



OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

July 18, 2006

Mr. Theodore Smith
Mail Stop: T-7F27
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U.S. Nuclear Regulatory Commission
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SUBJECT: CONFIRMATORY SURVEY RESULTS FOR THE EAST MOUNTAIN SIDE AT THE CONNECTICUT YANKEE HADDAM NECK PLANT, HADDAM, CONNECTICUT [DOCKET NO. 50-0213; RFTA NO. 06-006]

Dear Mr. Smith:

The Oak Ridge Institute for Science and Education (ORISE) performed confirmatory survey activities on the East Mountain Side (Survey Units 9527-0001, 9527-0002, 9527-0003, and 9527-0004) at the Connecticut Yankee Haddam Neck Plant in Haddam, Connecticut, on April 25 and 26, 2006. This survey activity was requested and approved by the U.S. Nuclear Regulatory Commission (NRC). Confirmatory survey activities included gamma surface scans and soil sampling. Enclosed are the results documenting these survey activities.

If you have any questions or comments, please direct them to me at 865.576.0065 or Scott Kirk at 865.574.0685.

Sincerely,

Wade C. Adams
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Enclosure

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**CONFIRMATORY SURVEY RESULTS
FOR THE EAST MOUNTAIN SIDE
AT THE CONNECTICUT YANKEE HADDAM NECK PLANT
HADDAM, CONNECTICUT**

INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) requested that the Oak Ridge Institute for Science and Education (ORISE) perform confirmatory surveys of the East Mountain Side (Survey Units 9527-0001, 9527-0002, 9527-0003, and 9527-0004) at the Connecticut Yankee (CY) Haddam Neck Plant (HNP) in Haddam, Connecticut (Figure 1). Confirmatory surveys were performed on April 25 and 26, 2006. Areas of the HNP included in the survey are depicted in Figure 2.

PROCEDURES

Confirmatory surveys were performed in accordance with a site-specific survey plan that was submitted to and approved by the NRC (ORISE 2006). Survey activities were implemented in accordance with ORISE Survey Procedures and Quality Assurance Manuals (ORISE 2004 and 2005a).

The survey activities included gamma surface scans that were performed over 60 to 75% of accessible portions of the grounds within Survey Units (SU) 9527-0001 through 9527-0004. Sodium iodide (NaI) scintillation detectors coupled to ratemeters with audible indicators were used for scanning. Accessibility to some areas was restricted due to safety concerns for ORISE personnel.

Soil samples were collected from six judgmentally selected locations within SUs 9527-0001 and 9527-0002 and five judgmentally selected locations within SUs 9527-0003 and 9527-0004 (Figures 3 through 6).

SAMPLE ANALYSIS AND DATA INTERPRETATION

Radiological data and sample media were returned to ORISE's laboratory in Oak Ridge, TN for analysis and interpretation. Radioassays were performed in accordance with the ORISE Laboratory Procedures Manual (ORISE 2005b). Soil samples were analyzed by gamma spectroscopy for the primary radionuclides of interest (i.e., Co-60 and Cs-137). However, spectra were also reviewed for other gamma-emitting fission and activation products associated with the HNP and other identifiable total absorption peaks. Soil sample results were reported in units of picocuries per gram (pCi/g).

FINDINGS AND RESULTS

Gamma surface scans identified three locations of elevated direct gamma radiation in SU 9527-0004 for further investigation. No elevated gamma activity was detected within the remaining SUs. ORISE personnel collected biased soil samples from these three locations and from two additional judgmentally selected locations within the SU. Seventeen soil samples were collected from judgmentally determined locations within SUs 9527-0001 through 9527-0003.

The range of radionuclide concentrations for the five to six soil samples collected within each SU by ORISE are as follows:

Survey Units ^a	Range of Radionuclide Concentrations in Soil Samples (pCi/g)	
	Co-60	Cs-137
9527-0001	-0.02 to 0.02	0.42 to 1.86
9527-0002	-0.02 to 0.05	0.40 to 1.38
9527-0003	0.00 ^b to 0.05	0.13 to 1.36
9527-0004	-0.01 to 0.07	0.87 to 3.32

^aRefer to Figures 3 through 6.

