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Robert F. Bonito
General Manager

August 17, 1998

Ms. Marie Miller
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Dear Ms. Miller,

On behalf of UNC Naval Products, I submit to you herewith UNC's Site/Soil Characterization and Decommissioning Plans for the site at 71 Shelton Avenue, New Haven, Connecticut. In accordance with our past correspondence, including your letter to me of August 10, 1998, UNC will use a concentration of 30 pCi/g as an acceptable release criterion for enriched uranium. NUREG/CR-5849 will be used as guidance for demonstrating that this criterion is met.

I look forward to working with you on this project.

Yours very truly,

Robert F. Bonito
General Manager of Operations

cc: L. Hulse Esq.
T. Corneil
J. Christman
R. Gregg
R. Uhrich

NMSS/RGN-002

CHARACTERIZATION PLAN

UNC Naval Products

Previously Licensed Facility in New Haven, CT

August 14, 1998

UNC Naval Products
P.O. Box 981
Uncasville, CT 06382

SITE SOIL/SEDIMENT CHARACTERIZATION
PREVIOUSLY LICENSED UNC NAVAL PRODUCTS FACILITY IN NEW HAVEN, CT

The following tables describe the sampling that UNC Naval Products (UNC) anticipates performing to characterize areas of concern at UNC's former nuclear fuel manufacturing facility located at 71 Shelton Avenue in New Haven, CT. The areas identified are those for which the NRC has requested further characterization* , based on data provided to them by UNC in 1996 and the NRC's preliminary sampling work in 1996. Specific details of UNC's sampling may need to be modified at the time the work is performed, based on site-specific conditions.

TABLE 1 - INDOOR AREAS

AREA	CHARACTERIZATION
Decon Room	Two core samples, one adjacent to the patched area on the west side, and one in the middle of the patched area.
Storage Area (room south of Decon room, where the pipe was excavated)	Two boreholes along the ~50 foot length of pipe excavation, taken adjacent to the patched floor. Note that these two are supplemented by a third to be taken in the x-ray read room, as noted in the characterization discussion for that room.
X-Ray Read Room	A total of seven boreholes associated with the area of floor repair adjacent to the NRC's Borehole #1. One of those boreholes will be in the patched area. Since the floor patch extends into the room to the north of the x-ray read room, two of these boreholes would be in that room, adjacent to the floor patch on the east and west. Three of the remaining four boreholes would be adjacent to the floor patch in the x-ray read room, one on the east side and two on the west side. The last hole would be several feet outboard of the NRC's borehole #1 on the east side of the floor patch, to check the lateral extent of the condition identified by the NRC. One borehole adjacent to the patched area where the NRC's Borehole #2 is located. Since this is a continuation of the pipe excavation, the information will supplement that from the storage room.
Pipe Trench (concrete lined trench along south side of building)	Residue samples : 1) in the rectifier room and the chem. lab room where the NRC sampled, locations further down the pipe trench (under the concrete floor), to see if the NRC results are only indicative of localized conditions under the access holes. 2) at all other trench access locations in areas that processed exposed U (i.e. Building 3H, to include areas that were converted to "clean" operations, and the rest of the chem. lab).
Concrete Floor	Visual examination of each core, and analysis of one core sample from each room where double thickness is found. Each layer would be separately analyzed.

TABLE 2 - OUTDOOR AREAS	
AREA	**CHARACTERIZATION**
Sewer	Sample the residue from the next manhole downstream from the one on Argyle Street identified by the NRC as #3. If there is no such manhole, or if this location shows an accumulation of residues in the pipe as was seen in manholes #3 and #4, the first manhole in the city sewer system downstream from the inlet from Argyle St. would be sampled.
Dirt/Debris Area North of 3H	A total of 8 samples on a standard 10m by 10m grid (4 samples per $100m^2$) to characterize this area.

Notes:

1. For all indoor sampling, multiple samples may be taken at 15 cm depth increments. If on-site gamma meter results indicate the probability of elevated U in samples below the top 15 cm, the deeper samples could be analyzed. If not, they would be held back, for possible future analysis if indicated by the results of the top sample analyses.

2. Analysis will be by gamma spectrometry, by a laboratory experienced in analysis of highly enriched uranium (e.g. NFS/Nuclear Fuel Services). UNC may elect to use the U-234 to U-235 ratio of 27 established by ORISE in their site sampling for the NRC in 1997. Alpha spectrometry analyses will be used if UNC decides to confirm or independently establish that ratio.

