
FINAL

**FISCAL YEAR 2001 PLAN FOR THE
ST. LOUIS FUSRAP NORTH COUNTY SITES
ST. LOUIS, MISSOURI**

MAY 2001

prepared by

U.S. Army Corps of Engineers, St. Louis District Office, Formerly Utilized Sites Remedial Action Program

with assistance from

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Science Applications International Corporation
An Employee-Owned Company

May 29, 2001

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SUBJECT: Contract DACW43-00-D-0515, Task Order 0001
Transmittal of Final Fiscal Year 2001 Plan for the St. Louis FUSRAP North County Site

Dear Mr. Mills:

Enclosed is the final document entitled *Fiscal Year 2001 Plan for the St. Louis FUSRAP North County Site*. Additional copies of this document are being distributed to the individuals identified below.

We appreciate the opportunity to support you on this project. If you have any questions or need additional information, please call Sherry Gibson at (314) 581-7767 or the undersigned at (314) 770-310.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

for Jim R. Moos
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1.0 INTRODUCTION

The purpose of this plan is to present the methodology pursuant to returning those St. Louis North County Site properties that are scheduled to be addressed in fiscal year 2001 (FY01) to normal use free of unacceptable risk from radiological contaminants. The full list of properties is presented in the *St. Louis FUSRAP North County Property Characterization Plan*. The properties scheduled to be addressed in FY01 are presented in Table 1. However, progress on individual properties within the scope of this plan may be affected by funding changes, discovery of previously unknown areas of significant contamination, lack of access agreements with property owners, or changes in priority based on other factors.

Table 1. . Properties Scheduled to be Addressed in FY01

Properties Remediated by Department of Energy (DOE) That Require Additional Action^(a)	Additional Properties Scheduled for Investigation^(b)
VP-3L	VP-35A
VP-4L	VP-46
VP-5L	VP-48A
VP-5L	VP-49
VP-24	VP-25
VP-31A	VP-28
VP-32	VP-29
VP-33	VP-31
VP-34	VP-1L
VP-38	VP-2L
VP-39	
VP-40	
VP-42	
VP-43	
VP-44	
VP-45	
VP-47	
VP-48	
VP-53	

- (a) - Properties Remediated by DOE That Require Additional Action - These properties were previously addressed by DOE but formal release letters were not issued. An evaluation of existing characterization, remediation, and verification records indicated the potential presence of contamination in levels above release criteria as described in the *St. Louis North County Vicinity Properties Status Report*. These properties will be further investigated as described in a Work Description for these properties.
- (b) - Additional Properties Scheduled for Investigation - These properties will be investigated to determine if they can be released or if additional characterization is necessary. In accordance with this plan, it is anticipated Steps 3.1 through 3.5 will begin for these properties. As a result, these properties may be released or may be subjected to additional investigation based on findings during these steps.

2.0 FISCAL YEAR 2000 SUMMARY

Nineteen North County properties were addressed, to varying degrees, in FY00 using the methodology described in the *Fiscal Year 2000 Plan for the St. Louis North County Site*. Approximately 441,006 m² were covered by gamma walkover surveys and approximately 1,657 soil samples were obtained during this period. Summary information regarding the actions taken at each of these properties is presented in Table 2.

3.0 GENERAL METHODOLOGY

The steps listed below represent the progression of activities that is anticipated for properties within the scope of this plan. This sequential process is presented graphically as Figure 1. Evaluation and verification activities will be performed in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) and are further described in the *FUSRAP Final Status Survey Plan for the St. Louis North County Vicinity Properties*.

3.1 ACCESS AGREEMENT

Before activities can begin at a property, an agreement must be made with the property owner to allow access to the property. USACE Real Estate personnel will coordinate access agreements with each property owner. If access agreements for specific properties are not obtained within a reasonable time frame, progress at those properties will likely be delayed until an agreement can be reached.

