

McCORMICK RANCH
ENVIRONMENTAL BASELINE SURVEY - PHASE II

MONTHLY PROGRESS REPORT
NOVEMBER 3, 1994

Prepared for :
SAFETY AND ENVIRONMENTAL DIVISION
PHILLIPS LABORATORY
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**McCORMICK RANCH
ENVIRONMENTAL BASELINE SURVEY - PHASE II**

PROGRESS SINCE LAST MEETING

- **COMPLETED ALL FIELD ACTIVITIES**
 - **TRENCHING AND HAND AUGERING**
 - **FIELD SCREENING**
 - **LABORATORY ANALYSIS**
 - **SURVEYING**

- **DRAFT REPORT**

McCORMICK RANCH ENVIRONMENTAL BASELINE SURVEY - PHASE II

OVERVIEW:

- **PROGRESS SINCE LAST MEETING**
- **RESULTS OF TRENCHING AND HAND AUGERING**
- **RESULTS OF FIELD SCREENING**
- **RESULTS OF LABORATORY ANALYSIS**
- **COMPARISON OF FIELD SCREENING AND LABORATORY RESULTS**
- **ACTION ITEMS**
- **SCHEDULE**

SUMMARY OF FIELD SAMPLING AT McCORMICK RANCH

ENVIRONMENTAL SAMPLES COLLECTED

TRENCHING: 160 Soil Samples Collected From 4 Trenching Areas

HAND AUGERING: 150 Soil Samples Collected From 13 Hand Augering Areas
2 Soil Samples Collected From Background Locations

SURFACE WATER SAMPLING: Insufficient Rainfall and Water Ponding to Collect Water Samples

