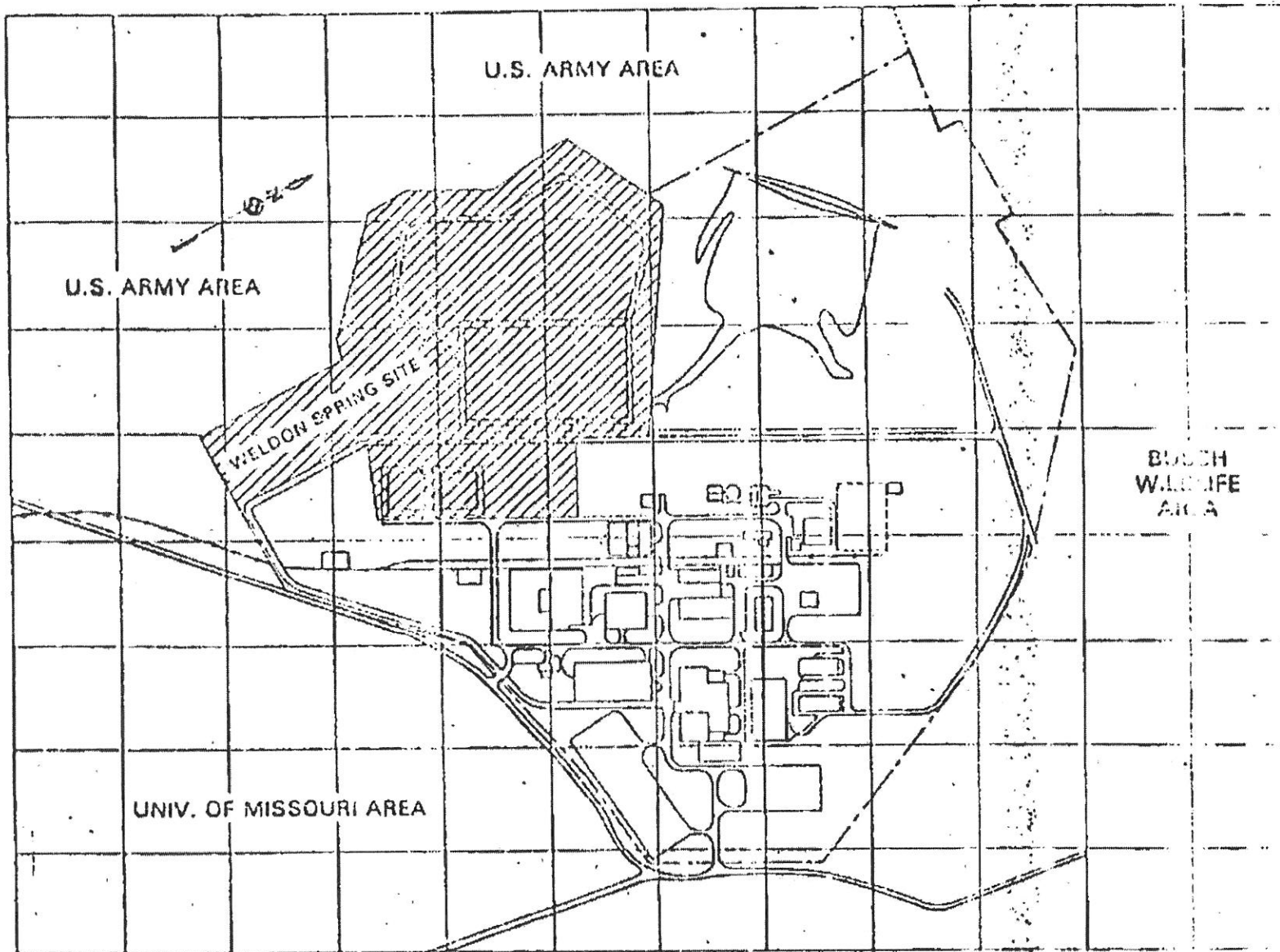


WELDON SPRING

L2
178

MAY 81

WELDON SPRING SITE PLAN



L2 179

MAY 81

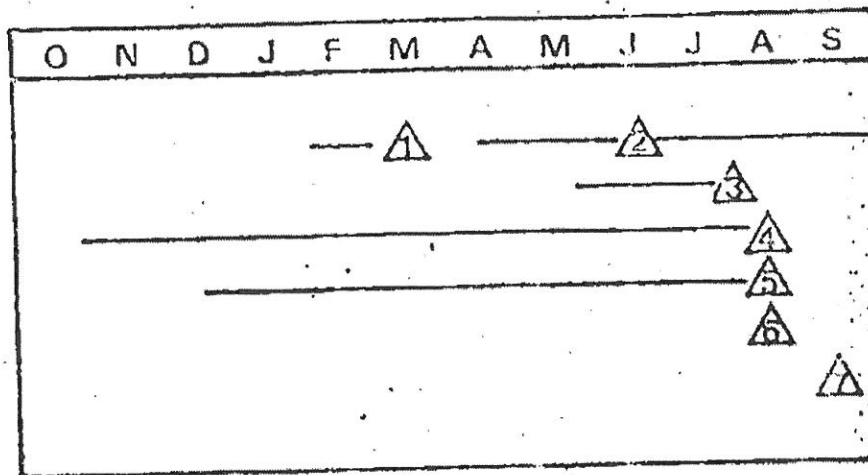
SEMI-ANNUAL ENVIRONMENTAL WATER SAMPLING POINTS

1. PROCESS SEWER OUTFALL
2. PROCESS SEWER OUTFALL STREAM AT SR-94
3. NORTHWEST STREAM, ONSITE
4. NORTHWEST STREAM, OFFSITE AT COUNTY ROAD "D"
5. ST. CHARLES CO. WATER TREATMENT PLANT. INCOMING FLOW
6. LITTLE FEMME OSAGE CREEK AT SR-94, UPSTREAM FROM QUARRY
7. LITTLE FEMME OSAGE CREEK AT MK & T RR BRIDGE, DOWNSTREAM FROM QUARRY
8. FEMME OSAGE SLOUGH, 920 FT. SOUTHEAST OF QUARRY POOL
9. FEMME OSAGE SLOUGH, 2680 FT. EAST OF QUARRY POOL AT DIRT ROAD CROSSING
