in the table matches the wording of the question item. The word "group" is recommend to remain in the heading in page 19 because the group may want to structure it own organization in some other fashion than a committee (such as a non-profit association).

Section 4.0 (page 18, Section 4.2.8)

Comment: There will probably be several ROD's for the installation, and each ROD will require public notice. The US EPA Regional Administrator will sign the ROD, and the decision will meet the requirements of the CERCLA.

Response: Concur. Wording to that effect will be inserted in to that section.

Section 19, Section 4.2.9

Comment: The list of items to be filed in the repository should be listed in planned order of production or from " A to Z".

Response: Concur. Items listed "A to Z".

Page 21, Table 4-1

Comment: For the Fact Sheet mark "X" in each activity area (RI/RS Summary and ROD) instead of * "Activity if needed. Also Fact sheet should be published for the beginning of the field work and for each proposed ROD.

Response: Concur. Table will reflect change.

Comment: The Citizens Advisory Groups should be formed to obtain citizens involvement as early as possible.

Response: Concur

HQ, AMSMC-EQ Comments:

1. Page i, Executive Summary, Line 4: Delete the word "land" and add the word "and".

Response: Concur.

2. Page i, Executive Summary, Line 7: Delete the word "program" and add the word "process/phase".

Response: Concur.

3. Page 5, Section 2.2.3, last line: Delete the word "presently", because on Page 6, Lines 3-5 it is stated that "... groundwater contamination outside the installation has not been detected at this time."

Response: Concur.

4. Page 16, Section 4.2.2, Line 5: Insert after "(RI/FS)" the following "and/."

5. Page 16, Section 4.2.2, Lines 7-9: The statement about the chairman in the last sentence is vague. IAW the 23 Apr 90 AR 200-1, Page 54, Paragraph 9-10 (b), "The IC will be responsible for establishing and designating a chairperson for the TRC as part of any ongoing IRP cleanup program ..."

Response: Language will be added to suggest that LHAAP representative be the TRC chair.

6. Page 16, Section 4.2.3, All: The TRC may or does not appoint the independent environmental advisory group. However, individuals or groups who are not satisfied with the technical information or findings provided by the Army may hire an independent consultant to verify the Army's findings. The individuals or the groups will have to apply for the Superfund Technical Assistance Grant (TAG), which is controlled by USEPA. Mr. Tom Oliver of USEPA Region VI will be more qualified to provide detailed information about the TAG program. Mr. Oliver can be reached at the following commercial telephone number: (214) 655-2240. Request that Paragraph 4.2.3 be deleted.

Response: No where in the CRP is it suggested that the independent environmental group utilize a TAG or function to verify findings. Conversations with EPA Region VI indicate that such groups are very useful and desirable to facilitate public involvement and communication. EPA comments recommend establishing such a group as soon as possible. Based on this recommendation, Paragraph 4.2.3 will remain unchanged.

7. Page 24, Introductory Remark, Line 5: Insert the words "Texas Water Commission" after the word "Agency,".

Response: This was the actual wording in the interview.

8. General: Request that the reference documents used in preparing the draft CRP be cited in a reference section of the draft CRP.

Response: Concur. Reference documents will be listed in Section 1.2, Regulatory Involvement.

AMSMC-IN Comments:

General: Telephone contact has been made by TD PAO with the U.S. Army Toxic and Hazardous Material Agency (USATHAMA) PAO for guidance on material and subject material. TD requested and received a USATHAMA style CRP. Suggestions and review of the USATHAMA document have been taken into account in responding to written comments.

1. In Section 2.0, History and Site Description: Need to add a subsection 2.4, and entitle it Previous Environmental Studies. Include when first studies were done, when was the contamination first discovered/verified, and when were efforts, such as the installation of groundwater monitoring wells, completed.

Logic: The section as it now reads leads one to believe nothing happened until the ammunition plant was placed on the NPL in 1990.

Response: Concur. Though the CRP is only in response to the NPL, Section 2.4, Previous Environmental Studies, will be added.

2. In Subsection 3.4, Community Interviews: Need to add a sentence stating who conducted the interviews.

Logic: As section reads now, one doesn't know who actually conducted the interviews. Was it Longhorn AAP personnel, Corps of Engineers personnel, a private contractor, or a combination thereof.

