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Medical Center

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Institute of Environmental Health

Kettering Laboratory
3223 Eden Avenue
Cincinnati, Ohio 45267-0056

THE CINCINNATI SOIL PROJECT
(Contract #V00 5035-01)

April 13, 1989

Ms. Cindy Wakat,
Project Officer
U.S. Environmental Protection Agency
Region V
235 S. Dearborn St.
Chicago, Illinois 60604

Dear Cindy:

I have enclosed four (4) copies of our work plan for the Cincinnati Soil Lead Demonstration Project. Our revised budget is near completion and will be sent out within the next week--you should receive by 4/21/89.

I will be contacting you sometime within the next few days to confirm receipt of the enclosed.

I realize that you will be in another position after the end of this month; therefore, I hope to have the Work Plan and the Revised Budget reviewed by you before you leave the position. As you are aware, the Blood QAAP and the Soil QAAP was submitted. The Dust QAAP (revised) is scheduled to be submitted by 5/5/89.

Should you have any questions or suggestions, please contact me.

Thank you for your assistance and good luck in your new endeavors.

Sincerely,

Linda Conway-Mundew

Linda Conway-Mundew,
Project Manager

enclosures

CINCINNATI SOIL LEAD DEMONSTRATION PROJECT

EPA No. V00 5035-01

WORK PLAN

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SUPERFUND PROGRAM
MANAGEMENT BRANCH

Submitted to:

U.S. Environmental Protection Agency

Region V

Ms. Cindy Wakat, Project Officer

by

Linda Conway-Mundew
Project Manager

Scott Clark, Ph.D.
Co-Principal Investigator

Robert Bornschein, Ph.D.
Co-Principal Investigator

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1.1 Introduction

1.1.1 Objectives

The primary objective of the demonstration project is to determine whether procedures to abate the lead (Pb) concentration in (1) soil, (2) exterior dust and (3) house dust, applied separately and in combination, are effective in reducing the blood lead levels of children up to five years of age residing in completely rehabilitated housing, or in non-rehabilitated housing in satisfactory condition, in the abatement areas. Secondary objectives of this project are to determine the effectiveness of the abatement procedures in reducing the quantity of lead on the hands of the children and the lead dust levels in residences and to determine the rate of reaccumulation of household dust lead and factors associated with such reaccumulation.

1.1.2 Results and Benefits Expected

This project will produce information on the effectiveness and relative cost of soil and dust abatement procedures as applied to rehabilitated housing units and their immediate neighborhoods. Currently the blood lead of one-half of the children residing in the proposed study areas reaches and exceeds the current recommended limit of the Centers for Disease Control at least once by the time they are 24 months of age. Although it is currently widely thought that lead paint abatement is the only effective method to reduce lead exposure, children living in houses in Cincinnati that have had the paint lead removed have been found to have blood lead levels several ug/dl higher than those of children living in public housing or in private housing built since World War II. This study is expected to yield results concerning three abatement methods to reduce the blood lead of these children (soil, interior dust and exterior dust lead abatement.

Other benefits expected to accrue to the residents and property owners of the neighborhoods involved are improved grass cover and other vegetation, improved conditions of play areas, removal of debris from vacant lots, improved cleaning of streets and other paved areas and the special cleaning of floor areas in the housing of many of the study participants. The landscaping of public recreational areas will also be improved.

For individuals found to have elevated blood levels requiring medical attention, the resources of the Lead Poisoning Control Program of the Cincinnati Health Department and the Children's Hospital Lead Clinic will be available.

1.1.3 Approach

An evaluation of data from an ongoing study of childhood lead poisoning led to the development of a causal model that indicated the existence of a lead exposure pathway leading from lead in external soil/dust adjacent to housing units (PbSS) and paint lead (XRF) to interior house dust (PbD), then to hand lead (PbH) and ultimately to blood lead (PbB). This suggests that an intervention strategy involving control of exterior dust/soil, paint, and interior dust could potentially lead to statistically significant reductions in blood lead. Contaminated soil serves as one of the lead reservoirs that contributes to external dust on the street and other areas in or near housing units. The reduction in soil lead in areas where the house paint lead has already been throughly abated would, therefore, lead to reduction in exterior dust lead and consequently interior dust lead, hand lead and ultimately blood lead. However, because of the existing accumulations of exterior and interior dust lead in the housing environment, the impact on blood lead reduction of soil lead abatement alone would be delayed and reduced if dust lead abatement did not also occur. The Cincinnati Soil-Lead Abatement Demonstration Project will therefore evaluate three abatement components thought to be significantly linked to elevated blood lead levels; soil lead abatement, exterior dust abatement and interior abatement.

When soil lead abatement is carried out, exterior dust abatement will always be carried out since soil removal and replacement will generally result in some temporary contamination of adjacent paved areas which must therefore routinely be abated as part of any well-executed soil abatement effort.

The impact of existing paint lead is not expected to interfere with the evaluation of the effectiveness of soil and dust lead abatement because the Cincinnati Soil Lead Abatement Demonstration Project will focus on lead-paint-free rehabilitated housing units. However, paint lead from housing outside the abatement areas is expected to migrate into the abatement areas to some extent and children may spend a portion of their time outside the abatement areas. Cincinnati

fortunately has a large stock of about 6000 residential housing units, available to low and moderate income families; that have been completely rehabilitated and deleaded under various U.S. housing programs, mainly during the late 1960's and early 1970's.

1.1.4 Background

Blood lead profiles of Cincinnati children, up to 60 months of age, living in rehabilitated housing units (low paint lead), public housing (also containing very low levels of paint lead), newer post World War II housing (low paint lead), and 19th century private housing (multiple sources of lead), that are in deteriorated/dilapidated or satisfactory condition (by exterior evaluation), show a strong association between house type and blood lead. The children with the lowest PbB reside in the post World War and public housing, while those in the deteriorated housing, not unexpectedly, have the highest PbB values. What was surprising, however, is that children residing in the rehabilitated housing have PbB values much higher than those in public housing. Blood leads are higher by about 10 ug/dl at 18 months of age, even though paint lead levels are equally low in both housing categories. Blood lead levels of children living in the rehabilitated housing are similar to those living in satisfactory housing that has not been rehabilitated. The higher than expected PbB of children in rehabilitated housing appears to be due to the fact that most of the rehabilitated housing is intermixed in neighborhoods with non-rehabilitated housing, frequently in a poor state of repair, which results in much higher interior and exterior dust lead levels in rehabilitated housing than in public housing. Being in close proximity to housing with lead paint, the rehabilitated housing becomes contaminated by lead-contaminated dust which migrate to the areas immediately outside and within the rehabilitated units. This project offers the opportunity to test the hypothesis that the blood lead levels of children living in rehabilitated and satisfactory housing can be reduced by reducing lead levels in soil and dust in the areas in which housing is located.

1.1.5 Study Population

In order to determine the impact of the exterior and interior abatement procedures, selection of similar study areas is important. This will be accomplished by selection of several areas within the neighborhoods where socio-economic and ethnic backgrounds are similar. Other matching variables to be considered include current housing type, age of child, prior housing history, season, soil availability per block (group match) and percent non-rehabilitated housing per block (group match). In order to maximize the potential impact of soil lead abatement on blood lead reduction, a number of other features of the study area are desireable, including a high percentage of lead-paint-free housing in the study area, a high percentage of young children, and a high density of children exposed to accessible lead contaminated soil. Measurement of lead in environmental intermediates (hand lead and exterior and interior surface dust) will also provide useful information even if there is movement of children into and out of the study areas during the abatement process.

An evaluation of Cincinnati neighborhoods has revealed several areas which appear to be promising candidates for the soil lead abatement project. Each neighborhood has 40-60 children less than five years of age. The percent of land area that is soil ranges from about 20 to 27 percent of the land area with an average of 24 percent. The soil exists primarily in large parcels of land such as common recreational areas.

1.1.6. Population Size Needed

Based on data collected in the on-going prospective study of lead poisoning in Cincinnati it has been estimated that 31 children between the age of 12 and 60 months, with an average age of 36 months at the start of the study, are needed in each of the five groups, to test the hypothesis that abatement has a significant effect on blood lead.

1.1.7 Hypotheses

The specific questions to be asked in the Cincinnati Soil Lead Abatement Demonstration Project are as follows:

(1) Does interior dust abatement in rehabilitated housing in conjunction with soil lead and exterior dust abatement (Area A), or interior dust abatement alone (Area B), result in a statistically significant reduction in blood lead of children relative to children living in rehabilitated housing in another area (Area C) where no abatement occurs? or does abatement result in a covariate adjusted reduction in blood lead relative to each child's preabatement blood level?

Statistical contrasts: Area A vs Area C
Area B vs Area C

This question will be addressed in 1989.

(2) Does exterior abatement (dust and soil) in housing in Area B result in a significant reduction in blood lead relative to that in children in housing where no abatement occurs (Area C). This question will be addressed in 1990

(3) Is the reduction in PbB and environmental Pb transient or long term? This question will be addressed by tracking changes in lead concentrations over a two year study interval.

It is anticipated that soil and interior lead abatement will be one of the major incentives for property owners and residents to participate in the abatement project and that therefore all property not previously lead-abated may have to be eventually abated during the project. In addition, if either the exterior or interior abatements are found to be effective then ethical considerations will require that such abatements be performed in the remaining areas.

Environmental and blood lead monitoring will be conducted during May 1989, just prior to the initiation of abatement activities (June), and at six month intervals thereafter. In addition environmental monitoring will occur, in all areas, immediately after abatement has been completed. Paint and water monitoring will occur in September, 1989 and September, 1990.

1.2 Site Description

All soil within the designated abatement areas will be tested. The abatement areas under consideration are urban areas, with a high population density. The soil is generally associated with residential housing or public areas such as playgrounds. Much of the area is paved.

1.3 Site History or Background

Lead contamination of soil is present in these urban areas from a multitude of sources. Primary among these sources are lead paint and the historical accumulations from leaded gasoline and the weathering of exterior lead-containing paint.

1.4 Target Compounds

The sampling of soil for lead contamination and the measurement of lead in soil is key to the objectives of the study. The lead concentration will be used to: delineate abatement areas; choose abatement stragegies; determine the effectiveness of abatement; study the recontamination of the areas; and relate soil lead concentration to children's blood lead.

1.5 Project Objectives

The primary objective of this demonstration project is to evaluate the effectiveness of several abatement strategies in reducing lead toxicity in urban children. The abatement strategies include: a) removal of contaminated soil and exterior dust, b) removal of contaminated interior house dust and c) combined removal of a) and b). Measures of effectiveness will include: a) reduction in average PbB of treatment groups relative to a control group and/or their own pre-abatement PbB level, b) reduction in lead recovered from hand wipes, c) sustained reduction in interior dust lead levels and exterior surface dust levels. A secondary objective will be to estimate the rate of exterior and interior recontamination and to identify modifying factors. In order to meet these objectives, it will be necessary to sample and measure Pb in the environment, sample and measure Pb in children, abate lead in the environment, relate change in environmental lead to change in blood lead, to monitor this relationship over an extended time (2 years) and to analyze the resulting data base in a manner which will permit an evaluation of effectiveness of various abatement strategies.

Data will be organized in data files on the University's mainframe computer. Each item will be associated with sufficient identifying information so as to permit merging of various environmental and biological data in a correct and efficient manner. Data identities will include, City I.D., Neighborhood I.D., Property I.D., Building I.D., Family I.D., Subject I.D. and Sample I.D. Data directories and data dictionaries will be developed and accompany the master data file.

1.6 Project Schedule

A timetable for the overall project is presented in Attachment A and as a bar chart in Attachment B.