10. BACKGROUND SAMPLE FROM SPRING AT JUNCTION OF SR-94 AND U.S. 40/61

NOTE: ARMY SAMPLES QUARTERLY AT 15 ADDITIONAL LOCATIONS.

L2
180

WELDON SPRING PROJECT MILESTONES FY 1981



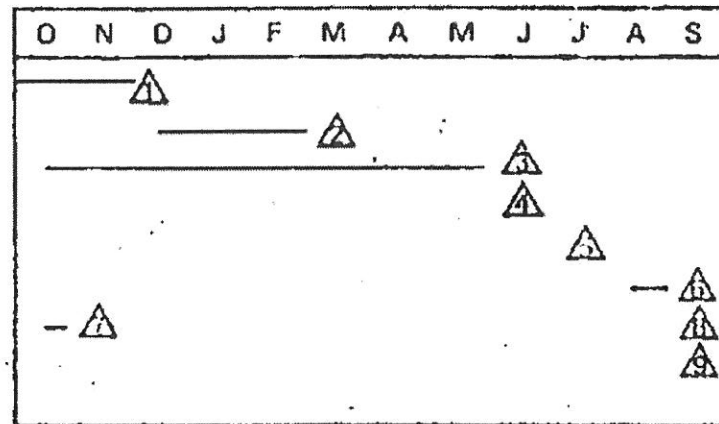
FUNDING: \$650 K

1. INITIATION OF MONITOR WELL NETWORK OUTSIDE OF QUARRY.
2. ISSUE REPORT ON MATERIALS AND OTHER SPECIFICATIONS FOR ENGINEERING OPTIONS AT WELDON SPRING QUARRY.
3. COMPLETION OF HYDROLOGIC TESTING OF THE ALLUVIUM TO THE SOUTH OF THE QUARRY.
4. INITIATION OF MODEL MODIFICATION AND APPLICATION TO THE QUARRY SITE.
5. INITIATION OF MONITORING OF FY 1980 OBSERVATION BORINGS AROUND RAFFINATE PITS.
6. REVIEW MEETING WITH ORO/ORNL AND STATE OF MISSOURI.
7. SUBMIT FINAL REPORT OF FY 1981 ACTIVITIES.