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* NRC Inspection Report No. 070-00371/97-001, dated February 12, 1997

DECOMMISSIONING PLAN

UNC Naval Products

Previously Licensed Facility in New Haven, CT

August 14, 1998

UNC Naval Products
P.O. Box 981
Uncasville, CT 06382

Decommissioning Plan
UNC Naval Products, Previously Licensed Facility in New Haven, CT

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Decommissioning Plan
UNC Naval Products, Previously Licensed Facility in New Haven, CT

I. Background and Site Information

The site that is the subject of this plan is located at 71 Shelton Avenue, New Haven, CT (Figure 1), and consists of a building identified as 3H and 6H (Figure 2), its environs, and a connected sewer system (Figure 3) which is apparently inactive. The site is located at the edge of an industrial park, and the building is used primarily as a warehouse. It is enclosed by a chain link fence and access is controlled by the owner, Mr. Alan Jarman.

The site was once owned by UNC Naval Products and was licensed under NRC License No. SNM-368. Primary activities performed under that license were the fabrication of nuclear fuel components for the United States Government. Nuclear material used for this work consisted primarily of highly enriched uranium. Minor amounts of thorium, depleted uranium, and natural uranium were also used.

The site was decontaminated and decommissioned (D&D) in 1973-76, after the work performed there was transferred to a new facility located in Montville, CT. The New Haven site was officially removed from License SNM-368 on April 22, 1976[1]. License SNM-368 was terminated by the NRC eighteen years later, on June 8, 1994[2], following UNC's successful D&D of the Montville facility.

In April 1996, UNC Naval Products was contacted by NRC Region I, and informed that a review of old decommissioning files showed a lack of data for the New Haven site relative to soils and the plant sewer line. UNC was told that the NRC was interested in performing some sampling at the site in order to obtain such information.

The NRC made arrangements with the current property owner for a site visit to perform radiation measurements and collect samples. This work was performed on May 29, 1996 and the results reported to the owner in July 1996[3].

Based on the results of this inspection and additional information provided by UNC, the NRC determined that more soil testing was necessary. This testing was performed by NRC and their contractor ORISE on September 16 - 17, 1996, and the results reported to UNC Inc. (Lange) on February 12, 1997.[4] The results of the soil testing showed that a small number of local areas of soil and sediments contained enriched uranium exceeding the soil acceptance criteria established by the NRC in 1981[5].These areas showed total U levels up to 723 pCi/g, exceeding the NRC's decontamination limit of 30 pCi/g. At the time of the site D&D, there were no published soil decontamination criteria, other than "as low as reasonably achievable" (ALARA), and meter surveys of the soil by an NRC inspector in 1976 were found to be acceptable.[6] Based on the new sampling results, the

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[1] Letter, NRC (W. T. Crow) to United Nuclear Corporation (Robert J. Pyzel) dated April 22, 1976
[2] Letter, NRC (John H. Austin) to UNC Naval Products (Robert F. Bonito) dated June 8, 1994
[3] NRC Inspection No. 070-00371/96-001, dated July 26, 1996
[4] NRC Inspection No. 070-00371/97-001, dated February 12, 1997
[5] NRC Branch Technical Position "Disposal or Onsite Storage of Thorium or Uranium Wastes From Past Operations", published in the October 23, 1981 Federal Register
[6] NRC Inspection No. 70-371/76-06, dated April 2, 1976

NRC concluded that "there is not an immediate health and safety hazard with respect to the soil and sediment contamination", but requested that UNC perform additional site characterization to determine the extent of remediation that might be necessary.

In response, UNC is submitting to the NRC, with this decommissioning plan, a characterization plan outlining the additional sampling and testing UNC proposes to perform in order to determine the lateral and vertical extent of the elevated levels of enriched uranium in the identified areas of concern. Upon completion of that testing, UNC intends to work with the NRC to reach agreement on specific remediation efforts to be implemented in order to bring the site into compliance with Option 1 of the 1981 Branch Technical Position decontamination limits.

II. Description of Planned Decommissioning Activities

A. Decommissioning Objectives and Activities For Identified Areas of Concern

1. Objectives

Decommissioning activities will:

- reduce soil and sewer residue enriched uranium contamination to levels meeting the decontamination limits of Option 1 of the 1981 Branch Technical Position
- remove all low level radioactive waste (LLRW) from the site, to licensed disposal facilities
- upon completion of remediation, verify acceptability

Performance and completion of these activities will:

- permit "unrestricted" use of the site and facilities
- maintain ALARA exposures during and after decommissioning
- accomplish the work in a safe and environmentally acceptable manner in accordance with all applicable federal and state laws and regulations

2. Activities

The following table delineates the major activities and tasks related to decommissioning for the areas which may be identified by UNC characterization as requiring remediation: (note: All of these areas may not require remediation. This will be determined by the characterization which will be completed subsequent to the submittal of this plan.)