1.7 Attachments

A - Timetable: Abatement and Monitoring

B - Bar Chart: Timeline for project activities

PROJECT DESCRIPTION
ATTACHMENTS

A. Timetable: Abatement and Monitoring

B. Bar Chart: Timeline for project activities

ATTACHMENT A

Abatement and Monitoring Time Table

Year 1 1988 — Soil Pb Surveys, Methods Development, Pilot Testing of Abatement Methods, Training, and Negotiation with Property Owners

	AREA A	AREA B	AREA C
Year 2 1989			
May	M[a]	M	M
June	abate soil ext dust int dust	abate int dust	no abatement
July	EM[b]	EM	M
Sept.	P/W M[c]	P/W M	P/W M
Oct.	M	M	M
Year 3 1990			
May	M	M	M
June	no abatement	abate soil and ext dust	no abatement
July	EM	EM	EM
Sept.	P/W M	P/W M	P/W M
Oct.	M	M	M
Year 4 1991			
May	M no abatement	M no	M abatement[d]

Complete sample and data analysis and report writing

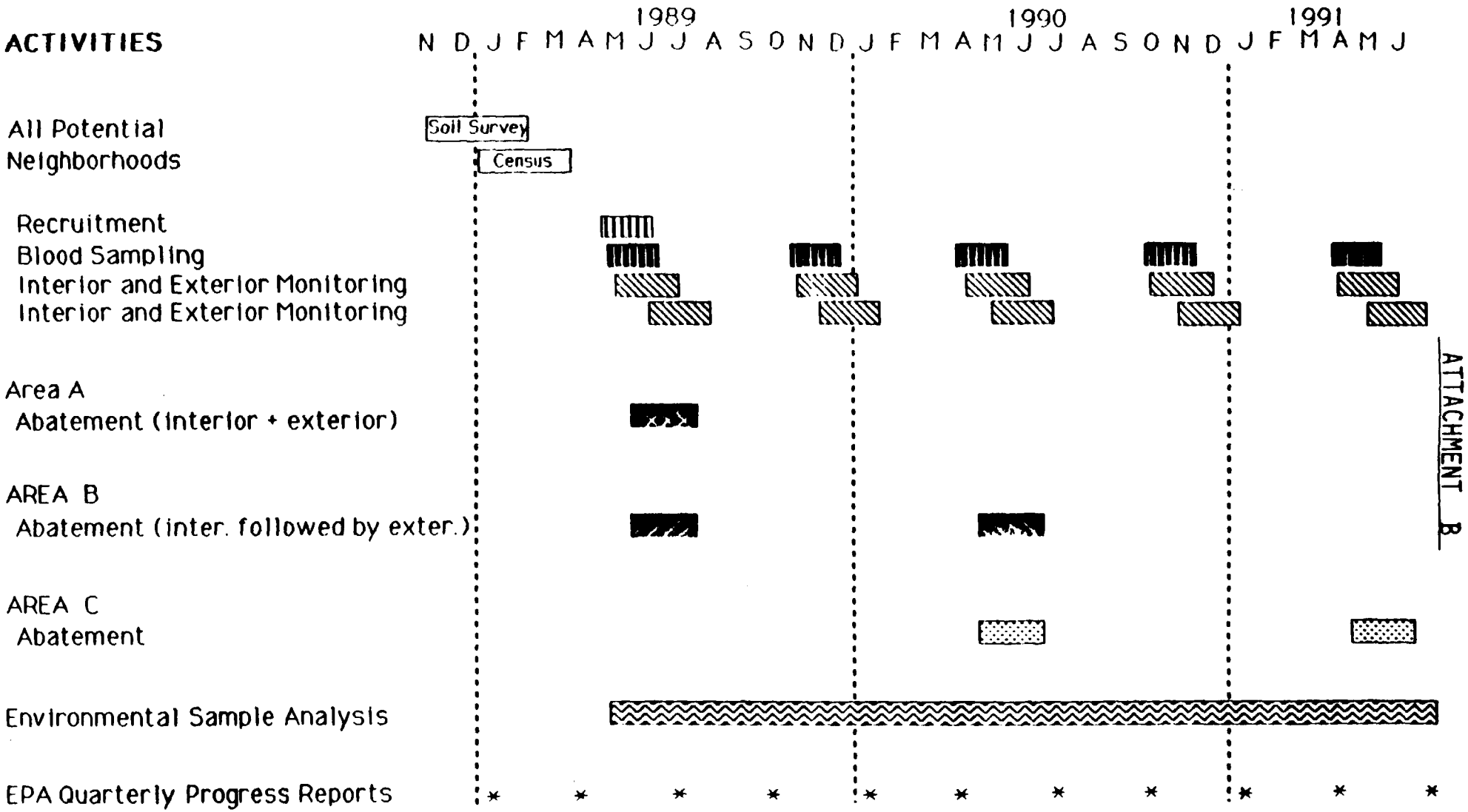
[a]M=Monitoring: Blood Lead, Hand Lead, Interior and Exterior Dust Lead and Soil Lead, prior to and at 6 month intervals post abatement.

[b]EM=Environmental Monitoring: Hand Lead, Dust Fall Interior & Exterior Dust Lead.

[c]P/W M: Paint and Water Monitoring.

[d]Abatement will include soil abatement in public areas where lead concentration exceeds guidelines and other abatement depending in part on outcome of earlier efforts. In other areas sampled during the initial soil surveys but not selected for the study, necessary soil abatement in public areas will occur during 1990 and 1991.

TIMELINE



LEGEND:

- Recruitment
- Blood Sampling
- Interior and Exterior Monitoring
- Environmental Sample Analysis
- * EPA Quarterly Progress Report
- Abatement: Exterior + Interior
- Abatement: Exterior
- Abatement: Interior
- Abatement: Yet To Be Determined

ATTACHMENT B

2.0 PROJECT ORGANIZATION

Project organization includes a description of the responsibilites of project personnel members and adminsitrative concerns that involve financial matters, work areas, and communication. In order to meet project goals and objectives, it is essential to begin with a talented managment group that is able to develop a cohesive staff and create an environment conducive for implementing project plans. The following work plan identifies Project personnel and related responsibilities, management of the budget and facility, establishment of committees, and various reports regarding project activities.

2.1	PRINCIPLE INVESTIGATORS AND KEY PERSONNEL
2.2	PROJECT ORGANIZATION
2.3	PROJECT MANAGEMENT
2.3.1	Recruitment of Management Group
2.3.2	Financial Management
2.3.3	Facilities and Adminstrative Needs
2.3.3.1	Space
2.3.3.2	Furniture and Equipment
2.3.3.3	Supplies
2.3.3.4	Miscellaneous
2.3.4	Project Operations
2.3.4.1	Project Steering Committee
2.3.4.2	Project Management Committee
2.3.4.3	Technical Project Consultants
2.3.4.4	Data Management Consultants
2.3.4.5	Scheduling Committee
2.3.4.6	Analytical Committee
2.3.4.7	Operations Management Committee
2.3.4.8	Staff Relations Committee
2.3.4.9	Project Staff Meeting

2.3.5 Reports

2.3.5.1 Financial and Technical Progress Reports

2.3.5.2 Form 60051, (MBE) Minority Business Enterprise and (WBE) Women's Business Enterprise

2.3.5.3 SF269 (Superfund Recipients)

2.3.5.4 Financial Status Report (Completion of Project Activity)

2.3.6 Attachments

2.0 Project Organization

Our Organizational Chart indicates the location of personnel within the project and the project personnel activities for which they are responsible. Many of the project activities are supported in part by temporary employees hired during specific phases of the project.

The organizational chart is presented in Attachment A. A chart showing the personnel and laboratories responsible for the control of soil samples is shown in Attachment B.

2.1 Principle Investigators and Key Personnel

Drs. Scott Clark and Robert Bornschein will be the Co-Principal Investigators on the Project. They both have had extensive experience conducting human population studies and are both involved in the on-going NIEHS - supported program project - Health Effects of Lead on Child Development.

Other investigators on the project will be Dr. U.-Q. Winkey Pan, statistician Dr. Paul Succop, statistician and Dr. Shane Que Hee, environmental monitoring; Linda Conway-Mundew, project manager; Bill Menrath, abatement and environmental monitoring; Sandy Roda, blood lead and soil lead determinations, JoAnn Grote, community liason and subject recruitment; and Douglas Dicks, environmental coordinator. Barbara Gordon of the Cincinnati Health Department (CHD) will serve as the initial coordinator of project activities at the Health Department and as liason with other local government entities. Technical consultants to the project for abatement and project managment will also be involved.

2.2 Project Organization and Responsibility

Project Directors (Drs. Clark and Bornschein) - These individuals will provide overall scientific leadership, develop general project design and goals, monitor progress toward specific aims, assist in writing quarterly progress reports and participate as members of the Project Steering Committee.

Project Manager (Ms. Linda Conway-Mundew) - This individual is an administrator with experience in multi-disciplinary projects, contracting and budget management in both the public and private sector. She has good interpersonal skills and experience in the health professions. She will be responsible for monitoring overall project supervision and adherence to project goals, schedules and budgets. She will have primary responsibility for writing quarterly and annual progress report as well as Affirmative Action and Human Research Reports.

Associate Project Manager for Scheduling and Subject Matters (Ms. JoAnn Grote) - She is primary assistant to the Project Manager with supervisory responsibility for the Patient Coordinator (Recruitment and Scheduling), and the clinic staff of phlebotomists and interviewers. She is responsible for establishing clinic sites in the study neighorhoods and will assist in recruitment and scheduling. She has final responsibility for coordinating clinic visits and environmental monitoring visits prior to and following abatement.

Associate Project Manager for Environmental Monitoring and Abatement (Mr. William Menrath) - This individual with several years experience will supervise site inspectors responsible for contract letting and monitoring the activities of contractors involved in interior house dust abatement, exterior paved surface cleaning and soil removal and replacement. This individual will determine property ownership and obtain property access permission through negotiations with property owners. He will also be responsible for utilities coordination which includes underground utilities and street and building repair. He will be assisted in these activities by a City Health Department Administrative Assistant (50%) and a City Sanitarian (50%). He will also have responsibility for the conduct of the environmental monitoring.

Statistician/Data Manager (Dr. Winkey Pan) - Dr. Pan will establish the data base with appropriate securities and data linkage capabilites between laboratory micro computers and the University's mainframe computers. He is also well versed in the statistical methods necessary to test project hypotheses and conduct data assessment. Consultation will be provided by Dr. Paul Succop, statistician and co-investigator in the Cincinnati Lead Study for the last eight years, and Dr. Lee Rafales, consultant to the Lead Study for data managment and programming.

Environmental Coordinator (Mr. Douglas Dicks) - With the oversight of the Monitoring and Abatement Manager, is responsible for daily scheduling and supervision of work crews for field monitoring, and preparation of written reports to the Project Manager. He will coordinate the flow of dust and soil samples from the field lab to the XRF lab or the chemical digestion lab and AA laboratory. He will also serve as a back-up for the second member of environmental monitoring crews. He will be responsible for the activity of about 6 to 8 full time and/or part time employees during environmental monitoring.

Director of Hematology and Environmental Laboratories (Ms. Sandy Roda) - Ms. Roda will establish and maintain analytical procedures necessary for accurate and precise blood lead determinations and related hematology measurements. She will schedule lab staff to meet changing work loads. She will maintain and monitor laboratory Q.A./Q.C. performance and assist in the training of clinic phlebotomists and other assistants involved in the handling and analysis of blood samples. She will develop methods for the X-ray fluorescence measurement of lead in soil and dust and will supervise the XRF analysis of such samples. She will also develop and implement a Quality Assurance program for the XRF laboratory.

Associate Director of Hematology and Environmental Lab and Technical Trainer (Ms. Belinda Peace) -She will design and implement environmental sample collection and analysis procedures. She will train environmental teams in appropriate sample collection and analysis procedures. She will serve as a back-up for any member of the field or laboratory team. She will direct the operation of the chemical digestion lab. She will monitor equipment and instrument calibration, design and implement environmental QAPP's, coordinate the 3-city Q.C. program for soils and dusts and write Q.C. reports to the Quality Assurance Officer.

Methods Advisor (Dr. Shane Que Hee) - He will provide scientific advice regarding development and utilization of analytical chemical methods and sample collection procedures, interpretation of environmental and sample analytical data and dust collection and abatement methods.

Environmental Field and Lab Staff - Several full-time and six to eight part-time hourly employees will be required to carry out exterior and interior environmental monitoring. The full-time research assistants (J. Centers and R. Linneman) will also be involved in sample collection and preparation for lead analyses of all soil, dust, air and water samples.

Subject Recruiter/Coordinator (To Be Named (TBN)/Interviewing has been completed and determination will be made by 4/24/89. For official approval for hire, U.C. Personnel Dept. requires approximately 2 weeks.) - This individual is responsible for recruitment of study participants, obtaining signed consent to participate, scheduling of participants for blood drawing, and "re-scheduling" missed clinic and environmental appointments. She will be assisted in the recruitment, scheduling and tracking activities by a City Health Department public health nurse (50% effort).

Secretary (T.B.N./We are in the initial stage of the recruitment process and plan to fill the position by 6/1/89) - The secretary will handle clerical functions, typing and phone coverage. In addition, she will assist in data entry activities through local P.C./terminals.

Site Inspectors (T.B.N.) - These two research assistants will monitor the activities of contract employees conducting interior abatement, soil abatement and exterior paved surface abatement. These activities will be underway in several different neighborhoods simultaneously. They are to report any deviation from specified protocol to the Abatement Manager.

Property Access and Utilities Coordinator (T.B.N.) - This City Health Department (CHD) Administrative Assistant will handle daily management of the Health Deparment activities and will assist with the coordination among the City Departments and with the liason functions to other government and quasigovernmental agencies. This individual also will assist with the handling of community and public relations for the project, and he/she may assist in the processing of access agreements and will prepare reports regarding project activities.

Public Health Nurse (T.B.N./ A CHD employee) - He/she will assist with community relations and the preparaton of reports, participate in the recruitment of property owners and individual study subjects, and refer and follow all patients with elevated lead levels until satisfactory treatment has been obtained. He/she also may assistant with staffing the lead screening clinic sessions that will be held to collect blood samples from both the study subjects and other residents in the areas.

