

"HTW At Former Military Sites"

RACO

A CASE STUDY

Presented by

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HISTORY

The former Raco Air Force Missile Site is located within the Hiawatha National Forest about 4 miles southwest of the town of Raco, Michigan. Raco is located in the Upper Peninsula approximately 30 miles southwest of Sault Ste. Marie, Michigan on Route M-28.

Department of Defense interest in this area dates back to 1895 when approximately 2,950 acres formed the Fort Brady Target Range.

In 1942-1943 the Raco Army Airfield was constructed. Around 1960 the former missile base was constructed adjacent to the airfield. The Raco missile site was constructed for the Bomarc surface to air missile. This was a rocket and ramjet powered delta winged unmanned missile. In 1964 the airfield portion was turned over to the United States Forest Service (USFS). The Air Force retained control of the missile site, which covered approximately 152 acres, until 1973 when it too was turned over to the USFS in whose hands it has remained.

Since 1973 the USFS has entered into several permit agreements with outside interests the activities of which have altered conditions at the site over the years. These include:

- a. 1973--A sawmill operation by a local Indian Tribe resulting in accumulation of a large pile (approximately 5,000 CY) of sawdust, wood waste and other debris.
- b. 1978--The sale and removal of seven of the base buildings, the water tower, and twenty-eight missile silo shelters.
- c. 1981 & 1984--The dumping of broken concrete and waste construction materials into the silos. This debris apparently resulted from road repair operations on Route M-28.
- d. The airfield runways are currently used during the winter months for automobile tire testing.

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PROJECT DISCUSSION

In 1984 Detroit District was directed to conduct a site survey of the former Raco missile site under the Defense Environmental Restoration Program. Subsequently a confirmation Study, or Site Investigation as it is now termed, was conducted by Envirodyne Engineers, Inc. under the direction of the U.S. Army Corps of Engineers St. Louis District during the 1986-1987 period. Results of the Confirmation Study are summarized later.

Plans and specifications for a demolition project were prepared by Detroit District. A contract was awarded September 11, 1987 to Anderson Excavating & Wrecking Company of Omaha, Nebraska. Work was substantially completed November 12, 1988 and the contract was financially complete on January 5, 1989. On-site contract administration was handled by the U. S. Army Corps of Engineers, Detroit District, Soo Area Office at Sault Ste. Marie, Michigan.

Items addressed by the demolition/debris removal project included:

- a. Removal of the remaining buildings consisting of two masonry block and structural steel construction at approximately 26,000 SF and 6,000 SF of floor area respectively; and two small masonry block buildings of approximately 190 SF and 260 SF of floor area respectively.
- b. Removal of fourteen underground storage tanks and their contents.
- c. Removal of approximately 600 CY of oil soaked soils.
- d. Removal of asbestos containing materials such as floor tiles, pipe insulation and boiler room equipment insulation.
- e. Removal of miscellaneous debris.
- f. Removal or covering over with two feet of earth several exposed building slabs.
- g. Filling, leveling and concrete capping of debris in the silos. The silo areas were covered with two feet of earth.
- h. Disturbed and filled areas were fertilized, seeded and mulched with a blend of grasses recommended by the USFS.

The underground storage tanks originally held various petroleum products including gasoline, boiler fuel oil, diesel oil, and aviation gasoline. At the time of removal the tank contents consisted primarily of fuel oil sludges, gasoline and fuel/water mixtures.

The UST's were removed during July and August, 1988. On removal it was evident that spillage and/or leakage had occurred. Samples taken from the excavations when analyzed showed petroleum hydrocarbon levels as high as 2,310 mg/kg (worst case) with the remainder ranging from <50 mg/kg to 650 mg/kg. The extent of the problem was not readily evident. Since a remedial investigation was to be undertaken by Omaha District it was decided to refer the situation to them for evaluation and determination of what further

remedial action would be appropriate. The excavations were filled in and their locations marked for future access once it is determined what further action is required.

CONFIRMATION STUDY RESULTS

The Confirmation Study was conducted by Envirodyne Engineers, Inc., for the U.S. Army Corps of Engineers St. Louis District. As part of the Confirmation Study four monitoring wells were installed. Soil samples (approximately two feet below the surface) were obtained from nine locations. Water samples were obtained from the monitoring wells as well as from seven silos.

Ground water samples from the monitoring wells, taken during the fall-winter 1986-1987 period, showed the following:

a. Well RG-1

No contamination detected.

b. Well RG-2

No contamination detected.

c. Well RG-3

--1.8 mg/l Petroleum hydrocarbons
--3.0 ug/l Trichloroethylene
--3.4 ug/l 2-pentene-3,4,5-trimethyl
--20.8 ug/l 1-pentene-2,4,4-trimethyl

d. Well RG-4

--1.9 ug/l Toluene

e. U.S. Forest Service Raco Ranger Station Well
(Used for well installation water)

--1.7 mg/l Petroleum Hydrocarbons.