DECOMMISSIONING ACTIVITIES

Area	Activity
Double thickness concrete floor	1. Remove impacted concrete and package for disposal as low level radioactive wastes (LLRW)
Sub-floor soils	1. Remove concrete floor slab 2. Excavate and package impacted soils for LLRW disposal 3. Retest to verify acceptability 4. Perform additional excavation and testing as necessary
Indoor residues	1. Remove and package impacted residues for LLRW disposal 2. Retest to verify acceptability 3. Perform additional removal and testing as necessary
Outdoor soils	1. Excavate and package impacted soils for LLRW disposal 2. Retest to verify acceptability 3. Perform additional excavation and testing as necessary
Sewer residues	1. Remove impacted residues, using techniques designed to prevent discharge into main sewer system 2. Dewater, solidify, or otherwise treat residues as necessary to meet LLRW disposal criteria for moisture content 3. Package residues for LLRW disposal

Methods used to accomplish these activities are expected to be non-exotic, using readily available equipment. Floor removal may utilize equipment such as concrete cutting saws, jack hammers, and back hoes. Soil removal may be performed using both mechanical (e.g. back hoe) and manual (e.g. shovels) techniques. Residue removal may use vacuum equipment as well as manual techniques. Sewer pipe cleanout techniques will be based on contractor knowledge and experience.

Following NRC acceptance of the decontamination results, UNC will backfill the remediated areas as necessary with clean fill, and repair the concrete floors.

B. Decommissioning Organization and Responsibilities

While overall responsibility for the D&D work lies with UNC, qualified contractors will be hired to perform the actual work, including maintenance of an acceptable radiation protection program.

C. Training

D&D contractors will be required to provide appropriate training to their personnel to assure that the work is performed in a safe, environmentally responsible manner.

III. Protection of Workers and the Environment Against Radiation Hazards During Decommissioning

A. Radiation Control Programs

Responsible remediation contractors will be required to have acceptable radiation control programs so as to assure that:

- Exposure levels are monitored (e.g. lapel monitors)
- Occupational radiation exposures are maintained ALARA
- Residues from remediation are controlled so as not to spread contamination to other objects or areas of the site
- Potentially contaminated tools, vehicles, etc. are verified to meet release limits before leaving the site

Since the radioactive material being dealt with consists of low levels of unirradiated uranium, there is no significant direct radiation hazard to personnel. The specific exposure pathways of concern are those of inhalation and ingestion. At the levels of uranium measured to date, these are not expected to be a major concern, given the relatively short time periods of potential exposure during the D&D process. Responsible contractors will be required to assess the radiation exposure potential under 10CFR20, and to base their protection programs on that evaluation.

B. Radioactive Waste Control Programs

Responsible remediation contractors will be required to have acceptable radioactive waste control programs, so as to assure that:

- Radioactive wastes generated during decontamination are properly packaged and controlled
- All LLRW packaging, shipment, and disposal meets applicable state, federal, and disposal site requirements

IV. Planned Final Radiation Survey

A. Surface Surveys

During NRC inspection 070-00371/96-001 the NRC took biased exposure rate, fixed contamination, and removable contamination readings at the site. This inspection report states "All measured exposure rates were consistent with the background radiation exposure rate of 12-14 μR/hr" and "All fixed and removable measurements met NRC release criteria as described in Attachment 3."

Based on this NRC data and the fact that current building and equipment release requirements for fixed and removable contamination are the same as they were in 1976, when the buildings were extensively surveyed by UNC and accepted by the NRC for unrestricted use, no additional building surface surveys are necessary.

B. Soil and Sediment Surveys

- Indoors

  While the usual survey procedures for soil areas, as delineated in NUREG/CR-5849, Section 4.2.3 and Figure 4-4, involve working with a systematic grid, the irregular shape of the indoor areas involved in this remediation do not lend themselves to that configuration. UNC anticipates taking systematic soil samples representative of the depth and breadth of the area(s) involved in the indoor remediation,. Those samples will be analyzed by a qualified contractor laboratory to determine their total enriched U content. Isotopic ratio will be established either by using the value determined by ORISE in 1997 by alpha spectrometry (U-234 to U-235 activity ratio of 27), or by independent alpha spec measurement. This value in turn will be used to determine the total enriched U content of samples analyzed by gamma spectrometry, which does not measure the U-234 content.
  Testing by the NRC in 1996 showed that thorium levels were "representative of natural background." This is consistent with the limited quantities of this material used at the site. Based on the NRC results, no additional evaluation will be done for thorium, either indoors or outdoors.

