R-584-11-85-01

FOCUS FEASIBILITY STUDY DATA EVALUATION
BLUE SPRUCE INTERNATIONAL, INC.
BOUND BROOK, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8502-02B
CONTRACT NO. 68-01-6699

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

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NUS CORPORATION
SUPERFUND DIVISION

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1.0 EXECUTIVE SUMMARY

This report summarizes the findings of the Focus Feasiblity Study sampling program conducted by NUS Corporation at Blue Spruce International, Inc., Bound Brook, New Jersey from June 25-27, 1985. The sampling program was designed to determine the extent of contamination of the building structure formerly occupied by Blue Spruce International, Inc. and to use the data to develop and evaluate alternatives for remediation of the facility. The program consisted of 29 building interior samples, five building exterior samples, six basement subsurface soil samples and additional quality assurance samples.

The samples were collected and analyzed for 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). Agent Orange is an equal mixture of the herbicides 2,4-D and 2,4,5-T. 2,3,7,8-TCDD has been shown to be a contaminant of Agent Orange.

An evaluation of the analytical results indicates 2,3,7,8-TCDD contamination throughout the building. The brick subflooring, uncovered in the one story section of the building, revealed the highest contamination with 2,3,7,8-TCDD. The concrete floors were less, although uniformly, contaminated. The walls contained the lowest degree of 2,3,7,8-TCDD contamination. Similar patterns exist for 2,4-D and 2,4,5-T contamination of the building. The herbicides appear at much higher concentrations and at the same order of magnitude to one another, suggesting the presence of Agent Orange.

Subsurface soil samples collected from the basement contained little 2,3,7,8-TCDD contamination. One sample contained a concentration at or below the analytical detection limit.

This report also includes the methodologies used to collect the samples, as developed by NUS Corporation and a photographic log of the sampling activities.

2.0 OBJECTIVES

The objectives of this study were:

(1) to determine the extent of 2,3,7,8-TCDD and Agent Orange contamination of the Blue Spruce International building structure, and

(2) to determine the presence and potential migration of 2,3,7,8-TCDD and Agent Orange contamination in the basement subsurface soil.

The results of the study will be used to develop and evaluate remedial action alternatives for the building.

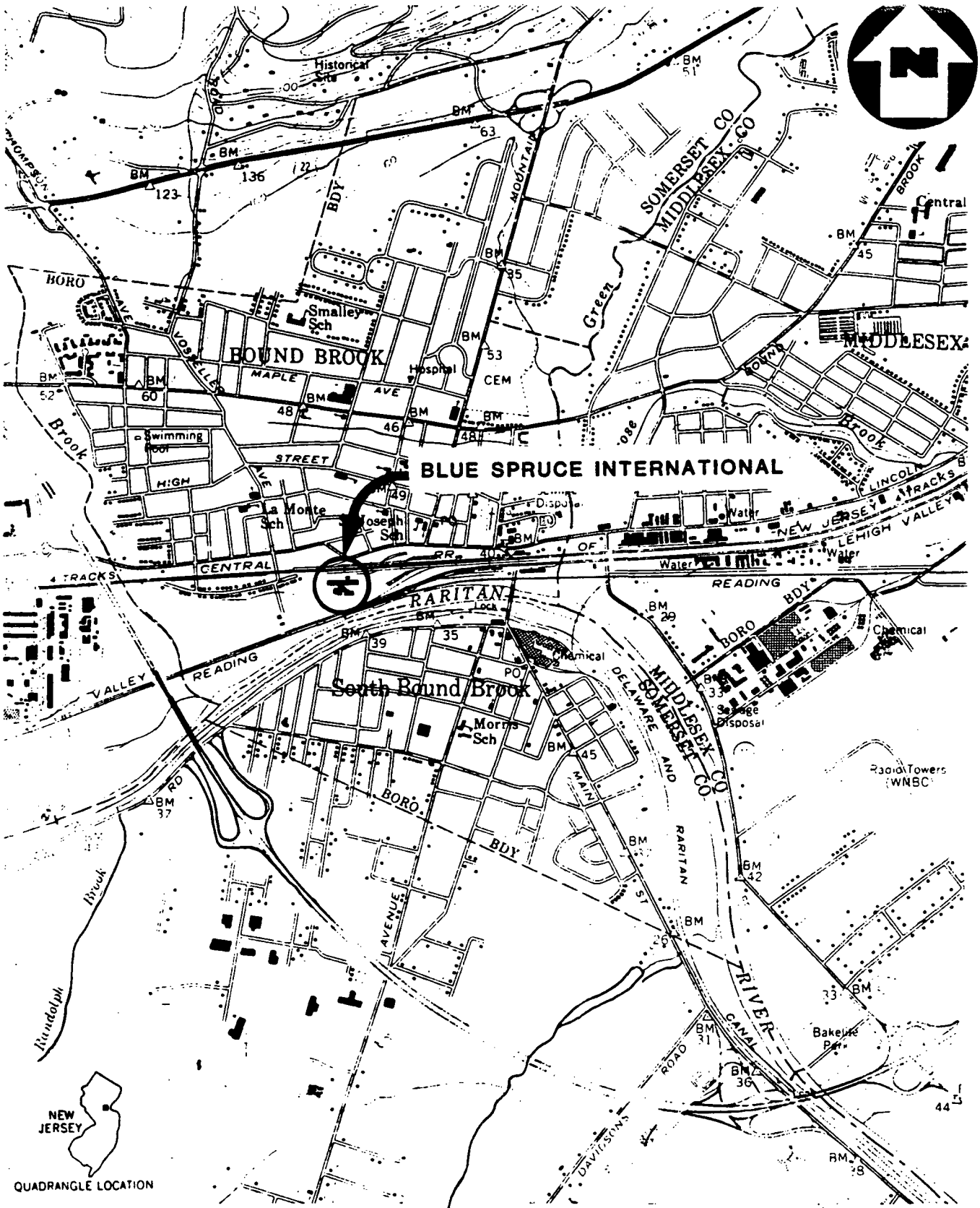
3.0 INTRODUCTION

NUS Corporation was tasked by the U.S. Environmental Protection Agency (EPA) to conduct a Focus Feasibility Study (FFS) of Blue Spruce International, Inc. The FFS will address the need for and identify and evaluate remedial actions related to 2,3,7,8-TCDD contamination at the site. A review of existing 2,3,7,8-TCDD data at the site revealed a deficiency in the data base. Further sampling was proposed to better characterize contamination and meet the objectives of the FFS.

Blue Spruce International, Inc. is located within the approximately 4.5 acre Brook Industrial Park in the Borough of Bound Brook, Somerset County, New Jersey. Figure 3-1 provides a site location map. Brook Industrial Park is bordered to the north by the Borough of Bound Brook and to the south by the Raritan River. The industrial park is bounded to the north by the Central Railroad of New Jersey and to the south by the Lehigh Valley and Port Reading Railroads, which are situated between the Raritan River and the site.

Blue Spruce International, Inc. formulated and packaged numerous pesticides within the facility. In addition, the facility stored a number of drums of Agent Orange. It has been reported that operations at the facility involved careless handling of pesticide compounds and lax housekeeping practices. Residual contamination of the building and the site environs is apparently the result of these operations and not waste disposal, per se. Pesticides and other chemicals were stored in unsealed 55 gallon drums and smaller containers and on plastic sheets in and around the building. Spillage, stained soil, and other contamination have been noted throughout the building. Poor housekeeping practices included hosing or sweeping spilled materials into the basement.

Data detailing the quantity of compounds handled at the facility are not available. However, 55-gallon drums numbering in the hundreds were counted during one inspection by the New Jersey Department of Environmental Protection (NJDEP), indicating that large quantities of compounds were handled. Currently no containerized hazardous materials are being stored at the site.



(QUAD) BOUND BROOK, N.J.

FIGURE 3-1

SITE LOCATION MAP

BLUE SPRUCE INTERNATIONAL, INC., BOUND BROOK, N.J.

SCALE: 1"=2000'

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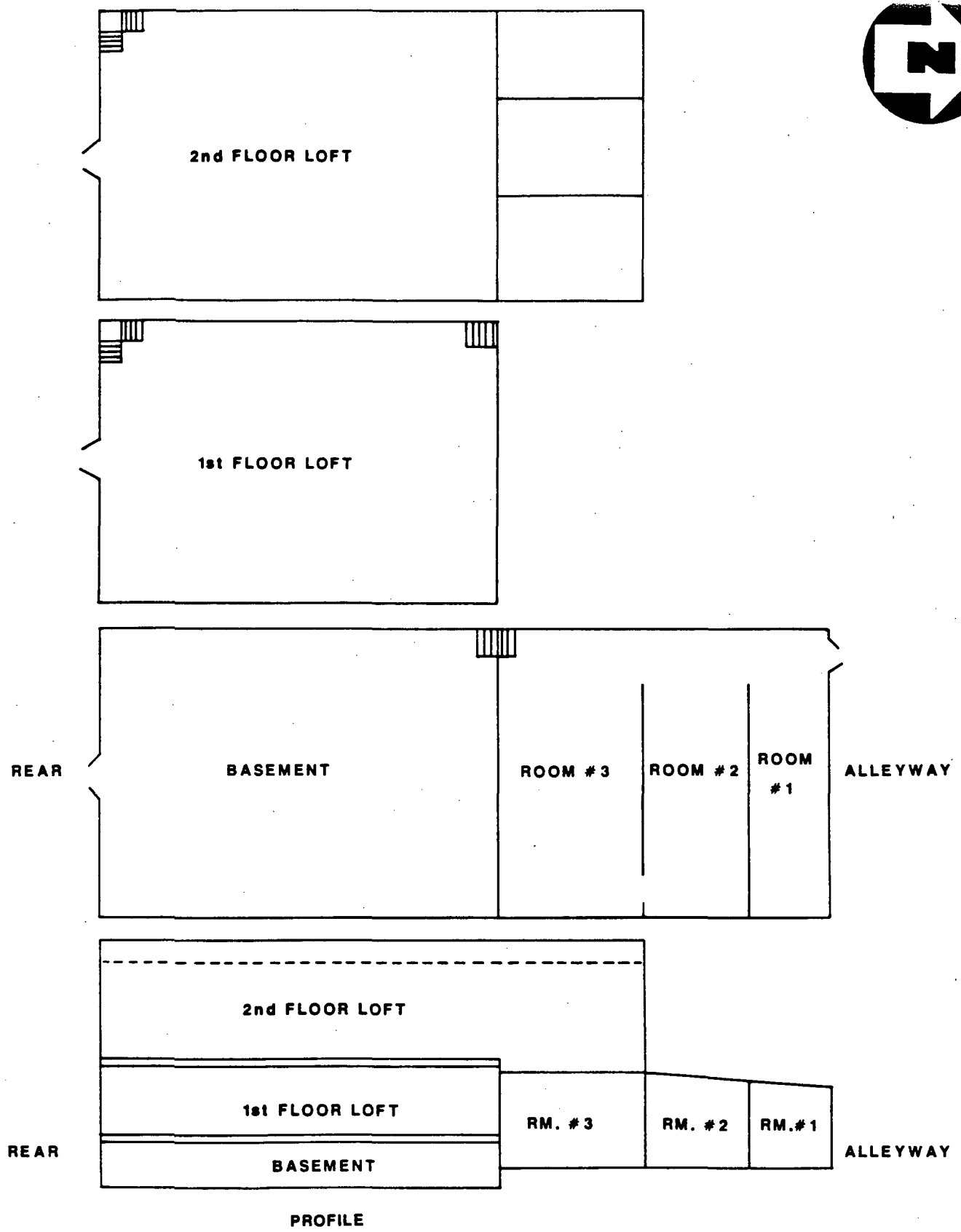
The roof and foundation of the building leaked during rainfalls and the industrial park itself is prone to flooding. On several occasions, standing water was noted in the basement and indications of erosion originating near the south door of the building were observed. Flooding commonly occurs within the building; floodwater discharges toward the Raritan River to the south.

3.1 Building Description

The building leased by Blue Spruce International, Inc. consists of one and two-story sections. The exterior and interior walls of the building are constructed of brick and set on a stone foundation. Figure 3-2 is a floor plan of the building.

The one-story section comprises two rooms, each with 12-foot high brick ceilings. Room 1 is 690 square feet and Room 2 is 736 square feet. Poured concrete floors overlie brick floors. Access to this section of the building is through a doorway facing the alleyway. Stucco was applied to the exterior brick surface in the alleyway after Blue Spruce International, Inc. vacated the building.

A third room, Room 3, although part of the two-story section of the building, is level with the two rooms of the one-story section. This room is 989 square feet and has a 14-foot high ceiling and poured concrete over brick floors. The flooring in Room 3 has been broken up. Access into the remainder of the two-story section is through two stairways located in Room 3. One of these stairways provides access to the basement and the other stairway provides access to the first of two loft floors in the two-story section. The basement is 2,714 square feet and contains a soil floor and 6 to 7 foot high ceiling. The basement has an outside door to the south of the building. The first and second floor lofts consist of single rooms with wood floors and brick walls. The first floor loft is 2,714 square feet with a 10.5 foot high ceiling. The second floor loft is a larger room covering 3,703 square feet. The increased floor space is due to a sunken area of flooring directly above Room 3. The ceiling height of the second-story is 14 feet with a 3 foot gable which raises the ceiling at the peak. The roof is constructed of wood. Both lofts have outside doors to the south of the building that appear to have been used for hoisting materials to and from the building at one time. The building is now abandoned and the doors to the one-story section of the building and the basement are locked.



BUILDING FLOOR PLAN

BLUE SPRUCE INTERNATIONAL, INC.,

BOUND BROOK, N.J.

SCALE: 3/64" = 1'-0"

FIGURE 3-2

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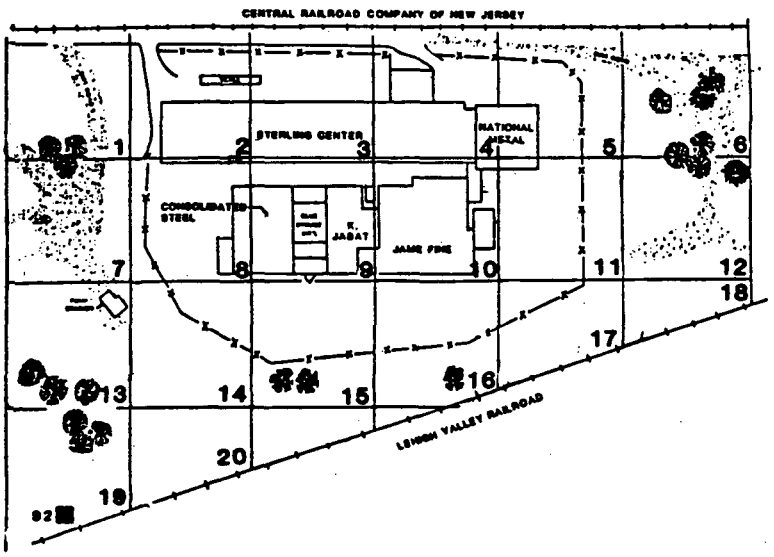
3.2 Evaluation of Existing Data

Between late June and October 1983, NUS Corporation conducted a phased sampling program to define the extent of 2,3,7,8-TCDD contamination in the vicinity of Blue Spruce International, Inc. Sample types included vacuum bags, an air conditioner filter, sweeps from building entrances and loading docks, and surface soil from a depth of 1 to 2 inches. One hundred and three environmental samples were collected and analyzed for 2,3,7,8-TCDD. The analytical results of these efforts have been reported previously (NUS Corporation, 1984).

Figure 3-3, a positive 2,3,7,8-TCDD sample location map, summarizes the findings of the study. 2,3,7,8-TCDD was detected in 22 surface soil samples. Two samples, Number 11 collected in the basement and Number 15 collected in Room 3 of the building, contained 6.1 and 5.7 parts per billion (ppb) of 2,3,7,8-TCDD respectively. Nineteen samples with detectable concentrations of 2,3,7,8-TCDD were located in the alleyway north of the building and adjacent to the south door of the buiding. Fifteen of these samples had 2,3,7,8-TCDD concentrations greater than 1 ppb; three samples had concentrations greater than 5 ppb. Sample Number 92, positive for 2,3,7,8-TCDD, was located adjacent to the Lehigh Valley Railroad tracks.