Sr. Sanitarian (T.B.N./A CHD employee) - also will assistant with community relations and with the recruitment of property owners. He/she will conduct preliminary property title searches for the project, and he/she will investigate the environmental conditions of non-rehabbed housing in the study areas if children with elevated lead levels are found to be occupants of said housing. He/she will seek, through referrals, compliance with local regulations regarding lead-based paint found in this non-rehabbed housing.

Q.A./Q.C. Officer (Dr. Winkey Pan) - Dr. Pan will be responsible for the review of Q.A./Q.C. data and reports submitted by Hematology and Environmental Chemistry; he will submit written reports to the Project Manager.

Health/Safety Officer (Ms. Barbara Poppe-Smith) - She will develop a health and safety plan, monitor the period collection of biologic specimens and review lab results for compliance with guidelines, determine that safety equipment is in place and being appropriately used and conduct initial employment training sessions to review pertinent health and safety issues. This individual will work closely with the University of Cincinnati Safety Office (Ms. B. Keyes, Manager) for worker health and safety and for the proper disposal of any hazardous waste.

Legal Affairs Office - Legal services, risk management and insurance. This office will provide guidance for the development of property access agreements and contracts.

Business Office - This office provides for purchasing, accounting and facilities support.

2.3 PROJECT MANAGEMENT

Project Management activities are presented in four categories: Recruitment, Financial Management, Facility and Administrative needs, and Project operations.

2.3.1 Recruitment of Management Group

Performed by:	**Co-Investigator**	**-C. Scott Clark**
	Co-Investigator	**-Robert Bornschein**
	Associate Project Manager	**-JoAnn Grote**

Time Period: **November 1, 1988 - March 30, 1989**

Recruitment of personnel to fill these positions was conducted by the project investigators with the assistance of other personnel already employed by the University. The individuals hired to fill key positions would then be responsible for hiring project staff--according to area of responsibility.
The key personnel include:

- -Project Manager
- -Associate Project Manager, Subject Matters
- -Associate Project Manager, Abatement and Environmental Monitoring
- -Statistician/Data Manager
- -Environmental Coordinator
- -Director, Hematology Lab and Environmental Lab

2.3.2 Financial Management

Performed by:	**Co-Investigator**	**-C. Scott Clark**
	Co-Investigator	**-Robert Bornschein**
	Project Manager	**-Linda Conway-Mundew**
	Associate Project Manager	**-JoAnn Grote**
	Associate Project Manager	**-William Menrath**
	Statistician/Data Manager	**-Winkey Pan**

Time Period: **November 1, 1988 - September 30, 1991**

The first phase of this activity involved the development of the project budget with associated cost centers and appropriate justifications for project expenses. The project will be monitored by the Project Adminstrator. Each area of concern

will be considered a cost center. The attached Budget format (Attachment C) is an example used for tracking expenses by cost center. The cost centers will be: Monitoring and Abatement, Subject Matters, Data Management, Health and Safety, and Administrative.

A monthly report will be produced with a cost of budgeted dollars and actual dollars spent. Approval for all expenditures will be managed by the project administrator. The monthly status report of the budget and monies expended will be provided to project investigators, associate project managers, and lab directors for review and as a guide for future expenditures.

2.3.3 Facilities and Administrative Needs

Performed by:	**Co-Investigator**	**-C. Scott Clark**
	Co-Investigator	**-Robert Bornschein**
	Project Manager	**-Linda Conway-Mundew**
	Associate Project Manager	**-JoAnn Grote**
	Associate Project Manager	**-William Menrath**
	Statistician/Data Manager	**-Winkey Pan**
	Support Staff	

Time Period: **November 1, 1988 - March 1, 1989**

The development and implementation of a Plan for obtaining office, lab and clinic space; furniture and equipment; and associated supplies was included in the intial undertaking.

2.3.3.1 Space

There was not enough contiguous space at the University of Cincinnati to accomodate all our project needs for offices, labs and clinics. Therefore, we conducted an investigation as to the availability of space for rent within our study areas. Decisions were based on total square footage, cost per square foot, and the layout/design (to facilitate work to be performed by office, lab and clinic staff).

Our plans are to utilize space available within the University and rent an off-campus facility in order to meet all project needs. The location of facilities for the project are planned as follows:

Office and Lab Accommodations on UC Property

-Co-Investigators Office (2)
-Blood Lab and Lab Director's Office
-XRF Soil Lab
-Environmental Lab and Associate Lab Director's Office
-Shared Office Space for Technical Staff
-Statistician/Data Manager and Data Manager Support Staff Offices
-Business Office Support

Office, Lab and Clinic Accommodations Located in Study Area

-Project Manager's Office
-Associate Project Manager's Office (2)
-Cincinnati Health Department Staff's Office (3)
-Environmental Coordinator's Office
-Environmental Monitoring Lab for Staging of Collection of Samples and Preparation of Samples
-Recruiter's Office
-Subject Matters (part-time staff) Work Area
-Clinic for (2) sample collections in 1989, 1990 and (1) in 1991
-Abatement Staff

-Please see attached floor plan for a facility located in the study area at 1142 Main Street (Attachment D).

2.3.3.2 Furniture and Equipment

Specific needs for furnishing (20) offices, (4) labs, and clinics were determined and detailed in the budget.

Implementation of a plan for all project expenditures are processed according to the University's policy and procedures for purchasing furniture and equipment. (Please see attached Administrative Memorandum, No. 27-Revised.) (Attachment E)

2.3.3.3 Supplies

A budget for the projected need for supplies was developed and will be monitored according to cost centers. Purchase requests will be submitted and requisitions signed by the project administrator. The requisitions will be forwarded to the Business Office in the Department of Environmental Health, and will then be processed through the University's accounting system for completion of the purchase transaction.

Supplies include:

- Office supplies such as paper, implements, filing dividers, calendars rolodexes, lamps, staplers, etc.
- Lab coats and other protective clothing required by Health and Safety.
- Technical supplies needed by clinical, environmental and lab staff.

2.3.3.4 Miscellaneous

Once the facility arrangements were made, we proceeded with implementation of plan to lease or purchase the following services:

- Security System
- Telephone System
- Heat, Water, Gas and Electric
- Facility Cleaning Service
- Copier (equipment and supplies)
- Printing (stationery, business cards, community information, etc.)
- Personal Service Contracts (PSC) for specialized work to be performed on an as needed basis.

2.3.4 Project Operations

The establishment of committees for the purpose of planning, decision making, and providing communication and direction for all project concerns is essential for the smooth functioning of the project.

Committees Established are:

- -Project Steering Committee
- -Project Management Committee
- -Technical Project Consultants
- -Data Management Consultants
- -Scheduling Committee
- -Analytical Committee
- -Operations Management Committee
- -Staff Relations Committee
- -Project Staff Meeting

The following represents a description of the purpose of each committee, composition of membership, schedule for meetings, and the objectives.

2.3.4.1 Project Steering Committee

This committee meets on the 3rd Thursday of every month and is responsible for the broader issues of project activities and concerns. Representatives are included based on their ability to provide information and planning, in order to maintain direction for meeting project goals.

Committee Members:

- -Project Directors: (Drs. Clark and Bornschein)
- -Project Manager: (Ms. Conway-Mundew) (Chairperson)
- -Project Associate Managers: (Ms. Grote and Mr. Menrath)
- -Environmental Coordinator: (Mr. Dicks)
- -Director of Nursing (Cincinnati Health Department): (Ms. Gordon)
- -Quality Assurance Officer: (Dr. Pan)
- -Health and Safety Officer: (Ms. Poppe-Smith)
- -Administrative Assistant III (Cincinnati Health Department): (To be named)

2.3.4.2 Project Management Committee

This committee meets weekly and is responsible for day to day decision making for the project. Membership is based on technical and managerial responsibility for planning, organizing and implementing project objectives.

Members Include:

- -Project Directors: (Drs. Clark and Bornschein)
- -Project Manager: (Ms. Conway-Mundew)
- -Project Associate Manager: (Ms. Grote and Mr. Menrath)
- -Statistician/Data Manager: (Dr. Pan)

2.3.4.3 Technical Project Consultant

A technical consultant group with experience in the administrative and technical aspects of a large-scale publicly-funded soil lead abatement project that also includes street cleaning and interior house lead dust abatement will be sought.

2.3.4.4 Data Management Consultants

Consultants with experience in designing custom software will be employed as needed to develop a data management system. These consultants will also assist in modifying software and developing software for report generation, graphics and data analysis throughout the entire course of the study.

2.3.4.5 Scheduling Committee

This committee will establish a plan for coordinating the timing and communication of blood drawing, pre-abatement monitoring, abatement and post-abatement monitoring activities. Of equal importance will be the timely resolution of conflicts in scheduling brought about by unexpected events such as inclement weather, building demolitions or water main breaks in the abatement areas, etc. This committee meets on a weekly basis (Thursday) or more frequently as needed.

Committee Members:

Chairperson:	Mr. Menrath, Associate Project Manager
	Ms. Grote, Associate Project Manager
	Mr. Dicks, Environmental Coordinator
Ex Officio:	Ms. Conway-Mundew, Project Manager

2.3.4.6 Analytical Committee

This committee reports directly to Drs. Clark and Bornschein. It concerns itself with analytical matters related to laboratory function that impacts the measurement of lead in blood, dust, soil and other media. This committee is not involved in work scheduling. This committee will resolve issues such as deviation from performance standards specified in the Quality Assurance Project Plan.

Committee Members:

Chairperson:	Ms. Roda, Lab Director, (Hematology and Environmental)
	Dr. Que Hee, Methods Advisor
	Mr. Dicks, Environmental Coordinator
	Ms. Peace, Associate Lab Director, (Hematology and Environmental)
Ex Officio:	Ms. Conway-Mundew, Project Manager

2.3.4.7 Field Operations Management Committee

This committee meets weekly for the purpose of managing the field facility and staff. The members will establish priorities for the staff that will best support the goals and objective of the project.

Committee Members:

Ms. Conway-Mundew, Project Manager
Ms. Grote, Associate Project Manager
Mr. Menrath, Associate Project Manager

2.3.4.8 Staff Relations Committee

This committee will meet on a monthly basis, on the fourth Wednesday of every month. The committee will be responsible for representing concerns of all Cincinnati Soil Project Staff Members. They will make recommendations for office morale issues, such as: coffee, birthdays, special events, etc.
The committee will have seven or nine members. They will hold open and closed meetings (to be communicated at project staff meetings so that project staff members may attend the open meetings). Committee members are non-managers and will elect a committee chairperson, vice-chairperson, treasurer, and secretary. The chairperson will report at monthly Staff Meetings.

Committee Members:

Chairperson:	Mr. Kuettner, Environmental Monitor
Vice-Chairperson:	Mr. Fletcher, Environmental Monitor
Treasurer:	Ms. Mary Kelsey, Blood Lab
Secretary:	Ms. Veronica Ratliff, Administration
Census:	Ms. Rose Linneman, Digestion Lab/Environmental
Management Liason:	Ms. Conway-Mundew, Project Manager

2.3.4.9 Monthly Staff Meeting

All staff members of The Cincinnati Soil Project are asked to attend. An update on key areas of the project is given. Staff members giving a report are asked to address three issues: (1) Progress/status related to timeline; (2) Problems/resolutions in areas of a) Personnel b) Supply/Equipment c) Methods; and (3) Issues for follow-up.

Attached is a typical agenda format. (Attachments F & G)

2.3.5 Reports

As a recipiant of Federal Government funds, we are responsible for progress and financial reporting. The following represents such reports and includes a description or type of report, person(s) responsible and a time schedule.

2.3.5.1.

Financial and technical progress reports are to be submitted to the U.S. E.P.A. Project Officer on a quarterly basis.

Submitted by:	Project Manager	Linda Conway-Mundew
Prepared by:	Co-Investigator	C. Scott Clark
	Co-Investigator	Robert Bornschein
	Project Adminstrator	Linda Conway-Mundew
	Associate Project Manager	JoAnn Grote
	Associate Project Manager	William Menrath
	Data Manager	Winkey Pan
	Environmental Coordinator	Douglas Dicks
	Director of Hematology and Environmental Labs	Sandy Roda

Associate Director of Hematology and Environmental Labs — Belinda Peace

Time Schedule: Within 30 days following the end of each federal fiscal quarter

March 31
June 30
September 30
December 31

2.3.5.2

The U.S. E.P.A. Form 60051 is a report on the utilization of Minority Business Enterprises and Womens Business Enterprises for procurement of supplies, equipment, construction or service.

Prepared by: Project Manager — Linda Conway-Mundew

Time Schedule: Within (15) days following the end of each federal fiscal quarter.

March 31
June 30
September 30
December 31

2.3.5.3.