Response: Concur. Sentence has been changed to identify the Corps of Engineers as the one conducting the CRP interviews.

3. In Section 4.0, Community Relations Activities: Need to add a new Subsection 4.2, and entitle it Responsibilities; and renumber existing subsections in Section 4.0. The new subsection should list the public affairs chain of command and what each level is responsible for.

Logic: The public needs to know who and what level is involved with each public affairs action that will/could occur as part of the ammunition plant's Installation Restoration Program.

Response: As specified in EPA guidance and to avoid confusion, the public needs one contact for CRP activities and that is the CRP Coordinator. Appendix G will be added specifying the LHAAP PAO chain of command for others who might be interested.

4. In Subsection 4.2, Activities: Rename subsection to Communication Activities and Techniques and list each of the techniques that could be used under each of three activity areas; Interagency communication techniques; public and media communication techniques; and installation employee communication techniques.

Logic: Better flow of material. As presently written, it is hard to understand what each of the activities should be used for.

Response: Mostly concur. This comment seems to making reference to the different elements of the community (agencies, public, and employees) and what CRP activities are planned for each element. The suggested title change is not specific enough because the section deals more with community relations than with communication. The title will be changed to Community Relations Activities and Techniques. Section 4.2, Techniques for Agencies, Public, and Installation Employees, will be added.

5. Under Subsection 4.2, Section 9, Public Information Repositories: The location of the repositories should be given; i.e., at the Karnack Community Hall, 10 Main Street; Longhorn Administration Building, Building 1A; etc.

Logic: Right to know information.

Response: Concur. At the suggestion of the Region VI EPA Office, the Marshall Public Library address will be listed in Section 4.2.9.

6. Need to include additional appendices:

a. Media Mailing list.
b. Elected Officials.
c. Concerned Citizens and Groups Mailing List.
d. Suggested Sites for Community Meetings.

Logic: Right to know information.

Response: Concur. Appendices have been added.

Comments CETHA-PA (360-61a) memorandum dated 31 March 1992

General:

Comments made in paragraphs 4a, 4b, 4e, and 4h are redundant in relation to comments made in letter AMSMC--IN, dated 16 March 1992. The same comment is also listed more than once in paragraphs 3 and 4c. The statement about seeking USATHAMA guidance is not accurate. Several telephone conversations between USATHAMA-PAO and Tulsa District PAO and Tulsa District Economic and Social Analysis Branch were conducted during the week of March 23, 1992. As evidence of the coordination, Tulsa District requested and received a copy of a USATHAMA style community relations plan sent to Tulsa District's PAO office.

The Longhorn CRP has been developed working closely with EPA Region VI personnel, Corps of Engineer District offices in Fort Worth and Tulsa, as well as staff from the installation. The CRP is based on sound information and experience in dealing with the community. USATHAMA-PAO has considerable experience in environmental restoration and should be considered a useful resource in implementing community relations for any future clean-up activities, including revisions to the CRP if needed. However, re-interviewing and reformatting the CRP document is not merited and would only delay other important community relations activities.

Specific.

4a. Comment. Lacks cohesiveness and clarity.

Response. Comment is not specific enough to provide a response.

4b. Comment. It should include a map of the "thirteen areas identified as having potential environmental problems" and explain what has been or is being done at each area to remedy the situation.

Response. In response to an earlier comment, a description of the sites has been added to Section 2. Detailed maps and discussion of clean-up action goes well beyond the scope of a community relations plan. Given the stage of investigation, discussion of remedial action is premature. This information is better suited for other documents included in the Information Repository.

4c. Comment. Not enough people were interviewed (10 people is not enough).