- Outdoors

  Remediated outdoor areas will have soil samples taken on a 10 meter by 10 meter grid. Samples will be analyzed by a qualified contractor laboratory to determine their total enriched U content.

C. Background

For purposes of this remediation, soil background will not be separately determined. Instead, the value determined for the UNC Naval Products Montville facility will be used, as was done by ORISE in their report on the New Haven facility in 1997. This value is 3.43 pCi/g.[7]

[7] Figure H-2.3, UNC Naval Products Final Site Decontamination Report, dated 3/12/93

D. Acceptance Criteria

- Surfaces

  No surface surveys are planned. If they were, the surface release criteria would be those that were used for the 1976 release of this facility and the 1994 release of UNC's Montville facility, as delineated in Condition 11 to terminated license SNM-368.

- Soils and Sediments

  Soil release criteria are those delineated in the NRC's Branch Technical Position "Disposal or Onsite Storage of Thorium or Uranium Wastes From Past Operations" and approved by the NRC for D&D of UNC's Monville, CT site: 30 pCi/g enriched U avg. for a 100 m^2 area, with higher local areas permitted, as limited by the formula

  30pCi/g x (100/A)^1/2

  where A is the area of the location with the elevated U level, in square meters. Values in excess of 90 pCi/g are not permitted.

E. Documentation

Results of the final survey will be documented and submitted to the NRC, with a request for permanent release of the facility for unrestricted use.

V. Decommissioning Costs

UNC expects that the U.S. Department of Energy will reimburse costs for this D&D effort under the terms of UNC's existing contracts, as they did for the D&D of this facility in the 1970's, and the UNC Montville facility in the 1990's.

VI. Physical Security Plan and Nuclear Material Control

A. Physical Security

The quantities and concentrations of SNM involved in this remediation effort are not great enough as to require special security under NRC safeguards requirements. UNC expects that normal industrial site security will be maintained during the remediation effort.

B. Nuclear Material Control

The quantities and concentrations of SNM involved in this remediation effort are not great enough as to require special nuclear material accountability or control. It will be necessary, however, to establish the uranium content of materials shipped to disposal, to meet disposal site requirements. LLRW shipments will be made to a licensed disposal facility according to current NRC and DOT guidelines/requirements for LLRW shipments.