It was later reported that this sample may have been contaminated by a hose with oil on it. Also there was an underground fuel storage tank at the Ranger Station.

Review of the field excavation data and the confirmation study data resulted in some concern that contaminants were moving offsite. In April, 1989 The Chippewa County and State of Michigan Health Departments were contacted about this concern. They arranged for sampling and analysis of seven local wells in the area, including a retest of the Ranger Station well. All tests were negative for hydrocarbons.

The on-site monitoring wells RG-1, RG-2, RG-3 and RG-4 were resampled in August 1989. Analysis showed the following:

- a. Well RG-1
 - 7 ug/l Lead
 - 5 mg/l Petroleum hydrocarbons
- b. Well RG-2
 - 6 ug/l Lead
 - 2 mg/l Petroleum hydrocarbons
 - 10 ug/l Silver
- c. Well RG-3
 - 130 ug/l Barium
 - 7 ug/l Lead
 - 10 mg/l Petroleum hydrocarbons
 - 10 ug/l Silver
 - 0.5 ug/l Endrin
- d. Well RG-4

Well was dry. No samples collected.

Organic analyses were run for purgeable halocarbons, polynuclear aromatic hydrocarbons, pesticides and PCB's. Except for the 0.5ug/l of endrin noted above all of the items were below the detection limit.

The above data has been provided to the Omaha District for use in their upcoming Remedial Investigation work at Raco. A copy of the data was also provided to the Chippewa County Health Department. While the levels detected are low, it is evident that there are differences between the 1986-1987 and 1989 items detected and reported on. Contributing factors may be the different laboratories used, difference in test methods and detection limits and the two year interval between samplings. It is hoped that Omaha District's additional work at Raco will resolve the reasons for any differences and determine what future action will be required.

It has been a pleasure to be here today. Thankyou.

Abbreviations:

CY Cubic Yards
mg/l milligram per liter (parts per million)
SF Square Feet
ug/l microgram per liter (parts per billion)
USFS United States Forest Service
UST Underground Storage Tank