FIELD SCREENING ANALYSES

NITRATES 300 Soil Samples

TNT 300 Soil Samples

PETN/SVOCs 305 Soil Samples

GROSS ALPHA/BETA/GAMMA 310 Soil Samples

LABORATORY ANALYSES

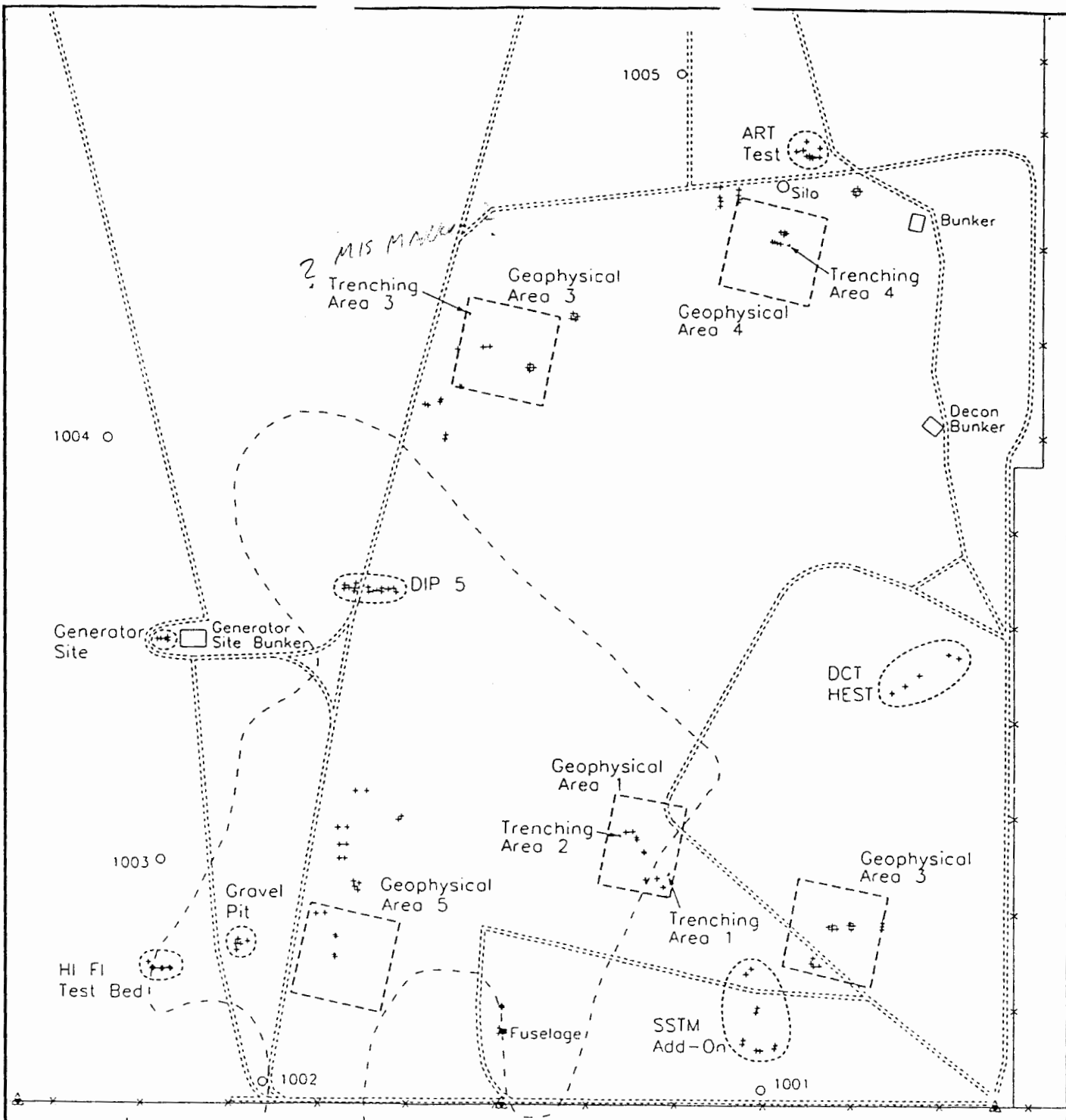
NITRATES 42 Soil Samples

EXPLOSIVES/CYANIDE 40 Soil Samples

SVOCs 18 Soil Samples

METALS 42 Soil Samples

GROSS ALPHA/BETA/GAMMA 17 Compositated Soil Samples



Isleta Indian Reservation



LEGEND

- | | | | |
|---|------------------|-------|--------------------------------------|
| ○ | USGS Well | - - - | Playa Lake Outline (from USGS, 1974) |
| + | Sample Point | ⋯⋯⋯ | Unpaved Road |
| ⊕ | Survey Benchmark | -*- | Barbed Wire Fence |

TRENCHING AREA DESCRIPTIONS

TRENCHING AREA 1 (TRENCH SEGMENTS 6 AND 12 FEET DEEP)

- Deep Linear Burial Trench Identified
- Wood, Cement, and Rebar Encountered to 12' Below Ground Surface In One Segment
- 1-2' Thick Cement Walls Encountered at 3' Below Ground Surface In Both Segments

TRENCHING AREA 2 (BOTH TRENCH SEGMENTS 9 FEET DEEP)

- Burned Steel Cable, Bolts, Rebar, and Wood (Including Railroad Ties) to 7' Below Ground Surface
- Distinct Burn Layers at 3 and 5' Below Ground Surface In One Segment
- Plastic Powder-Filled Cord Identified - Analysis Pending
- Burned Layers Appear to Define a Large Depression

TRENCHING AREA 3 (TRENCH SEGMENTS 6 AND 9 FEET DEEP)

- Wood Chips Present In First 3' Below Ground Surface
- Caliche Layer Sloping In Both Trench Segments Into Crater-Like Shape

TRENCHING AREA 4 (BOTH TRENCH SEGMENTS 6 FEET DEEP)

- Approximately 140 Strands of 1/4 Inch Instrument Cable Found At 2 Feet Below Ground Surface In Linear Depression
- Fill Materials Including Wood and Steel

GENERAL SOIL DESCRIPTIONS

- Top 6 Inches Investigated Were Primarily a Well Developed Organic-Rich Soil Horizon
- Distinct Carbonate-Cemented Caliche Layer Found Between 3 and 5 ' Below Ground Surface
 - Dense, Well Cemented Zone up to 5' Thick That May Serve as a Barrier to Contaminant Transport
 - Areas of Cementation and Cemented Grains Also Present from Ground Surface to Top of Caliche Horizon
- Two Soil Types Generally Found Above the Caliche Layer
 - Clayey Silty Sand, Well Sorted - Indicative of Eolian Depositional Environment
 - Clayey Sand - In Playa Area Where Fine-Grained Sediments Possibly Settled Out of Standing Water
- Two Soil Types Generally Found Within Caliche Layer
 - Clayey Silty Sand, Well Sorted - Indicative of Eolian Depositional Environment
 - Gravelly Sand, Poorly Sorted - Indicative of Alluvial Depositional Environment