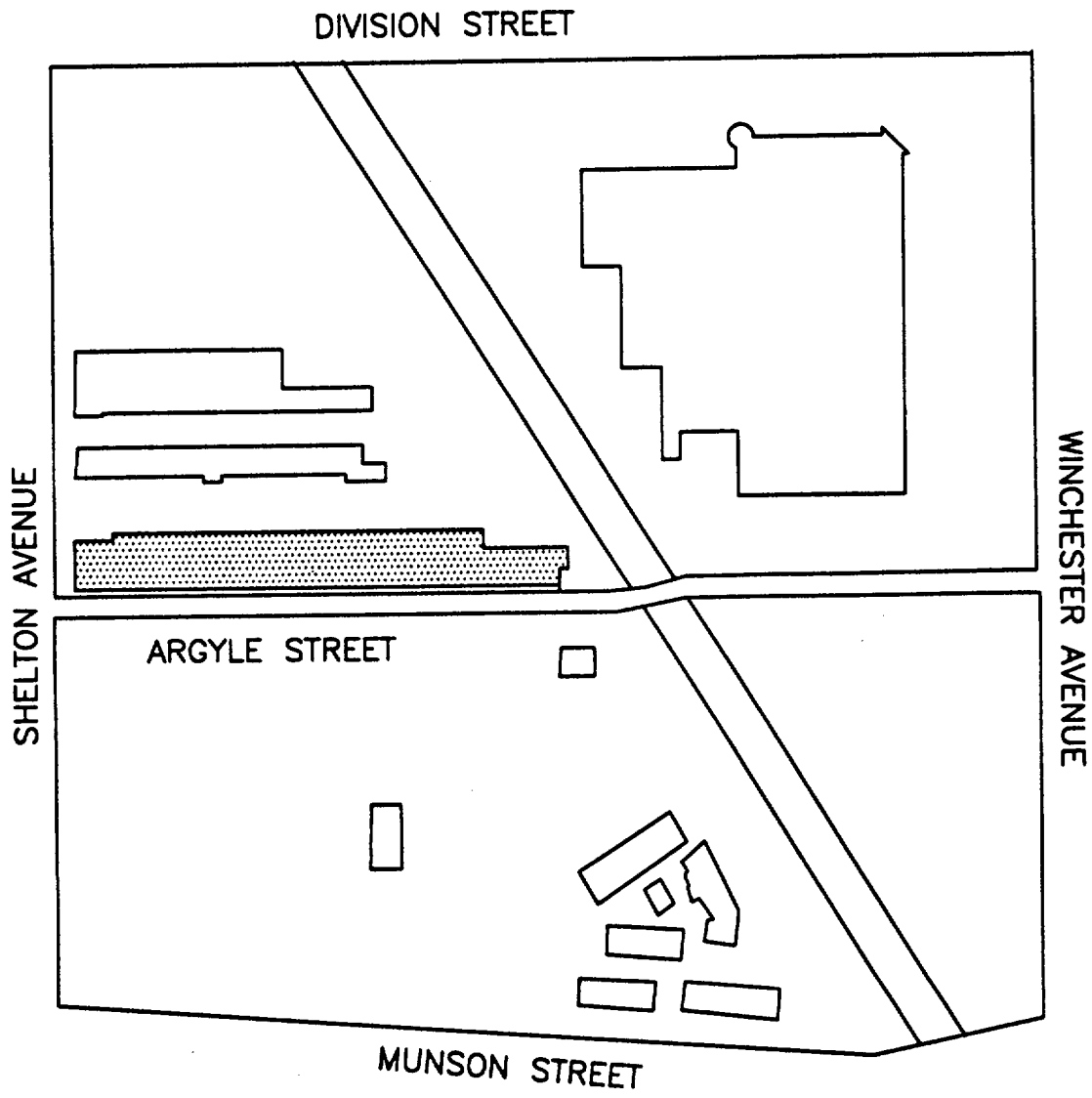
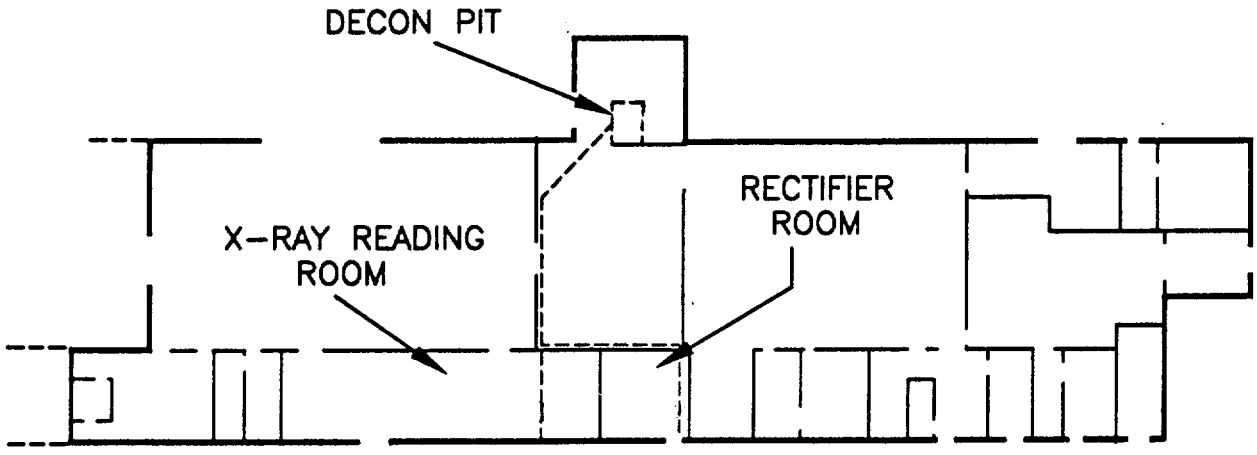
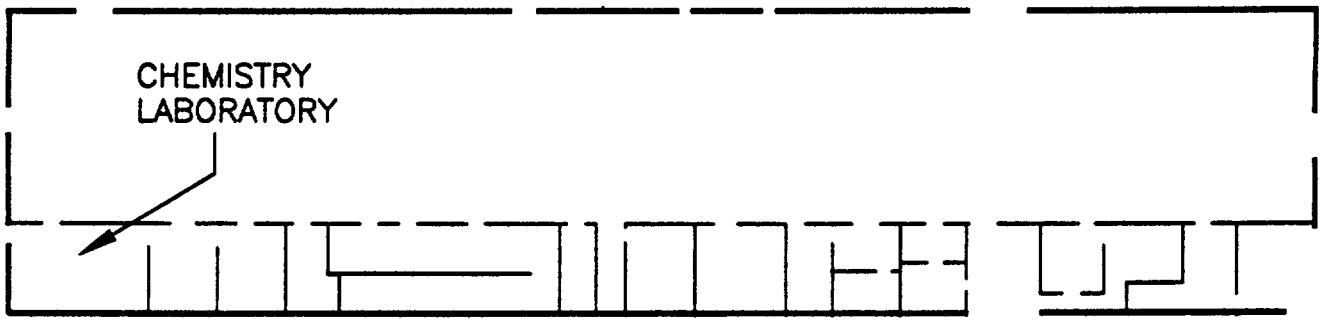