^bZero values due to rounding.

A complete listing of the confirmatory sample results is presented in Table 1.

COMPARISON OF SOIL SAMPLE RESULTS AGAINST THE RELEASE CRITERIA

A comparison of the soil sample results against the site-specific operational derived concentration guideline levels (DCGLs) for Co-60 (1.22 pCi/g) and Cs-137 (2.53 pCi/g) as per the Final Status Survey (FSS) Release Records for each SU was performed to determine whether or not the site was suitable for unrestricted release (CYAPCO). The confirmatory survey activities determined that detectable Cs-137 concentrations, in excess of the site-specific operational soil DCGLs, were present in two soil samples within the East Mountain Side SU 9527-0004. These two soil samples (Samples 1698S0002 and 1698S0003) were collected just above a granite rock surface at a depth of approximately 0.8 cm. A review of the FSS report for this SU indicates that the ORISE survey data corroborates the CY FSS data; that although the Operational DCGL is exceeded, the soil concentrations are less than the Base Case DCGL criteria listed in Table 2 of the FSS for SU 9527-0004. The radionuclide concentrations for all the remaining soil samples were below their respective Co-60 and Cs-137 Operational DCGLs.

Based upon ORISE's confirmatory survey results, the radionuclide concentrations present in the soil samples for SUs 9527-0001 through 9527-0004 are commensurate with the release criteria specified within their respective FSS Release Records (CYAPCO). Therefore, it is ORISE's opinion that the radiological conditions for these SUs are suitable for unrestricted use in accordance with the clean up criteria in the License Termination Plan [LTP (CYAPCO 2005)].