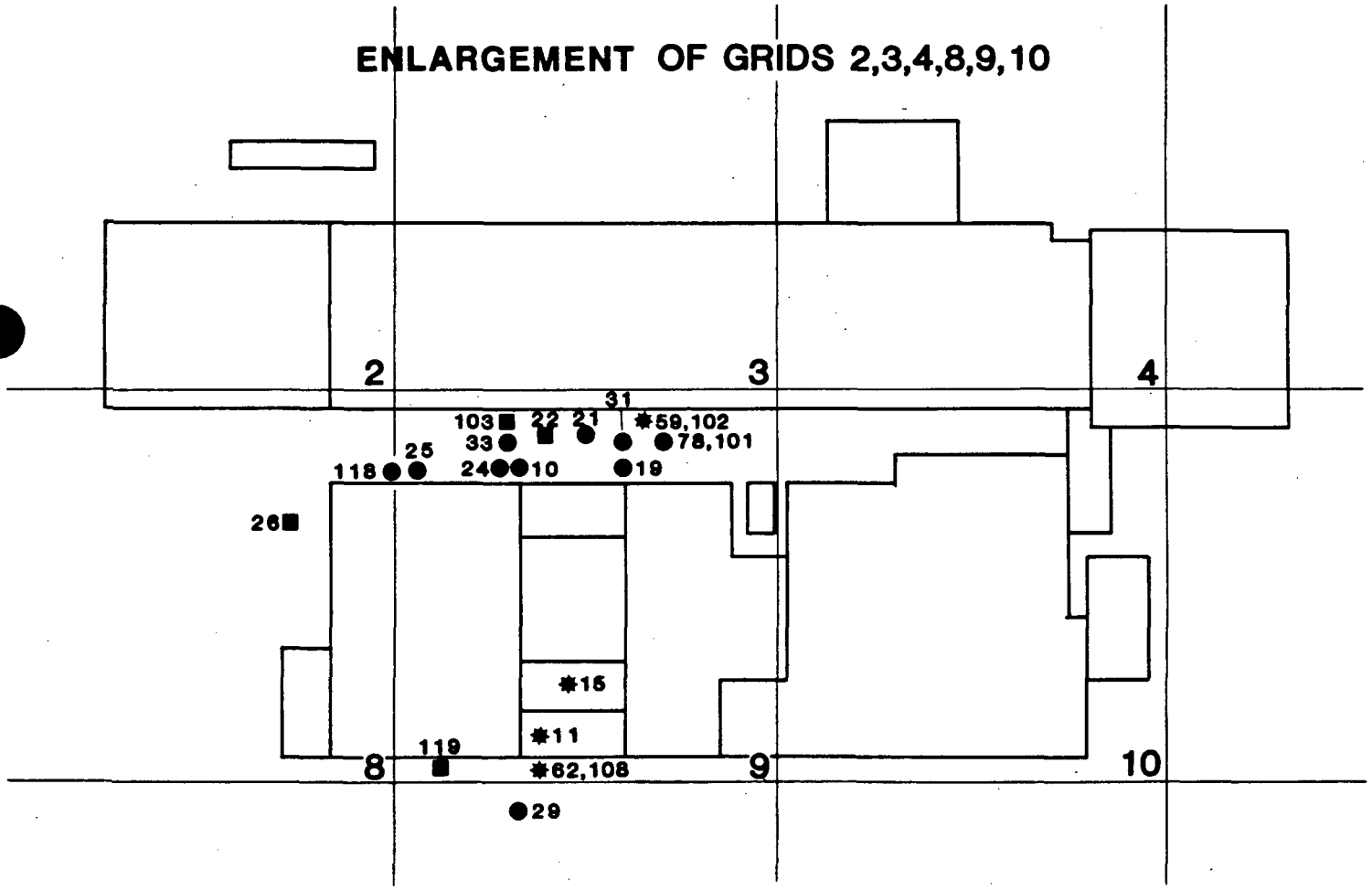
As a result of this study, the following temporary interim remedial measures have been taken: the building has been secured and is not accessible to persons without personal protective equipment, a temporary fence has been erected at the entrance to the alleyway to prevent vehicular and pedestrian traffic and to minimize the spread of contaminated soil, and a portion of the alleyway along the building wall was covered with asphalt.



LEGEND:

- ✱ ≥ 5.8 ppb 2,3,7,8-TCDD
- ● ≥ 1.0 ppb 2,3,7,8-TCDD
- ■ < 1.0 ppb 2,3,7,8-TCDD

ENLARGEMENT OF GRIDS 2,3,4,8,9,10



POSITIVE 2,3,7,8-TCDD SAMPLE LOCATION MAP

BLUE SPRUCE INTERNATIONAL, INC., BOUND BROOK, N.J.

(NOT TO SCALE)

FIGURE 3-3

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4.0 METHODOLOGY

The building sampling program for the Blue Spruce International Focus Feasibility Study was authorized by EPA under Technical Directive Document #02-8502-02A. A reconnaissance of the Blue Spruce International building was conducted by NUS on June 20, 1985 to assess the building in terms of health and safety considerations for NUS workers and to locate sampling points. Sampling was conducted from June 25 to June 27, 1985. Figures 4-1A, 4-1B and 4-1C provide sample locations. Table 4-1 provides sample descriptions.

Due to the physical nature of the samples being collected, NUS developed protocol for the collection and homogenization of samples. These procedures are discussed in the following sections. Table 4-2 provides information on some of the specialized equipment used to collect and process the brick and cement samples.

All samples were collected for 2,4-D, 2,4,5-T and 2,3,7,8-TCDD analyses. All brick, cement, wood and soil samples were analyzed for 2,3,7,8-TCDD according to the protocols under the Contract laboratory Program (CLP). 2,4-D and 2,4,5-T analyses were conducted according to Method 8150 of EPA's Test Methods for Evaluating Solid Waste (SW-846).

Sample locations were selected using several criteria:

1) An attempt was made to sample each surface in the three ground level rooms of the building as well as the basement (i.e., each wall and floor). These rooms were suspected of having higher worker activity and potential contamination.

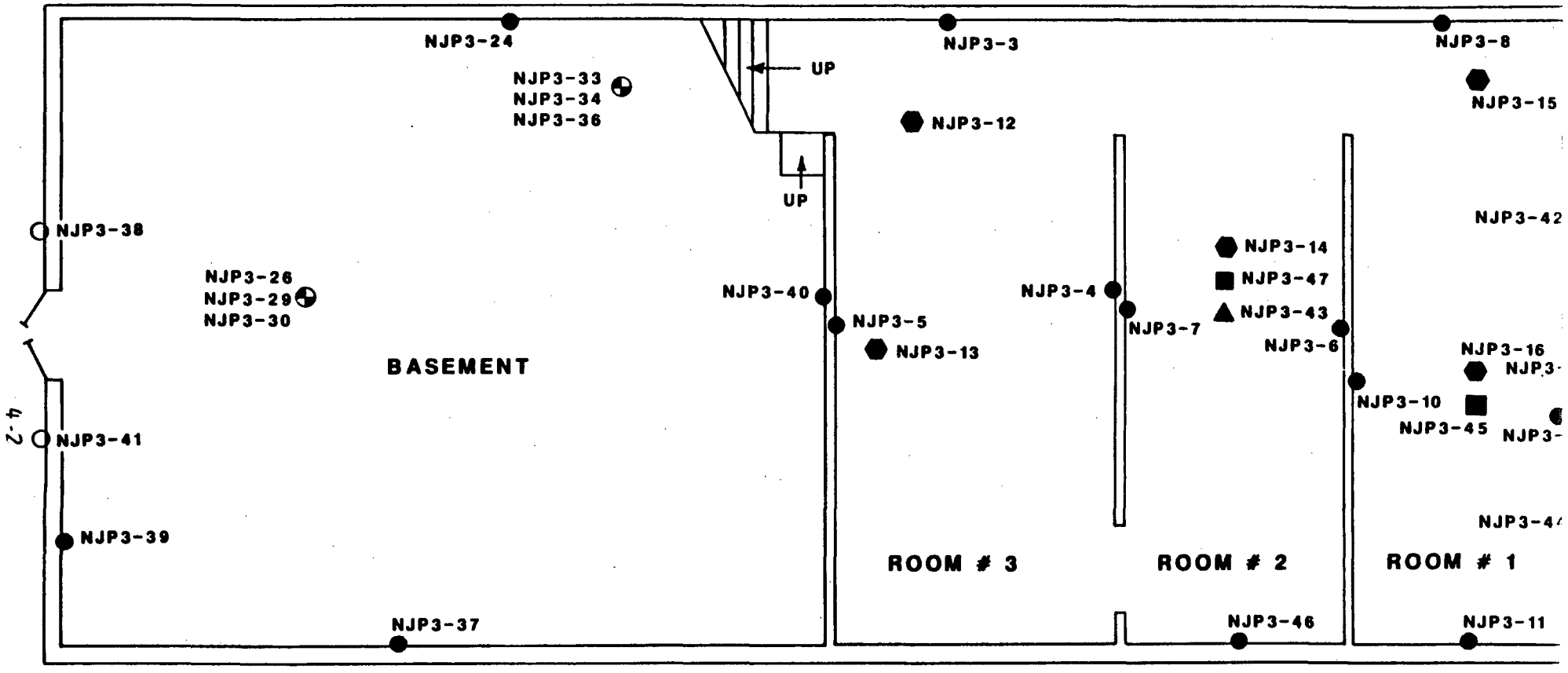
2) Samples were collected in areas where worker transport and contact were suspected.

3) Samples of sub-surface flooring were collected to detect potential contamination prior to being covered over with concrete.

4) Samples were collected from the exterior wall along the alleyway to detect potential contamination prior to being covered over with stucco.

LEGEND :

- EXTERIOR WALL SAMPLE
- BRICK WALL SAMPLE
- CEMENT FLOOR SAMPLE
- SUB-SURFACE BRICK FLOOR SAMPLE
- SUB-SURFACE WOODCHIP FLOOR SAMPLE
- SOIL SAMPLE



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SAMPLE LOCATION MAP-BASEMENT & GROUND LEVEL ROOMS

BLUE SPRUCE INTERNATIONAL, INC., BOUND BROOK, N.J.

SCALE: 3/32" = 1'-0"

FIGURE 4-1A

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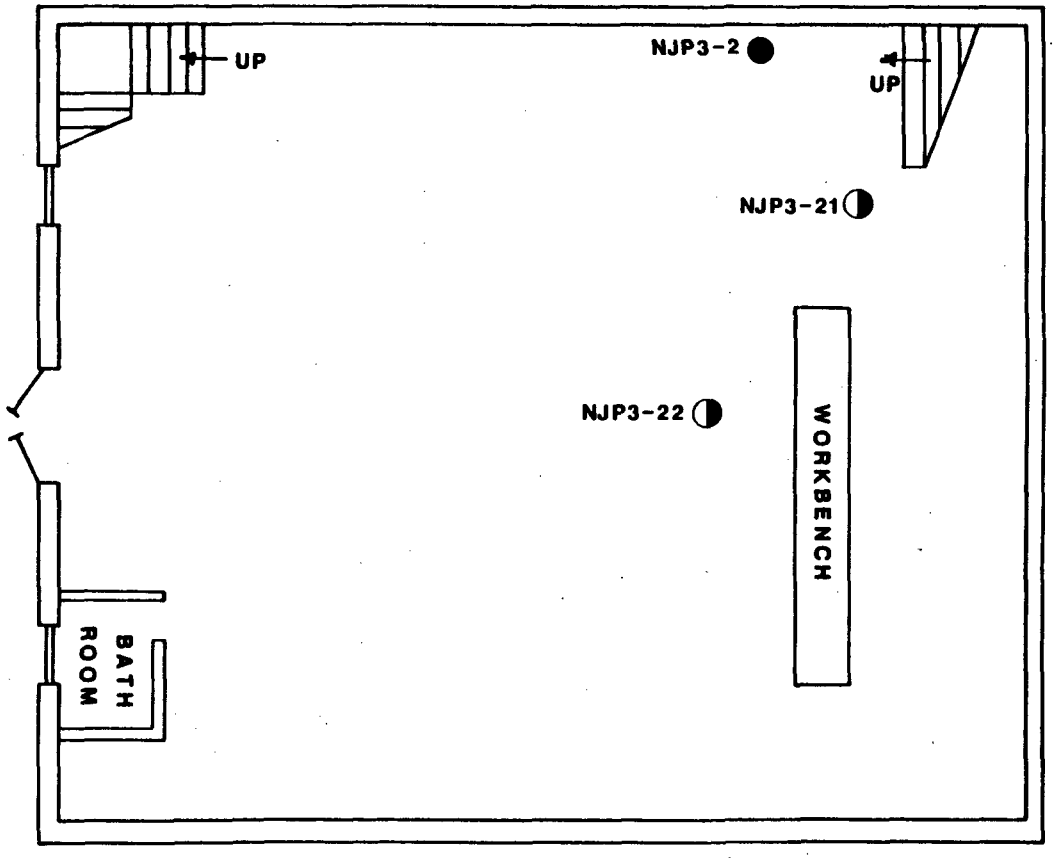
LEGEND:

◑ WOODCHIP SAMPLE

● BRICK WALL SAMPLE

FIRST FLOOR LOFT



SAMPLE LOCATION MAP-FIRST FLOOR LOFT

BLUE SPRUCE INTERNATIONAL, INC., BOUND BROOK, N.J.

SCALE: 3/32" = 1'-0"

FIGURE 4-1B

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LEGEND:

WOODCHIP SAMPLE

BRICK WALL SAMPLE

SECOND FLOOR LOFT

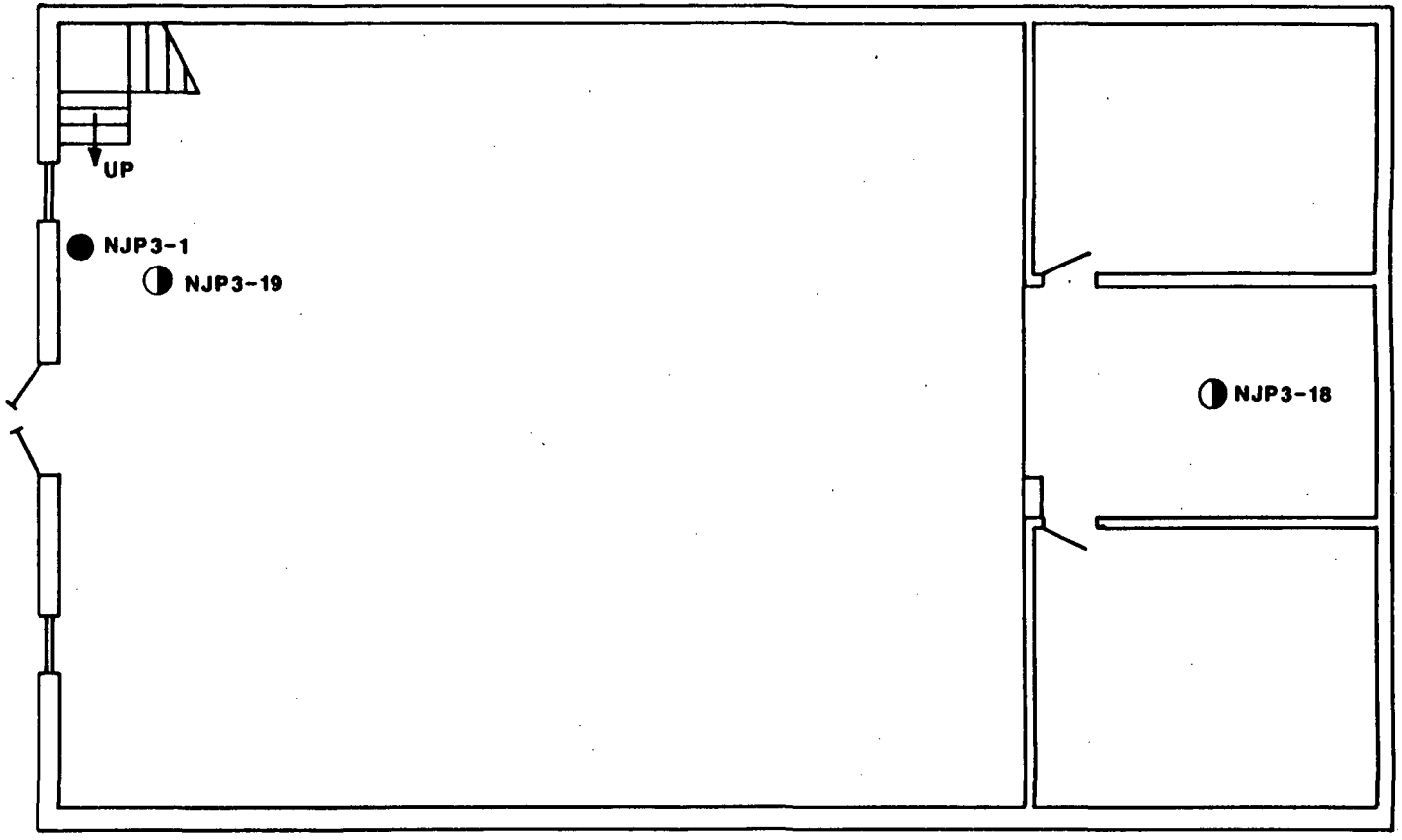

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FIGURE 4-1C

SAMPLE LOCATION MAP-SECOND FLOOR LOFT

BLUE SPRUCE INTERNATIONAL, INC., BOUND BROOK, N.J.

SCALE: 3/32" = 1'-0"

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TABLE 4-1

SAMPLE DESCRIPTIONS

BLUE SPRUCE INTERNATIONAL, INC.