The form SF269 must be submitted by Superfund recipients.

Prepared by: Project Manager — Linda Conway-Mundew

Time Schedule: Since our budget period is longer than one year, we will submit a report annually, on the anniversary date of the award.
This report is to be submitted within 90 days following the close of each budget period.

September 30, 1989
September 30, 1990
September 30, 1991

2.3.5.4

A financial status report will be submitted upon completion of project activity.

Prepared by:	Project Manager	Linda Conway-Mundew
Time Schedule:	Written 90 days following the project ending date, September 30, 1991.	

2.3.6 Attachments

A. Organizational Chart

B. Chart of Personnel and Laboratories for Control of Soil Samples

C. Budget Format with Cost Centers

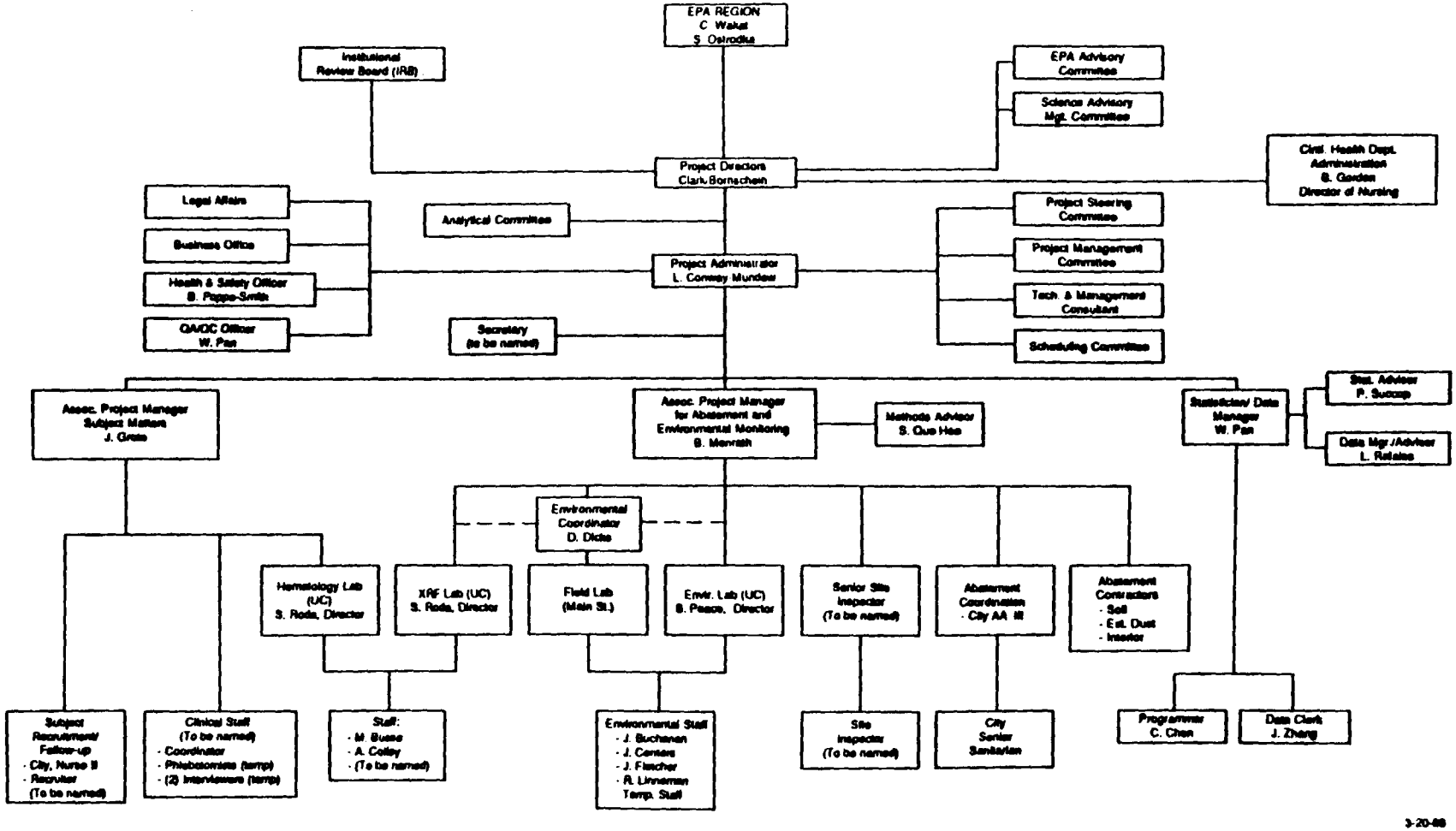
D. Floor Plan of Facility at 1142 Main St.

E. Admininstrative Memorandum, No. 27-Revised

F. Monthly Staff Meeting Agenda Format

G. Monthly Staff Meeting Issues to be Addressed

The Cincinnati Soil Project



ATTACHMENT A

ATTACHMENT B

PERSONNEL AND LABORATORIES RESPONSIBLE FOR CONTROL OF SOIL SAMPLES

PERFORMANCE & SYSTEM AUDITS: Dr. W. Pan

QUALITY CONTROL OFFICER: Dr. W. Pan

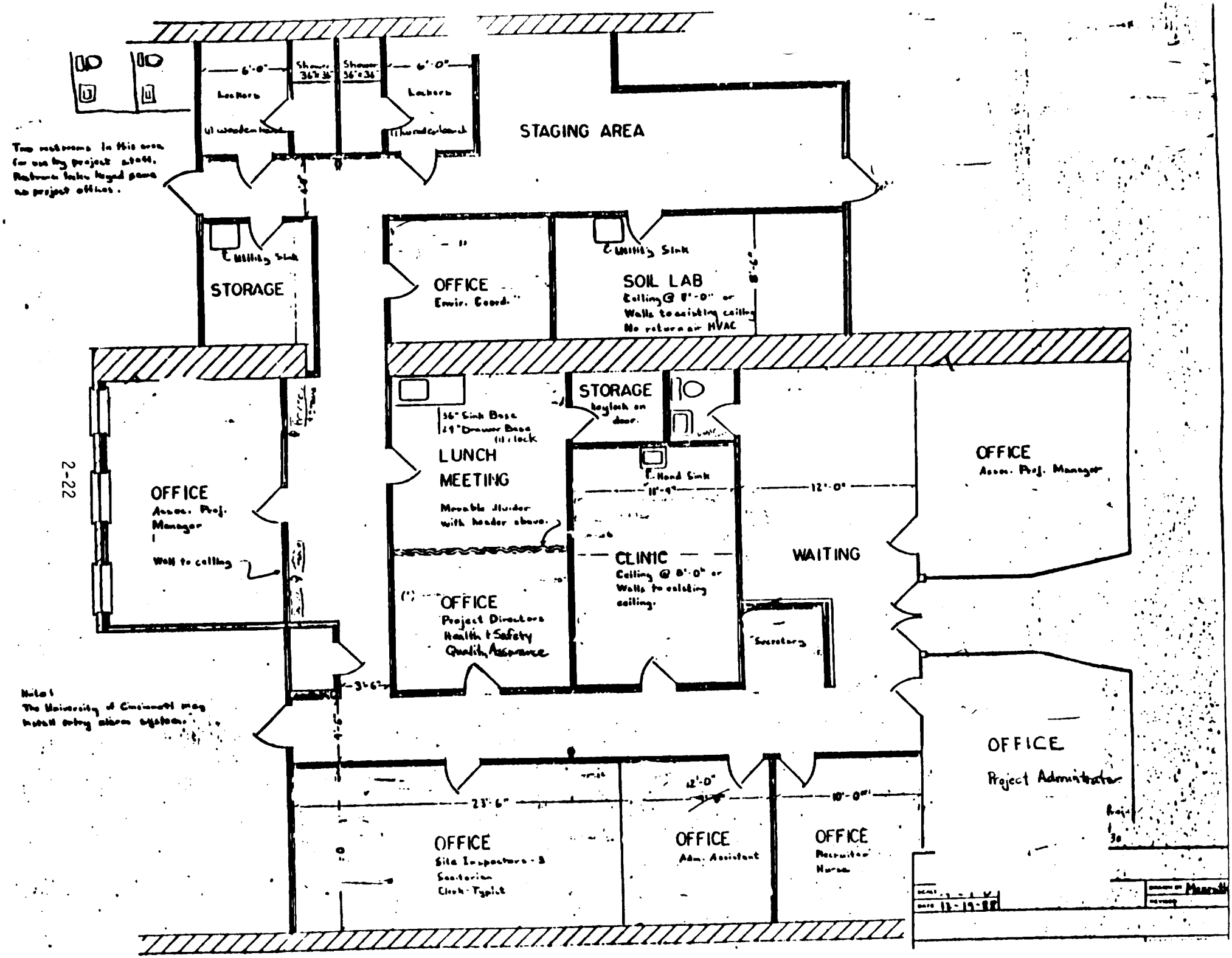
SOIL SAMPLE

PRELIMINARY DECISIONS	-	C. Kuettner
	-	B. Peace
	-	D. Dicks
SOIL SAMPLE COLLECTION	-	D. Dicks
	-	B. Peace
	-	R. Linneman
	-	J. Centers
SOIL SAMPLE CUSTODY	-	D. Dicks
SOIL SAMPLE PREPARATION	-	B. Peace
	-	D. Dicks
SAMPLE ANALYSIS BY XRF:	-	S. Roda (Director) Kevex Laboratory Dept. Envir. Hlth. U.C.
BY AAS:	-	B. Meiners Analytical Section Laboratory Dept. Envir. Hlth. U.C.
SAMPLE STORAGE	-	B. Peace (Digestion Lab Director)
DATA ANALYSIS/DATA CUSTODY	-	Dr. W. Pan (Data Manager)
FINAL EVIDENCE FILE/CUSTODY OF ALL RECORDS	-	Dr. C. Scott Clark (Project Director)

* includes: Sample collection/preparation and XRF for paint

	Total Project		Admin. (Facility)	Project Matters	Blood Lab	XRF Lab (Soil)	Abatement	Environ Monitoring* (Field Lab)	Environ Lab	Data Mgt.	Health + Safety		
Personnel													
Benefits													
Travel													
Equipment													
Supplies													
Contractual													
Construction													
Other Expenses													
Total Direct													
Indirect													
Project Total													

ATTACHMENT C



ATTACHMENT D

ATTACHMENT E

University of Cincinnati

Office of the President

Cincinnati, Ohio 45221-0063

April 6, 1987

ADMINISTRATIVE MEMORANDUM NO. 27 REVISED

TO: All Administrative Unit Heads

FROM: Thurman Owens

RE: University Contract Procedures/Purchases and Competitive Bidding

I. CONTRACTS IN GENERAL

Contracts are any agreement between the University - including all of its campuses, colleges, departments, divisions and other sub-units - and another party, and include, but are not limited to, such documents identified as contracts, agreements, grants or awards that require University approval, memoranda of understanding, letters of agreement, leases, rental agreements, deeds and purchase orders for goods or services to be provided by or for the University. Addenda or amendments to any of the foregoing and change orders are also forms of contracts subject to the requirements of this memorandum and the applicable University Rules.

The authority to enter into any and all contracts to which the University is a party rests with the University's Board of Trustees. Those persons who have been delegated authority by the Board to approve and sign contracts for the University are:

1. Chairman of the Board of Trustees: Contracts and/or modifications to contracts having a value in excess of $500,000, and in some cases $300,000.

2. President: Contracts and/or modifications to contracts having a value over $150,000 but not in excess of $300,000. The $300,000 may be increased to $500,000 with the verbal or written consent of the Chairman of the Finance Committee.

3. Contracting Officer: Contracts having a total value of $150,000 or less.

The Contracting Officer has delegated signature authority (1) to the Director of Purchasing for University Purchase Orders or Change Orders for $150,000 or less, (2) to the Patent Officer for patent-related confidentiality agreements, (3) to the Assistant Vice President for Administrative Services and Director of Facilities Management for Ohio Public Facilities Commission Project Certifications and (4) to the Vice Contracting Officer at the Contracting Officer's direction.

An affirmative action/equal opportunity institution

The Vice President for Administrative Services has authority to execute change orders for construction projects within the limit of funds appropriated by the Board for each project.

At the time of this writing, the persons holding these titles are:

Chairman of the Board of Trustees - Walter E. Bartlett

President - Joseph A. Steger

Vice President for Administrative Services - Howard W. Bell, Jr.

Contracting Officer - Melany Stinson Newby

Director of Purchasing - G. Robert Deubell

Patent Officer - C. Thomas Cross

Assistant Vice President for Administrative Services and
Director of Facilities Management - F. Eugene Moenck

Vice Contracting Officer - Evelyn V. Bush

All contracts must be approved in accordance with University Rule 3361:20-23-01, and must meet the requirements of University Rule 3361:20-23-02 (copies of which are attached) and be signed by one of the above authorized representatives of the Board of Trustees to create a binding University contractual obligation.