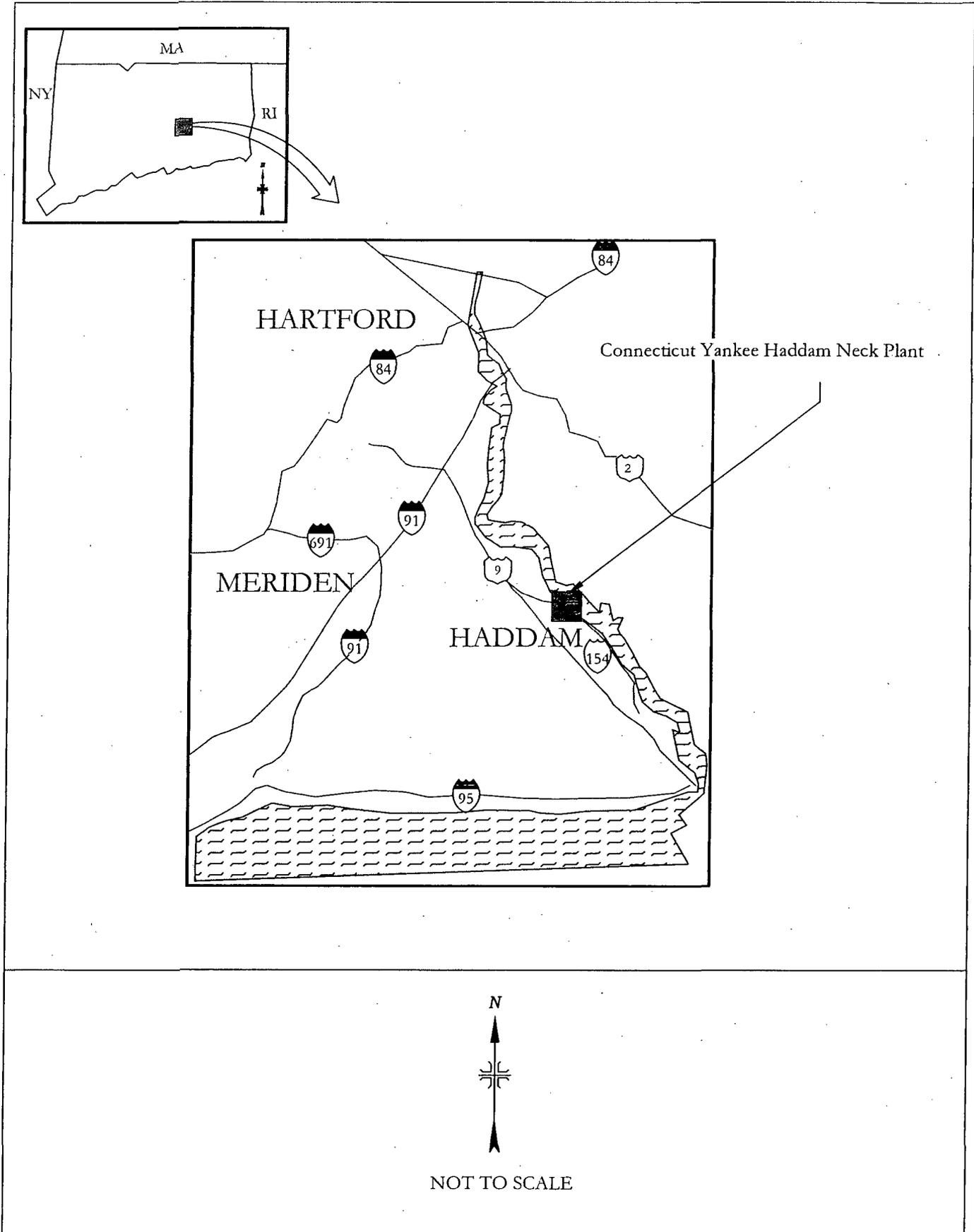


FIGURE 1: Location of the Connecticut Yankee Haddam Neck Plant - Haddam, Connecticut