3.2 HISTORICAL DATA REVIEW

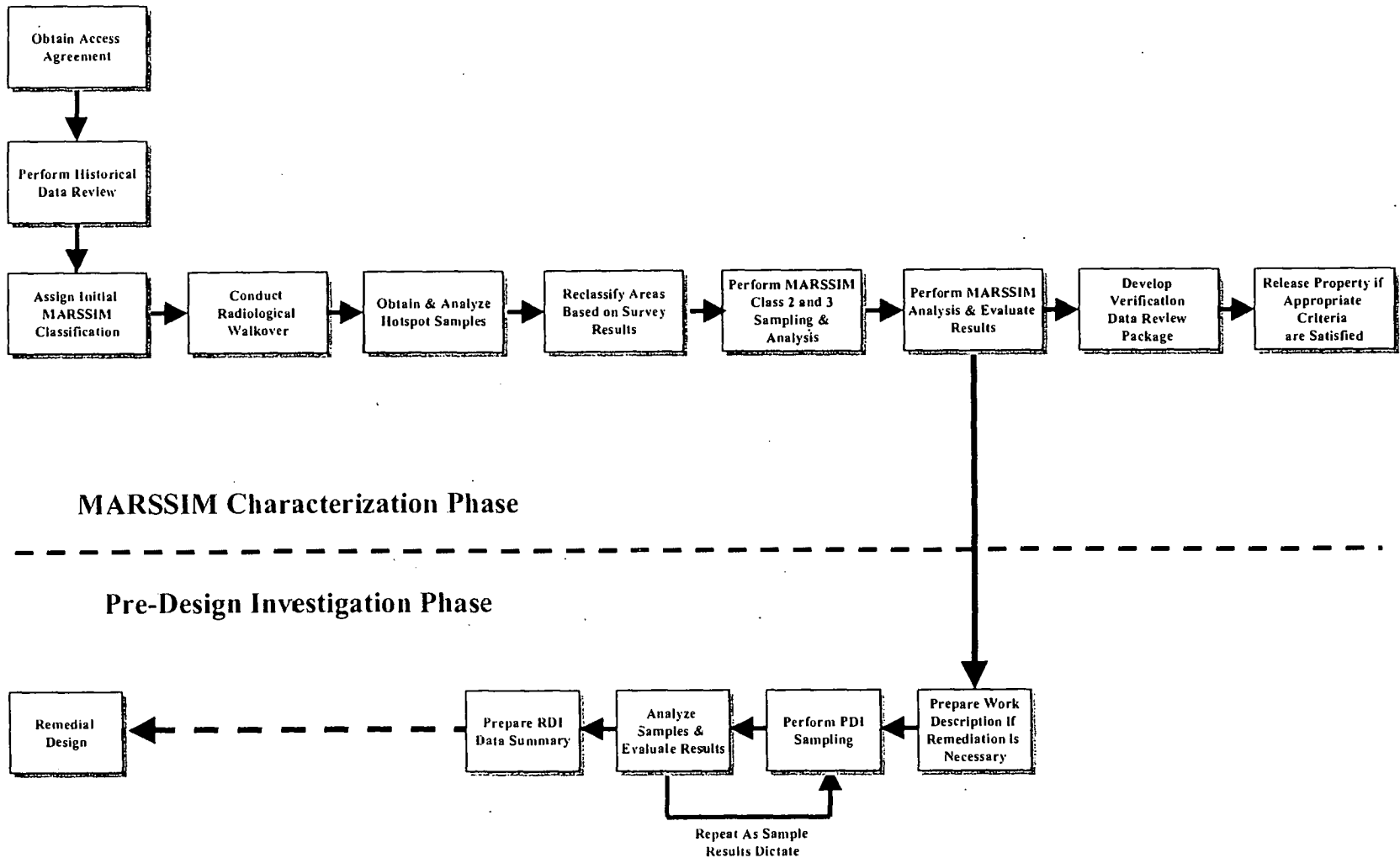
Previous removal actions and associated reports will be reviewed to perform an initial assessment of each property. All data points from previous sampling campaigns will be reviewed to optimize necessary future fieldwork. Historical data points indicating significantly elevated radiological constituents may be further investigated to verify the presence of such contamination. Such investigation would typically consist of gamma walkover surveys and collecting soil samples at the same location and depth as the historical sample point, as well as taking at least three additional samples within close proximity of the historical location to assess the size of the elevated area. If the investigation of the historical sample point reveals data that are inconsistent with the historical data, the data from the historical location will be considered suspect and ultimately may not be used in future data assessments or remedial design.