6/25/85, 6/26/85, 6/27/85

Sample Number	Sample Type	Date Collected	Sample Location
NJP3-1	Brick	6/25/85	2nd floor loft-south wall near staircase (3-5 ft.)
NJP3-2	Brick	6/25/85	1st floor loft-west wall (3-5 ft.)
NJP3-3	Brick	6/25/85	Room 3-west wall (3-5 ft.)
NJP3-4	Brick	6/25/85	Room 3-north wall (3-5 ft.)
NJP3-5	Brick	6/25/85	Room 3-south wall (3-5 ft.)
NJP3-6	Brick	6/25/85	Room 2-north wall (3-5 ft.)
NJP3-7	Brick	6/25/85	Room 2-south wall (3-5 ft.)
NJP3-8	Brick	6/25/85	Room 1-west wall (3-5 ft.)
NJP3-9	Brick	6/25/85	Room 1-north wall (3-5 ft.)
NJP3-10	Brick	6/25/85	Room 1-south wall (3-5 ft.)
NJP3-11	Brick	6/25/85	Room 1-east wall (3-5 ft.)
NJP3-12	Cement	6/25/85	Room 3-floor near west wall
NJP3-13	Cement	6/25/85	Room 3-floor near south wall
NJP3-14	Cement	6/26/85	Room 2-floor sample middle of room
NJP3-15	Cement	6/26/85	Room 1-floor sample near door
NJP3-16	Cement	6/26/85	Room 1-floor sample middle of room
NJP3-17	QA Brick Blank[A]	N/A[B]	Purchased at B & M Lumber Edison, NJ
NJP3-18	Wood	6/26/85	2nd floor - floor in sunken area
NJP3-19	Wood		2nd floor - floor near stairway
NJP3-20	QA Brick Matrix Spike[A]	N/A	Purchased at B & M Lumber Edison,

TABLE 4-1 (CONT'D)
SAMPLE DESCRIPTIONS
BLUE SPRUCE INTERNATIONAL, INC.
6/25/85, 6/26/85, 6/27/85

Sample Number	Sample Type	Date Collected	Sample Location
NJP3-21	Wood	6/26/85	1st floor - floor near north stairway.
NJP3-22	Wood	6/26/85	1st floor - floor near work bench
NJP3-23	Brick	6/26/85	North exterior wall (3-5 ft.)
NJP3-24	Brick	6/26/85	Basement - west wall (2-3 ft.)
NJP3-25	QA Soil P.E. Sample[C]	N/A	EMSL, Las Vegas, NV
NJP3-26	Soil	6/26/85	Basement soil sample south end, 6" - 9"
NJP3-27	QA Soil Field Blank[D]	N/A	EPA Region II, Edison, NJ
NJP3-28	QA Soil P.E. Sample[C]	N/A	EMSL, Las Vegas, NV
NJP3-29	Soil	6/26/85	Basement soil sample south end, 12" - 15"
NJP3-30	Soil	6/26/85	Basement soil sample south end, 18" - 21"
NJP3-31	QA Soil P.E. Sample[C]	N/A	EMSL, Las Vegas, NV
NJP3-32	QA Soil Matrix Spike[D]	N/A	EPA Region II, Edison, NJ
NJP3-36	Soil	6/26/85	Basement soil sample north end, 18" - 21"
NJP3-37	Brick	6/27/85	Basement - east wall (2-3 ft.)
NJP3-38	Brick	6/27/85	South exterior wall -west of basement door (2-3 ft.)
NJP3-39	Brick	6/27/85	Basement - south wall east of basement door (2-3 ft.)

TABLE 4-1 (CONT'D)

SAMPLE DESCRIPTIONS

BLUE SPRUCE INTERNATIONAL, INC.

6/25/85, 6/26/85, 6/27/85

Sample Number	Sample Type	Date Collected	Sample Location
NJP3-40	Brick	6/27/85	Basement - north wall (2-3 ft.)
NJP3-41	Brick	6/27/85	South exterior wall east of basement door (2-3 ft.)
NJP3-42	Brick	6/27/85	Lower north exterior wall - (1-3 ft.) east side of door
NJP3-43	Wood	6/27/85	Room 2 - subsurface wood sample
NJP3-44	Brick	6/27/85	Lower north exterior wall - (1-3 ft.) east end of alleyway
NJP3-45	Brick	6/27/85	Room 1 - subsurface brick sample
NJP3-46	Brick	6/27/85	Room 2 - lower east wall - (1-3 ft.)
NJP3-47	Brick	6/27/85	Room 2 - subsurface brick sample

Notes:

(A) QA brick blank and QA brick matrix spike consist of clean brick purchased at B & M Lumber, Edison, NJ on 6/24/85

(B) N/A = Not Applicable

(C) QA soil Performance Evaluation samples were obtained from EMSL, Las Vegas, NV

(D) QA soil Field Blank and QA matrix spike were obtained from EPA, Edison, NJ on 6/24/85

TABLE 4-2

SPECIALIZED SAMPLING EQUIPMENT

EQUIPMENT	DESCRIPTION
Ingersoll - Rand Air Hammer (Model MC 121)	Heavy duty air hammer delivers 3000 blows per minute for high volume front end body, muffler and truck fleet repair shops. Professional touch trigger allows precise control for cutting, shearing and punching. Tough one-piece steel alloy barrel. Uses 3 CFM of air at 90 PSI. 1/4 inch air inlet. 3/8 inch recommended hose size. Standard Parker 0.401 inch diameter chisel shank. Throttle valve assembly easily removes for simplified maintenance.
Dayton Cutting Chisels (Flat and Punch)	Quality cutting chisels for a wide variety of applications. For Dayton and other air hammers that require 0.401 inch diameter shank tools. Chisels are made from hardened tool steel and may be resharpened several times. Length of cutting chisels is 7 inches.
Coors Alumina Mortars and Pestles	Mortars are glazed outside and polished on inside. Made of a very high alumina compositions which is harder than agate. Grinding surface cannot be scratched with tungsten carbide scriber, and only slightly with a diamond. Pestles are of alumina with polished grinding ends.

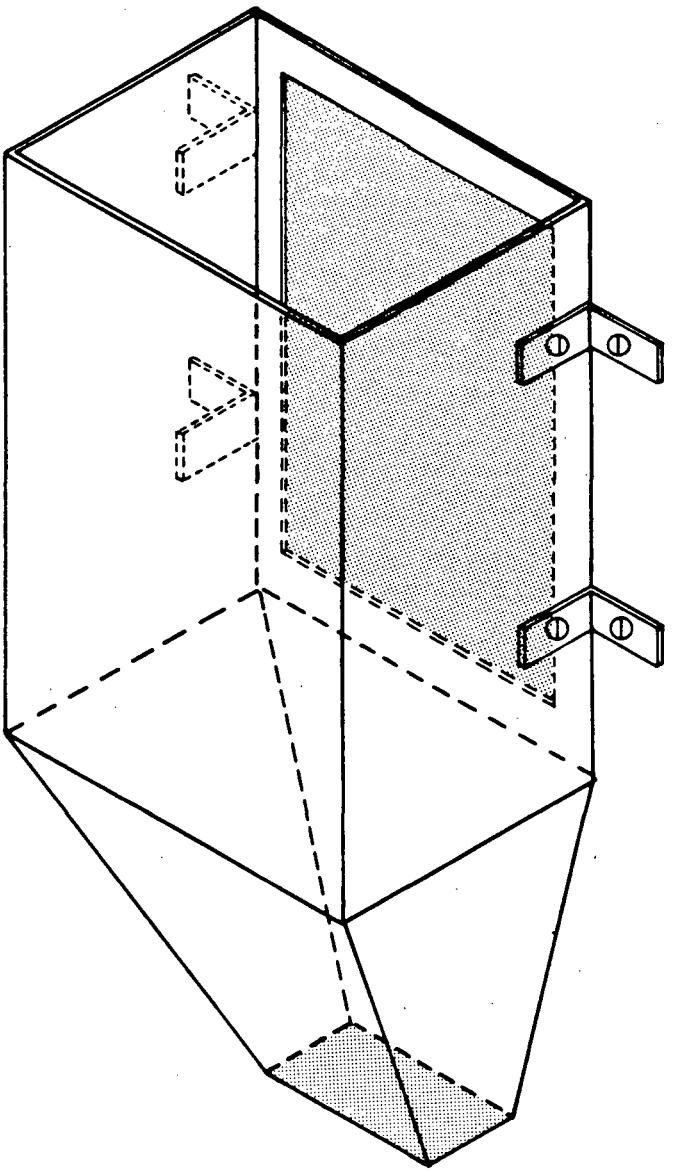
4.1 Wall Sampling

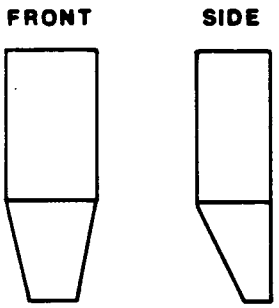
Samples of the interior and exterior building walls were collected to analyze for contamination due to worker activity, material handling incidents, and contaminated dust migration. Four samples were collected in Room 1, three samples were collected in Room 2 and three samples were collected in Room 3. Rooms 2 and 3 shared common walls on the east and west side of the building. Therefore, it was unnecessary to sample these walls twice. Four samples were collected in the basement. Two samples were collected from the lofts, one on each floor. These two samples were collected at the top of each staircase. Five samples were collected from the exterior walls: three in the alleyway on the north side of the building and two on the south wall, one on each side of the basement door.

Interior and exterior wall samples were obtained by attaching a four-sided, duct-work funnel with a stud gun and masonry nails to the section of the wall to be sampled. The funnel was a 3 feet high by 2 feet wide by 1½ foot deep rectangle with a bottom section tapered to a 6 inch by 12 inch opening. Figure 4-2 provides an illustration of the funnel. An aluminum foil pan was taped to the opening to collect the sample. Use of the funnel prevented sample material loss and cross contamination. Brick and mortar were collected from the wall with a pneumatic chisel and masonry chisel bits. Either flat-tipped or punch chisel bits were used. Areas approximately 12 inches wide by 18 inches long by ¼ inch deep were sampled.

New chisel bits and aluminum foil pans were used for each sample. The funnels were decontaminated after each sampling event.

The external wall in the alleyway was covered with stucco after Blue Spruce International vacated Brook Industrial Park. The stucco was removed with the pneumatic chisel in the areas to be sampled prior to collecting a sample from the original brick wall.





SAMPLE COLLECTION FUNNEL

BLUE SPRUCE INTERNATIONAL, INC.,

BOUND BROOK, N.J.

SCALE: 1" = 1'-0"

FIGURE 4-2

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4.2 Concrete Floor Sampling

Samples of the concrete floors were collected to analyze for adsorbed and absorbed contamination due to spillage, flooding or worker transport. Two concrete floor samples were collected from Room 1. One sample was collected near the doorway and another was collected from the middle of the room. Room 2 had one concrete floor sample collected from the middle of the room. Two samples were collected from Room 3; one near the south wall and one near the west wall.

Areas to be sampled were prepared by broom sweeping followed by vacuuming with a portable, battery-operated vacuum. These procedures were employed to remove loose contaminated soil and dust.

Concrete chips and fragments were collected by horizontally placing the four-sided, duct-work funnel over the sampling area. The bottom of the funnel was sealed with aluminum foil to prevent sample material loss. Sample collection was initiated near the large open end of the funnel and directed towards the narrow closed end. Samples were obtained by chipping the concrete floor with the pneumatic chisel. Areas approximately 12 inches wide by 18 inches long by ¼ inch deep were sampled. Concrete chips were swept with a paint brush onto a stainless steel taping knife and transferred into an aluminum foil pan.

New chisel bits, aluminum foil, aluminum foil pans, and paint brushes were used for each sample. The taping knives and funnels were decontaminated after each sampling event.

4.3 Wood Floor Sampling

Two samples of the wood floors were collected from each of the first floor and the second floor lofts. On the first floor, samples were collected near the north stairway and in front of a wooden workbench. On the second floor, samples were collected at the head of the staircase and at the north end of the room in the sunken area of the loft.

Wood samples were taken by cutting an area approximately 12 inches wide by 18 inches long by ¼ inch deep with a wood chisel and hammer. Wood chips were swept with a paint brush onto a stainless steel taping knife and transferred into an aluminum foil pan.

New paint brushes and aluminum foil pans were used for each sample. The wood chisel was decontaminated after each sampling event.

4.4 Subfloor Sampling

In Rooms 1 and 2, samples of the subflooring underneath the concrete were sampled. A brick sample was collected from Room 1. A brick sample and a sample from a wooden beam were collected from the Room 2 subfloor.

The subfloor was exposed by using a 90-pound pneumatic jack hammer to break up and remove the upper concrete floor. An approximately 2-foot by 2-foot opening was made in each sampling area to expose the subfloor. The sampling areas were swept and vacuumed before sampling.

A sample of the wooden beam in the subfloor was collected with a wood chisel as described earlier.

Samples of the brick subfloor were collected by chipping with a pneumatic chisel. Areas approximately 12 inches wide by 18 inches long by ¼ inch deep were sampled. The brick chips were retained by placing sheet metal, 18 inches high, around three sides of the sampling area and directing the brick chips and fragments toward the sheet metal. The brick chips and fragments were swept with a paint brush onto a stainless steel taping knife and transferred into an aluminum foil pan.

New aluminum foil pans, chisel bits, and paint brushes were used for each sample. The wood chisel, sheet metal, and taping knives were decontaminated after each sampling event.

4.5 Basement Soil Sampling

Soil samples were collected from depths of 6 to 9 inches, 12 to 15 inches, and 18 to 21 inches from two locations in the basement, at the northwest end of the room and at the south end. Soil was removed by a spade to a depth of 6 inches from a square area, 2.5 feet on a side, to expose the first sampling surface. Depth was measured from the existing surface of the basement floor. Soil was sampled to a depth of approximately 3 inches with a stainless steel trowel from nine locations regularly spaced along the sampling surface. Soil from each location was combined in a stainless steel mixing bowl and homogenized by hand with the trowel. Once homogenized, samples were transferred into two 8-ounce glass jars for shipment to the analytical laboratory.

The entire procedure was repeated twice to obtain the two deeper soil samples by advancing to 12 inches and then to 18 inches with the spade. Clean trowels and mixing bowls were used for the collection and preparation of each sample. Where groundwater was encountered, samples were collected and removed through the groundwater column and excess liquid was decanted. Soil was replaced at each location following completion of sample collection.

4.6 Sampling Equipment Decontamination

All reusable sample collection and preparation equipment was cleaned and decontaminated prior to and after each use. This equipment consisted of the sample collection funnels, wood chisel, taping knives and mortar and pestle sets. The following cleaning/decontaminating sequence was employed:

1. Alconox and tap water solution scrub
2. Tap water rinse
3. 1,1,1-Trichloroethane rinse
4. Acetone rinse

The equipment was allowed to air dry prior to reuse. The final acetone rinse served to facilitate the drying process.

5.0 SAMPLE HOMOGENIZATION PROCEDURES

All samples were collected in disposable aluminum pans and covered with aluminum foil until homogenization was ready to begin.

The homogenization process was as follows:

CONCRETE AND BRICK SAMPLES

1) Stones and very large sample chips were removed from the pan and discarded as waste.

2) A small amount of sample was transferred to a 120 mm diameter alumina composed mortar using a clean stainless steel spoon. A pestle was used to pulverize the larger chips into smaller homogeneous fragments and fine powder.

3) The pulverized sample was transferred back to the aluminum pan where it was set at one end of the pan apart from the collected sample.

4) Steps 2 and 3 were repeated until all the material was homogenized.

5) The homogenized sample was then completely mixed in the pan and transferred to three 8-ounce glass jars using a stainless steel spoon.

Several QA samples were prepared from a clean brick purchased at an Edison, New Jersey lumber store. The brick was broken up with the pneumatic chisel and a clean masonry chisel bit. Steps 2 through 5 were employed to process the samples. Brick pieces too large to pulverize were placed in 8-ounce jars and archived for any additional future QA analyses.

WOOD SAMPLES

Wood samples were reduced to smaller, more uniform chips by using a pair of sheet metal snips. All cutting was performed within the aluminum pan. The wood chips were then completely mixed and transferred to three 8-ounce glass jars.

Two 8-ounce jars of each sample were shipped to the contract laboratory for analysis. One jar was designated for 2,3,7,8-TCDD analysis. The other jar was designated for 2,4-D and 2,4,5-T analysis. The third jar was retained for QA/QC purposes.

The stainless steel spoons, mortars, pestles and sheet metal snips were decontaminated, according to the project work plan, after each sample was homogenized.

SOIL SAMPLES

Soil samples were not carried through the homogenization process, due to the fact that they were wet and could not be properly homogenized.

6.0 QUALITY ASSURANCE SAMPLES

Quality Assurance (QA) samples were sent to the laboratory with the field samples due to the nature of the matrices and the analyses being performed.

Two QA samples were of the brick matrix. One was a Field Blank and the other was a Matrix Spike sample. Both samples consisted of a clean brick, purchased at B & M Lumber in Edison, New Jersey on June 24, 1985. The samples were homogenized according to the procedures used for the field samples.

In addition to the six field soil samples, a set of six samples was sent to the laboratory as part of the NUS Corporation 2,3,7,8-TCDD sampling protocol. These included four Performance Evaluation (PE) samples containing two different known concentrations of 2,3,7,8-TCDD, 1.00 ppb and 7.77 ppb. The PE samples were obtained from the EPA Environmental Monitoring Systems Laboratory (EMSL) in Las Vegas, Nevada. EMSL has calculated a standard deviation of 1.56 ppb for the 7.77 ppb sample. There has been no standard deviation calculated for the 1.00 ppb sample at the present time. Two soil Field Blanks were collected from the EPA-Region II property in Edison, New Jersey on June 24, 1985. One was submitted as a Field Blank and the other was to be treated as a Matrix Spike by the laboratory.

7.0 FINDINGS

Analytical results of all brick, cement, wood, and brick QA samples are presented in Table 7-1. Soil samples collected from the basement and the additonal 2,3,7,8-TCDD QA samples for the soil matrix are presented in Tables 7-2 and 7-3 respectively. The data are presented by room to illustrate the varying degrees of contamination throughout the building.