Figure 1

Site Location in New Haven, CT



BUILDING 3H



BUILDING 6H

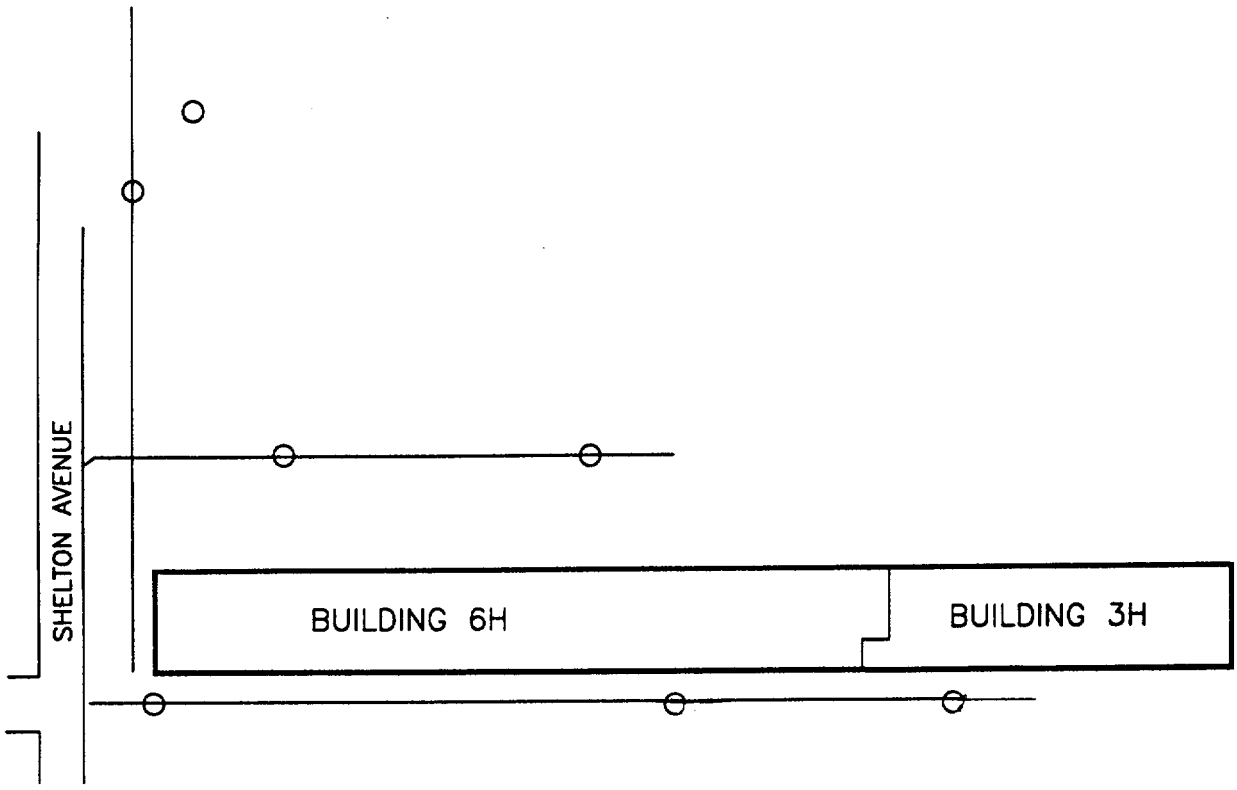
N

Not to Scale

Figure 2

Buildings 3H and 6H

Potential Areas of Remediation



Manhole

N

Not to Scale

Figure 3

Sewer System Layout