All contracts, including those accompanied by a University Purchase Requisition or Purchase Order to facilitate payment, which are being processed for signature by the Chairman of the Board of Trustees, the President or the Contracting Officer must be submitted to the Contracting Officer with a completed Contract Approval Cover Sheet, except Personal Service Contracts (University form A-127), and Sponsor Credit Agreements. No Cover Sheet is required with a University Purchase Requisition being transmitted to the Department of Purchasing for a University Purchase Order for $150,000 or less, with which there are no other contract documents requiring an official University signature.

It is the responsibility of the initiating department to complete the Cover Sheet and to see that all the signatures required on it are secured. It is very important that the Contract Approval Cover Sheet be properly completed. Otherwise execution of the contract itself may be delayed.

Questions about a contract must be raised and resolved prior to the execution process in order for it to proceed smoothly. If any changes are desired in a pre-printed or other contract document, they must be agreed to by both parties to the contract. Agreement should be secured and the changes made before the contract is routed for signature. When such changes are identified during the execution process and are noted under "Exception" on the Contract Approval Cover Sheet, execution will be delayed until the "Exception" is resolved.

Special note should be made of the following items on the Contract Approval Cover Sheet (Form A-910, available at Central Stores):

1. Item 4.C. If any of the preprinted terms of any standard form agreement or any previously typed terms of any other agreement have been altered or interlineations made, the page number(s) where the change(s) appears must be identified by the initiating department on the Cover Sheet.

2. Item 4.D. If the contract is a renewal or modification of an existing contract, the paragraph, title, terms and/or conditions that have been changed, if any, must be identified by the initiating department on the Cover Sheet.

3. Item 4.G. If the contract or modification requires submission to the Board of Trustees for approval prior to its execution, because the amount to be paid by the University thereunder exceeds $500,000, then a Recommendation to the Board of Trustees from the appropriate vice president must accompany the contract.

4. Item 4.H. If the contract has the prior approval of the Board of Trustees, evidence of that approval must be attached to the Cover Sheet. This evidence may be a copy of the appropriate page of the "Summary of Actions Taken" from the Board meeting where the contract was approved, a copy of the applicable Board minutes, or a copy of the original Recommendation to the Board of Trustees. If this evidence is not available in the department, it may be obtained from the Office of the Secretary of the Board of Trustees at 475-3233.

5. Item 4.I. If a contract previously approved by the Board of Trustees requires resubmission to the Board for approval prior to its execution because the amount of this particular modification or renewal also exceeds $500,000, a new Recommendation to the Board of Trustees from the appropriate vice president must accompany the contract.

6. Item 5. In any contract which requires the expenditure of University funds, the source of which is a legislative appropriation, either the term of the contract must end on or before the end of the current biennium, or there must be either a "funding out" clause (permitting the University to terminate the contract without penalty at the end of the current fiscal period in the event funds to support the contract are not appropriated for the next fiscal period) or a termination clause, allowing for termination by the University for any reason upon notice to the other party.

7. Item 6. Usually no more than 2 copies of a contract need to have original signatures. One for the contractor and the other for the University's Contracting Officer. If there are others who need to have a copy of the contract as executed, give them copies of the executed contract. It is the responsibility of the initiating department to provide the copies for execution.

8. Insurance. All contracts which contain a clause requiring the University to carry any type of insurance must be routed to the Director of Risk Management and Insurance for approval and signature on the Contract Approval Cover Sheet.

9. Patent Rights. If a contract contains language releasing all or any part of the University's patent rights, the University Patent Officer must sign the Cover Sheet. [The University, by virtue of Section 3345.14 of the Ohio Revised Code and University rule 3361:10-19-01, has first priority to all rights and title to any inventions, and discoveries made at the University as well as to any patents thereon.]

All contracts must also be accompanied by any other applicable documents, whether noted on the Cover Sheet, in this memorandum or in the contract itself. These might include a formal board recommendation, a UCCC Financing Statement, schedules and/or appendices, an acceptance certificate, a copy of any corresponding University Purchase Order, a request for waiver of competitive bidding and the like.

Should any question(s) arise regarding the drafting, interpretation or effect of any contract provision or the processing of contract documents, assistance is available from Legal Advisory Services. Legal Services can prepare standard forms and redraft and adapt existing forms on request and can negotiate desired contract terms with the other party. Such assistance should be sought prior to routing for execution. The Legal Services' approval on the Cover Sheet is as to the contract's form, not substance. If, however, substantive problems are noted by Legal Services - or others - during the processing for execution, execution will be delayed until the substantive problems are resolved.

The following are some common contract terms and other items which should be noted in particular:

1. Hold Harmless. Any contract which contains a provision under which the University is to agree to "hold harmless" or indemnify the other party must be reviewed by either Legal Advisory Services or Risk Management and Insurance before it is routed for signature. Many standard "hold harmless" clauses cannot be agreed to by the University and require modification prior to their acceptance.

2. Binding Arbitration, Applicable Law, Late Penalties. Provisions regarding binding arbitration, the choice of applicable law and late payment penalties can also present problems. The initiating department should review all documents and identify such clauses prior to processing for execution. Questions can be directed to Legal Advisory Services.

3. Time of Execution. Further, all University contracts should be signed before their term begins, but in any event must be signed before their term ends. The signing of any document, purporting to create a contract, after the term has ended or one of the parties has fully performed its obligations, does not create a valid, binding agreement. Where the term has ended or performance is complete, the University's obligation is a moral, and not legal, one. As a state university, we have no authority to pay a moral obligation without a specific act of the legislature.

4. Personal Liability. Any officer or employee of the University who executes a contract on behalf of the University, without authority under the University Rules or this memorandum and without following the required procedures, may be personally liable on that contract by virtue of Section 3.12 of the Ohio Revised Code.

II. PURCHASES BY THE UNIVERSITY.

A. COMPETITIVE BIDDING.

University Rule 3361:20-23-02 (attached) sets forth the University's competitive bidding guidelines. All purchases of goods or services by or for the University must be made through competitive bidding conducted by the Department of Purchasing and Materiel Management unless the purchase is expressly exempted from bidding or an appropriate bidding waiver is secured.

Purchases under §§4115.31 - 4115.35 which cover certain products and services of the handicapped are exempted by law from our competitive bidding requirements. So also are purchases under §5147.07 which covers articles and supplies manufactured by prison or reformatory inmates. Purchases of professional, non-competitive services for $20,000 or less over a calendar year period are exempted from our bidding guidelines at (C)(1) of Rule 3361:20-23-02.

A waiver or modification of the bidding guidelines may be sought where either timing (i.e., emergency) or unique product requirements (i.e., sole source) justify the waiver or modification. Requests for these waivers or modifications are made to and granted by the Director of Purchasing. The Director of Purchasing may also grant certain waivers or modifications of the bidding procedures established by that department where circumstances justify such waiver or modification.

A waiver of the bidding guidelines may also be sought where the purchase is of professional, non-competitive services in an amount greater than $20,000, with sufficient justification. Requests for a waiver in this case are made to and granted by the Contracting Officer where the services are proposed to be purchased from an individual/sole proprietor, and by the Director of Purchasing where the services are proposed to be purchased from a corporation, partnership or other business entity or organization.

Even where the competitive bidding guidelines do not apply or may be waived, compliance with such guidelines is encouraged.

B. SERVICES

1. IN GENERAL:

a. The University should only be contracting for services to be provided to it when it is not possible to have those services provided by a University employee. Individuals, corporations, partnerships, or other business entities or organizations which agree to provide contract services do so as independent

contractors, not as employees. They, not the University, are responsible for their own liability, taxes, retirement, workers' and unemployment compensation. Because the University does not have to assume these responsibilities, it also does not control or direct the contractor's work beyond having described it in the contract itself. Further, if upon audit, an individual performing services, ostensibly as an independent contractor, is determined to be, in reality, an employee of the University, the University, not the individual/employee, is liable for amounts which should have been withheld as taxes and for retirement.

b. Rule 3361:20-23-02 and this policy apply to all services which the University deems it appropriate to secure through an independent contractor (whether corporation, partnership, or other business entity or organization, or individual/sole proprietor) rather than through a University employee (whether by Personal Service Contract, Purchase Order, or otherwise). They do not apply to the employment or reemployment of regular faculty, librarians, administrators or staff. If a current employee is to perform additional services for the University for which he or she is to be compensated, it is handled through the University's Personnel Department, reflected on the employee's PAF and paid through the normal payroll process. This is because of our withholding and W-2 reporting obligations.

c. Some services being purchased by or for the University from independent contractors are professional and non-competitive in nature. Other such services may be professional yet competitive, and still others may be simply non-professional and competitive. These latter two types of services must be secured through competitive bidding (unless expressly exempted from bidding or an appropriate waiver is secured) or through employees. Some common examples of services which can often be professional yet competitive are those of accounting firms, architects and engineers. Some non-professional, competitive services are equipment maintenance, janitorial and security services, secretarial and typing services, carpentry, and word processing. If a contract for services (such as a Personal Service Contract) is rejected because the services should be secured through the hiring of an employee or through competitive bidding, it will be sent back through those who approved it, with instructions to contact either Personnel or Purchasing. Purchasing maintains an extensive list of service contractors under Term Contracts with the University. A contract for services, including a Personal Service Contract, will not be approved if the University has a Term Contract for that service unless use of the Term Contract is waived by the Director of Purchasing.

d. Those services which are both professional and non-competitive must be purchased following the requirements of University Rule 3361:20-23-02(C). See also PROFESSIONAL, NON-COMPETITIVE SERVICES at 4. hereof. The services of highly specialized consultants, artists and instructors being retained to conduct special seminars or classes are often professional and non-competitive. In many cases, the determining issues are (1) whether the contractor is to exercise his or her own discretion without supervision and control in completing the service contracted for and (2) whether the same service could be provided by another contractor. Questions regarding whether specific services are professional and non-competitive may be directed to Legal Advisory Services or the Director of Purchasing.

e. If a Personal Service Contract or other form of agreement is processed for execution for services which are not both professional and non-competitive, it will be rejected and no payment will be authorized whether the performance of services has already begun or not, unless an express waiver of bidding is issued by the Director of Purchasing and/or Personnel agrees that an employee could not be hired.

f. No contract is created by the execution of a document under which the services are already performed. The University does not have the authority to agree to pay for services performed and completed prior to the initiation of a contract document.

g. Where services are to be purchased, it is important to ascertain whether the contractor (vendor) is an individual/sole proprietor, a partnership, a corporation or other form of business entity or organization. This status affects the choice of contract form, the procedure to be followed and, sometimes, the method of payment.

h. Please keep in mind that irrespective of the status of the contractor as an individual/sole proprietor, partnership, corporation or other business entity or organization, an outside purchase of services is appropriate only where it is necessary to have an independent contractor perform a particular service (personally or through the independent contractor's employees) rather than to hire an employee to perform it. As distinguished from employees, the University assumes neither liability for nor control over an independent contractor's performance beyond that specified in the contract itself. The University also does not withhold amounts from their compensation for taxes, retirement or the like. (See II.B.2.i. for a limited exception)

2. INDIVIDUALS/SOLE PROPRIETORS AND PERSONAL SERVICE CONTRACTS

a. In all cases, the purchase of services from non-employee, individuals/sole proprietors, whether competitively bid or not, is accomplished through the use of the University of Cincinnati Personal Service Contract (Form A-127). This form is not appropriate where the contractor is a partnership, corporation or other business entity or organization. Until it has been executed on behalf of the University by the Contracting Officer or other authorized individual, this form is only a requisition to purchase the services. No performance should begin and no payment should be authorized for services performed before this form is fully executed.

b. Under no conditions may a University of Cincinnati employee agree to perform additional service on a Personal Service Contract.

c. It is very important that the services to be rendered are described as fully as possible. A separate attachment may be used where the space on the form is inadequate. The same is true with respect to the section regarding the financial consideration to be paid. When completing the compensation blanks on the Personal Service Contract, please state a maximum dollar figure in the "amount of _____" and state the hourly rate (if applicable) and the time of payment in the "payable _____." Additional terms and conditions may also be set forth on the form itself if space permits or in a separate attachment incorporated into the A-127.

d. Where the purchase of services has been bid and the award made to an individual/sole proprietor, the Personal Service Contract must state that the purchase was bid and include the appropriate Purchase Requisition number.

e. If the purchase has not been bid and the contractor is an individual/sole-proprietor, then the services to be provided should be both professional and non-competitive. If not, the Personal Service Contract must contain an express bidding waiver from the Director of Purchasing. No such express waiver from the Director of Purchasing is necessary where the services are both professional and non-competitive. See 4. PROFESSIONAL, NON-COMPETITIVE SERVICES.