Concentrations of 2,3,7,8-TCDD are presented in parts per billion (ppb) whereas the herbicides 2,4-D and 2,4,5-T are presented in parts per million (ppm). Detection limits for 2,4-D and 2,4,5-T are 0.02 ppm and 0.005 ppm respectively. Detection limits for the 2,3,7,8-TCDD analyses are listed in a separate column in the tables. These detection limits are reported for those samples which have no quantifiable concentrations of 2,3,7,8-TCDD. The notation ND is used to represent no detectable quantities of 2,3,7,8-TCDD, 2,4-D or 2,4,5-T. The notation EM refers to samples that have detectable concentrations of 2,3,7,8-TCDD at or below the detection limit. The notation E refers to an analysis which did not pass EPA QA requirements.

Correlation coefficients were calculated to determine the relationships between the 2,4-D, 2,4,5-T and 2,3,7,8-TCDD concentrations in the building material samples. Table 7-4 provides a correlation matrix. The coefficients of determination (r^2) indicate strong positive correlations between 2,3,7,8-TCDD and 2,4,5-T concentrations (n=14), 2,3,7,8-TCDD and 2,4-D concentrations (n=14), and 2,4,5-T and 2,4-D concentrations (n=30) over the entire data set.

7.1 Building Interior

The highest concentration of 2,3,7,8-TCDD in the building, 99.5 ppb, was found in the brick subfloor in Room 2, sample NJP3-47. Three other samples in Room 2 contained detectable levels of 2,3,7,8-TCDD. The three wall samples collected from Room 2 had herbicide concentrations between 1.49 and 15.9 ppm. The wood subflooring sample collected from Room 2, NJP3-43 did not pass EPA QA requirements.

TABLE 7-1
ANALYTICAL DATA
BLUE SPRUCE INTERNATIONAL, INC.
BUILDING SAMPLES - FOCUS FEASIBILITY STUDY
JUNE 25 - 27, 1985

SAMPLE LOCATION	SAMPLE MATRIX	SAMPLE DATE	SAMPLE NUMBER	2,3,7,8-TCDD[a] MEASURED	2,3,7,8-TCDD DETECTION LIMIT	2,4,5-T[b]	2,4-D[c]
BUILDING INTERIOR FIRST FLOOR ROOM 1				PPB	PPB	PPM	PPM
north wall	brick	06/25/85	NJP3-9	0.10	N/A	3.10	3.86
east wall	brick	06/25/85	NJP3-11	1.45	N/A	63.5	3.15
south wall	brick	06/25/85	NJP3-10	ND	0.47	4.36	7.14
west wall	brick	06/25/85	NJP3-8	EM	0.14	10.6	8.65
floor	cement	06/26/85	NJP3-15	3.58	N/A	619	624
floor	cement	06/26/85	NJP3-16	16.6	N/A	63.7	71.3
subfloor	brick	06/27/85	NJP3-45	3.85	N/A	1.14	0.89
ROOM 2							
north wall	brick	06/25/85	NJP3-6	EM	0.25	8.45	5.68
east wall	brick	06/27/85	NJP3-46	0.10	N/A	8.59	15.9
			NJP3-46(dup.anal.)	EM	0.06	N/A	N/A
south wall	brick	06/25/85	NJP3-7	ND	0.92	1.49	2.67
floor	cement	06/25/85	NJP3-14	6.07	N/A	11.9	8.65
sub floor	brick	06/27/85	NJP3-47	99.5	N/A	2390	2590
sub floor	wood	06/27/85	NJP3-43	E	N/A	178	97.2
			NJP3-43(dup.anal.)	N/A	N/A	157	71.5
ROOM 3							
north wall	brick	06/25/85	NJP3-4	ND	0.16	2.53	4.04
			NJP3-4(dup.anal.)	N/A	N/A	2.00	3.30
south wall	brick	06/25/85	NJP3-5	EM	0.09	1.15	1.41
west wall	brick	06/25/85	NJP3-3	EM	0.05	1.46	1.81
floor	cement	06/25/85	NJP3-13	2.78	N/A	5.43	3.42
floor	cement	06/25/85	NJP3-12	4.14	N/A	2.50	2.72

NOTES:

a = 2,3,7,8-tetrachlorodibenzo-p-dioxin, measured in PPB
b = 2,4,5-trichlorophenoxyacetic acid, measured in PPM
c = 2,4-dichlorophenoxyacetic acid, measured in PPM
N/A = not applicable
ND = not detected
EM = detectable concentration of 2,3,7,8-TCDD at or below the detection limit
E = analysis did not pass quality assurance requirements

TABLE 7-1 cont'd
ANALYTICAL DATA
BLUE SPRUCE INTERNATIONAL, INC.
BUILDING SAMPLES - FOCUS FEASIBILITY STUDY
JUNE 25 - 27, 1985

SAMPLE LOCATION	SAMPLE MATRIX	SAMPLE DATE	SAMPLE NUMBER	2,3,7,8-TCDD MEASURED	2,3,7,8-TCDD DETECTION LIMIT	2,4,5-T [b]	2,4-D [c]
FIRST FLOOR LOFT							
west wall	brick	06/25/85	NJP3-2	EM	0.09	0.115	0.142
floor	wood	06/26/85	NJP3-21	1.65	N/A	5.72	7.01
floor	wood	06/26/85	NJP3-22	4.31	N/A	519	970
SECOND FLOOR LOFT							
south wall	brick	06/25/85	NJP3-1	EM	0.12	0.038	0.053
floor	wood	06/26/85	NJP3-18	ND	0.27	2.51	5.81
			NJP3-18(dup.anal.)	ND	0.401	N/A	N/A
floor	wood	06/26/85	NJP3-19	0.52	N/A	14.3	17.3
BASEMENT							
north wall	brick	06/27/85	NJP3-40	ND	0.12	0.67	0.92
east wall	brick	06/27/85	NJP3-37	EM	0.04	0.014	ND
south wall	brick	06/27/85	NJP3-39	E	N/A	0.11	0.12
west wall	brick	06/26/85	NJP3-24	E	N/A	0.73	1.13
BUILDING EXTERIOR							
north wall	brick	06/27/85	NJP3-44	EM	0.06	0.009	ND
	brick	06/26/85	NJP3-23	E	N/A	0.072	0.05
	brick	06/27/85	NJP3-42	0.10	N/A	0.073	0.05
south wall	brick	06/27/85	NJP3-41	E	N/A	0.012	ND
	brick	06/27/85	NJP3-38	ND	0.13	0.066	0.05
QUALITY ASSURANCE SAMPLES							
blank	brick	N/A	NJP3-17	0.10	N/A	0.038	0.03
blank(dup.analysis)	brick	N/A	NJP3-17	N/A	N/A	ND	ND
matrix spike [d]	brick	N/A	NJP3-20	1.10	N/A	0.325	0.72

NOTES:

a = 2,3,7,8-tetrachlorodibenzo-p-dioxin, measured in PPB
b = 2,4,5-trichlorophenoxyacetic acid, measured in PPM
c = 2,4-dichlorophenoxyacetic acid, measured in PPM
d = blank sample was spiked with 1.00 PPB 2,3,7,8-TCDD, 0.400 PPM 2,4,5-T and 1.00 PPM 2,4-D
N/A = not applicable
ND = not detected
EM = detectable concentration of 2,3,7,8-TCDD present or below the detection limit
E = analysis did not pass quality assurance requirements

TABLE 7-2
ANALYTICAL DATA
BLUE SPRUCE INTERNATIONAL, INC.
BASEMENT SOIL SAMPLES - FOCUS FEASIBILITY STUDY
JUNE 26, 1985

BASEMENT SOIL SAMPLES

SAMPLE LOCATION	SAMPLE DEPTH (inches)	SAMPLE NUMBER	2,3,7,8-TCDD MEASURED [a]	2,3,7,8-TCDD DETECTION LIMIT [a]	2,4,5-T [b]	2,4-D [c]
north	6-9	NJP3-33	ND	0.21	ND	ND
	12-15	NJP3-34	ND	0.14	ND	ND
	18-21	NJP3-36	ND	0.16	ND	ND
south	6-9	NJP3-26	ND	0.15	0.052	ND
	12-15	NJP3-29	EM	0.12	0.005	ND
		dup. anal	N/A	N/A	ND	ND
	18-21	NJP3-30	ND	0.07	0.012	ND

TABLE 7-3
ANALYTICAL DATA
BLUE SPRUCE INTERNATIONAL, INC.
BASEMENT SOIL SAMPLES - FOCUS FEASIBILITY STUDY
JUNE 26, 1985

QUALITY ASSURANCE SAMPLES

SAMPLE TYPE	SAMPLE MATRIX	SAMPLE NUMBER	2,3,7,8-TCDD MEASURED [a]	2,3,7,8-TCDD DETECTION LIMIT	2,3,7,8-TCDD SPIKE/STANDARD [d]
blank	soil	NJP3-27	ND	0.11	N/A
matrix spike	soil	NJP3-32	E	N/A	N/A
PE sample "LV"	soil	NJP3-25	0.91	N/A	1.00
PE sample "LV"	soil	NJP3-35	E	N/A	1.00
PE sample "LV"	soil	NJP3-28	7.95	N/A	7.77 +/-1.56
PE sample "LV"	soil	NJP3-31	8.11	N/A	7.77 +/-1.56

NOTES:

a = 2,3,7,8-tetrachlorodibenzo-p-dioxin, measured in PPB
b = 2,4,5-trichlorophenoxyacetic acid, measured in PPM
c = 2,4-dichlorophenoxyacetic acid, measured in PPM
d = true concentration +/- standard deviation as determined by the Environmental Monitoring System Laboratory (EMSL)
N/A = not applicable
ND = not detected
EM = detectable concentration of 2,3,7,8-TCDD at or below the detection limit
E = analysis did not pass quality assurance requirements

TABLE 7-4

CORRELATION MATRIX OF 2,3,7,8-TCDD, 2,4-D and 2,4,5-T DATA

Coefficient of Determination (r^2)

2,3,7,8-TCDD	1.000		
2,4,5-T	0.942	1.000	
2,4-D	0.909	0.988	1.000
	2,3,7,8-TCDD	2,4,5-T	2,4-D

Concentrations of 2,4-D and 2,4,5-T were found in nearly all samples collected from the building interior. This includes wall, floor and subfloor samples of brick, cement and wood. Herbicide concentrations were generally the same order of magnitude for each sample. This contamination pattern appears to indicate the presence of Agent Orange in these samples.

The highest levels of 2,4-D and 2,4,5-T contamination were detected in Room 2. A brick sample, NJP3-47, taken from the subflooring contained 2590 and 2390 ppm of 2,4-D and 2,4,5-T, respectively. A wooden beam sample under this subflooring, sample NJP3-43, contained concentrations of 97.2 and 178 ppm of 2,4-D and 2,4,5-T, respectively. Cement flooring laid over the brick flooring, sample NJP3-14, contained concentrations of 8.65 and 11.9 ppm of 2,4-D and 2,4,5-T respectively.

2,3,7,8-TCDD was detected in five of the seven samples collected in Room 1. The highest 2,3,7,8-TCDD concentration was found in a cement floor sample at 16.6 ppb. Concentrations of 2,4-D and 2,4,5-T in Room 1 ranged from 0.89 -624 ppm and 1.14 - 619 ppm, respectively, for the seven samples collected.

2,3,7,8-TCDD was detected in two floor samples collected from Room 3. Two of three wall samples contained concentrations of 2,3,7,8-TCDD at or below the detection limit. Room 3 had concentrations of 2,4-D and 2,4,5-T between 1.41 - 4.04 and 1.15 - 5.43 ppm, respectively.

All three samples collected from the first floor loft contained 2,3,7,8-TCDD, although the wall sample contained a concentration at or below the detection limit. The two wood floor samples contained 1.65 and 4.31 ppb 2,3,7,8-TCDD. The latter sample, located in front of the workbench, contained 970 and 519 ppm of 2,4,-D and 2,4,5-T, respectively.

2,3,7,8-TCDD was detected in one of two floor samples collected from the second floor loft. The floor samples contained from 5.81 to 17.3 and 2.51 to 14.3 ppm of 2,4-D and 2,4,5-T, respectively. The one wall sample collected from the second floor loft contained 2,3,7,8-TCDD at or below the detection limit and lower concentrations of herbicides (less than 0.1 ppm).

2,3,7,8-TCDD was detected in one of four wall samples collected in the basement. 2,4-D was detected in three samples and 2,4,5-T in all four samples but at concentrations less than 1 ppm.

7.2 Building Exterior

Two samples, collected from the north wall along the alleyway, contained 2,3,7,8-TCDD although one sample was at or below the detection limit. Two of the samples did not pass QA requirements for 2,3,7,8-TCDD analyses. 2,4,5-T was detected in all five samples although at concentrations less than 0.1 ppm. Three of the samples contained 2,4-D at 0.05 ppm.

7.3 Basement Soil

One of six samples collected from the basement contained a trace amount of 2,3,7,8-TCDD at or below the detection limit. This sample was collected from a depth of 12 to 15 inches. No other soil samples contained 2,3,7,8-TCDD. 2,4,5-T was detected in three samples at concentrations less than 0.1 ppm. 2,4-D was not detected in any of the samples.

8.0 CONCLUSIONS

The results of the analytical data indicate the presence of 2,3,7,8-TCDD throughout the Blue Spruce International building. The greatest contamination was found in the subflooring beneath the ground level rooms. The degree of contamination varies throughout the building. Cement floors, wood floors, interior walls and exterior walls exhibit decreasing levels of 2,3,7,8-TCDD contamination, respectively.

The high concentrations of 2,4-D and 2,4,5-T herbicides and their correlation to 2,3,7,8-TCDD suggest that 2,3,7,8-TCDD detected in the building is related to Agent Orange.

2,3,7,8-TCDD contamination of the subflooring indicates the possibility of soil contamination beneath the building structure. Levels of potential contamination in the soils are unknown at this time.

The presence of 2,3,7,8-TCDD in the building as well as the vicinity of Blue Spruce International, Inc., has been documented from previous sampling efforts (NUS Corporation, 1984) in addition to this sampling study. 2,3,7,8-TCDD was detected in 22 surface soil samples, including two soils collected in the building, and 19 samples located in the alleyway north of the building and adjacent to the south door of the building.

9.0 BIBLIOGRAPHY

NUS Corporation. 1984. Evaluation of Analytical Chemical Data from Blue Spruce International, Bound Brook, New Jersey. Report Number R-584-12-83-9 prepared for the Environmental Services Division, U.S. Environmental Protection Agency. NUS Corporation, Edison, New Jersey. 21 pp.

APPENDIX A

PHOTOGRAPH INDEX

02-8502-02A/NJ73

BLUE SPRUCE INTERNATIONAL
BOUND BROOK, NEW JERSEY
TDD# 02-8502-02A

PHOTOGRAPH INDEX

401094

BLUE SPRUCE INTERNATIONAL
BOUND BROOK, NEW JERSEY
TDD# 02-8502-02A
JUNE 25, 1985

PHOTOGRAPH INDEX

Photo Number	Description	Time
1.	Sample NJP3-1-2nd floor brick wall (prep.)	1000
2.	Second floor ceiling construction.	1010
3.	Collection of brick wall sample NJP3-1.	1030
4.	Sample NJP3-1.	1040
5.	Chisel being used to collect sample.	1045
6.	Sample NJP3-1 being crushed.	1050
7.	Decon/SMO area.	1052
8.	Sample location of NJP3-1.	1055
9.	Collection of NJP3-2-1st floor brick wall.	1105
10.	Sample NJP3-2.	1114
11.	Collection of brick wall sample #NJP3-3-rm #3.	1140
12.	Sample NJP3-3.	1150
13.	Collection of brick wall sample NJP3-4-rm #3.	1245
14.	Sample NJP3-4.	1300
15.	Collection of brick wall sample NJP3-5-rm #3.	1310
16.	Sample NJP3-4.	1315
17.	Sample location of NJP3-5.	1316
18.	Collection of brick wall sample NJP3-6-rm #2.	1325
19.	Sample location of NJP3-6.	1335
20.	Collection of brick wall sample NJP3-7-rm #2.	1340
21.	Sample NJP3-7.	1342
22.	Sample location of NJP3-7.	1342

BLUE SPRUCE INTERNATIONAL
BOUND BROOK, NEW JERSEY
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JUNE 25, 1985

PHOTOGRAPH INDEX

Photo Number	Description	Time
23.	Collection of brick wall sample NJP3-8-rm #1.	1400
24.	Sample NJP3-8.	1405
25.	Collection of brick wall sample.	1410
26.	Sample NJP3-9.	1415
27.	Sample location of NJP3-9.	1417
28.	Collection of brick wall sample NJP3-10-rm #1.	1420
29.	Sample NJP3-10.	1440
30.	Sweeping area to be sampled NJP3-12.	1535
31.	Collection of cement floor sample NJP3-12-rm #3.	1535
32.	Sample NJP3-12.	1607
33.	Collection of cement floor sample NJP3-13-rm #3.	1620
34.	Sample NJP3-13.	1710
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35.	Collection of cement floor sample NJP3-14-rm #2.	1025
36.	Sample NJP3-14.	1045
37.	Sampling waste used by NJDEP.	1050
38.	Sampling waste used by NJDEP.	1050
39.	Collection of cement floor sample NJP3-15-rm #1.	1052
40.	Collection of soil sample NJP3-26 at a depth of 6"-12".	1105
41.	Sample NJP3-15.	1115
42.	Collection of soil sample NJP3-29.	1127