Response. Do not concur. It is not clear what the basis is for the opinion that "10 people are not enough". As stated in the EPA Guidance, Community Relations in Superfund (OSWER Directive 9230.03b), situations occur where only a few selected interviews or

informal discussions need to be conducted to complete the information necessary to develop a successful CRP (page 3-2). The persons interviewed for this CRP were selected from a list of community leaders of diverse background. This technique of using community leaders as a reflection of community attitudes and concern is well documented as an effective methodology. The Corps of Engineers has effectively used such techniques for environmental planning for over two decades. EPA Region IV and Texas Water Commission regulators have not raised the issue of sample size in this or other community relations efforts conducted in Fort Worth's or Tulsa District's jurisdiction. Review of newspaper files, letters written to the installation, discussions with installation staff, regulators, and other familiar with Longhorn support the findings reported in the CRP. As pointed out in the EPA guidance, more interviews may have to be conducted as the clean-up action progresses. However, at this time, such efforts are not merited.

4d. Comments. The interview questions and the conclusions drawn were too broad.

Response. Do not concur. Questions listed in Appendix B are far more detailed and specific than those listed in the EPA guidance or those listed and displayed in the USATHAMA IRP (CRP) document. These questions were reviewed by regulators and installation staff and accepted prior to conducting the interviews. Questions very similar in format have been addressed in the research literature. It would not be appropriate to tabulate responses to each question within the text of a CRP. The CRP document is considered to be a nontechnical document intended for a variety of audiences. Information presented is intended to be brief and to the point.

4e. Comment: The plan does not contain any news clips to show what kind of media coverage the Plant has received.

Response: Concur. The plan does not display such information because in the case of Longhorn, there has been a minimal amount of media coverage about this specific clean-up action. The Longhorn PAO maintains an extensive clipping file containing articles on a variety of activities at the installation. However, inclusion of such in this CRP would not be relevant. If this comment is intended to state that the plan should include such information, the response is "do not concur".

4f. Comment: The plan does not contain any Army news release or fact sheets to show what kind of effort the Army has made to keep the public informed.

Response. Such information belongs in the Information Repository, not in the CRP. As outlined in the EPA guidance, the intent of the CRP is to define community concerns and method of information exchange, not to demonstrate that efforts have been made to do so.

4g. Comment: The schedule for community relations activities is incorrect (i.e., formal comment solicitation is at the ROD stage, not at the RI/FS stage as the plan currently states, etc.)

Response: Concur. Schedule has been corrected in earlier comment made by EPA regulators. It is not clear what "etc." references.

4h. Comment: The plan is missing a mailing list, interview list, officials/community leaders list, ALL Army points of contacts (both technical and public affairs, as well as all levels from installation to MACOM to Corps).

Response: Concur, with exception. Mailing lists have been added. Interview lists are not included because each interviewee was guaranteed confidentiality. Army points of contacts and chain of contact have been added in an appendix.

004653

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

May 13, 1992

Lynn Mucklerath, Project Manager
Longhorn Army Ammunition Plant
Attn: SMCLO-EN
Marshall, Texas 75671-1059

Re: Longhorn Army Ammunition Plant

Dear Mr. Muckelrath:

We have reviewed your April 28, 1992 requests to extend the submittal date for the revised RI/FS Work Plan an additional 20 days to June 12, 1992, and to extend the submittal date for the revised Community Relations Plan 20 days to May 20, 1992. Texas Water Commission staff have no objection to the extensions. If we can be of further assistance, please call me at 512/463-7797.

Sincerely yours,

Michael A. Moore
RI/FS II Unit
Superfund Investigation Section
Pollution Cleanup Division

MM:ls

cc: Lisa Price (6H-ET), EPA Region VI

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
MARSHALL, TEXAS 75671-1059

004654

REPLY TO
ATTENTION OF

May 14, 1992

SMCLO-EV

Environmental Protection Agency
ATTN: Ms. Lisa Marie Price
1445 Ross Avenue, Suite 1200

Dear Ms. Price:

As required by the Federal Facility Agreement, we are submitting responses to comments by the Environmental Protection Agency and the Texas Water Commission on the Initial Remedial Actions/Data Quality Objectives Report.

For further information, please contact Mr. Lynn Muckelrath, (903) 679-2980.

Sincerely,

Robert W. Bringman
Lieutenant Colonel, U.S. Army
Commanding Officer

Enclosure

Copy Furnished:
CESWT-EC-GR (Anderson)

RESPONSE TO COMMENTS
LONGHORN ARMY AMMUNITION PLANT
INITIAL REMEDIAL ACTION/DATA QUALITY OBJECTIVES

EPA

General Comment.