L2-181

MAY 81

WELDON SPRING PROJECT MILESTONES FY 1982



FUNDING: \$1540 K*

1. ISSUE FINAL REPORT ON ENGINEERING OPTIONS FOR WELDON SPRING QUARRY.
2. COMPLETION OF THE MONITORING WELL NETWORK OUTSIDE THE QUARRY SITE.
3. UPDATE MODELING RESULTS OF QUARRY TO INCLUDE NEW DATA.
4. SUBMIT REPORT WITH SUGGESTED REMEDIAL ACTIONS FOR QUARRY BASED ON FIELD AND MODELING RESULTS.
5. CONDUCT REVIEW OF REMEDIAL ACTION OPTIONS MEETING WITH ORO/ORNL AND STATE OF MISSOURI.
6. FINALIZE MODELING OF REMEDIAL ACTION PLANS SUGGESTED BY DOE.
7. COMPLETION OF OBSERVATION BORINGS AROUND RAFFINATE PITS.
8. COMPLETION OF HYDROLOGIC TESTING AT THE RAFFINATE PITS.
9. PUBLICATION OF REPORT COVERING WORK AT WELDON SPRING QUARRY AND RAFFINATE PIT SITES.

*MILESTONES ARE GIVEN FOR A MAXIMUM EFFORT CASE; EXPECTED LOWER LEVELS OF FUNDING WILL AFFECT STATED MILESTONES.

MAY 81

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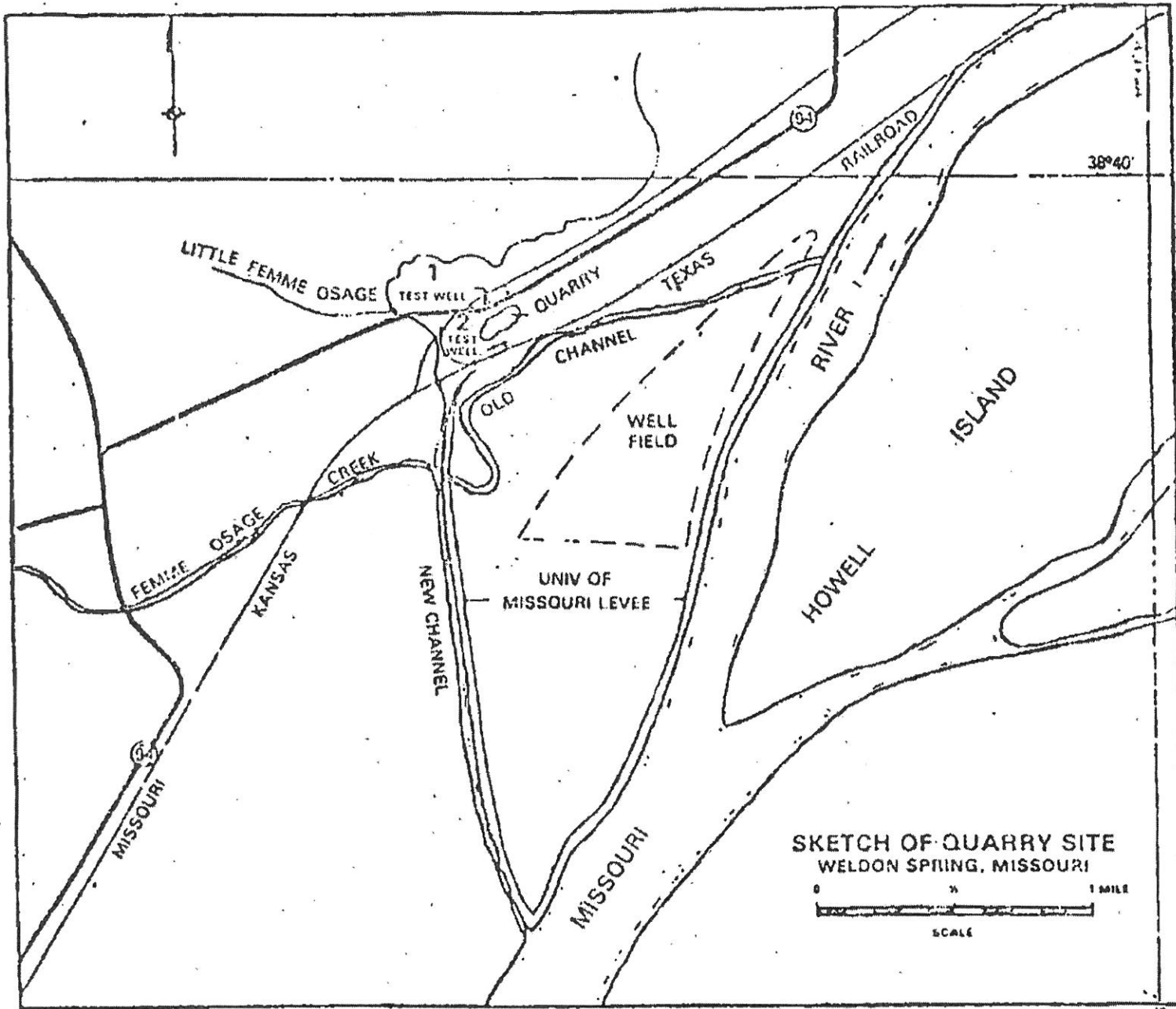
WELDON SPRING
QUARRY