BLUE SPRUCE INTERNATIONAL
BOUND BROOK, NEW JERSEY
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PHOTOGRAPH INDEX

Photo Number	Description	Time
43.	Collection of cement floor sample NJP3-16-rm #1.	1130
44.	Sample NJP3-16.	1155
45.	Soil sample NJP3-30.	1157
46.	Collection of woodchip sample NJP3-18 2nd floor.	1311
47.	Woodchip sample NJP3-18.	1315
48.	Collection of soil sample NJP3-33.	1315
49.	Soil sample NJP3-34.	1320
50.	Depth of hole for soil collection at 12"-18".	1325
51.	Collection of woodchip sample NJP3-19 2nd floor.	1330
52.	Collection of soil sample NJP3-36.	1340
53.	Sample preparation of woodchips.	1345
54.	Sample location for woodchip sample NJP3-21.	1400
55.	Woodchip sample NJP3-22.	1430
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56.	Collection of exterior wall sample NJP3-42.	1330
	JUNE 26, 1985	
57.	Sample NJP3-22.	1435
	JUNE 27, 1985	
58.	Stucco-wall - exterior wall samples	1410
	JUNE 26, 1985	
59.	Collection of basement wall sample NJP3-24.	1500
60.	Sample NJP3-24.	1510

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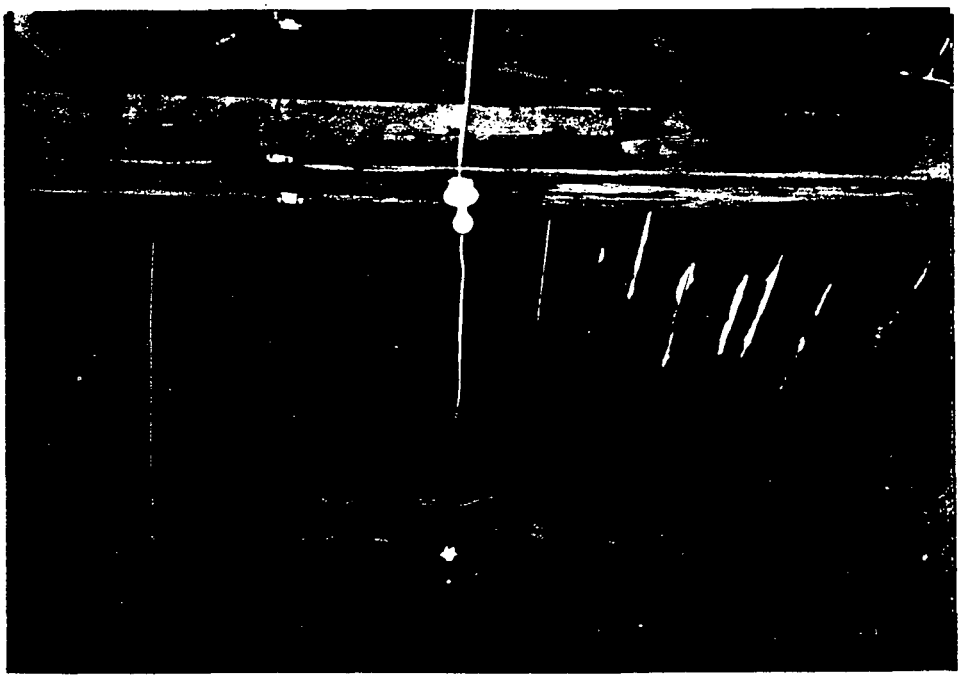
PHOTOGRAPH INDEX

Photo Number	Description	Time
61.	Collection of brick wall sample NJP3-37 - basement.	1000
62.	Sample NJP3-37.	1010
63.	Collection of brick wall sample NJP3-39 - basement.	1015
64.	Sample NJP3-39.	1030
65.	Sample location for NJP3-39.	1032
66.	Water by foundation of basement.	1042
67.	Collection of brick wall sample NJP3-38 - rear exterior wall.	1142
68.	Sample NJP3-38.	1200
69.	Collection of soil sample NJP3-34.	1225
70.	Collection of brick wall sample NJP3-41.	1245
71.	Sample location NJP3-43 - woodchip sample rm #2.	1310
72.	Collection of subsurface woodchip sample NJP3-43-rm #2.	1315
73.	Woodchip sample NJP3-43.	1325
74.	Brick wall sample NJP3-42.	1325
75.	Collection of subsurface brick floor sample NJP3-45-rm #1.	1410
76.	Collection of subsurface brick floor sample NJP3-47-rm #2.	1425
77.	Sample NJP3-47.	1450
78.	Sample location of NJP3-46.	1452

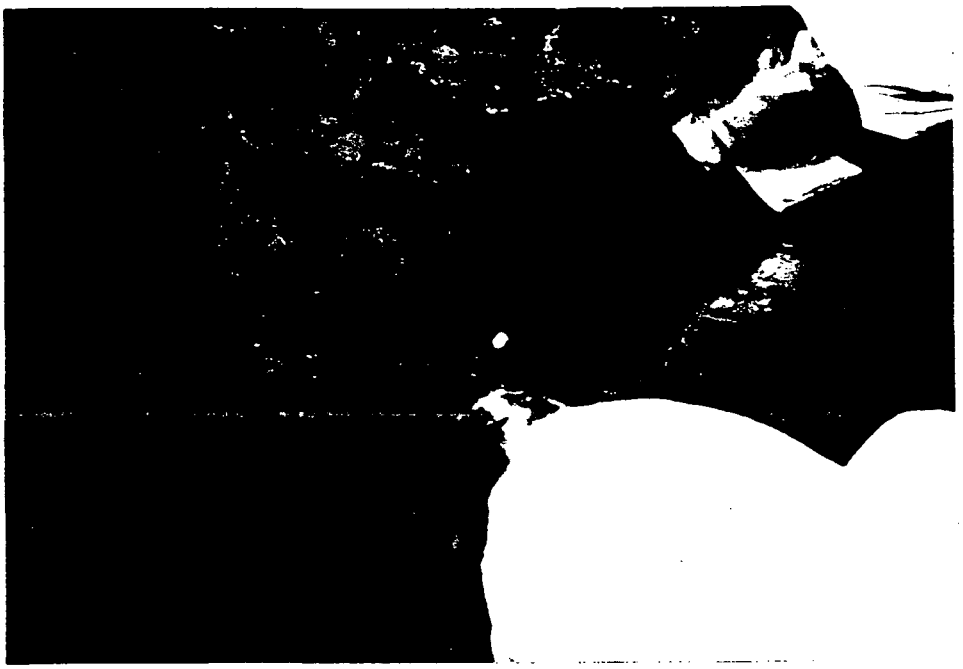
1. June 25, 1985 1000
Sample NJP3-1-2nd floor brick wall (prep.).



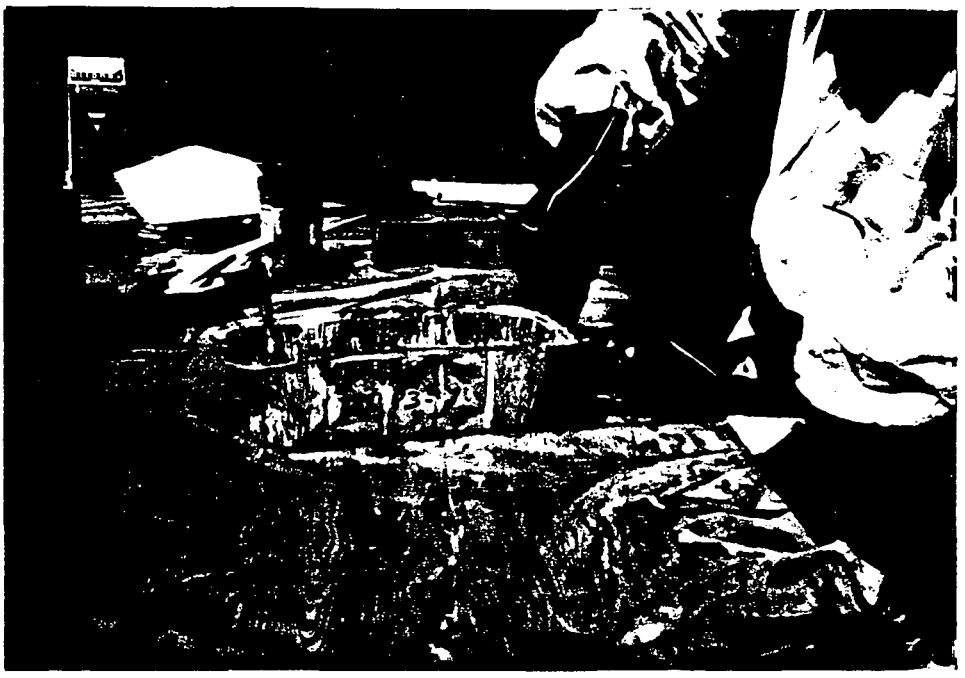
2. June 25, 1985 1010
Second floor ceiling construction.

3. June 25, 1985 1030
Collection of brick wall sample NJP3-1.

4. June 25, 1985 1040
Sample NJP3-1.



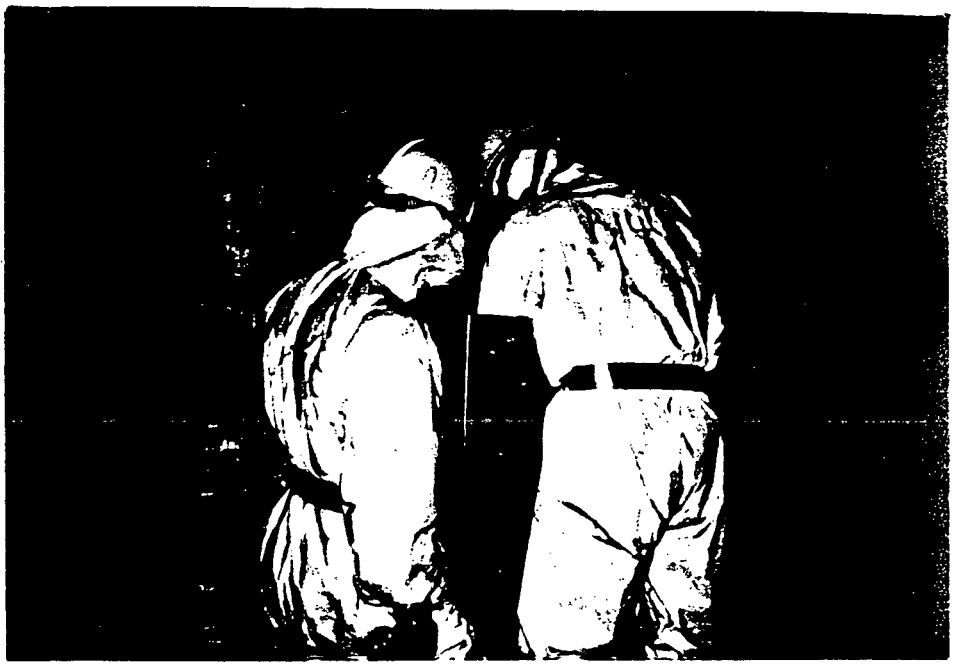
5. June 25, 1985 1045
Chisel being used to collect sample.



6. June 25, 1985 1050
Sample NJP3-1 being crushed.

7. June 25, 1985 1052
Decon/SMO area.

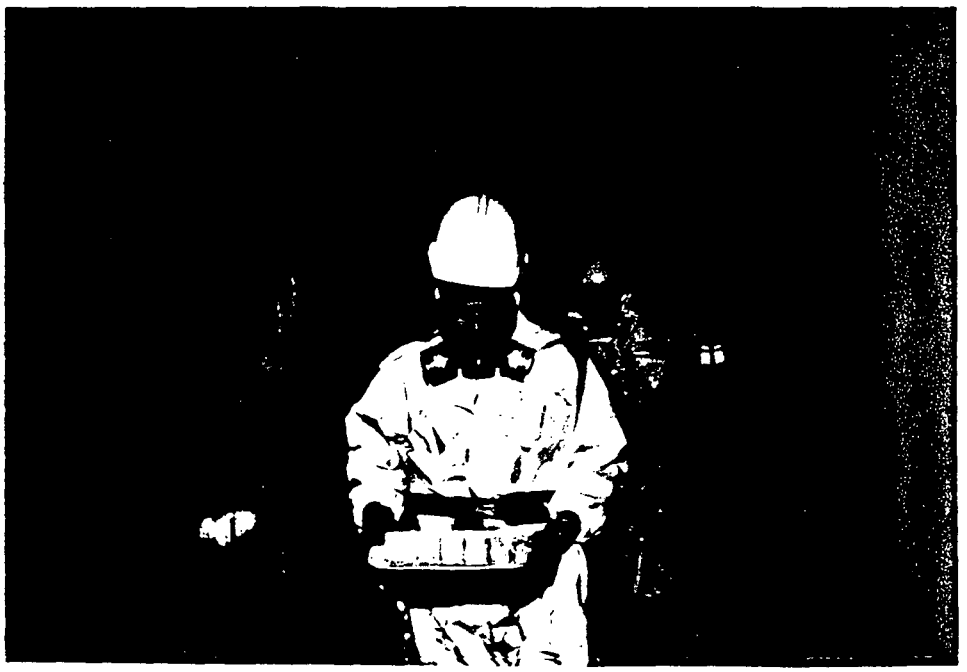
8. June 25, 1985 1055
Sample location of NJP3-1.



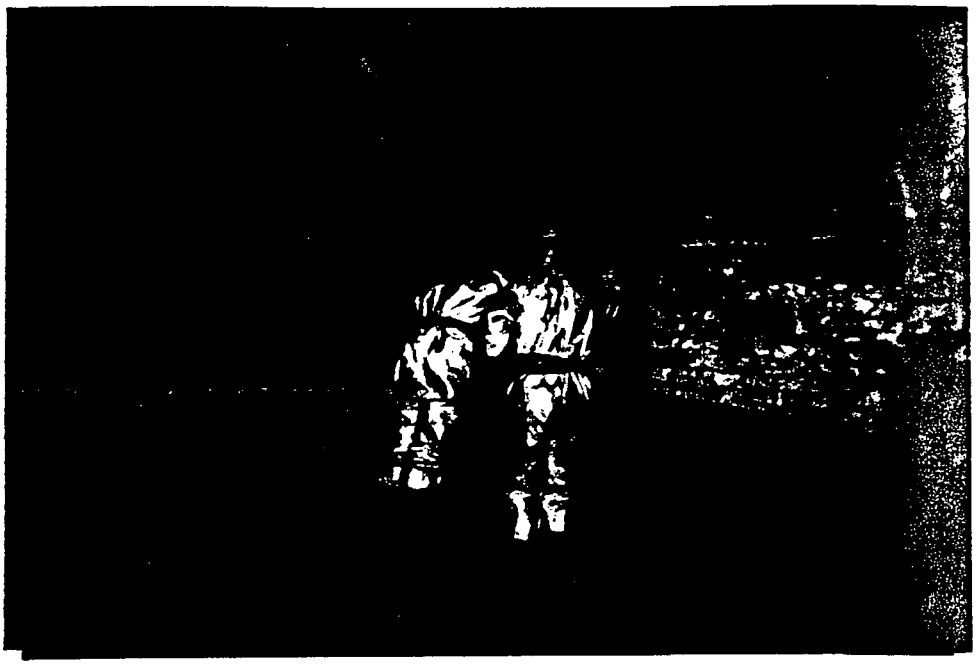
9. June 25, 1985 1105
Collection of NJP3-2-1st floor brick wall.