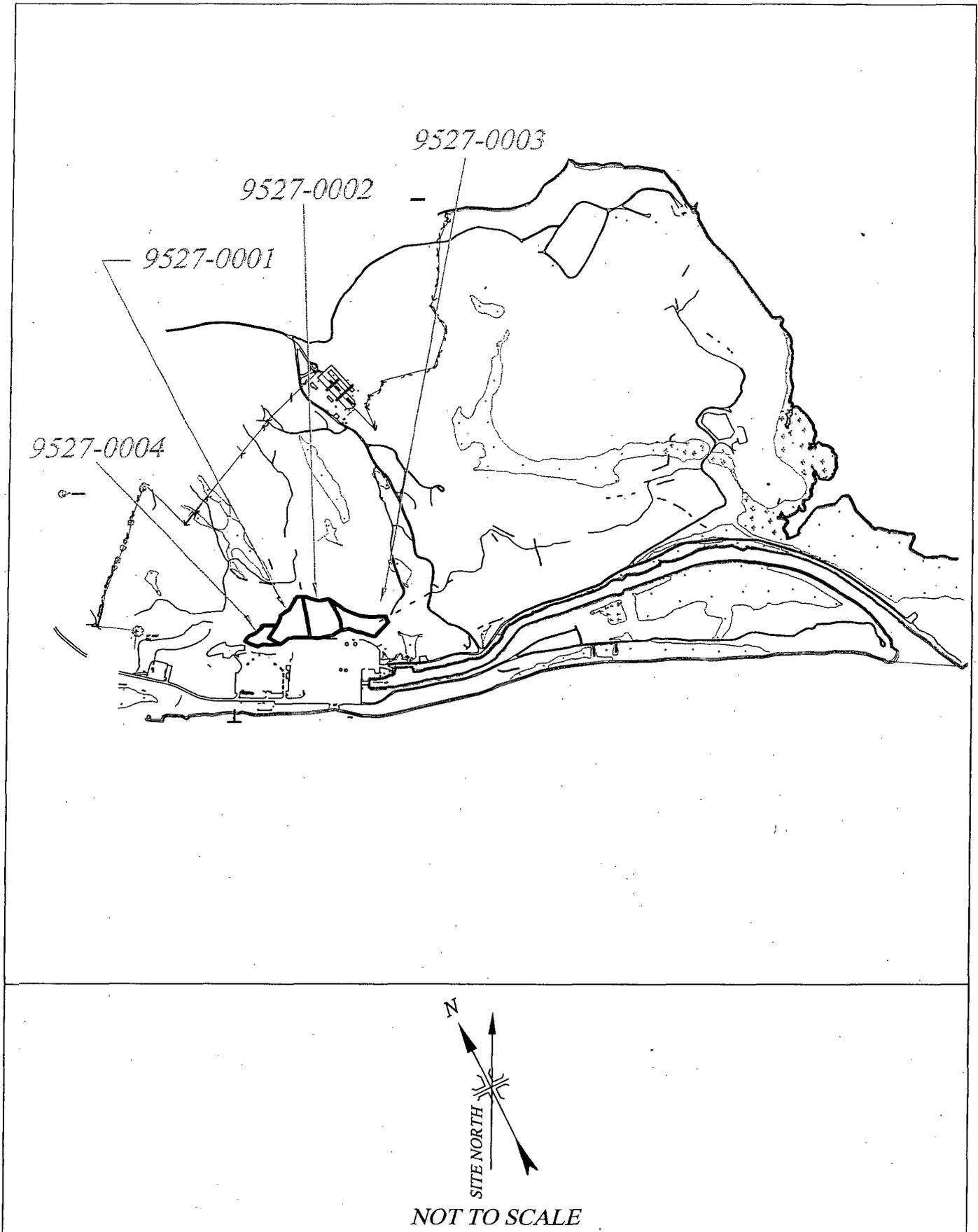


FIGURE 2: Plot of the Connecticut Yankee Haddam Neck Plant Site Indicating Areas Surveyed East Mountain Side