Table 2. Fiscal Year 2000 North County Characterization

Property	Total Area Size (m ²)	Approximate Area Walked-Over (m ²) (Note 1)	Percent of Prop. Walked Over (Note 1)	Number of Class 1 Samples Taken	Number of Class 2 Samples Taken	Number of Class 3 Samples Taken	Number of Contamination Delineation Samples Taken	Number of Samples (All Types)	Status
VP-21	26,024	14,000	53.80%	0	0	0	0	0	Complete
VP-23	18,724	9,200	49.13%	0	0	0	0	0	Complete
VP-26	16,260	15,860	97.54%	0	0	0	0	0	Complete
VP-27	2,867	1,305	45.52%	0	0	0	0	0	Complete
VP-37	15,725	10,000	63.59%	0	0	0	0	0	See Table 1-1
VP-38	111,196	97,386	87.58%	26	106	25	141	298	See Table 1-1
VP-9	2,041	1,600	78.39%	0	4	0	77	81	Remedial Design
VP-10	35,635	23,500	65.95%	0	20	7	41	68	Remedial Design
VP-11	9,245	9,245	100.00%	0	6	5	7	18	Complete
VP-12	33,260	19,000	57.13%	0	26	10	93	129	Remedial Design
IA-10	17,300	17,300	100.00%	0	23	0	120	143	Remedial Design
Ballfield Hotspot	630	630	100.00%	0	0	0	115	115	Remedial Design
VP-56	83,203	60,500	72.71%	91	68	17	0	176	Remedial Design
VP-57	13,831	13,831	100.00%	0	75	10	40	125	See Table 1-1
VP-58	92,329	81,500	88.27%	0	95	90	60	245	See Table 1-1
VP-57/58 R.O.W.	13,355	13,355	100.00%	0	0	0	0	0	See Table 1-1
VP-59	42,774	34,000	79.49%	0	0	0	0	0	See Table 1-1
VP-2L (Pad)	6,200	6,200	100.00%	0	0	0	251	251	Complete
VP-1C	2,594	2,594	100.00%	0	8	0	0	8	See Table 1-1
Totals	543,193	431,006	79.35%	117	431	164	945	1657	

Note 1: "Area Walked-Over" typically represents the accessible area of the property. Portions of the properties covered by buildings or other structures were not surveyed.

Figure 1. General Methodology for Characterization of St. Louis North County Site Properties



Historical photographs will be examined to establish property boundaries and features, construction dates of existing buildings as well as areas covered with asphalt or concrete. Those areas that were beneath such cover during the time frame when contamination most likely occurred will be excluded from the assessment unless evidence exists that suggests contaminant migration into these areas. Chemical contamination is assumed to be incidental and co-located with the radiological soil contamination for the scheduled properties.

3.3 INITIAL MARSSIM CLASSIFICATION

Based upon review of information such as historical soil data, contaminated material haul routes, and exposed areas at the time of hauling, each property will be preliminarily classified in accordance with the MARSSIM guidelines. This initial classification will result in designation of MARSSIM Class 1, Class 2, and/or Class 3 areas within each property. Based upon the results of the radiological walkover survey and soil samples (as described in Section 3.4), boundaries of the initial MARSSIM classification areas may be modified. For example, an area initially classified as Class 2 may become Class 1 based on the additional data obtained from the walkover survey and associated soil sampling.

3.4 RADIOLOGICAL WALKOVER SURVEY AND HOTSPOT SAMPLING

Th-230, Ra-226 and its progeny, Th-232 and its progeny, and processed natural uranium have associated gamma radiation, which can be used to identify the presence of residual contamination and estimate the concentrations of the various individual radionuclides potentially present at the North County properties. Field survey techniques are relatively insensitive to Th-230 due to the low abundance of gamma radiation it emits. However, concentrations of mixtures of other primary radioactive contaminants can be detected by field methods. Surface scans for gross gamma radiation will be performed to identify locations of elevated external radiation, suggesting possible residual radiological contamination. Instrument response will be continuously monitored during scanning through use of the instrument audible signal. Scanning results will be recorded in counts per minute (cpm).

Screening gamma scans will, to the extent possible, be performed over 50-100% of each property. On properties where less than 100% of the accessible area is surveyed, scans should focus on areas most likely to have elevated levels of activity as determined by the survey supervisor. The surveyor will advance at a speed of approximately 2 ft/s (approximately 0.5 m/s) while passing the detector over the surface in a serpentine pattern. Audible response of the instrument will be monitored, and locations of elevated audible response will be noted. The ambient background for a survey unit will be determined at the start of the survey and a scanning response that is detectable above the background level (e.g., 2,000 cpm above background) will be set as the investigation level, indicating potential contamination. Locations exceeding the investigation level will be investigated and, if appropriate, sampled. Gamma scan data may also be recorded in real time, using position and data recording methods.