10. June 25, 1985 1114
Sample NJP3-2.

11. June 25, 1985 1140
Collection of brick wall sample #NJP3-3-rm #3.

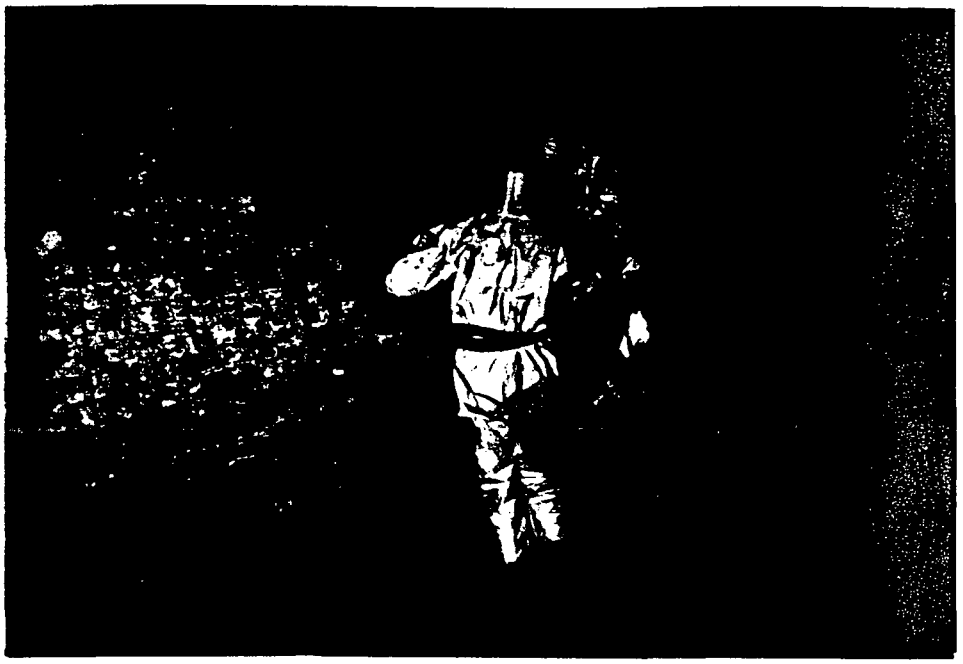


12. June 25, 1985 1150
Sample NJP3-3.



13. June 25, 1985 1245
Collection of brick wall sample NJP3-4-rm #3.

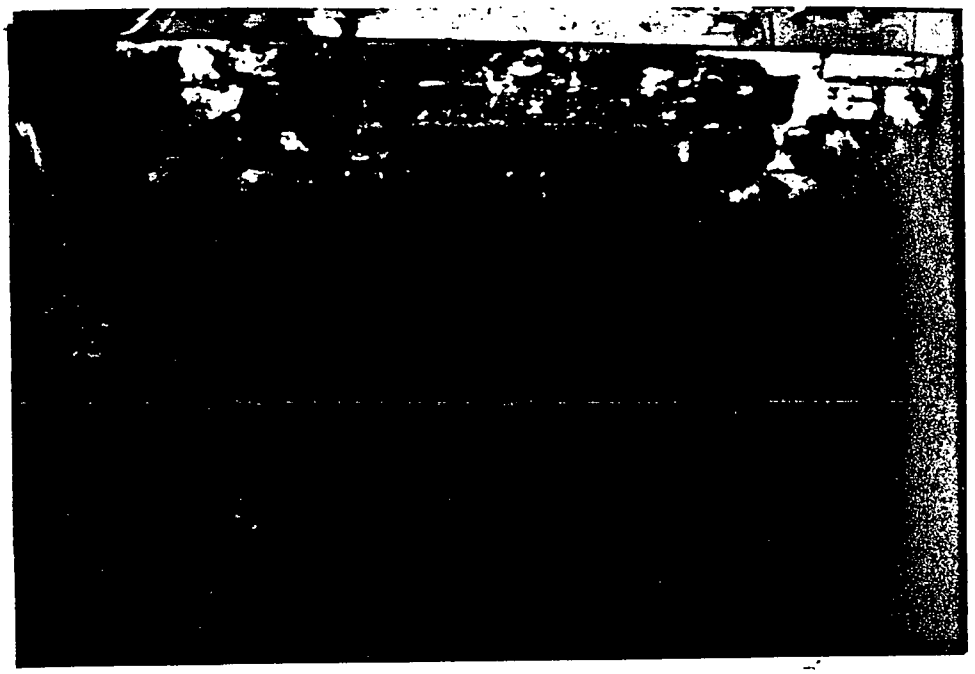
14. June 25, 1985 1300
Sample NJP3-4.



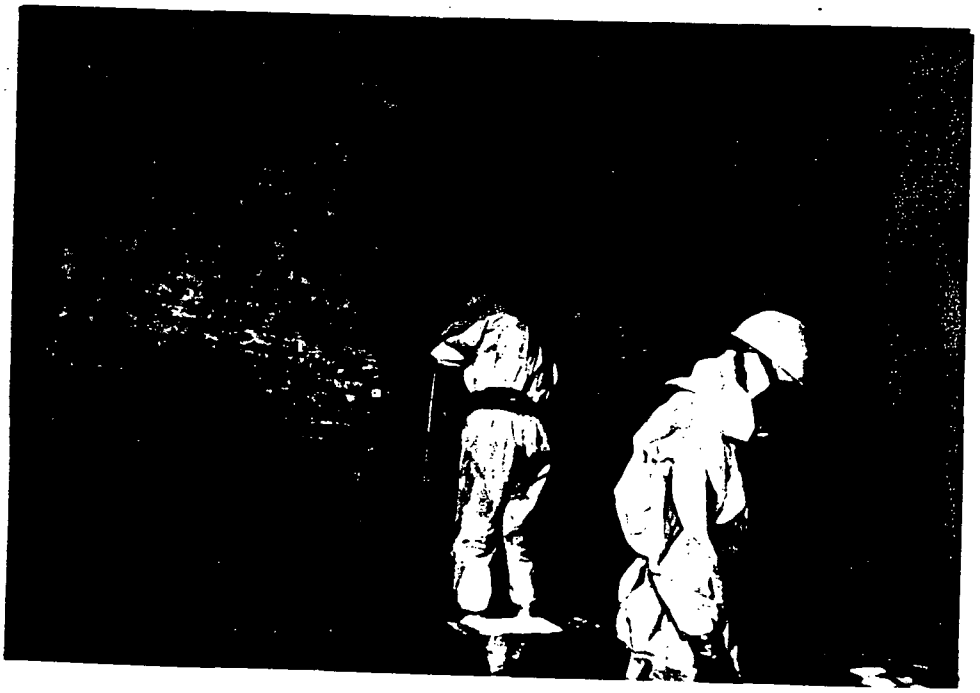
15. June 25, 1985 1310
Collection of brick wall sample NJP3-5-rm #3.

16. June 25, 1985 1315
Sample NJP3-4.

BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY



17. June 25, 1985 1316
Sample location of NJP3-5.



18. June 25, 1985 1325
Collection of brick wall sample NJP3-6-rm #2.

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19. June 25, 1985 1335
Sample location of NJP3-6.

20. June 25, 1985 1340
Collection of brick wall sample NJP3-7-rm #2.

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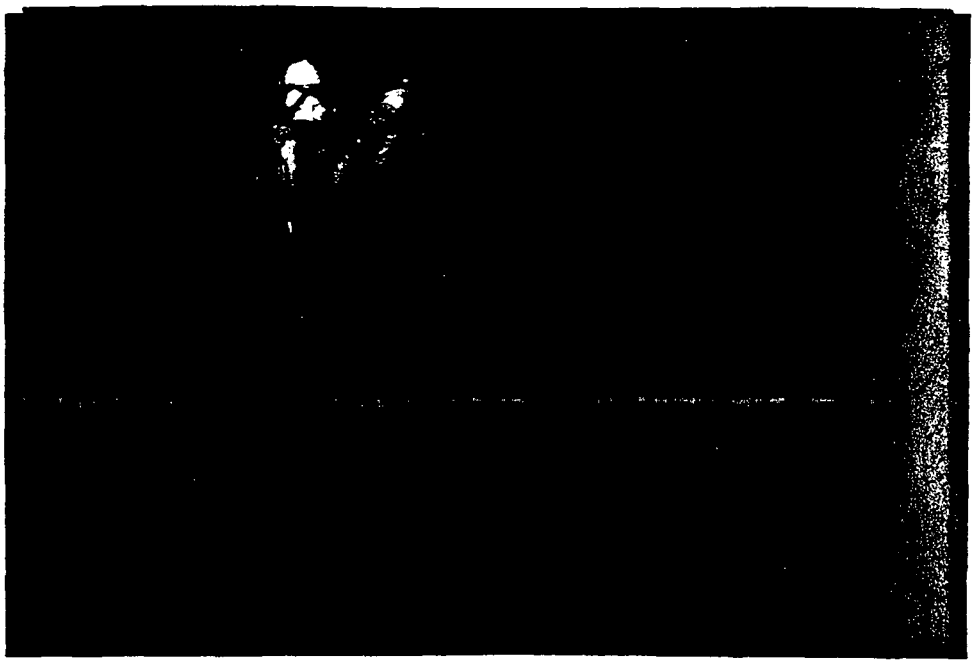
21. June 25, 1985 1342
Sample NJP3-7.

22. June 25, 1985 1342
Sample location of NJP3-7.



23. June 25, 1985 1400
Collection of brick wall sample NJP3-8prm #1.

24. June 25, 1985 1405
Sample NJP3-8.

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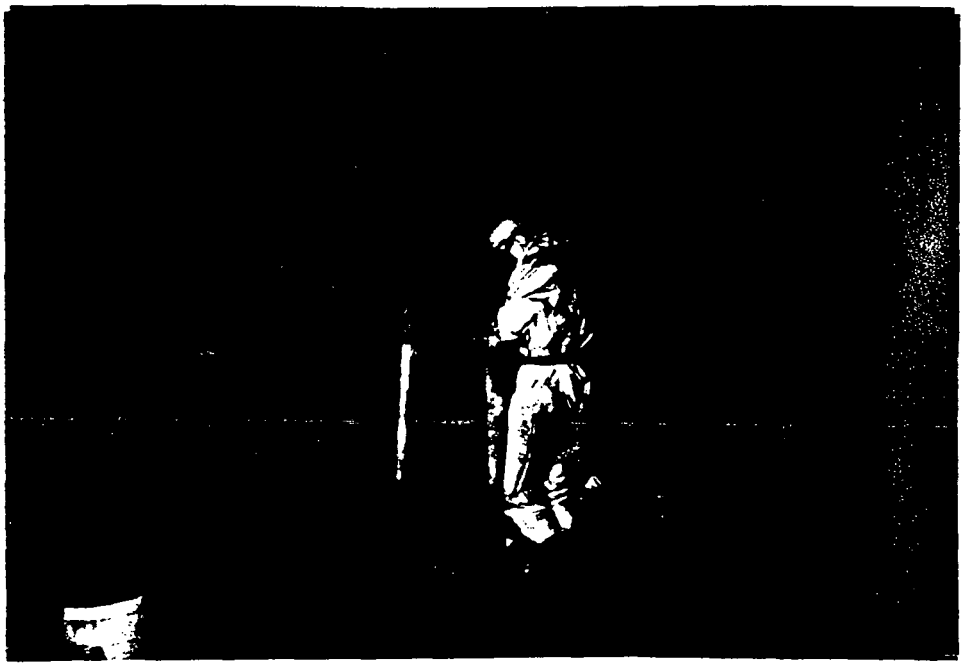
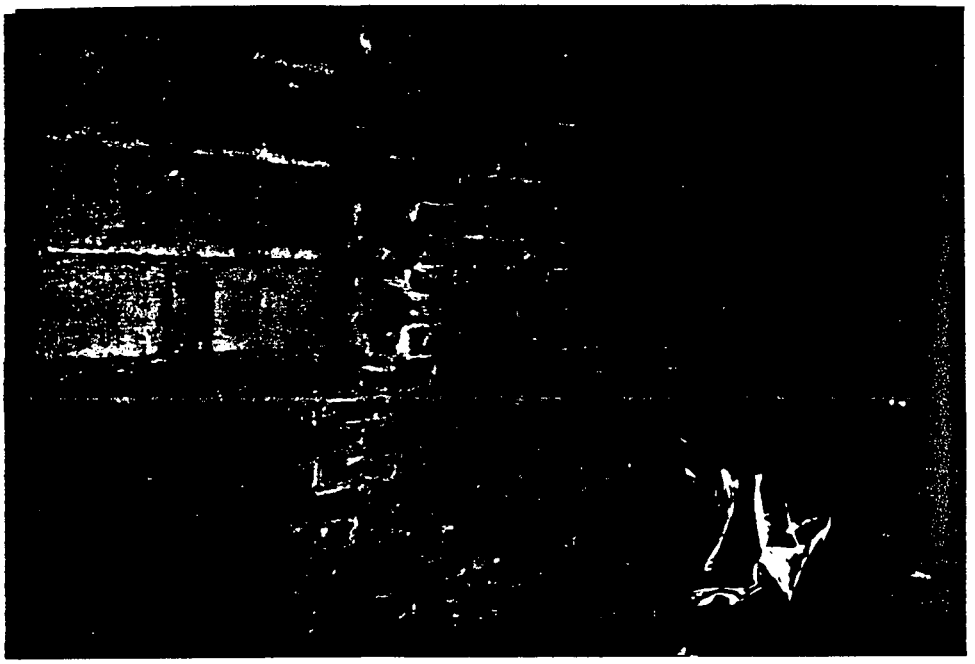


25. June 25, 1985 1410
Collection of brick wall sample.

26. June 25, 1985 1415
Sample NJP3-9.

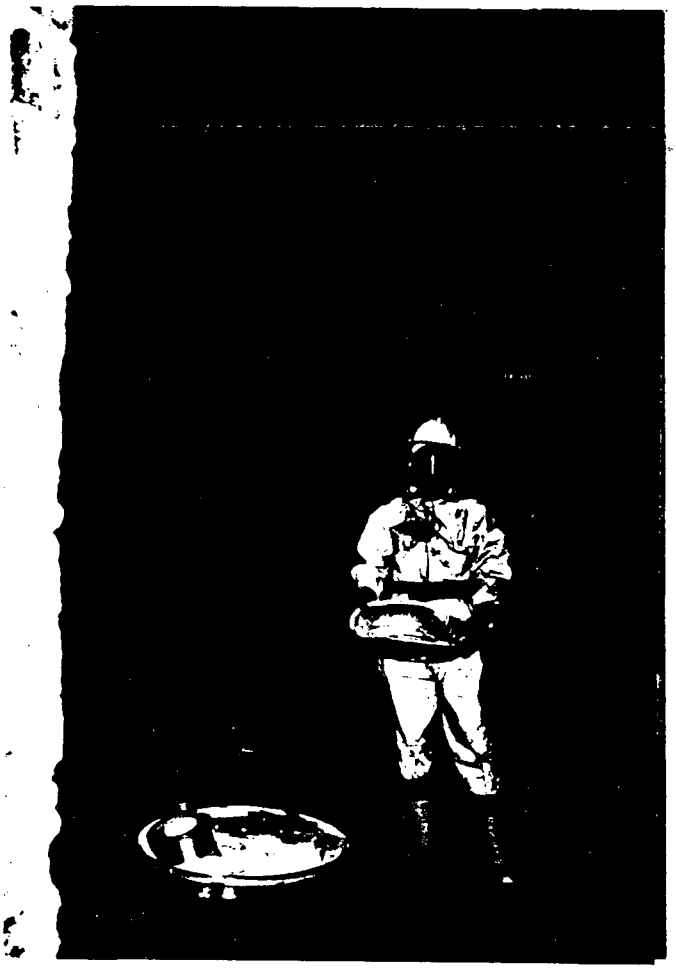
BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY



27. June 25, 1985 1417
Sample location of NJP3-9.

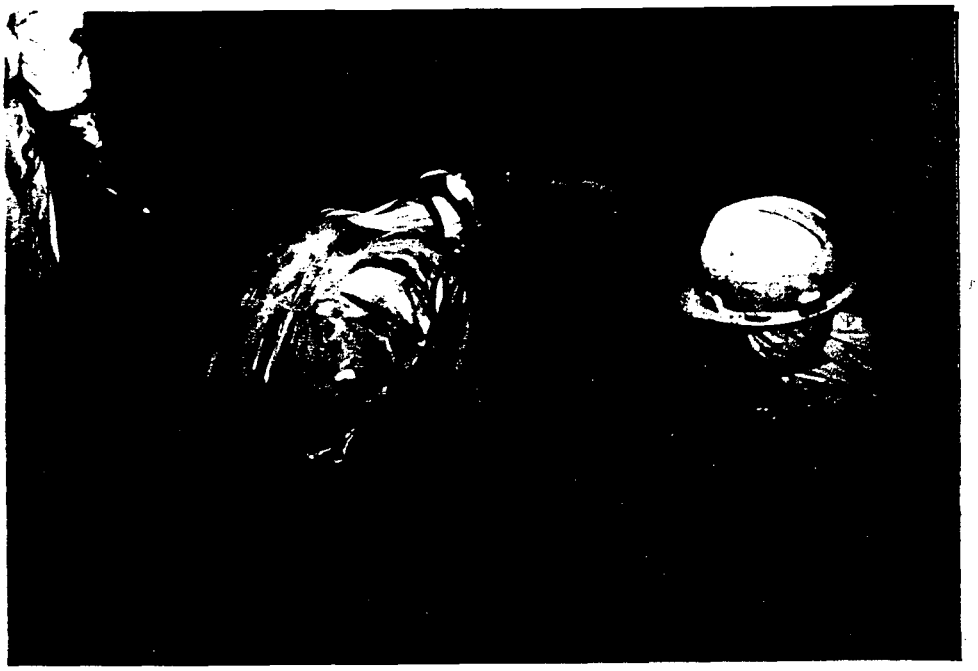
28. June 25, 1985 1420
Collection of brick wall sample NJP3-10-rm #1.

BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY

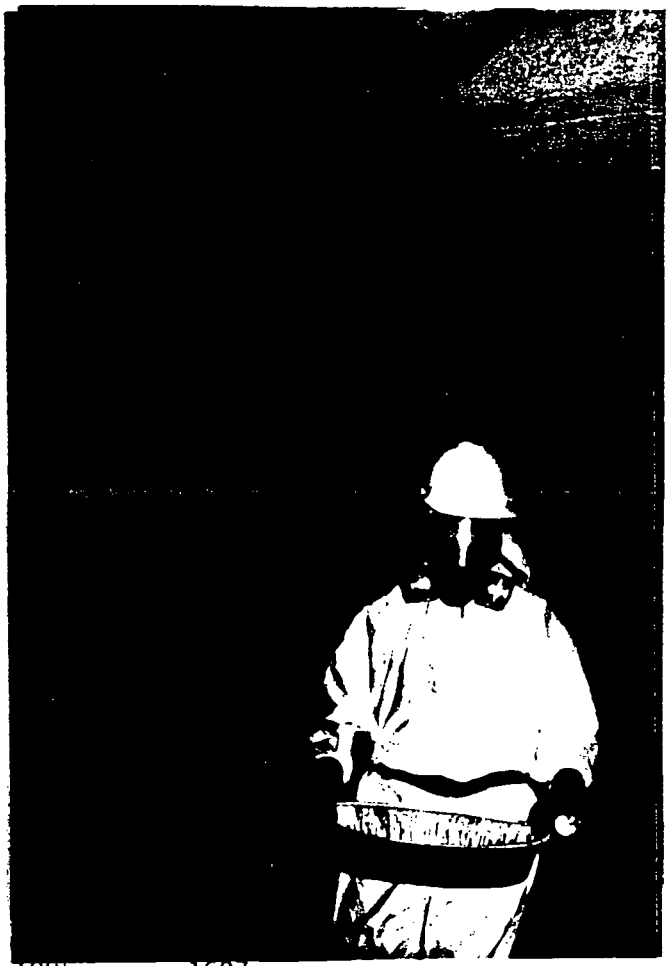


29. June 25, 1985 1440
Sample NJP3-10.

30. June 25, 1985 1535
Sweeping area to be sampled NJP3-12.



31. June 25, 1985 1535
Collection of cement floor sample NJP3-12-rm #3.

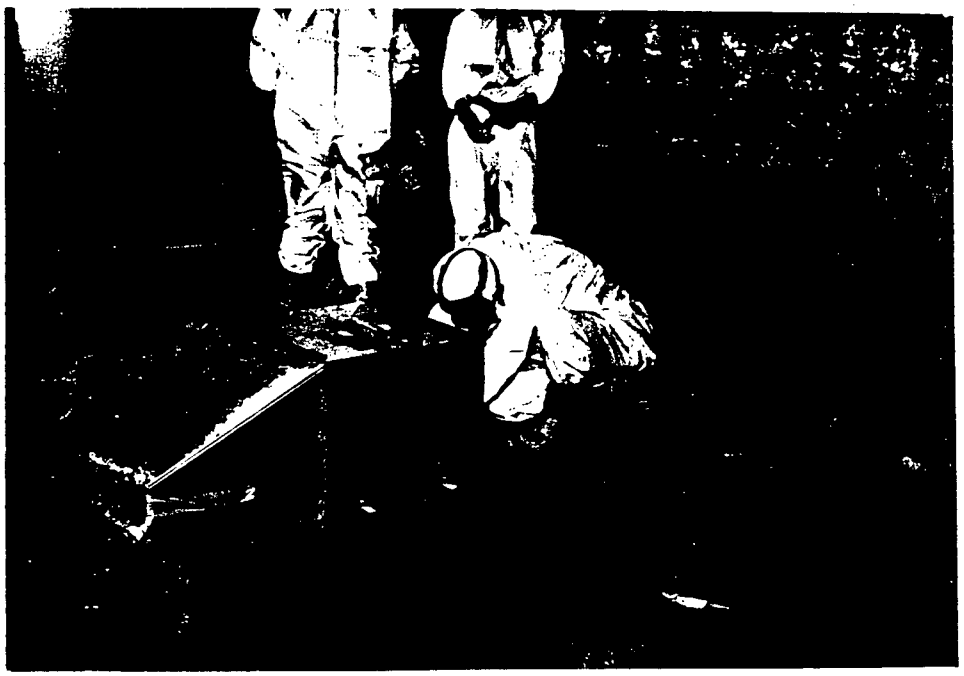


32. June 25, 1985 1607
Sample NJP3-12.

33. June 25, 1985 1620
Collection of cement floor sample NJP3-13-rm #3.

BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY

34. June 25, 1985 1710
Sample NJP3-13.



35. June 26, 1985 1025
Collection of cement floor sample NJP3-14-rm #2.

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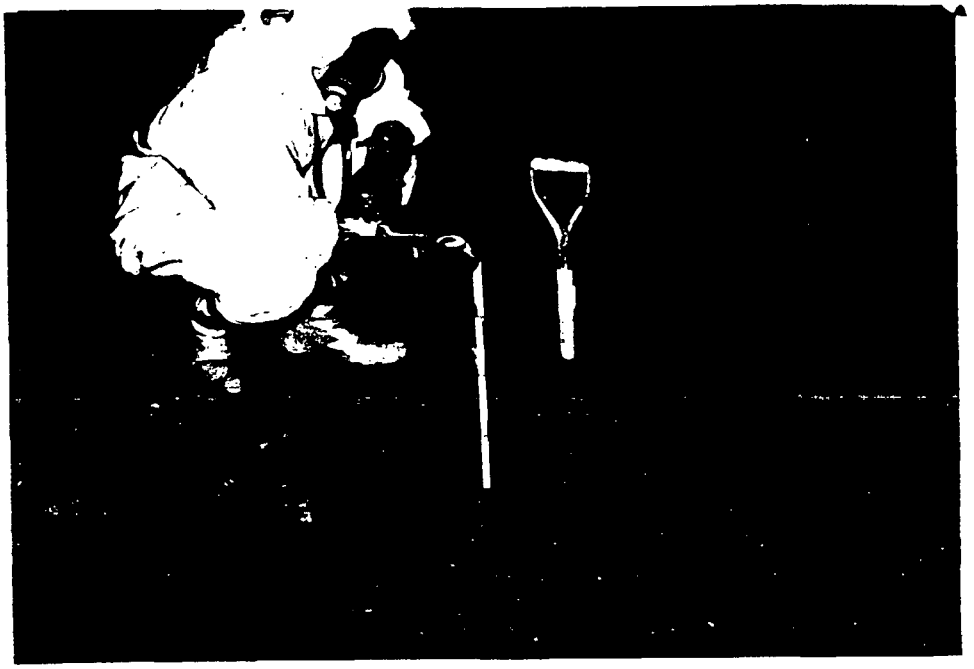
36. June 26, 1985 1045
Sample NJP3-14.

37. June 26, 1985 1050
Sampling waste used by NJDEP.

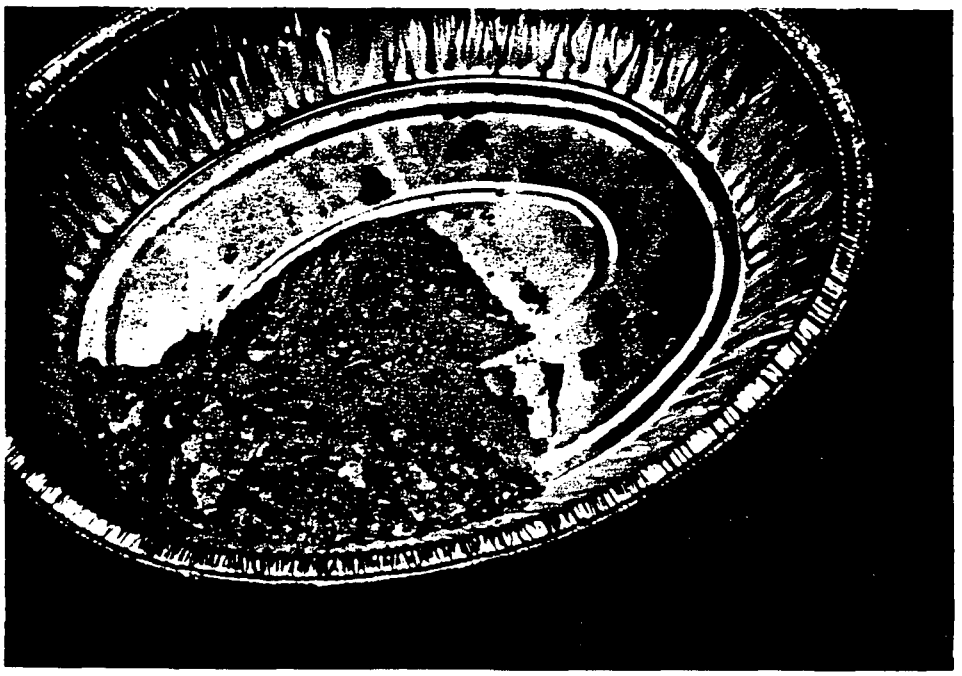
38. June 26, 1985 1050
Sampling waste used by NJDEP.

39. June 26, 1985 1052
Collection of cement floor sample NJP3-15-rm #1.

BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY



40. June 26, 1985 1105
Collection of soil sample NJP3-26 at a depth of 6"-12".



41. June 26, 1985 1115
Sample NJP3-15.

BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY

42. June 26, 1985 1127
Collection of soil sample NJP3-29.

43. June 26, 1985 1130
Collection of cement floor sample NJP3-16-rm #1.

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44. June 26, 1985 1155
Sample NJP3-16.

45. June 26, 1985 1157
Soil sample NJP3-30.

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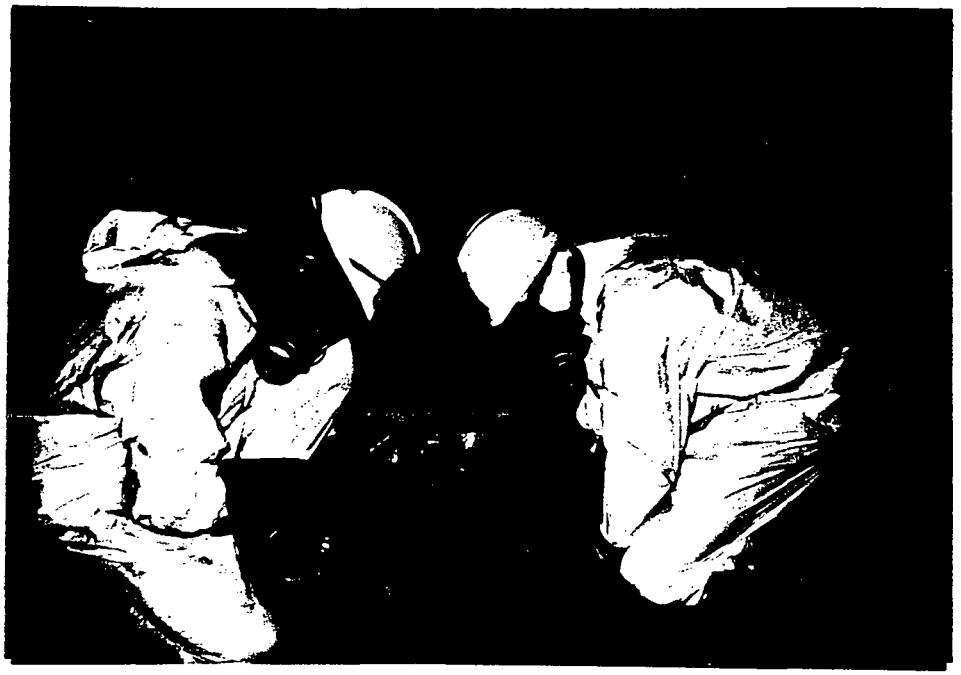

46. June 26, 1985 1311
Collection of woodchip sample NJP3-18 2nd floor.

47. June 26, 1985 1315
Woodchip sample NJP3-18.

48. June 26, 1985 1315
Collection of soil sample NJP3-33.

49. June 26, 1985 1320
Soil sample NJP3-34.

50. June 26, 1985 1325
Depth of hole for soil collection at 12"-18".

51. June 26, 1985 1330
Collection of woodchip sample NJP3-19 2nd floor.

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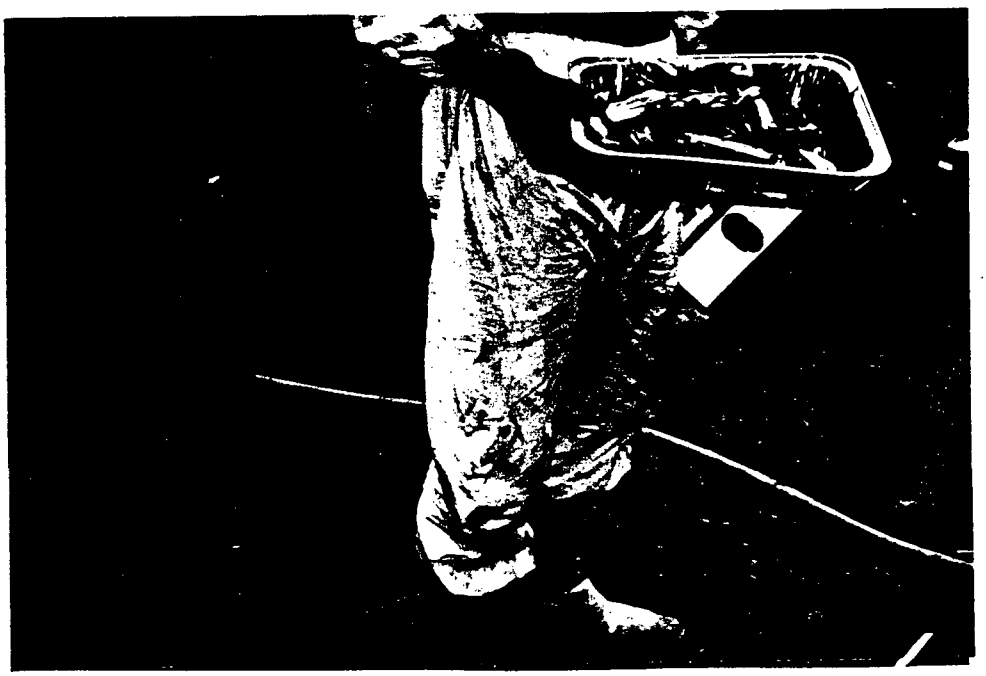
52. June 26, 1985 1340
Collection of soil sample NJP3-36.

53. June 26, 1985 1345
Sample preparation of woodchips.

54. June 26, 1985 1400
Sample location for woodchip sample NJP3-21.



55. June 26, 1985 1430
Woodchip sample NJP3-22.

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56. June 27, 1985 1330
Collection of exterior wall sample NJP3-42.

57. June 26, 1985 1435
Sample NJP3-22.

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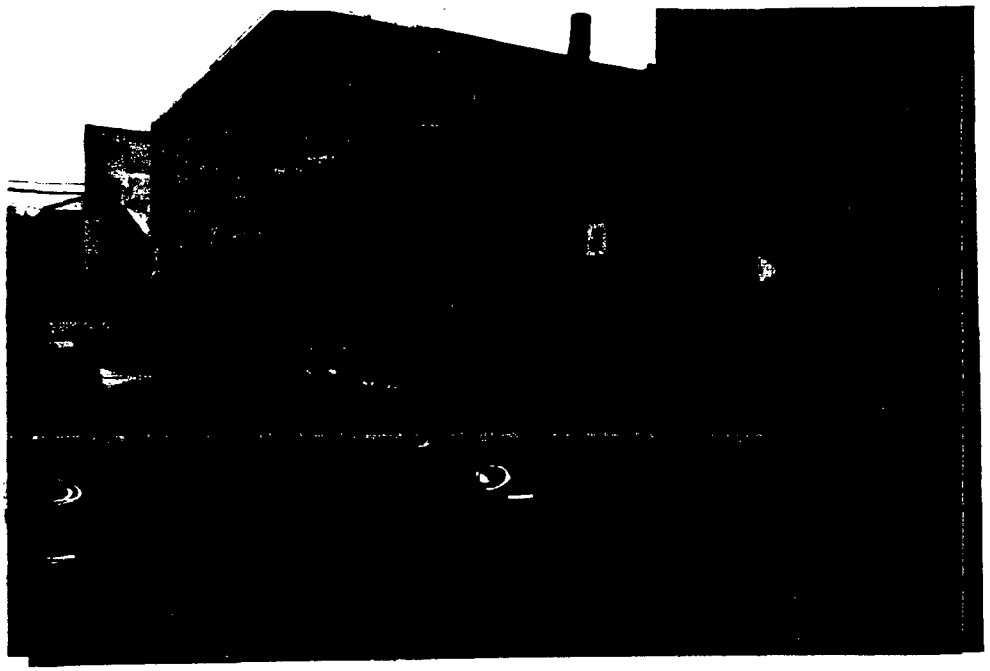