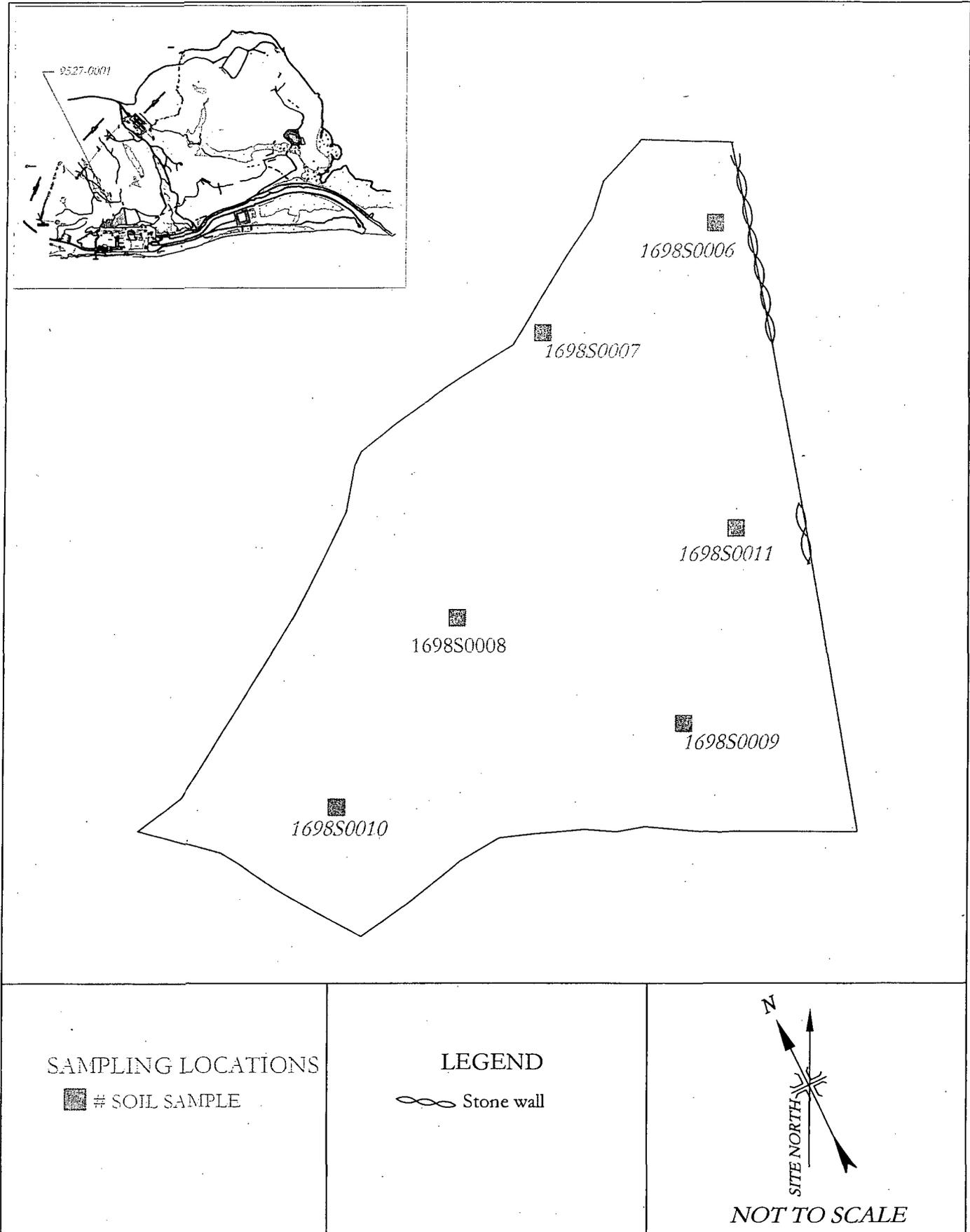


FIGURE 3: East Mountain Side, Survey Unit 9527-0001 - Soil Sampling Locations

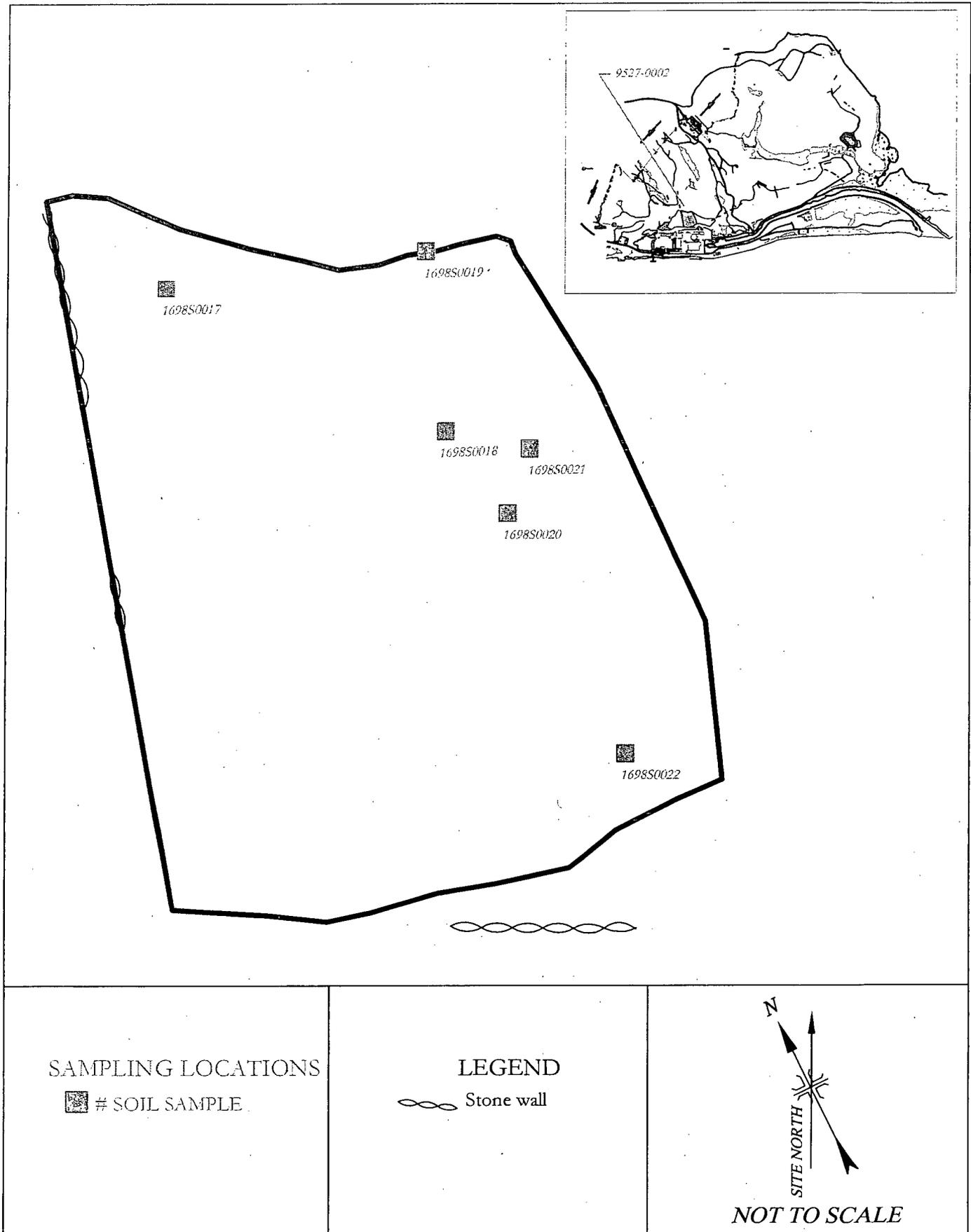


FIGURE 4: East Mountain Side, Survey Unit 9527-0002 - Soil Sampling Locations

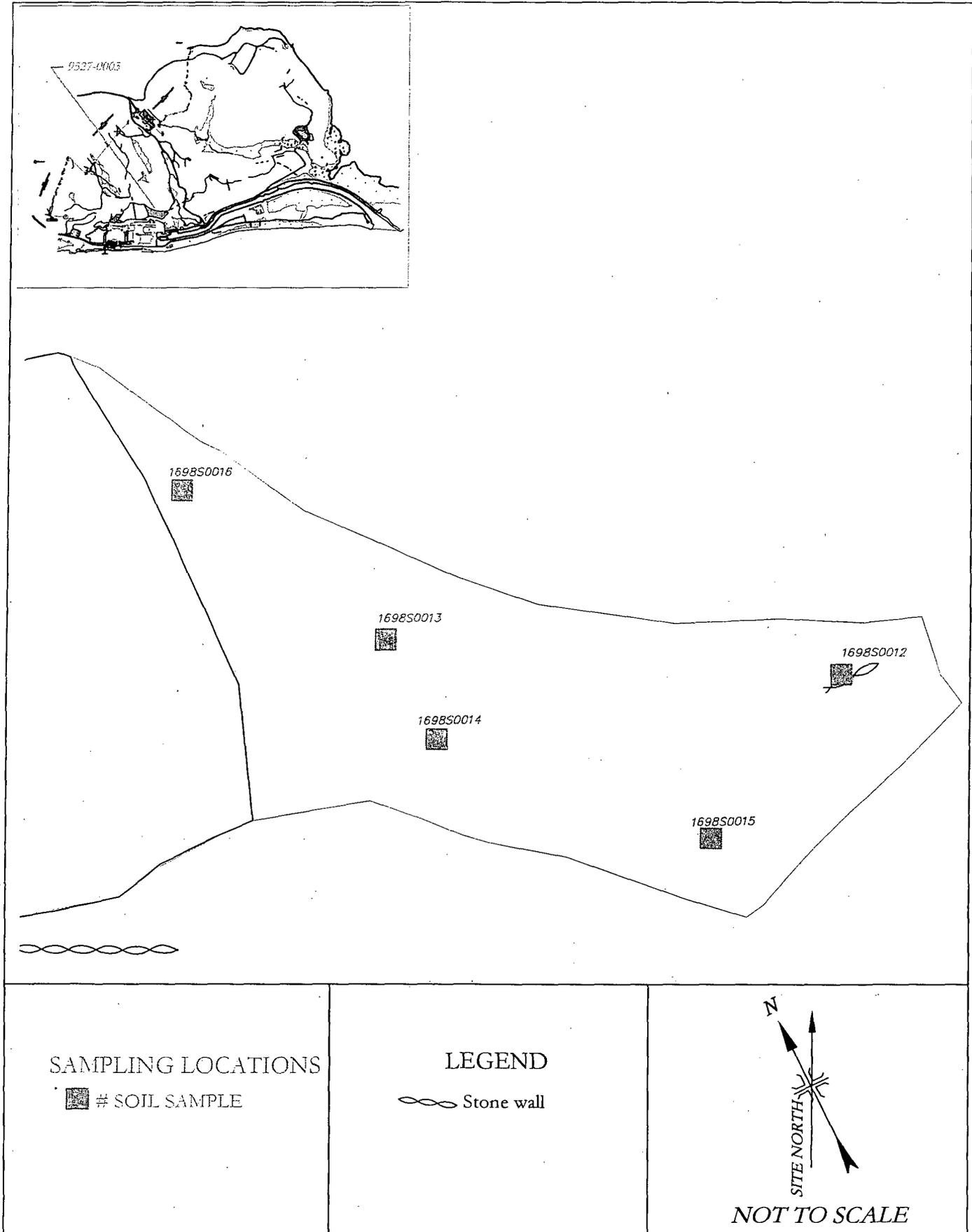


FIGURE 5: East Mountain Side, Survey Unit 9527-0003 - Soil Sampling Locations

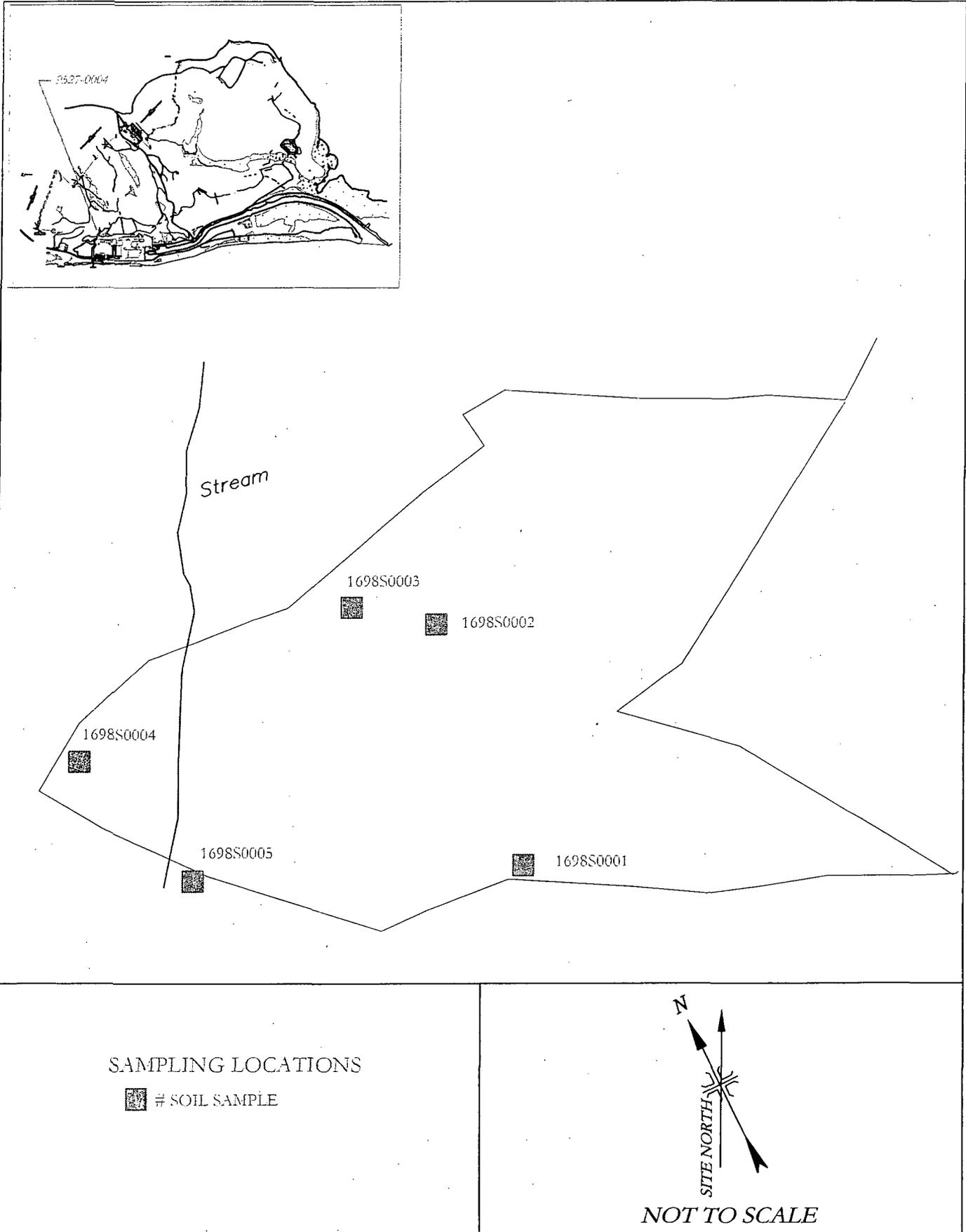


FIGURE 6: East Mountain Side, Survey Unit 9527-0004 - Soil Sampling Locations

TABLE 1
CONFIRMATORY SURVEY RESULTS
FOR THE EAST MOUNTAIN SIDE
AT THE CONNECTICUT YANKEE HADDAM NECK PLANT