L2

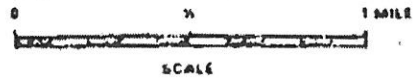
183

MAY 81

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SKETCH OF QUARRY SITE
WELDON SPRING, MISSOURI



MAY 81

WELDON SPRING SITE—QUARRY

LOCATION: ST. CHARLES COUNTY, NEAR WS PLANT SITE—30 MILES WEST OF ST. LOUIS

AREA: FENCED AREA—8 ACRES; MAIN QUARRY—2 ACRES; SUMP—1/2-ACRE

DESCRIPTION OF RESIDUES: CONTAMINATED SOLIDS AND RESIDUES FROM VARIOUS PROCESSING SITES

WASTE	DATE DEPOSITED	VOLUME YDS. ³	RADIOACTIVE MATERIAL Kgs.
3.8% Th RESIDUES	1959	185	4,500
DESTREHAN ST. DEMOLITION	1963-64	50,000	-
3% Th RESIDUES	1966	555	11,600
WS DECONTAMINATION	1968-69	<u>5,555</u>	<u>-</u>
		56,295	16,200

COMMENTS:

SITE SURVEILLANCE MAINTAINED; SITE FENCED; INSPECTION TWICE DAILY; SEMI-ANNUAL WATER QUALITY ASSESSMENT; U-238 MIGRATION DETECTED—WELL WITHIN CURRENT GUIDELINES; FISH STUDY FEMME OSAGE SLOUGH 1980; NO DETECTABLE RADIONUCLIDES.

CONCERNS:

GEOLOGIC SETTING NOT GOOD—FRACTURED LIMESTONE; RESIDUES BELOW WATER TABLE; U MIGRATION TOWARD MUNICIPAL WATER WELLS 0.7 MILE DOWN GRADIENT.