f. The State of Ohio requires that all State agencies (including State universities) set aside a certain percent of their purchases for state certified Minority Business Enterprises. These purchases are reported to the State on a quarterly basis. A certified Minority Business Enterprise is "an individual, partnership, corporation, or joint venture of any kind that is owned and controlled by United States citizens, residents of Ohio, who are members of one of the following economically disadvantaged groups: Blacks, American Indians, Hispanics, and Orientals," which has been certified as such by the State of Ohio. The Personal Service Contract includes space for vendors to identify if they are a certified Minority Business Enterprise. All contractors must specify if they do or do not meet the definition of a certified Minority Business Enterprise. Personal Service Contracts that do not have this item completed will be returned to the originating department for completion of this item, thereby delaying the approval process.

g. All Personal Service Contracts should be prepared and fully executed prior to the date(s) on which the services are to begin. The usual order for obtaining signatures on Personal Service Contracts is as follows: a. Unit Head, Director or Dean, b. Vendor, c. Vice President, d. Director of Purchasing, and e. Contracting Officer. Until executed by the Contracting Officer, the Personal Service Contract is only a requisition, and it may be rejected if for services which should be competitively bid or for which an employee should be hired.

h. Payment on a Personal Service Contract is made through an A-114, Recommendation for Payment. The A-114 must state the approved Personal Service Contract number when it is submitted for payment, and a copy of the approved Personal Service Contract must be attached. Advance payments may not be authorized. In a situation of special circumstances when a check must be available for immediate payment, the Office of Accounts Payable should be notified at least 72 hours in advance for special handling.

i. To enable the University to properly file required 1099 forms with the IRS, the A-114 must also contain the vendor's social security number and complete home mailing address. Otherwise, the University is required to withhold 20% of the compensation to be paid.

j. Copies of the fully executed Personal Service Contract are distributed as follows: the Contracting Officer copy will be kept by the Contracting Officer; the Vice President's copy will be sent to the appropriate vice president; the Vendor's copy and the Originating Department's copy will be sent to the Originating Department.

k. Personal Service Contracts should also be used for honoraria to avoid a misunderstanding between the person and the University.

l. Personal Service Contract forms (A-127) and Recommendation for Payment forms (A-114) are available in Central Stores.

3. PARTNERSHIPS, CORPORATIONS AND OTHER BUSINESS ENTITIES OR ORGANIZATIONS.

a. When a partnership, corporation or other business entity or organization is being retained to provide professional, non-competitive services to the University, without competitive bidding, a separate contract or agreement may be prepared defining the scope of the services, the compensation and method of payment and the term. The inclusion of other clauses may also be desirable. Legal Services can assist in the drafting of such contracts or agreements. A University Purchase Order may also be used in lieu of a separate contract or agreement. Such use is encouraged, especially since in every case, whether the contract itself is created by University Purchase Order or by separate agreement, a University Purchase Order will be required in order to facilitate payment. Any desired or required additional terms can be set forth on extra pages or attachments to the Purchase Order. In fact, if any of the pre-printed terms on the University's Purchase Order are at variance with some of the terms desired or negotiated as part of the agreement, it is essential that the terms at variance be specifically set forth on a separate page or attachment. Again, payment on this type of contract or agreement in either event is made by University Purchase Order.

b. If a separate contract or agreement is used, it is processed with an appropriately completed Contract Approval Cover Sheet. Also, because the University Purchase Order is used to facilitate payment, an appropriate Purchase Requisition is required to be included. Otherwise, the process will be delayed at the point where a Purchasing Department representative must sign the Contract Approval Cover Sheet, until the Requisition is provided. Purchase Requisitions when used in this instance need only state "To facilitate payments for providing _____ in accordance with the _____ page agreement attached. The term of this agreement is from _____ to _____."

c. When the contract amount is $150,000 or less, because the University Purchase Order is always used as a payment mechanism, the process is likely to be more expeditious if only the Purchase Order is used, with additional terms set forth in it. This is so because the entire process can be handled by the Purchasing Department. When a separate contract or agreement is used, it must be routed with a Contract Approval Cover Sheet and executed by the Contracting Officer.

d. When the contract amount is greater than $150,000, a completed Contract Approval Cover Sheet is required even if there is no separate contract or agreement and only a University Purchase Order is used. This is so because it must be executed by either the President or the Chairman of the Board. The Contract Approval Cover Sheet serves as a "route slip" in these cases.

e. The use of the University Purchase Order as a payment mechanism when services are being purchased by the University from a corporation, partnership or other business entity or organization is, in part, for contract compliance purposes. In order for the University to meet its state and federal contract compliance obligations, certain data and assurances must be obtained from our non-individual contractors. It is the University's Purchase Requisition/Purchase Order, not the Contract Approval Cover Sheet, which initiates the contract compliance process. Purchases of services using the Personal Service Contract are exempt from this process because the contractor is an individual/sole proprietor.

f. When a partnership, corporation or other organization is awarded a contract for services as the result of competitive bidding or where bidding was waived by the Director of Purchasing, an appropriate University Purchase Order is issued, in response to the duly submitted Purchase Requisition (with the request to waive bidding, where applicable).

4. PROFESSIONAL, NON-COMPETITIVE SERVICES

a. When the aggregate amount to be paid to one contractor by the University for services which are both professional and non-competitive will not exceed $20,000 in any calendar year, no bidding or express waiver thereof is required. An appropriate Personal Service Contract, Purchase Order or other form of agreement will be required under the applicable University contract policies and procedures. It will also be necessary for the appropriate department or division head to certify that the aggregate amount to be paid to this contractor in the current calendar year does not exceed $20,000. This information can be secured from Accounts Payable.

b. When the aggregate amount to be paid for professional, non-competitive services will exceed $20,000 in any calendar year, bidding is required unless expressly waived by the Contracting Officer (where the contractor is an individual/sole proprietor) or the Director of Purchasing (where the contractor is a corporation, partnership or other business entity or organization). A written request for such waiver containing an explanation of the reasons for the request must be forwarded to the Contracting Officer or Director of Purchasing prior to processing an appropriate University Personal Service Contract, Purchase Order or other form of agreement under the applicable University contract policies and procedures.

c. Where a Personal Services Contract, Purchase Order or other form of agreement is already entered into with a particular contractor of professional, non-competitive services (either below the $20,000.00 amount or

above it subject to an express waiver) and additional services from that contractor are desired, an extension, amendment or addendum to the original agreement or a Change Order is preferable to a new contract. Legal Services, or Purchasing, as appropriate, is available to assist in accomplishing this.

d. Questions regarding whether certain services are professional and non-competitive may be directed to either Legal Advisory Services or Purchasing.

III. PURCHASES FROM THE UNIVERSITY

Contracts for purchases from the University for services, computer time, space or the like, to be valid must be signed by one of the following:

1. Chairman of the Board of Trustees: Contracts and/or modifications to contracts having a value in excess of $500,000, and in some cases $300,000.

2. President: Contracts and/or modifications to contracts having a value over $150,000 but not in excess of $300,000. The $300,000 may be increased to $500,000 with the verbal or written consent of the Chairman of the Finance Committee.

3. Contracting Officer: Contracts having a total value of $150,000 or less.

All such contracts are routed for execution with an appropriately completed Contract Approval Cover Sheet.

Sometimes such contracts raise the issue of the University's receipt of unrelated business taxable income. If there are questions about this, or assistance in contract drafting is desired, contact Legal Services.

IV. SPONSORED CONTRACTS AND GRANTS

Sponsored contracts and grants which require a University signature are signed by one of the following:

1. Chairman of the Board of Trustees: Contracts and/or modifications to contracts having a value in excess of $500,000, and in some cases $300,000.

2. President: Contracts and/or modifications to contracts having a value over $150,000 but not in excess of $300,000. The $300,000 may be increased to $500,000 with the verbal or written consent of the Chairman of the Finance Committee.

3. Contracting Officer: Contracts having a total value of $150,000 or less.

Prior to being signed, each such agreement must be approved by the Vice President and University Dean and Vice President for Finance or their designees. If the contract or grant involves Medical Center activity, it must also be approved by the Senior Vice President and Provost for Health Affairs. These approvals are secured on an appropriately completed Contract Approval Cover Sheet.

V. CONCLUSION

This memorandum supersedes and rescinds Administrative Memoranda No. 27 revised, dated January 24, 1986 and Administrative Memorandum No. 27-A, dated August 7, 1986. These previous memoranda should be removed from your files and disposed of.

Please distribute this widely in your area in order that all persons who must process contracts or initiate purchases may become familiar with it.

All questions should be directed to Legal Advisory Services (which is also the office of the Contracting Officer) at 475-3483.

Attachments
MSN:hd
CC: President Joseph A. Steger
HD2032B

3361:20-23-01 Contracts: contracts, purchase orders, and modifications thereof.

(A) No contract, agreement, promise, bank account, or other undertaking in the name of the university of Cincinnati or purporting to be made for or on behalf of any college, school, department, division or other part of the university of Cincinnati, shall be made by any of its officers, agents, or employees, or by any student, faculty, or alumni organization, enterprise, or association whatever, unless the same shall have been first authorized by the board of trustees of the university or in pursuance of authority conferred by the university rules.

(B) The board of trustees shall designate the university's contracting and vice contracting officers. The vice contracting officer shall have the power to exercise any and all of the authority of the contracting officer upon the proper delegation of that authority by the contracting officer. The contracting officer may delegate to other officers of the university the authority to carry out specific functions, under the direction of the contracting officer, as may be necessary.

(C) Without board of trustees' approval, the contracting officer shall have the authority to execute non-sponsored contracts, purchase orders, and modifications thereof on behalf of the university which require the expenditure of funds by the university of ~~one-hundred-thousand~~ ONE HUNDRED FIFTY THOUSAND dollars or less and sponsored grants, contracts, and modifications thereof in amounts of ~~one--hundred--thousand~~ ONE HUNDRED FIFTY THOUSAND dollars or less.

(D) Without board of trustees' approval, the president, or his or her designate, shall have the authority to approve and execute non-sponsored contracts, purchase orders and modifications thereof which require the expenditure of funds by the university of amounts greater than ~~one-hundred-thousand~~ ONE HUNDRED FIFTY THOUSAND dollars but not in excess of ~~two--hundred thousand~~ THREE HUNDRED THOUSAND dollars and sponsored grants, contracts and modifications thereof in amounts greater than ~~one-hundred-thousand~~ ONE

HUNDRED FIFTY THOUSAND dollars but not in excess of ~~two---hundred---thousand~~ THREE HUNDRED THOUSAND dollars. THE THREE-HUNDRED-THOUSAND DOLLAR LIMIT MAY BE INCREASED TO FIVE HUNDRED THOUSAND DOLLARS WITH THE VERBAL OR WRITTEN CONSENT OF THE CHAIRMAN OF THE FINANCE COMMITTEE. UNDER NORMAL CONDITIONS WRITTEN APPROVAL IS PREFERRED. The president, or his or her designate, shall report all such contracts, purchase orders, grants or modifications approved and executed to the board finance committee, for its information.

(E) All non-sponsored contracts, purchase orders, and modifications thereof which require the expenditure of funds by the university of amounts greater than ~~two hundred--thousand~~ THREE HUNDRED THOUSAND dollars require prior approval of the board of trustees, after which they shall be executed by the chairman of the board or his or her designate, according to board bylaws, without further approval.

(F) Without prior board of trustees' approval, sponsored grants, contracts, and modifications thereof in amounts greater than ~~two--hundred--thousand~~ THREE HUNDRED THOUSAND dollars may be signed by the board chairman or his or her designate, according to board bylaws. Such grants, contracts and modifications signed without prior BOARD approval by the board chairman or his or her designate, will be ratified by the board at its subsequent meeting.

(G) THIS RULE WILL BE AUTOMATICALLY MODIFIED EVERY THREE YEARS BY RAISING THE SIGNING AUTHORITY LIMITATIONS BY TEN PER CENT.

Effective: February 16, 1987
Amends: Rule 3361:20-23-01 of the Administrative Code.

CERTIFICATION Evelyn V. Lewis
January 29, 1987
Date

Promulgated under: R.C. Section 111.15
Rule amplifies: R.C. 3361.04.
Amended: March 16, 1978*

March 1, 1981
July 1, 1981
January 7, 1983
November 1, 1984
December 18, 1985

*The above is a pre-existing rule at the University of Cincinnati now being filed in accordance with the requirements of Revised Code Section 111.15.

3361:20-23-02 Contracts: purchasing, competitive bidding.

(A) The university will adhere to established guidelines for competitive bidding when purchasing goods or services for the university, except as is otherwise hereinafter permitted. This rule applies to purchases using any and all funds administered by the university of Cincinnati.

(B) The bidding guidelines are as follows:

(1) For purchases of less than two thousand dollars, the buyer will obtain bids by telephone.

(2) For purchases of two thousand dollars or over, the buyer will obtain bids in writing in a number commensurate with the amount of the expenditure and the competition available in the traditional market.