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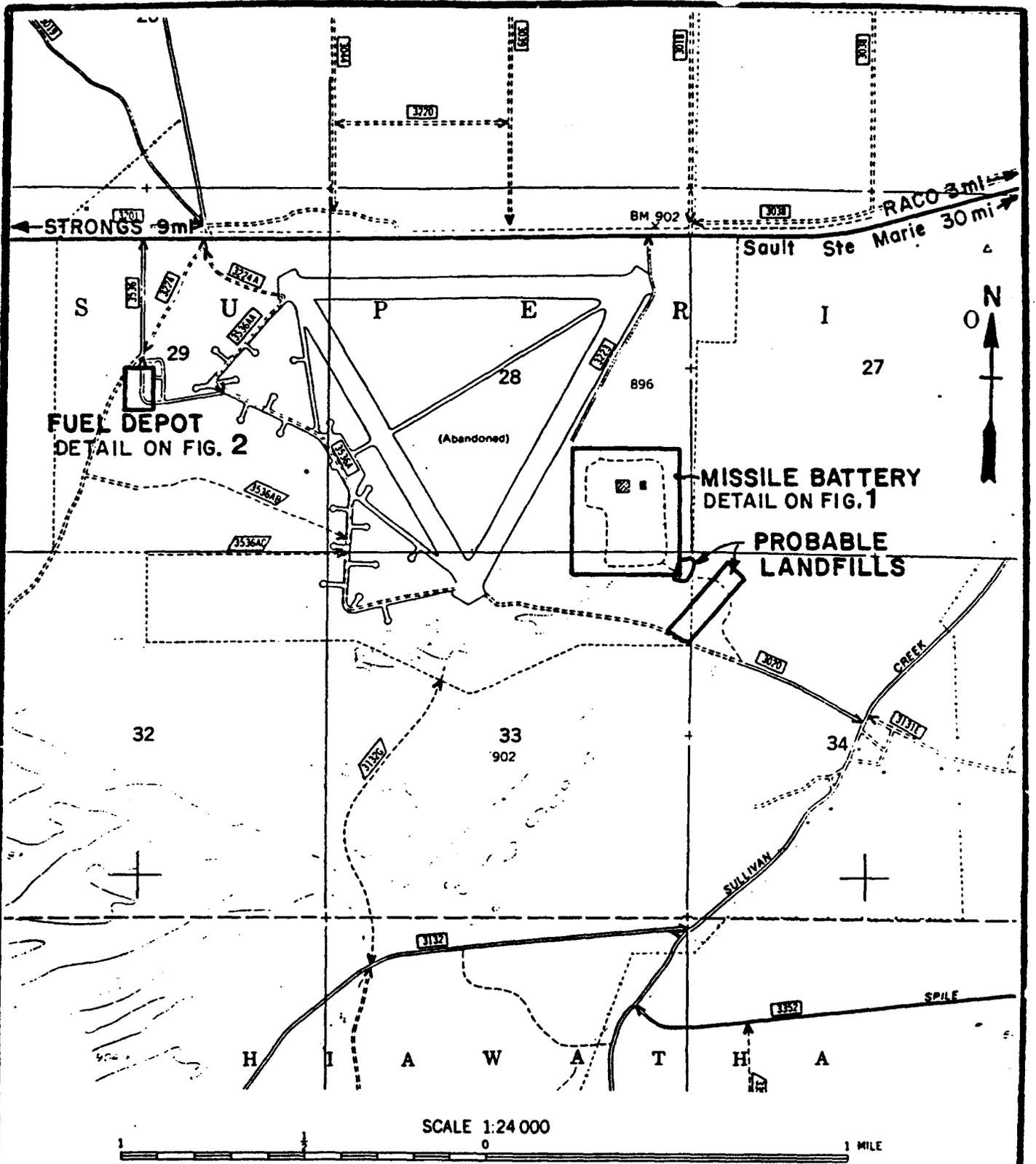
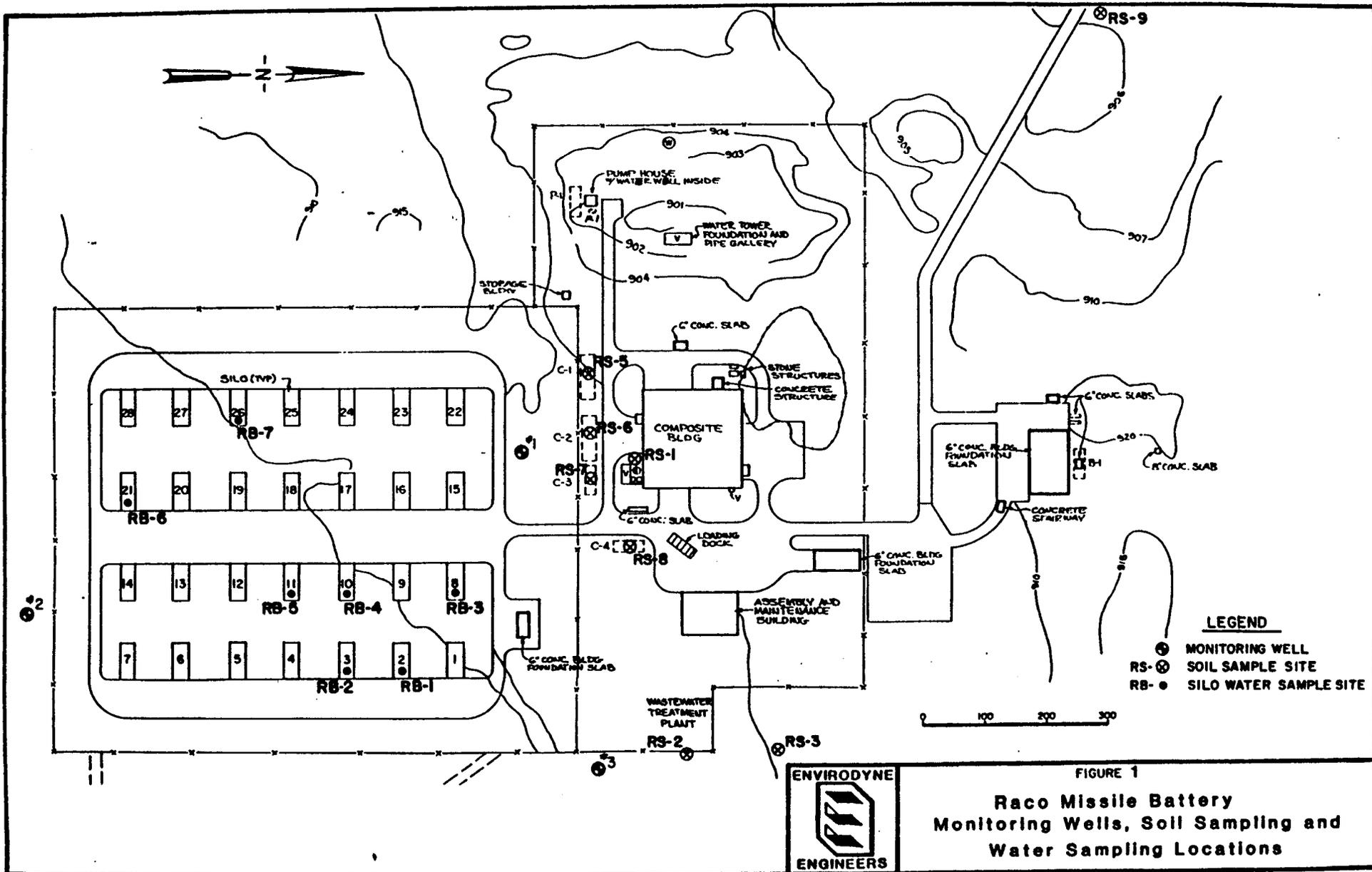