L2
185

MAY 81

SITE ASSESSMENT CURRENT STATUS—QUARRY

SITE CHARACTERIZATION

- LBL SITE ASSESSMENT DRAFT 1/80 & 11/80
- SAI RISK ASSESSMENT 9/79
- NLO GEOHYDROLOGICAL STUDY 12/78
- TASK FORCE REPORT 6/67
- USGS REPORTS 11/60 & 6/60

ENVIRONMENTAL FACTORS

- NLO SEMI-ANNUAL MONITORING AND INSPECTION 1967-PRESENT

CONCEPTUAL ENGINEERING

- WELDON SPRING DECOMMISSION STUDY 6/75
- QUARRY SUPPLEMENT

L2
186

MAY 81

REMEDIAL ACTION PLAN MILESTONES FOR QUARRY

- ASSESSMENT PHASE
 - PRELIMINARY SITE CHARACTERIZATION REPORT 1980
 - SITE CHARACTERIZATION COMPLETE 1982
- ALTERNATIVE PHASE
 - SELECT PREFERRED ALTERNATIVE 1983
- ENGINEERING PHASE
 - COMPLETE DESIGN/APPROVAL 1984
- REMEDIAL ACTION PHASE
 - SITE OPERATIONS COMPLETE 1986
- CERTIFICATION PHASE
 - SITE CERTIFIED 1987

L2
187

MAY 81

GEOHYDROLOGICAL ASSESSMENT AT THE WELDON SPRING QUARRY

1. CONTINUATION OF HYDROLOGIC AND CHEMICAL MONITORING PROGRAM.
2. COMPLETION OF RADIOLOGICAL INVENTORY SURVEY.
3. SEISMIC PROFILING TO LOCATE THE BEDROCK SURFACE.
4. DRILLING OF ADDITIONAL OBSERVATION WELLS.
5. CALIPER AND SPINNER LOGS OF SELECTED WELLS.
6. TRACER TEST TO DETERMINE THE CONNECTION OF THE QUARRY AND SLOUGH AREAS.
7. PUMP AND TRACER TEST TO DETERMINE HYDROLOGIC PROPERTIES AND DISPERSIVITY.
8. CLAY MINERALOGY ANALYSIS.
9. CORRELATION AND REASSESSMENT OF AIR AND GROUND RADIOLOGICAL SURVEYS.
10. COMPLETION AND VALIDATION OF PREDICTIVE ANALYSIS TOOLS.
11. FINALIZATION OF THE SITE ASSESSMENT REPORT.