58. June 27, 1985 1410
Stucco wall-exterior wall samples.

59. June 26, 1985 1500
Collection of basement wall sample NJP3-24.

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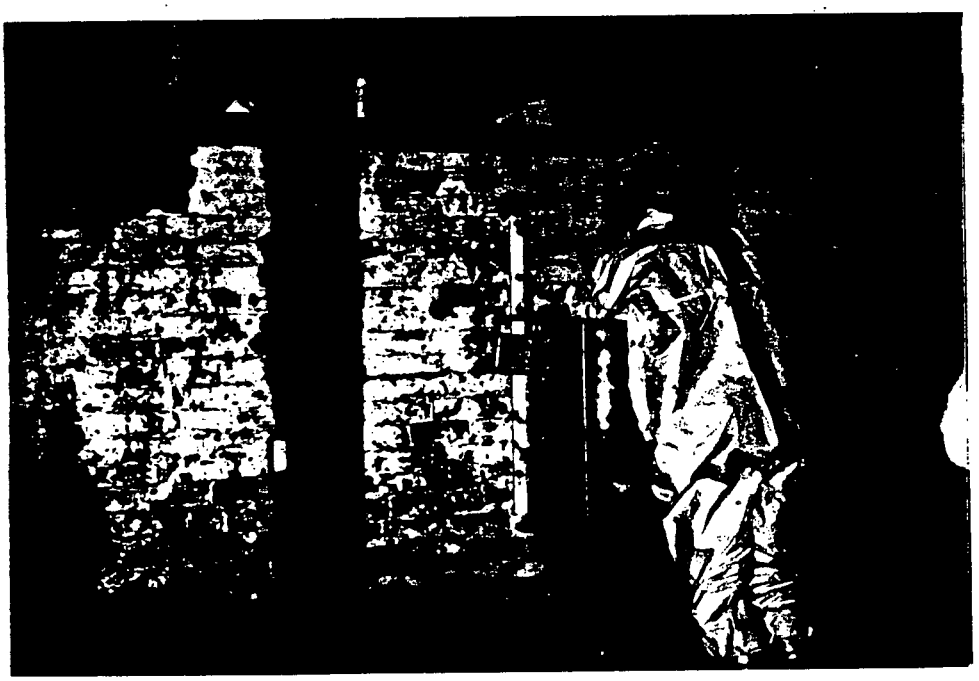
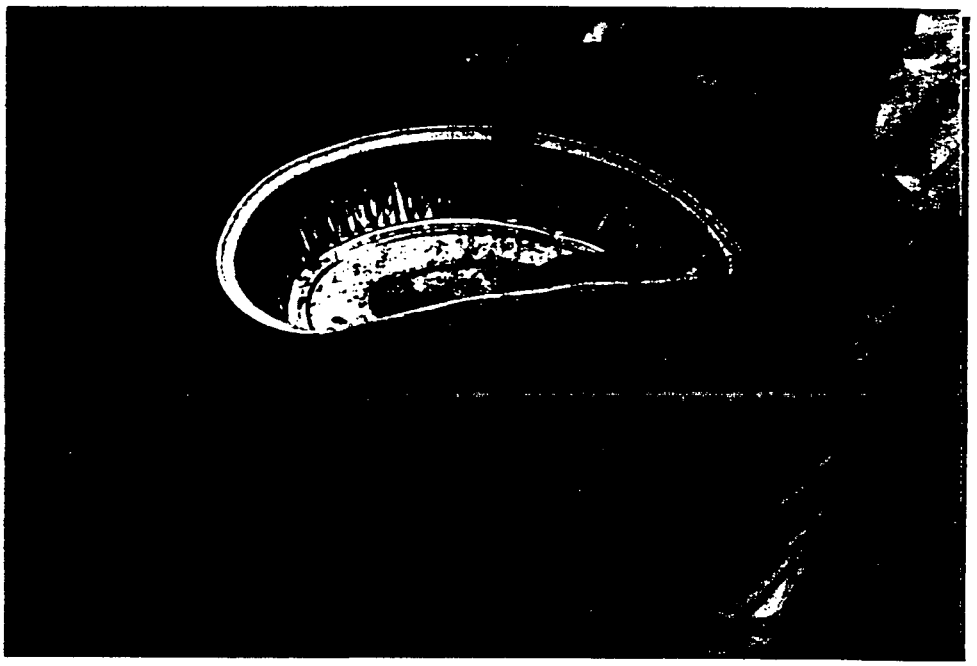
60. June 26, 1985 1510
Sample NJP3-24.



61. June 27, 1985 1000
Collection of brick wall sample NJP3-37 - basement.

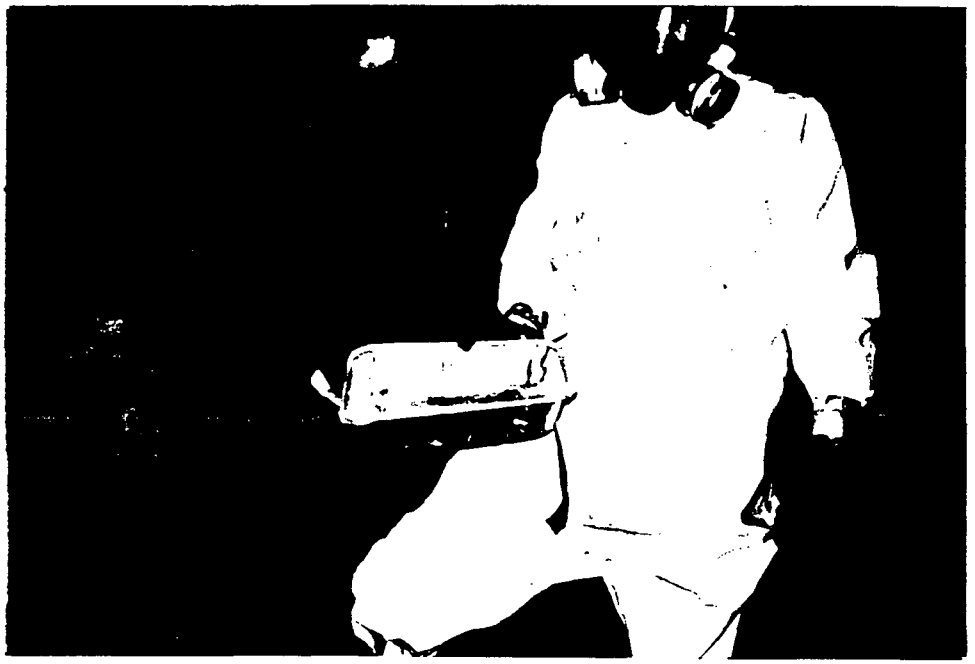
BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY



62. June 27, 1985 1010
Sample NJP3-37.

63. June 27, 1985 1015
Collection of brick wall sample NJP3-39 - basement.

BLUE SPRUCE INTERNATIONAL, BOUND BROOK, NEW JERSEY



64. June 27, 1985 1030
Sample NJP3-39.

65. June 27, 1985 1032
Sample location for NJP3-39.

66. June 27, 1985 1042
Water by foundation of basement.

67. June 27, 1985 1142
Collection of brick wall sample NJP3-38 - rear exterior wall.

68. June 27, 1985 1200
Sample NJP3-38.

69. June 27, 1985 1225
Collection of soil sample NJP3-34.

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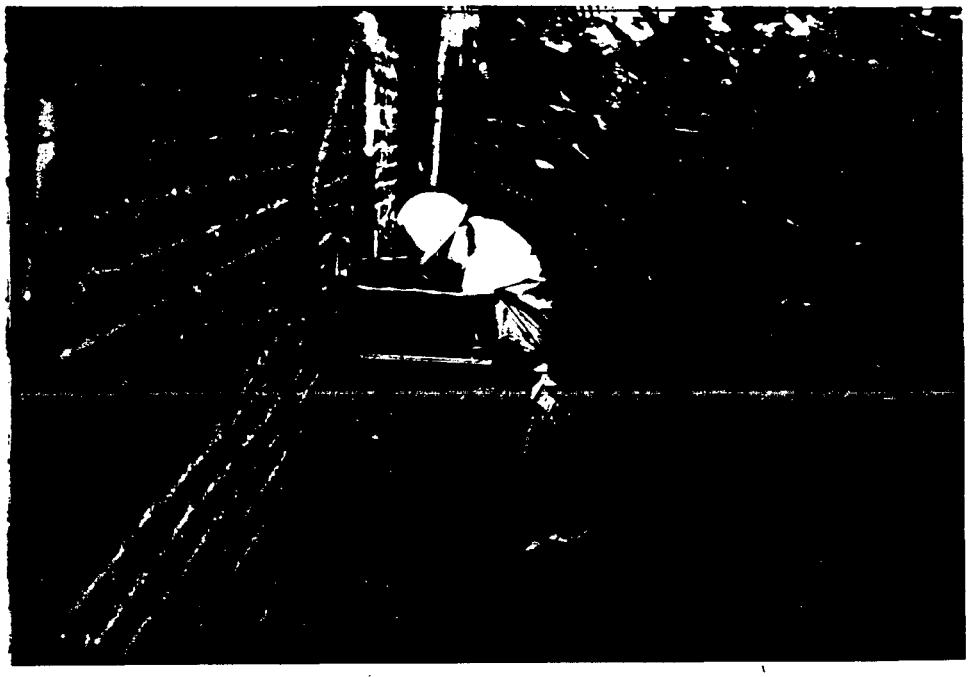
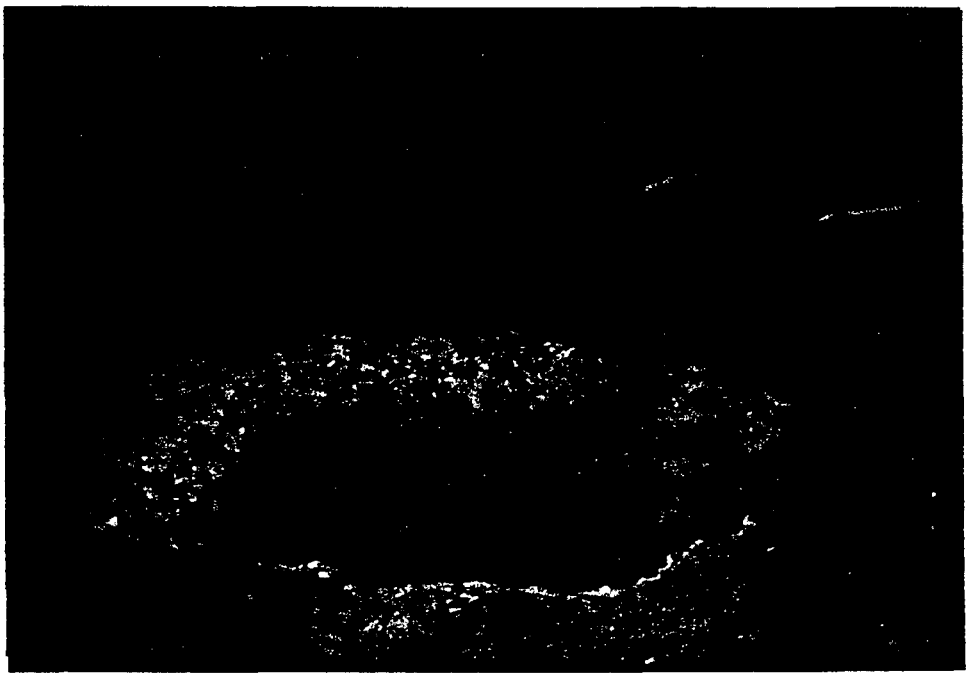


70. June 27, 1985 1245
Collection of brick wall sample NJP3-41 - rear exterior wall.



71. June 27, 1985 1310
Sample location NJP3-43 - woodchip sample rm #2.

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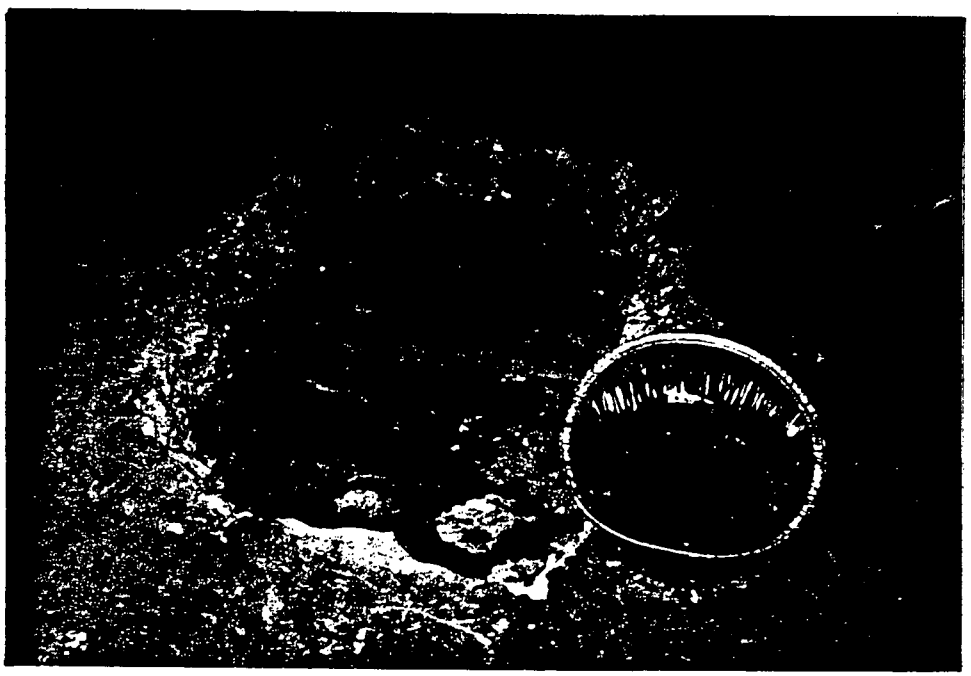
72. June 27, 1985 1315
Collection of subsurface woodchip sample NJP3-43-rm #2.



73. June 27, 1985 1325
Woodchip sample NJP3-43.

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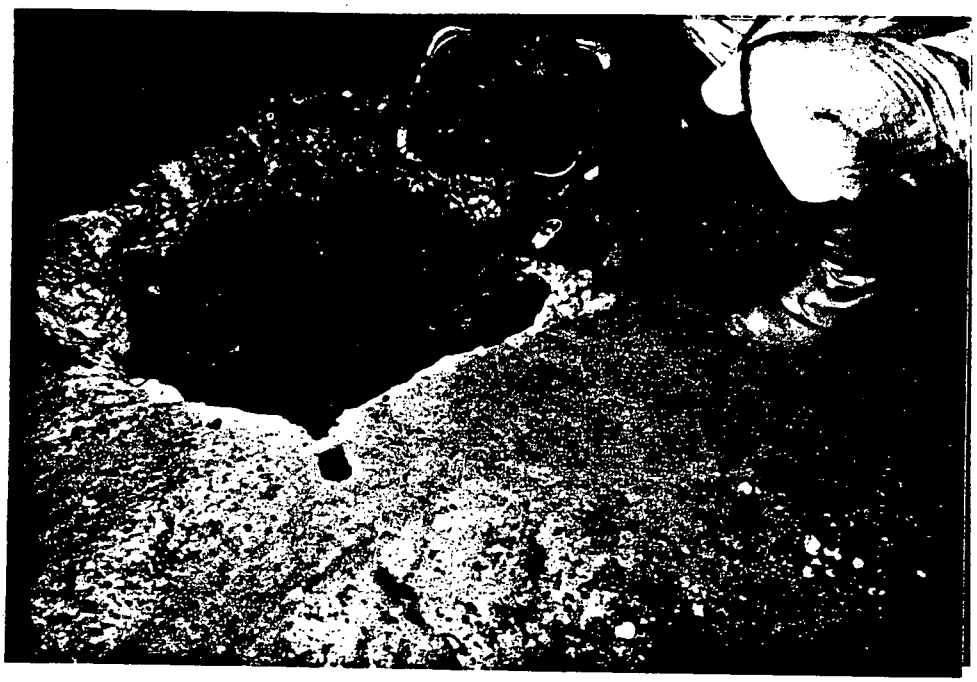
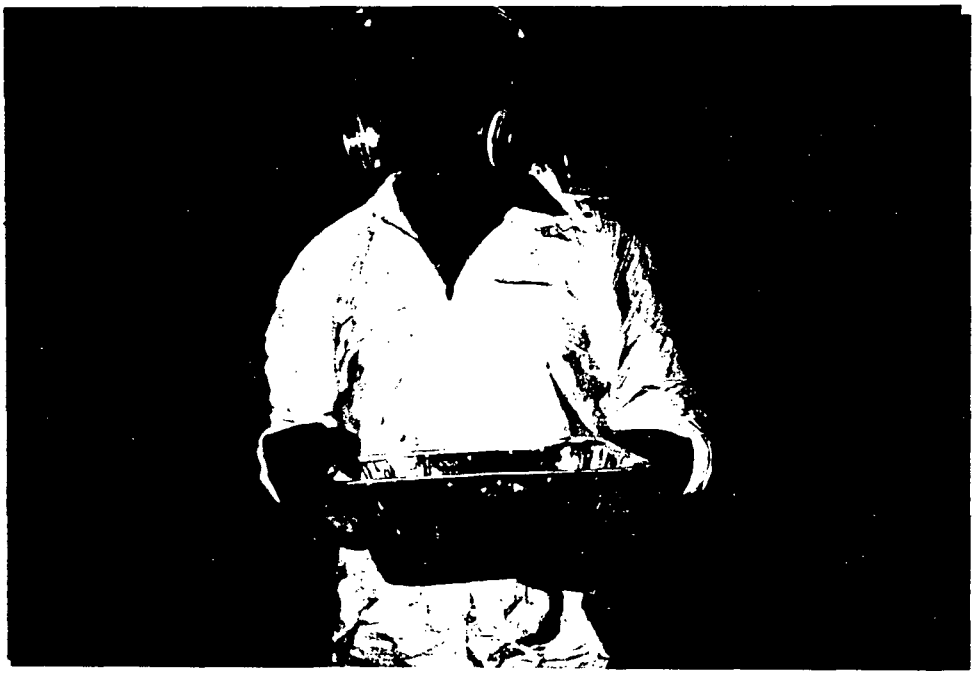
74. June 27, 1985 1325
Brick wall sample NJP3-42.



75. June 27, 1985 1410
Collection of subsurface brick floor sample NJP3-45-rm #1.

76. June 27, 1985 1425
Collection of subsurface brick floor sample NJP3-47-rm #2.



77. June 27, 1985 1450
Sample NJP3-47.

78. June 27, 1985 1452
Sample lcoation of NJP3-46.