(3) For purchases above ~~one--hundred--thousand~~ ONE HUNDRED FIFTY THOUSAND dollars, approval of the president is required in addition to the requirements of paragraph (B)(2) above in order to make an award.

(4) For purchases above ~~two—hundred—thousand~~ THREE HUNDRED THOUSAND dollars, approval of the board of trustees is required in addition to the requirements of paragraph (B)(2) above to make an award.

(5) For the purchase of printed material, the requirements of section 3345.10 of the Revised Code shall be adhered to in addition to the requirements set forth above.

(6) As required, certain public works projects will be bid through the state department of administrative services under those laws and regulations applicable thereto.

(7) Those bids to be advertised and the details of the bidding process shall be determined by policies established by the department of purchasing and materiel management.

(8) Contracts shall be awarded to the lowest and best bidder, except that the university reserves the

right to accept or reject any or all bids or proposals in whole or in part.

(9) A waiver or modification of the bidding guidelines may be sought because of timing or unique product requirements, or where sufficient economic reasons exist. A written request for a waiver containing an explanation of the reasons for the request must be forwarded to the director of purchasing and materiel management with the requisition. Such waiver shall be effective on approval of the director of purchasing and materiel management for purchases of ~~one-hundred thousand~~ ONE HUNDRED FIFTY THOUSAND dollars or less, by the president for purchases of above ~~one hundred--thousand~~ ONE HUNDRED FIFTY THOUSAND dollars or by the board of trustees for purchases above ~~two-hundred-thousand~~ THREE HUNDRED THOUSAND dollars. THE THREE-HUNDRED-THOUSAND DOLLAR LIMIT MAY BE INCREASED TO FIVE HUNDRED THOUSAND DOLLARS WITH THE VERBAL OR WRITTEN CONSENT OF THE CHAIRMAN OF THE FINANCE COMMITTEE. UNDER NORMAL CONDITIONS WRITTEN APPROVAL IS PREFERRED.

(10) Purchases made pursuant to sections 4115.31 to 4115.35 and 5147.07 of the Revised Code are exempt from these guidelines.

(11) Purchases of professional, non-competitive services for twenty thousand dollars or less as provided for in paragraph (C)(1) below are exempt from these guidelines.

(C) For the purchase of services which are professional and non-competitive in nature, the following shall apply:

(1) When the aggregate amount to be paid for such services will not exceed twenty thousand dollars in any calendar year, no bidding or express waiver thereof is required. An appropriate personal services contract purchase order or other form of agreement will be required under the applicable university contract policies and procedures.

(2) When the aggregate amount to be paid for such services will exceed twenty thousand dollars in any calendar year, bidding is required unless

expressly waived by the contracting officer or director of purchasing and materiel management. A written request for such waiver containing an explanation of the reasons for the request must be forwarded to the contracting officer when the services are proposed to be provided by an individual sole proprietor or by the director of purchasing and materiel management when the services are proposed to be provided by a corporation, partnership or other business entity or organization prior to processing an appropriate university personal services contract purchase order or other form of agreement under the applicable university contract policies and procedures.

(D) Even where the competitive bidding guidelines may be waived or do not apply, compliance with such guidelines is encouraged.

(E) In compliance with section 125.081 of the Revised Code, the university shall set aside a number of purchases each year for bidding by certified minority businesses only. The bidding procedures for such contracts shall be the same as for all other contracts except that:

(1) Only minority business enterprises certified by the state of Ohio equal employment opportunity coordinator shall be qualified to submit bids, and

(2) The cost of products and services may not exceed the estimated market price by more than approximately ten per cent.

If bids are rejected because of this cost consideration, the purchase shall be awarded in accordance with standard bidding procedures.

(F) This rule shall not apply to the employment or reemployment by the university of regular teaching or administrative personnel.

(G) The university will also adhere to all other applicable laws and regulations with respect to purchasing and competitive bidding.

Effective: May 29, 1987
Amends: Rule 3361:20-23-02 of the Administrative Code.

CERTIFICATION Evelyn V. Bush

May 25, 1987
Date

Promulgated under: R.C. Section 111.15
Rule amplifies: R.C. 3361.03;
R.C. 3361.04;
R.C. 3345.10;
R.C. CH. 125;
R.C. CH. 153;
R.C. 123.15.
Amended: November 1, 1984
December 18, 1985

ATTACHMENT F

SOIL ABATEMENT STAFF MEETING AGENDA

Cincinnati Health Dept.	Shirley Wilkerson
Contract	
Personnel	
Data Management	Winkey Pan
Data Entry	
Subject Matters	JoAnn Grote/Sherry Wilkens
Census	
Recruitment	
Environmental	Bill Menrath
Monitoring	
Abatement	
SOIL PROJECT LABS	
Hematology Lab (Kettering)	Sandy Roda
XRF (Soil) (Kettering)	Sandy Roda
Soil Sample Prep Lab (Main St.)	Doug Dicks
Digestion Lab	Belinda Peace
Interior Dust Lab	Belinda Peace
Hand Wipe Lab	Belinda Peace
Health & Safety	Barb Poppe-Smith
EPA Update (FYI)	Scott Clark
IRB (Internal Review Board for Human Research)	Bob Bornschein

SOIL ABATEMENT STAFF MEETING AGENDA (CONT.)

QAPPS	
Blood	Sandy Roda
Soil	Belinda Peace
Dust/Paint/Air	Belinda Peace
Water	Belinda Peace/Sandy Roda
Employee Morale Committee	Chris Kuettner
Administrative	Linda Conway-Mundew
Facility Managment (Policy and Procedure)	
Budget	
Workplan	
NEW BUSINESS	

ATTACHMENT G

ALL REPORTS SHOULD ADDRESS THE FOLLOWING ISSUES:

I. Progress/Status Related to Timeline

II. Problems/Resolutions in areas of:

-Personnel

-Supply/Equipment

-Methods

III. Issues for Follow-up

3.0 Subject Matters

The area of Subject Matters covers those activities necessary for recruiting and maintaining the cohort of children necessary for the conduct of this study. In order to attain this goal we must establish good community rapport, hire and train a staff of assistants, conduct a census, establish a clinic for blood sampling and implement a tracking system that will maintain contact with the subjects over the next three years. The following work plan identifies key personnel, and procedures and time frames for accomplishing this process.

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3.1 STAFFING

Performed by: **Associate Project Manager - JoAnn Grote**
Personnel Search Committee - Robert Bornschein
Scott Clark
Linda Conway-Mundew
William Menrath

Time Period: **1/1/89 - 4/15/89**
(Permanent Staff)

11/1/88 - 6/91
(Temporary Part-time Staff)

3.1.1

Study participants and their families will, for the most part, meet project recruitment staff first. If the families view this encounter with project staff as pleasant, continued cooperation will, in all probability be assured. A negative first encounter with a parent or child will result in a substantial attrition rate. Therefore considerable time and effort will be spent on staff selection. The following is a list of personnel and their functions.

Associate Project Manager for Scheduling and Subject Matters, Ms. JoAnn Grote, assists the Project Manager with supervisory responsibility for the Patient Coordinator (Recruitment and Scheduling), and the clinic staff of phlebotomists and interviewers. She will be responsible for establishing clinic sites in the study neighborhoods and assist in recruitment and scheduling. She will serve on the Scheduling Committee which will have final responsibility for coordinating clinic visits, environmental monitoring visits and abatement visits. She will be responsible for developing and executing procedures designed to maximize subject participation and minimize attrition over the course of the study.

Subject Recruiter/Coordinator (Interviewing has been completed and individual to be hired by 4/24/89) Responsible for recruitment of study participants obtaining signed consent to participate, scheduling of participants for blood drawing, and "re-scheduling" missed clinic and environmental appointments. She will be assisted in the recruitment, scheduling and tracking activities by a City Health Department public health nurse.

Clinic Coordinator (Interviewing has been completed and individual to be hired by 4/24/89) Responsible for obtaining blood samples of participants. She will be one of two clinic phlebotomist (1 temporary). She will make sure all samples are collected, properly labeled and delivered to the Hematology lab each day. During non-clinic sessions, she will score interview forms and be involved in visits to participant's homes.

Public Health Nurse (To Be Named) He/she will assist with community relations and the preparation of reports, participate in the recruitment of individual study subjects, and refer and follow all patients with elevated lead levels until satisfactory treatment has been obtained. He/she also may assist with staffing the lead screening clinic sessions that will be held to collect blood samples from both the study subjects and other residents in the areas.

Phlebotomist - during the blood collection periods this temporary person will collect blood samples and assist the clinic coordinator with participants.

Census Takers (4) - 2 teams of 2 members each in the field

- -Sherry Wilkens
- -Denise Thomas
- -Patricia Grady
- -JoAnn Grote

Teams were responsible for going door-to-door in prospective neighborhood areas and completing the dwelling form (Form 13, See attachment A), preparing completed forms for data entry and error checking data.

Housing Inventory (2) 1 team of 2 each

- -Terry Mitchell
- -Joyce Frondorf

The Housing Inventory team's responsibility is to evaluate the exterior of each building using Form 12. (See attachment B)

Interviewers (2) - using a structured interview form, these part-time employees will conduct interviews, code and prepare forms for data entry during the five blood collection periods.

Fulltime staff will be hired by mid-April, 1989 for the length of the work activity involved in the project.
Temporary part-time staff will be hired prior to each of five blood collection periods.

Final staff training will take place one week prior to the beginning of each blood collection period. Training will cover several issues: project goals, prevention of blood contamination and health & safety requirements for staff and participants. Ample training time must be allowed for proper staff training prior to each blood collection period. Subsequent to initial training, weekly training reinforcement sessions will be held.

In addition to training, in compliance with the project's Health and Safety plan, some staff will be requested to undergo physical exams and blood testing. Physical exams and blood tests will be conducted during the training period and at the end of staff employment periods.

Careful selection and training of clinic staff will also enhance the projects likelihood of success. Carefully selected staff who can alleviate a young child's apprehensions and make the child and caregiver feel comfortable, increase the likelihood of participant cooperation for the length of the project.

3.1.2 <u>The following is an outline of the steps required for Staffing</u>

-Determine need, identify and hire fulltime and temporary staff

-Develop position descriptions

-Train all staff on clinic/recruitment procedures

-Train all staff on Health and Safety matters

-Deliverable - Carefully selected staff increase likelihood of 230 participants for the length of project. A fully-trained recruitment/clinic staff will be in place by May 1, 1989.

3.2 Community Relations Plan
Performed by: Investigators and All Project Staff
Time Period: 11/88 - End of Project

3.2.1 <u>Community Contact</u> Initial efforts to announce the purpose and scope of the project to the over all local community occurred by a joint press conference by the Director of the Cincinnati Health Department (Stanley Broadnax, M.D.) and the Project Co-Investigators. The press release associated with this conference is attached as Attachment I. The conference was well-attended by the three commercial television stations, print and radio media. Examples of print media coverage resulting from the conference, and a recent follow-up article, are presented as Attachment J.

Building rapport with potential study neighborhoods began as our census, housing inventory and soil sampling teams prepared for and entered each of the prospective neighborhood areas. Although the above groups maintained a low profile they were University of Cincinnati, Soil Project representatives. The University has an excellent reputation in the Cincinnati area. The University's excellent reputation coupled with carefully selected project staff, and our initial community contact in each of the prospective neighborhood areas with residents, small business owners, a few community leaders and private property owners, has resulted in good initial relations.

Census takers left carefully-prepared notices if they were unable to make contact. (See attachments C & D) Prior to soil sampling all property managers or owners were contacted and all areas were "leaf-lettered" with a notice of our forthcoming sampling (See attachment E).

An essential component of the community relations plan is our contact with various local government agencies. This has been facilitated through an extensive series of meeting with the Cincinnati Health Department and other agencies. In the early stages of project development these meetings took the form of Project Steering Committee meetings chaired by Addy Kochanowski, Grants and Contract Officer of the Cincinnati Health Department which were attended by representatives of the Public Works Dept. (Sanitation-street cleaning), Parks and City Solictior's Office. Since we initially considered having city agencies

perform the actual abatement activities, they became very familiar with the types of activities that would be undertaken under this project. (Minutes from one of these meetings is included as Attachment K). In the course of developing the contract with the Cincinnati Health Department for their role, appearances were made before two City Council Committees and contact was made with the City Manager's Office. One of the functions of the Administrative Assistant to be hired under the contract with the Health Department will be to maintain continuous contact with local government and public utilities with respect to their activities within the project abatement areas and with respect to how project activities may impinge on thier responsibilities.

Initial meetings with community leaders in prospective neighborhood areas were very productive for the project. Community leader support, coupled with recruitment of neighborhood residents to assist with conducting the census, maximized entry into neighborhood resident's homes resulting in a complete census of the target population.