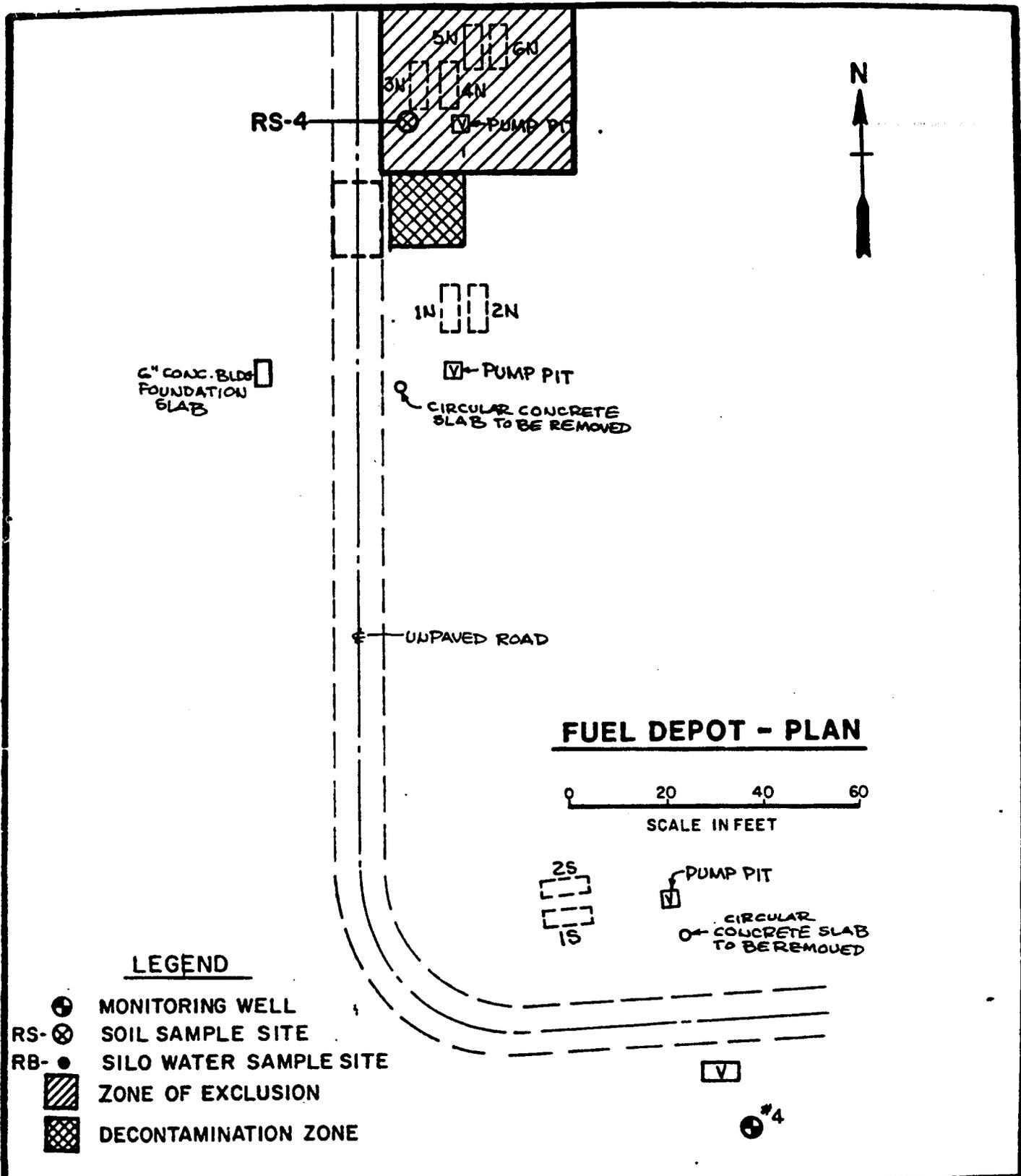
FIGURE 3

Raco Missile Battery and Airfield



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ENVIRODYNE ENGINEERS

FIGURE 2
Airfield Fuel Depot
Monitoring Well and Soil Sampling Locations
with Safety Zones