FIELD SCREENING METHODS AND PROCEDURES

NITRATES (N-trak Soil Test Kit; Hach Company)

- Provides quantitative, colorimetric analysis
- Will detect nitrate in soil down to 1 part per million (ppm) and up to 50 ppm
- Method is accurate to +/- 2 ppm in the range of 10 to 30 ppm concentrations
- Less accurate outside this range
- QA/QC samples analyzed: three standards (15 ppm nitrate) analyzed daily; one duplicate and one method blank every 20 environmental samples screened
- Of the 300 soil samples screened for nitrate, 95% of the samples screened positive for nitrate

TNT (Immunoassay Test Kit; Ensys, Incorporated)

- Provides quantitative, colorimetric analysis for TNT and TNT degradation products using the Hack DR/2000 spectrophotometer
- Test kit conforms to EPA SW846 draft Method 8515 and will detect TNT in soil down to 1 ppm in concentration
- TNT free soil and soil containing 1 ppm TNT were tested with the kit; the method correctly identified 95% of the samples analyzed
- QA/QC samples analyzed: one standard containing 20 ppm TNT; one duplicate and one method blank every 20 environmental samples screened; one soil blank every 40 environmental samples screened
- Of the 300 soil samples screened for TNT, 0% of the samples screened positive for TNT or TNT degradation products

PETN and SVOCs (Thin Layer Chromatography; Friedman & Bruya, Inc.)

- Provides qualitative analysis for semi- and non-volatile organic contaminants
- Method is used to screen samples and limit the use of more expensive analytical laboratory procedures
- Solid-liquid system in which the liquid phase (i.e., acetone and/or hexane) is used to physically move the analytes through the solid media (i.e., silica gel); analytes strongly attracted to the solid phase will remain on the solid phase longer
- The distance the analyte has moved relative to the distance the solvent has moved is used to tentatively identify the analyte
- QA/QC samples analyzed: two PETN standards and two diesel standards daily; one duplicate, one method blank, one matrix spike, one blank spike every 20 environmental samples screened; one soil blank every 40 environmental samples screened
- Of the 305 soil samples screened for PETN and SVOCs, 5% of the samples screened positive for PETN and/or SVOCs

SUMMARY OF ORGANIC ANALYSES

- Explosive Constituents (SW8330, ADD-1, and ADD-2) Were Below Detection Limits in All Samples
- Cyanide (SW9012M) Was Below Detection Limits in All Samples
- Semi-Volatile Organic Compounds Were Detected As Follows:

Trenching Area 2 - Sample 0046-0001

Naphthalene - 56 mg/kg

Phenanthrene - 46 mg/kg

Trenching Area 2 - Sample 0049-0001

Naphthalene - .058 mg/kg (j-value)

Phenanthrene - .046 mg/kg (j-value)

- The Detected SVOCs Are Found In Creosote, Which is a Common Preservative for Railroad Ties

Generator Site - Sample 0266-0001

Diethyl Phthalate - .80 mg/kg

- Possibly Caused by Storage in Plastic Bags

SUMMARY OF INORGANIC ANALYSES

	On-Site Soil Statistics (in mg/kg)			
	Average (1)	Max (2)	Min (3)	PQL (4)
Aluminum	9345.9	15400.0	4910.0	50.0
Arsenic	3.3	7.2	1.4	0.5
Barium	141.6	275.0	95.2	10.0
Calcium	44163.6	142000.0	14300.0	100.0
Chromium	9.3	19.5	ND	5.0
Cobalt	2.9	7.1	ND	5.0
Copper	49.5	1520.0	ND	5.0
Iron	10520.0	30300.0	4420.0	5.0
Lead	7.8	27.2	3.3	0.5
Magnesium	3441.1	4710.0	2080.0	100.0
Manganese	182.1	445.0	71.1	2.0
Nickel	18.2	19.3	ND	15.0
Potassium	2037.8	3510.0	913.0	500.0
Selenium	0.4	2.0	ND	0.5
Vanadium	16.2	24.7	ND	10.0
Zinc	31.0	126.0	10.9	2.0
Nitrate + Nitrite (as N)	20.2	386.0	0.6	0.3