Concur

Specific Comments.

CMT #	SECTION	PAGE/ PARA	RESPONSE
1	2.0	2-1	Concur
2	3.0	3-1	Concur
3	4.0	4-1	Concur
4			Concur. All TWC comments have been annotated and addressed in revisions.

RESPONSE TO COMMENTS
LONGHORN ARMY AMMUNITION PLANT
INITIAL REMEDIAL ACTION/DATA QUALITY OBJECTIVES

EPA
METCALF & EDDY

General Comments.

1. The chemicals listed on Table 5-1 were selected using data obtained from former investigations at the sites, using knowledge of activities performed at the sites, and using the ARARs for chemicals identified or suspected for the sites. Chemicals identified during past investigations as exceeding the ARARs are listed. For those sites not previously investigated, the chemicals suspected to be present are listed. For those chemicals having ARARs, the minimum action level specified by the ARAR is the minimum level of concentration used for listing the chemical on Table 5-1. For those chemicals not having ARARs but known to be a threat to health and the environment due to a characteristic, i.e., explosive compounds, the detection limit for these chemicals is the minimum level of concentration used for listing the chemical on Table 5-1.

2. A comprehensive list of analyses was developed for analyzing samples at all sites to include all contaminants of concern, as well as to eliminate any potential contaminants of concern should no contamination be found, especially at those sites where no investigations have been performed. Past investigations performed at some sites were not always comprehensive in identifying the full realm of contaminants which may be present. The metals and anions selected for inclusion in the analyses are those for which primary drinking water standards are established. It was discussed at the first ARAR meeting for the project that only those constituents addressed in the primary drinking water standards would be selected for analysis because it is unlikely that remediation of ground or surface water at any of the sites will be to secondary drinking water standards. However, there is some concern about elevated levels of chloride and sulfate at some of the sites. Therefore, at the request of the regulators, chloride and sulfate analyses will be added to the comprehensive list of parameters to be analyzed for each of the sites. This will be included in the revised Work Plan.

Specific Comments:

Page 5-9, Table 5-1.

Targeting VOCs as a DQO for Site 29 is an error. Toluene is the only VOC of concern because of the bulk storage of this compound at the site. Sites 13 and 14 do not include VOCs as a DQO because

neither site has been previously investigated and the activity suspected for each site does not include VOCs as a suspected contaminant. Site 13 is listed for either explosive or acidic waste burial, with stressed vegetation possibly suggesting pesticide or herbicide disposal. Site 14 is listed as a burial ground with debris suspected to be contaminated with explosive wastes. The comprehensive list of analyses to be performed on the samples from each of these sites will identify these other contaminants if they are present, and the DQOs will be revised accordingly.

Page 5-9, Table 5-1 and Page 3-117, Table 3-7-2.

Lead was erroneously listed as a contaminant of concern.

Page 5-10, Table 5-1.

These specific VOCs were listed because they have been identified in the ground water at the site and are addressed by the ARARS. Because various solvents have been disposed at the site, all VOCs are also included as a DQO until a complete list of specific targeted VOCs can be determined for the site.

Page 5-10, Table 5-1.

Asbestos was erroneously listed as a contaminant of concern.

Page 5-9, Table 5-1.

Concur. Detection limit shown was typographical error. Detection limit should be 0.01 mg/l.

RESPONSE TO COMMENTS
LONGHORN ARMY AMMUNITION PLANT
INITIAL REMEDIAL ACTION/DATA QUALITY OBJECTIVES

TWC

Comments

CMT #	SECTION	RESPONSE
1	2.0	Concur
2	3.0	Concur
3	4.0	Concur
4	5.2.4.1.5	Concur. The intent of the sampling methods described in this section is to perform a field screening of potential contaminants at a site, not to obtain representative samples of the ground water. As a field screening tool, grab sampling of the ground water encountered in soil borings can be used to determine if soil contamination at the site has impacted the ground water. The methods are "good" in the sense that if contaminants are present, they will be detected using these sampling methods. Only ground-water samples from monitoring wells will be used for representing the ground-water quality of the transmissive zone(s) beneath the site.
5	Table 5-1	Concur. The units of Table 5-1 are correct for metals and nitrates. The correct units of measurement for all other contaminants are ug/l for water and ug/kg for soil/sediment. A table addressing the sampling plan for each of the sites is provided and will be included in the revised Work Plan. The table addresses all information requested except the test methods to be used. These are listed in Volume 2, Chemical Data Acquisition Plan, of the Work Plan. Numbers of samples reflect the revised sampling plans for each site, which will be addressed in the revised Work Plan.