MAY 81

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ASSESSMENT OF ENGINEERING OPTIONS AT THE WELDON SPRING QUARRY

1. ACCESS RESTRICTION AND MONITORING.
2. WASTE STABILIZATION IN THE QUARRY.
3. WASTE ENTOMBMENT.
4. WASTE REMOVAL.

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1981

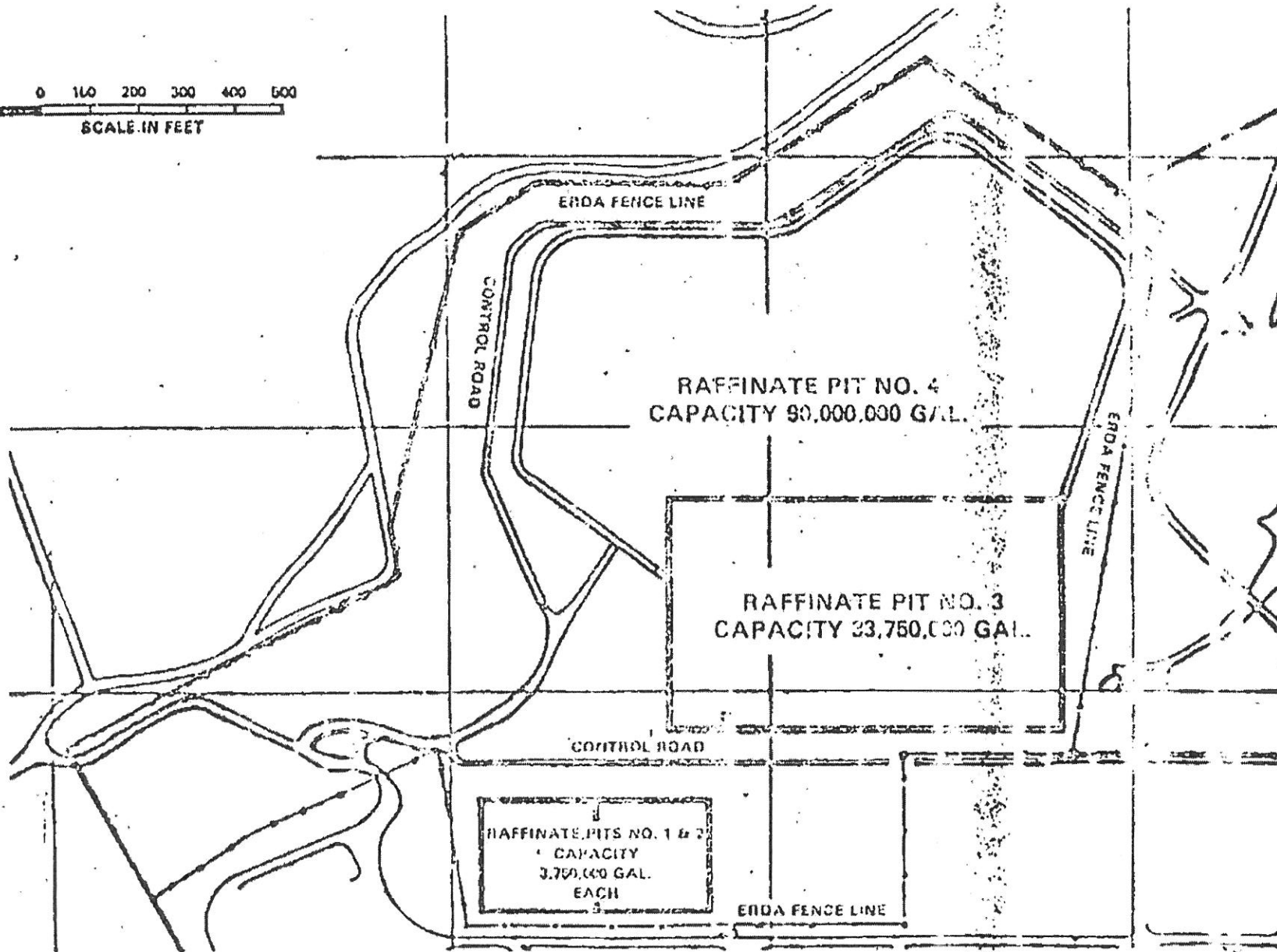
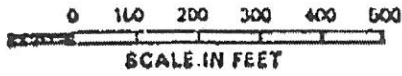
MAY 81

WELDON SPRING
PITS

L2

190

MAY 81



L2 191

MAY 31

WELDON SPRING SITE—RAFFINATE PITS

LOCATION: ST. CHARLES COUNTY; ~25 MI. WEST OF ST. LOUIS

DESCRIPTION: RESIDUES RESULTING FROM REFINING WESTERN PLATEAU
CONCENTRATE AND Th PROCESSING

PITS	CONSTRUCTED	ACRES	WASTE VOL. YDS. ³	PERCENT OCCUPIED	U (Kgs)	Th (Kgs)
1	1958	1.2	17,400	94	9,100	-
2	1958	1.2	17,400	94	9,100	-
3	1959	8.4	129,600	78	91,000	500
4	1964	<u>15.0</u>	<u>55,000</u>	12	<u>2,600</u>	<u>13,600</u>
		25.8	220,000		136,800	14,100

NOTE: RADIOACTIVITY PER PIT—20 μ Ci/Kg of SLUDGE.

COMMENTS:

- SITE SURVEILLANCE MAINTAINED; SITE FENCED; INSPECTION TWICE DAILY.
- SEMI-ANNUAL WATER QUALITY ASSESSMENTS; OFF-SITE EFFLUENTS WELL BELOW CURRENT GUIDELINES.
- GOOD GEOLOGIC SETTING/CONTAINMENT; PITS CLAY LINED.
- RESIDUES CONTAIN RECOVERABLE U (ABOUT 0.15%) AND OTHER METALS.
- COTTER CORPORATION ADVISED 6/22/80; NO LONGER INTERESTED.