HADDAM, CONNECTICUT

Sample Location ^a	Radionuclide Concentrations (pCi/g)	
	Co-60 ^b	Cs-137 ^b
Survey Unit 9527-0001		
1698S0006	0.02 ± 0.03 ^c	1.86 ± 0.13
1698S0007	0.00 ^d ± 0.02	0.42 ± 0.05
1698S0008	0.02 ± 0.03	0.49 ± 0.05
1698S0009	-0.02 ± 0.02	0.51 ± 0.05
1698S0010	0.00 ± 0.03	0.74 ± 0.08
1698S0011	0.00 ± 0.03	0.88 ± 0.09
Survey Unit 9527-0002		
1698S0017	-0.02 ± 0.04	0.57 ± 0.08
1698S0018	0.03 ± 0.03	0.64 ± 0.07
1698S0019	0.01 ± 0.03	1.38 ± 0.11
1698S0020	0.01 ± 0.02	0.57 ± 0.06
1698S0021	0.01 ± 0.04	0.53 ± 0.06
1698S0022	0.05 ± 0.08	0.40 ± 0.07
Survey Unit 9527-0003		
1698S0012	0.01 ± 0.02	0.84 ± 0.06
1698S0013	0.05 ± 0.06	0.45 ± 0.05
1698S0014	0.01 ± 0.03	1.36 ± 0.10
1698S0015	0.00 ± 0.00	0.13 ± 0.01
1698S0016	0.01 ± 0.02	0.46 ± 0.04
Survey Unit 9527-0004		
1698S0001	-0.01 ± 0.04	1.19 ± 0.10
1698S0002 ^e	0.07 ± 0.04	3.32 ± 0.23
1698S0003 ^e	0.03 ± 0.03	2.51 ± 0.16
1698S0004	0.02 ± 0.05	1.22 ± 0.12
1698S0005	0.03 ± 0.03	0.87 ± 0.10

^aRefer to Figures 3 through 6.

^bThe LTP Base Case DCGL values are 3.81 pCi/g for Co-60 and 7.91 pCi/g for Cs-137. The FSS Operational DCGL values are 1.22 pCi/g for Co-60 and 2.53 pCi/g for Cs-137.

^cUncertainties represent the 95% confidence level, based on total propagated uncertainties.

^dZero values due to rounding.

^eThese two soil samples were collected just above granite rock surfaces at a depth of approximately 0.8 cm.

REFERENCES

Connecticut Yankee Atomic Power Company (CYAPCO). Draft-CYAPCO Final Status Survey Release Records, East Mountain Side, Survey Units 9527-0001, 9527-0002, 9527-0003, and 9527-0004. Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut; Reference dates not provided.

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