TABLE A - 1
SAMPLING PLAN SUMMARY
RI PHASE I FIELD INVESTIGATIONS

SITE	TYPE OF SAMPLE																											
	SURFACE WATER			SEDIMENT			SHALLOW SOIL / WASTE			SOIL FROM SOIL BORINGS (SB) AND WELL BORINGS (MW)											GROUND WATER FROM SOIL BORINGS (SB) AND WELLS (MW)					TRAVEL BLANK	EQUIP BLANK
LHAAP NO.	SAMPLE TYPE			SAMPLE TYPE			SAMPLE TYPE			LOCATION		EST. AVG. DEPTH WTR.	EST. AVG. DEPTH		SAMPLING FREQUENCY	SAMPLE TYPE			LOCATION	SAMPLE TYPE				TB	EB
	WATER	QA	QC	SOIL	QA	QC	SOIL	QA	QC	SB	MW		SB	MW		SOIL	QA	QC	SB	MW	WATER	QA	QC		
	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	FEET	FEET	FEET	FEET	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY
11	2	0	0	2	0	0	0	0	0	6	0	16	18	-	5.0	30	3	3	6	0	6	1	1	4	2
13	0	0	0	0	0	0	0	0	0	4	1	25	27	45	5.0	30	3	3	4	1	5	1	1	4	2
14	0	0	0	0	0	0	0	0	0	3	1	24	26	45	5.0	24	3	3	3	1	4	1	1	3	2
16	5	1	1	5	1	1	0	0	0	4	11	19	21	40	5.0	75	8	8	4	12	16	2	2	12	4
17	3	0	0	3	0	0	0	0	0	7	1	5	7	25	2.5	24	3	3	7	3	10	1	1	6	3
18 & 24	8	1	1	8	1	1	0	0	0	0	0	-	-	-	-	0	0	0	0	40	40	4	4	13	3
29	13	1	1	13	1	1	8	1	1	8	0	20	22	-	5.0	40	4	4	8	6	14	2	2	10	4
12	3	0	0	3	0	0	2	0	0	0	7	18	-	40	5.0	35	4	4	0	9	9	1	1	8	3
32	7	1	1	7	1	1	4	0	0	13	0	10	12	-	2.5 & 5.0	39	4	4	8	1	9	1	1	7	3
01	6	1	1	6	1	1	0	0	0	8	0	5	7	-	2.5	24	3	3	8	1	9	1	1	7	2
XX	7	1	1	7	1	1	0	0	0	7	0	20	22	-	2.5 & 5.0	29	3	3	4	2	6	1	1	6	2
27	4	0	0	4	0	0	4	1	1	9	0	8	10	-	5.0	27	3	3	9	2	11	2	2	6	3
TOTALS	58	6	6	58	6	6	18	2	2	69	21	-	-	-	5	377	41	41	61	78	139	18	18	86	33

- DENOTES NOT APPLICABLE

NOTES:

1. ALL SAMPLES WILL BE ANALYZED FOR VOLATILE ORGANIC COMPOUNDS (VOC'S), SEMIVOLATILE ORGANIC COMPOUNDS (SVOC'S), EXPLOSIVE COMPOUNDS, 11 SELECTED METALS, NITRATE, CHLORIDE, AND SULFATE, WITH THE FOLLOWING EXCEPTIONS:
   a. WASTE LINE SAMPLES FROM LHAAP 29 & LHAAP 32 WILL BE ANALYZED FOR VOC'S AND EXPLOSIVES ONLY.
   b. TRIP BLANKS WILL BE ANALYZED FOR VOC'S ONLY.
2. SITES LHAAP 13, 32, AND 27 WILL INCLUDE PESTICIDES AND HERBICIDE ANALYSES.