There may be locations where safety considerations or other restrictions prevent access for normal scanning activities. Reasonable efforts to scan such locations will be made. Alternative and innovative approaches (e.g., employing extension poles, mounting detectors on platforms

with wheels or skids, placing detectors in protective sleeves, using excavating equipment to position and move detectors, etc.) will be considered. Table 3 lists radiological field survey instruments that will be used (functional and performance equivalents may be used, as determined by a Certified Health Physicist).

Table 3. Typical Gamma Scan Instruments

Description	Application	Approximate Detection Sensitivity (pCi/g)
Ludlum Model 44-10; 2-inch × 2-inch NaI gamma scintillation detector	Gamma scans of all surfaces	Th-230(1122); Ra-226(1.2); and U-238 (19.6)
Ludlum Model 2221; Scaler/ratemeter (with earphones)	Readout instrument for gamma scintillation detector	N/A

All instrumentation will have current calibration (within the past 12 months or more frequently if recommended by the manufacturer). Daily field performance checks will be conducted in accordance with individual instrument use procedures. These performance checks will be performed prior to and following daily field activities and at any time the instrument response appears questionable. Only data obtained using instruments that satisfy the performance requirements will be accepted for use in the evaluation.

Based on the results of the radiological walkover survey, soil investigation samples may be taken. These samples would be biased to represent areas identified by the walkover survey as exhibiting elevated levels of radioactivity. The number of investigation samples, if any, will be determined by the survey supervisor after review of the walkover survey findings.

3.5 MARSSIM CLASS 2 AND CLASS 3 SOIL SAMPLING

Areas designated as Class 2 and Class 3 will be sampled and evaluated in accordance with the *FUSRAP Final Status Survey Plan for the St. Louis North County Vicinity Properties* unless the radiological walkover survey provides evidence to suggest reclassification to a more restrictive MARSSIM class.

3.6 PRE-DESIGN INVESTIGATION

Based on historical data, radiological walkover surveys, and soil sample results, contaminated areas will be further investigated to determine the vertical and horizontal extent of contamination. This pre-design investigation (PDI) will consist of additional soil sampling in order to provide a reasonable data set on which to base the remedial design. Data requirements to be satisfied by this additional sampling will be described in a property-specific work description. The work description document will describe data needs for each appropriate area of design. For example, it may be necessary to collect data regarding the nature and extent of contamination, waste profiling and/or soil blending, as well as structural, geophysical, and

chemical issues. Samples will be collected and analyzed for appropriate radiological constituents in accordance with the *Sampling and Analysis Guide for the St. Louis Site* and the *SAIC Site Safety and Health Plan for St. Louis-FUSRAP Activities*.

Soil samples will be taken with hand-held augers, a hand-held motorized auger, a mechanized soil probe, or a standard drill rig. The drill rig will be used for all depths > 9.9 ft. Table 4 shows the backfill requirements that apply to boreholes taken pursuant to this plan.

Table 4. Backfill for Exploration Holes

Boring Type	Boring Depth, d in feet	Typical Location	USACE-directed Special Location
Exploration Holes	$d < 4.0'$	Bentonitic chips✚	Native Soil
Exploration Holes	$3.9' < d < 10.0'$	Bentonitic chips✚	Strength Grout for backfill✚
Exploration Holes	$d > 9.9'$	High-solids Bentonitic Slurry Grout for backfill✚	Strength Grout for backfill✚

d symbol for Boring Depth.

✚ Depending upon the type of surrounding surface, either a base course and pavement should be placed to match the site, or alternatively, the two feet nearest the surface requires native soil for backfill as a growing medium.

Initial boreholes will be established at the perimeter of suspected contamination, based on the results of an evaluation of existing data. Samples will be taken in each borehole to delineate depth of contamination. Each sample will be a composite of the soil from an appropriate sampling interval (i.e., 6 inch, 1-ft). Data evaluation and additional sampling will continue until the edge of the contamination has been adequately defined on all sides or until property/physical boundaries are encountered.

A design for remediation of contaminated areas will be developed based on the data obtained from the PDI.

3.7 REMEDIAL ACTION

The selected remediation contractor will remediate the property, if necessary, in accordance with the remedial design.

3.8 FINAL VERIFICATION

After characterization or remedial activities are completed, each property will undergo final verification in accordance with the MARSSIM guidance and the *FUSRAP Final Status Survey Plan for the St. Louis North County Vicinity Properties*. Documentation of successful remediation and final status survey will occur through the issuance of a property Post Remedial Action Report (PRAR).

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Further Info?

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