MAY 81

L2

192

SITE ASSESSMENT

CURRENT STATUS - RAFFINATE PITS

SITE CHARACTERIZATION

- Y12 CHEMICAL ANALYSIS - H₂O SUPERNATE 9/30
- LBL GROUNDWATER STUDY 9/31
- EG&G AIR RAD. SURVEYS 5/76 - 11/75
- MO. GEOHYDROLOGICAL STUDY 4/37
- TASK FORCE REPORT 6/37

ENVIRONMENTAL FACTORS

- LBL WELL MONITORING CONTINUING
- NLO SEMI-ANNUAL MONITORING AND INSPECTION 1967-PRESENT

CONCEPTUAL ENGINEERING

- ORNL BIODENITRIFICATION STUDY - WATER SUPERNATE 9/30
- NLO STUDY RAD. WASTE STORAGE AREAS 4/77
- WELDON SPRING DECOMMISSIONING STUDY 6/75

MAY 81

L2
193/

REMEDIAL ACTION PLAN MILESTONES FOR RAFFINATE PITS

- ASSESSMENT PHASE 1981
 - SITE CHARACTERIZATION COMPLETE
- ALTERNATIVE PHASE 1984
 - SELECT PREFERRED ALTERNATIVE
- ENGINEERING PHASE 1985
 - COMPLETE DESIGN/APPROVALS
- REMEDIAL ACTION PHASE 1987
 - SITE OPERATIONS COMPLETE
- CERTIFICATION PHASE 1989
 - SITE CERTIFIED

L-2-194
[194]

MAY 81

GEOHYDROLOGICAL ASSESSMENT OF THE WELDON SPRING RAFFINATE PITS

1. COMPLETION OF RADIOLOGICAL DATA BASE OF WELLS AND DRAINAGE BASIN SEDIMENTS.
2. SEISMIC AND RESISTIVITY PROFILING.
3. DRILLING ADDITIONAL TEST BORINGS AND WELLS TO WATER TABLE.
4. FIELD AND LABORATORY ANALYSIS TO EVALUATE HYDROLOGIC PROPERTIES OF THE MATERIAL UNDER THE PITS.
5. CLAY MINERALOGY ANALYSIS.
6. DEVELOP A PREDICTIVE ANALYTICAL TOOL TO EVALUATE FUTURE ACTIONS.
7. PREPARE A SITE ASSESSMENT REPORT.

L2
195

MAY 81

SOME ISSUES REGARDING
MISSOURI REMEDIAL
ACTION SITES

MAY 81

L 2

196

SITE

ISSUE

MALLINCKRODT, INC.

- LEGISLATIVE AUTHORITY
- CONCERN OVER WORKER ACCEPTANCE
- SPLIT OF REMEDIAL RESPONSIBILITIES (MI/DOE)
- DISPOSAL SITE FOR RESIDUES

SLAPSS

- LEGISLATIVE AUTHORITY
- OWNERSHIP
- ACCEPTABILITY OF INCORPORATING LATTY AVENUE RESIDUES

WELDON SPRING PITS

- ACCEPTABILITY OF IN SITU STABILIZATION WITH OR WITHOUT QUARRY WASTE; ALTERNATIVELY, AVAILABILITY OF OTHER DISPOSAL SITES IN STATE

QUARRY

- ACCEPTABILITY OF VARIOUS MITIGATING OPTIONS
- PROGRAM FUNDING/SCHEDULES

WEST LAKE LANDFILL

- COMPLETION OF SITE CHARACTERIZATION BY NRC
- IF DESIGNATED A FUSRAP SITE, NEED LEGISLATIVE AUTHORITY

ALL SITES

- BUDGET CONSTRAINTS

MAY 81

L2

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