DEPARTMENT OF THE ARMY
LONGHORN/LOUISIANA ARMY AMMUNITION PLANTS
MARSHALL, TEXAS 75671-1059

004660

REPLY TO
ATTENTION OF

May 18, 1992

SMCLO-EV

Environmental Protection Agency
ATTN: Ms. Lisa Marie Price
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Price:

As required by the Federal Facility Agreement, we are submitting responses to comments and the Final Community Relations Plan.

For further information, please contact Mr. Lynn Muckelrath, 903-679-2980.

Sincerely,

Robert W. Bringman
Lieutenant Colonel, U.S. Army
Commanding Officer

Enclosure

Copy Furnished:
CESWT-EC-GR (Anderson)

EPA Comments:

1. The Community Relations Plan (CRP) needs to identify the local and area media (i.e., newspapers and local or area television stations). Include addresses and phone numbers for the local and area media. This information can be included as an appendix.

Response: Concur, see Appendix C.

2. The CRP needs to identify local and area elected or appointed officials and Federal, State, and local agencies. This information can be included as an appendix.

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3. Page 10, Section 3.3, Para. 2: typo "reenforce" should be "reinforce".

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5. Page 18, Section 4.2.8: The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300) indicates that public comment is only required for the selection of a remedy (300.430(f)(2)), not on the RI/FS itself. However, the administrative record that has been compiled for the site will contain the RI/FS, and the administrative record is available for public comment (300.800) during the public comment period on the proposed plan. Furthermore, the NCP requires that a minimum of "...30 calendar days be established for the submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS. Upon timely request, the lead agency will extend the public comment period by a minimum of 30 additional days" (300.430(f)(3)(i)(C)).

Response: Add paragraph using the content and language in the above para 4.

6. Page 18, Section 4.2.8: The ROD requires EPA's approval of the remedy selection. Although concurrence by the State is sought by EPA and DOD, the State's concurrence with the remedy is not necessary for implementation of a remedial action at a Federal facility. However, concurrence is ultimately necessary for the deletion of a site from the NPL.

Response: Delete the work "state" in Section 4.2.8, Para 2.

EPA Comments (cont. from Metcalf & Eddy)

Section 3.0 (page 7)

Comment In addition to the many federal and state organizations,. at least one non-profit water supply corporation (Karnack should be included.

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(page 14 table 3.2)

Comment: "Serving on Independent Citizen Advisory Committee" should match Section 4.2.3 heading "Independent Environmental Advisory Group, page 19 (4.2.9)

Response: The wording in the table matches the wording of the question item. The word "group" is recommend to remain in the heading in page 19 because the group may want to structure it own organization in some other fashion than a committee (such as a non-profit association).

Section 4.0 (page 18, Section 4.2.8)

Comment: There will probably be several ROD's for the installation, and each ROD will require public notice. The US EPA Regional Administrator will sign the ROD, and the decision will meet the requirements of the CERCLA.

Response: Concur. Wording to that effect will be inserted in to that section.

Section 19, Section 4.2.9

Comment: The list of items to be filed in the repository should be listed in planned order of production or from " A to Z".

Response: Concur. Items listed "A to Z".

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Comment: For the Fact Sheet mark "X" in each activity area (RI/RS Summary and ROD) instead of * "Activity if needed. Also Fact sheet should be published for the beginning of the field work and for each proposed ROD.

Response: Concur. Table will reflect change.

Comment: The Citizens Advisory Groups should be formed to obtain citizens involvement as early as possible.

Response: Concur

DEPARTMENT OF THE ARMY
LONGHORN/LOUISIANA ARMY AMMUNITION PLANTS
MARSHALL, TEXAS 75671-1059

004663

REPLY TO
ATTENTION OF

May 19, 1992

SMCLO-EV

SUBJECT: Revised Remedial Activities Schedule for Longhorn Army Ammunition Plant

Environmental Protection Agency
ATTN: Ms. Lisa Marie Price
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Price:

Enclosed is the revised schedule proposed for the Remedial Activities at Longhorn Army Ammunition Plant. This schedule incorporates the additional time requirement for Phase 2 investigations and the Remedial Investigation/Feasibility Study Work Plan extensions.

If you have any questions, please contact Mr. Lynn Muckelrath at (903) 679-2980.