Background Soils (in mg/kg)	
0311-0001	0312-0001
7940.0	6120.0
2.2	2.2
127.0	128.0
53100.0	58100.0
8.5	6.0
ND	ND
5.6	ND
8210.0	6230.0
4.0	2.9
3310.0	2730.0
116.0	71.8
ND	ND
1450.0	864.0
ND	ND
17.3	14.7
18.8	13.6
0.8	0.4

Range of Reported Soil Action Levels (in mg/kg)	
Minimum	Maximum
-	-
20	80
4000	6000
-	-
400	80000
-	-
-	-
-	-
-	400
1600	2000
-	-
400	400
-	600
-	24000
-	8000, 100000

- (1) Average. The average concentration of each constituent analyzed, calculated from values in Table 5.2, where non-detects have been replaced with 1/2 the PQL value.
- (2) Max. The maximum reported concentration for each constituent analyzed.
- (3) Min. The minimum reported concentration for each constituent analyzed.
- (4) PQL. Practical Quantitation Limit. The lowest level at which an analyte can be detected reliably and within the precision and accuracy of the laboratory instrument.

ND Non Detect, the concentration of the constituent is below the Practical Quantitation Limit (PQL).
 - No soil action level for this constituent.

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COMPARISON OF FIELD SCREENING AND LABORATORY RESULTS

- **TWO OF THE THREE POSITIVE RESULTS FOR SEMI VOLATILE ORGANIC COMPOUNDS WERE DETECTED USING THE THIN LAYER CHROMATOGRAPHY METHOD**
- **NITRATE RESULTS FROM THE HACH N-TRAK KIT HAD AN AVERAGE RELATIVE PERCENT DIFFERENCE OF $\pm 37\%$ WITH THE ANALYTICAL LABORATORY RESULTS**
- **TNT FIELD SCREENING YIELDED NO HITS GREATER THAN THE DETECTION LIMIT OF 1 PPM. LABORATORY ANALYSIS IDENTIFIED NO EXPLOSIVES IN SOIL SAMPLES.**

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ACTION ITEMS

- **COMPLETE DRAFT REPORT FOR PHASE II ACTIVITIES**
- **TRANSFER MATERIALS IN FIELD SCREENING LABORATORY AND DECON BUNKER TO KAFB - EM**

McCormick Ranch Schedule of Activities

ID	Name	Duration	Scheduled Start	Scheduled Finish	1994											
					June	July	August	September	October	November	December					
1	Preparation of Plans and Procedures	35d	6/6/94	7/22/94	[Critical Bar]											
2	Draft Plans Delivered	0d	7/25/94	7/25/94		◆										
3	Phillips Lab Review Plans & Procedure	15d	7/25/94	8/12/94		[Critical Bar]										
4	Finalize Plans and Procedures	5d	8/15/94	8/19/94			[Critical Bar]									
5	Final Plans Delivered	0d	8/22/94	8/22/94			◆									
6	Preparation for Field Work	20d	7/25/94	8/19/94		[Critical Bar]										
7	Field Work	30d	8/22/94	9/30/94			[Critical Bar]									
	Field Work Completed	0d	9/30/94	9/30/94				◆								
9	Results of Laboratory Analysis	30d	9/12/94	10/21/94				[Critical Bar]								
10	Final Lab Results Received	0d	10/21/94	10/21/94					◆							
11	Prepare Draft Report	25d	10/3/94	11/4/94					[Critical Bar]							
12	Draft Report Delivered	0d	11/7/94	11/7/94						◆						
13	Phillips Lab Review Draft Report	20d	11/7/94	12/2/94						[Critical Bar]						
14	Revise Draft Report	5d	12/5/94	12/9/94							[Critical Bar]					
15	Phillips Lab Review Final Draft Report	10d	12/12/94	12/23/94								[Critical Bar]				
16	Prepare Final Report	5d	12/26/94	12/30/94									[Critical Bar]			
17	Final Report Delivered	0d	12/30/94	12/30/94										◆		

Project: McCormick Ranch
Date: 11/2/94

Critical [Hatched Bar] Noncritical [Grid Bar]

Progress [Solid Bar] Milestone [Diamond]

Summary [Arrow] Rolled Up [Open Diamond]