Sincerely,

Randall J Miller CAPTAIN
for Robert W. Bringman
Lieutenant Colonel, U. S. Army
Commanding Officer

Enclosure

Deadlines for Primary and Secondary Documents

Initial Activities:

Community Relations Plan: (primary document)	
Draft submitted	February 29, 1992
Final	June 19, 1992
RI/FS Work Plan: (primary document)	
Draft submitted	February 29, 1992
Final	July 13, 1992
Initial RA/DQO: (secondary document)	
submitted	March 14, 1992

Remedial Investigation Activities:

Phase 1 and 2 Field Investigations	July 13, 1992 - April 9, 1993
Sampling and Data Results: (secondary document)	
submitted	September 23, 1993
Site Characterization Summary: (secondary document)	
submitted	January 22, 1994
Remedial Investigation Report: (primary document)	
Draft submitted	May 23, 1994
Final	August 22, 1994

Feasibility Study Activities:

Initial Screening of Alternatives Report: (primary document)	
Draft submitted	December 11, 1992
Final	March 12, 1993
Post-Screening Investigation Work Plan: (secondary document)	
submitted	May 26, 1993
Treatability Study Report: (secondary document)	
submitted	April 22, 1994
Detailed Analysis of Alternatives Report: (secondary document)	
submitted	August 21, 1994

Deadlines for Primary and Secondary Documents

Feasibility Study Activities: (continued)	
Feasibility Study Report: (primary document)	
Draft submitted	December 20, 1994
Final	March 21, 1995
Risk Assessment Report: (primary document)	
Draft submitted	April 22, 1994
Final	July 22, 1994
Proposed Plan: (primary document)	
Draft submitted	April 20, 1995
Final	July 20, 1995
Responsiveness Summary: (primary document)	
Draft submitted	October 20, 1995
Final	January 19, 1996
Record of Decision: (primary document)	
Draft submitted	November 19, 1995
Final	February 18, 1996
Remedial Design Work Plan: (primary document)	
Draft submitted	March 21, 1996
Final	June 20, 1996
Remedial Design Activities:	
30% Remedial Design: (secondary document) submitted	June 21, 1996
60% Remedial Design: (secondary document) submitted	August 21, 1996
90% Remedial Design: (secondary document) submitted	October 20, 1996
Remedial Design: (primary document) Final	January 20, 1997
Remedial Action Work Plan: (primary document)	
Draft submitted	January 19, 1997
Final	April 20, 1997

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MAY 29 1992

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

P773 283 186

Lynn Muckelrath, Project Manager
Longhorn Army Ammunition Plant
ATTN: SMCLO-EN
Marshall, Texas 75671-1059

Dear Lynn,

Pursuant to the Federal Facilities Agreement (FFA) for the Longhorn Army Ammunition Plant, EPA has reviewed the revised deadlines for primary and secondary documents dated May 19, 1992. In principle, EPA agrees with the revised schedule given that it incorporates the need for a phased approach during the conduct of the Remedial Investigation (RI) and shows the affect the phased approach will have on the overall CERCLA activities schedule. However, EPA requests that an additional secondary document be submitted to EPA and TWC in response to the phased approach.

This additional secondary document should be submitted at the completion of Phase 1 field activities, and include a summary of sampling results and a site characterization based on the field information collected during Phase 1. You could entitle this document(s) Addendum to the RI/FS Work Plan, and you could submit the addendum(s) at the completion of the field/analysis activities for each site or at the completion of an operable unit, which ever you prefer. This addendum would allow EPA and TWC to review data collected during Phase 1, to review the site characteristics, to assist LHAAP in determining if additional information (beyond what is called for in the RI/FS Work Plan) is needed to completely characterize a site, or to assist LHAAP in determining that there is no need for further investigation.

I have discussed this matter with the Project Coordinator for the TWC, and he is in agreement that this additional document is necessary. It will allow for continued coordination between the parties and a thorough and complete RI.

If you have any questions regarding this matter or any other, please call me at (214) 655-6735.

Sincerely,

Lisa Marie Price
Remedial Project Manager
Texas Enforcement Section

6H-ET
Black

cc: copy sent Federal Express

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