As we come close to final neighborhood area selection, community relations plans are being established. Each neighborhood area is the same in many respects (e.g., inner city, low SES, single parent, head of household, etc.). However, different lead abatement strategies and their time sequences will be implemented at different times in each neighborhood. Because of these different abatement strategies, recruitment of project participants will be handled area-by-area. An area-by-area approach will be used for community leaders, property owners and potential project participants. Various strategies such as community meetings, mailings and door-to-door contact will be employed.

A listing of neighborhood churches and organizations is being assembled for use in describing the project to the communities. (Attachment H)

Currently, materials needed for recruitment are being prepared. We are developing a list of anticipated questions and appropriate answers for each group, i.e., community groups, property owners and family participants. Also a log book is being designed to record complaints, their nature, person(s) involved, solution or person used as a referral person to initiate steps to deal with said complaint/problem. Quick resolution will be sought.

One of the neighborhoods included in the initial census of children has a local community newsletter which was used to announce the purpose of our survey (Attachment L). Where such newletters exist in the actual abatement areas they will be used to transmit information to the local community.

A strong viable and well developed community action plan in effect throughout the length of the project. Will ensure our project's ability to meet scientific goals.

3.2.2 The following is an outline of the steps required in developing a **Community Relations Plan.**

Steps taken prior to recruitment or community contact

- Identify potential issues of concern in each neighborhood
- Sensitizing project staff to community concerns
- Develop a concise description of the demonstration project and it's goals
- Ascertain the current level of awareness of lead issues in each neighborhood
- Project Plan
    1. Obtain Community/Property Owner/Individual Support
    2. Keep Community/Property Owner/Participant Informed
    3. Document of Community Concerns and Responses
    4. Notify City Departments of Project Timeline
    5. Use Media Releases When Appropriate
    6. Revise Community Plan Based on Continuing Interactions

Census, Housing Inventory and/or Soil Sampling of the following groups:

- Neighborhood area residents
- Neighborhood area business owners
- Community leaders
- Property owners

Recruitment of Subjects

- Develop neighborhood specific approach
- Preparation of materials needed
- Establish community awareness of project goals
- Establish property owner awareness of specific project impact
- Conduct participant meetings, door-to-door contact, and mail contact

Develop and Maintain a Current List of Potential Contacts

Deliverable

A neighborhood specific plan will be in place prior to initiation of recruitment in May, 1989.

3.3 Subject Recruitment

3.3.1 Census

Performed by:	**Census Taker**	**-Sherry Wilkens**
	Census Taker	**-Denise Thomas**
	Census Taker	**-Patricia Grady**
	Assoc. Proj. Mgr.	**- JoAnn Grote**

Time Period **11/1/88 - 4/15/89**

Census information is necessary to identify neighborhood areas that will meet project criteria for inclusion (Attachment G) in the Soil Project. Information gathered will also contribute to the Environmental Monitoring and Abatement sections of the project allowing each section to estimate staff time and costs that will be incurred throughout the project. Procedures were established for obtaining census data in an orderly and reportable fashion. Development and piloting a data collection form (Form 13) (Attachment A) was initiated. Temporary staff to conduct the census was identified, hired and trained. Training included techniques in obtaining needed information, personal field safety and record keeping.

A door-to-door census was undertaken in prospective neighborhood areas (6) to ensure the number of children < 5 years of age were in fact available for recruitment as project participants. Two teams of two people each were used to conduct the census. Data collection was prepared for database entry making sure of complete and accurate information. On-going meetings were held with the Data Manager to allow for proper data collection and data linkage ability with other project sections.

At the conclusion of the census approximately 230 children will have been identified, census data will be entered in the database and neighborhood areas for project inclusion will be identified. The census will be conducted once during the project.

3.3.2 Housing Inventory

Performed by: **Housing Evaluators - Terry Mitchell**
Joyce Frondorf

Time Period: **1/15/89 - 3/15/89**
10/1/90 - 11/1/90

Based on previous research, identification and recording of housing stock will be a crucial factor in determining the magnitude of change in children's blood lead as a result of dust and soil abatement. Type of housing, age of housing and condition of housing for prospective neighborhood areas was carried out using methods that have proven effective in the Cincinnati Lead Program Project (LPP).

With slight modification of an existing Cincinnati Lead Program Project form for this project, the Property Form (Form 12) (Attachment B) was used to evaluate housing stock. This form summarizes information on housing description, number of buildings and the total number of apartment units within each building.

Each building was evaluated by one team of experienced evaluators to ensure reliability and consistency between building classification within a prospective area, as well as across prospective neighborhoods. Data was carefully collected and coded. Procedures developed with the Data Manager will allow us to collect and link information with other project data.
At the completion of the Housing Inventory, approximately 770 properties will have been catalogued. Information gathered will become part of the Project database by 4/15/89.

The Housing Inventory will be repeated again in the fall of 1990 to confirm our initial findings and to note any changes such as building rehabilitation or demolition.

3.3.3 Community and Family Participation

Performed by: **Project Investigators**
Managers
Recruiter

Time Period: **2/1/89 - 5/1/89**

As indicated in section 3.2: Community Relations Plan, participation of individuals in this study is linked to community acceptance of project objectives. Thus, overall project goals must be found acceptable by neighborhood community groups, public and private property owners and individual neighborhood families with young children. As soon as the census is completed and neighborhood areas are designated, individual neighborhood area meetings with community leaders and property owners will be scheduled at our Main St. project office. Soil Abatement Project goals will be discussed and active participation by community leaders and property owners will be solicited. Separate neighborhood area meetings will be held to allow in depth explanation of the proposed scientific approach for that particular area. Also, possible benefits resulting from participation in the project will be discussed. In order to conduct human research, the University of Cincinnati's Internal Review Board (IRB) reviews the proposed project and grants permission for the conduct of human research. Approval will be otained prior to obtaining blood samples (i.e., by May 1, 1989).

Several recruitment strategies will be employed for family project participation. Letters will be sent mid-April to announce neighborhood area selection. Neighborhood area meetings will be held to explain project goals and to encourage participation for the length of the project. In addition to mailings and meetings, personal contact by phone or in person will be carried out by the recruitment team.

At the conclusion of the project's recruitment phase, general acceptance and participation by community groups, property owners and individual family participants will be obtained. Approximately 230 children less than five years of age will be recruited. Generally, recruitment of project participants will occur once during the project. A second smaller recruitment phase is planned for neighborhood areas scheduled for Year Two soil and dust abatement in order to ensure maximum possible sample size.

3.3.4 The following is an outline of steps required for **Subject Recruitment**

Census

- -Establish procedures for obtaining census data
- -Develop and pilot Form 13 used for census data collection
- -Conduct door-to-door census in prospective neighborhood areas
- -Enter census data into database
- -Deliverable - Known number of children less than 60 months of age in prospective neighborhood areas (approximately 260 children) by 4/15/89

Housing Inventory

- -Develop procedure to be used for obtaining housing information
- -Develop and pilot Form 12 used for housing inventory data collection
- -Conduct complete housing inventory in each proposed neighborhood
- -Enter housing inventory into database
- -Deliverable - Inventory of approximately 770 properties in prospective neighborhood areas by 3/15/89.

Recruitment of Project Participants

- -Notify and meet with community leaders
- -Notify and meet with property owners
- -Obtain Internal Review Board (IRB) permission to conduct human research
- -Correspondence to potential participants
- -Group and personal contact of potential participants
- -Deliverable - Cooperation of community leaders, property owners and > 230 children less than 60 months of age to actively participate in the project by 5/1/89.

3.4 Transportation Reimbursement for Participants

Performed by: **Recruiter - To be Named by 4/24/89**

Time Period:

Phase 1	**5/89**	**-**	**6/89**
2	**10/89**	**-**	**11/89**
3	**4/90**	**-**	**6/90**
4	**10/90**	**-**	**11/90**
5	**4/91**	**-**	**6/91**

3.4.1 The Process

Project participants in the prospective neighborhood areas, for the most part, are not automobile owners. Thus, to ensure adherence to project goals it is necessary to provide transportation expenses incurred during the blood collection periods (5). Transportation reimbursements for "clinic" visits will increase the probability of continued participation for the length of the project.

University procedures for establishing transportation reimbursment to research participants have been implemented. Pre-numbered receipts will be used and parents will be required to sign a receipt for each blood collection period during the project. The recruiter will be responsible for dispensing the money and obtaining the signed receipt.

Providing transportation reimbursement will enhance cooperation of project participation by not placing a monetary burden on the family and thus helping to maintain a lower attrition rate. Transportation reimbursement will occur during each of the five scheduled blood collection periods.

3.4.2 <u>The following is an outline of steps required for Transportation Reimbursements</u>

-Establishment of reimbursement fund

-Accountability

-Deliverable - Setting up of "bank" and accounting procedures by by 5/1/89.

3.5 Clinic Set-Up

Performed by:	**Associate Project Manager**	**JoAnn Grote**
	Associate Project Manager	**William Menrath**
	Project Administrator	**Linda Conway-Mundew**

Time Period: **11/1/88 - 4/15/89**

3.5.1 Clinic Site and Functions

Field office space was carefully selected to include space for a clinic. Choosing space in close proximity to several neighborhood areas will minimize subject attrition rates and be more cost effective for staff and rental space. Identification of a second clinic site will not be determined until final neighborhood areas are selected to allow for maximum convenience. Each clinic site will have a waiting area, an interview area and a blood collection area. The waiting area furnishings were selected keeping young children in mind. A toy box with age-appropriate toys will be available for the children. Magazines and educational material for the parents will also be available. The television/monitor will be available in the waiting room if it is not being used for staff training elsewhere. Interviews will be conducted in an area adjacent to the waiting area to protect confidentiality of participants. The Blood Collection area will be equipped with exam tables to allow for the greatest degree of safety to the child and the project staff. A refrigerator for blood storage is in the Blood Collection area to maintain the quality of blood samples collected. A sink for frequent hand washing is also in the area to decrease possible sample contamination.

By providing a pleasant clinic site convenient to neighborhood area participants, active participation will be maximized throughout the project. Equipment and furnishings will be in place prior to the first of five blood collection periods.

3.5.2 The following is an outline of the steps required for Clinic Set-up

-Determine space needs for Clinic Sites
-Identify Clinic Site # 1
-Identify Clinic Site # 2
-Procure Equipment/Furnishings
-Deliverable - Provision for convenient, pleasant blood collection facilities to maximize continued project participation by 5/1/89.

3.6 Blood Collection

Performed by:	**Associate Project Manager**	**JoAnn Grote**
	Recruiter	**To be Named (TBN)**
	Clinic Coordinator	**To be Named (TBN)**
	City Nurse	**To be Named (TBN)**
	3 Temporary Staff	**To be Named (TBN)**
		Expected Start Date for TBN- 4/24/89

Time Period:	**Phase 1**	**5/89**	**- 6/89**
	2	**10/89**	**- 11/89**
	3	**4/90**	**- 6/90**
	4	**10/90**	**- 11/90**
	5	**4/91**	**- 6/91**

3.6.1 Supplies

Considerable time was spent to determine type, current cost and number of supplies needed for the entire length of the project. Blood Collection supplies will be ordered in 1989 in compliance with the Center for Disease Control (CDC) recommendations. Supplies will be on-hand by mid-April.
A few supplies will be ordered in early 1990 i.e., those bearing expiration dates. Several types of data collection forms are currently under development. Some forms will be for internal use only. Examples of these are: sign-in sheet and a check-list. The "Interview at Clinic" form containing SES, housing and secondary residence information is a database entry form. This form (Form 14) (Attachment F) is currently in revision and will be field tested prior to 5/1/89. The Informed Consent form required by the University's Interal Review Board (IRB) is written and IRB approval is pending.

3.6.2 Personnel

The fulltime and partime personnel required for the Blood Collection periods must possess special skills and will still be required to undergo a rigorous training period tailored to meet our specific project goals. (See Staffing section 3.1 for individual descriptions.)

3.6.3 Collection of Samples

The project is committed to a strong Health and Safety Plan. Following OSHA recommendations, standard safety practices and equipment will be employed: e.g. brisk hand washing using antiseptic soap; disposable gloves; protective lab jackets; proper disposal containers for potentially infectious waste; etc. In addition, physical exams and immunizations will be required/offered to appropriate staff as determined by our project Health and Safety Officer.
The collection of blood samples during the five blood collection periods will be carried out by skilled, experienced pediatric phlebotomists to insure the best possible opportunity to obtain every needed sample. Both the success of obtaining the sample and the quality of the sample collected are critical.

By careful planning and implementation of procedures during blood collection periods we will obtain all necessary signed informed consent forms during the first collection period and quality blood samples and questionnaire information during all five blood collection periods.

3.6.4 The following is an outline of the steps required for Blood Collection

-Determine needs and order clinic supplies
-Development of Data Forms
-Hire Personnel
    -fulltime and part-time temporary
-Health & Safety Plan - Train Staff
-Blood Collection
-Deliverable - Collection of quality blood samples throughout the five blood collection periods beginning 5/1/89 and ending 6/91.

3.7 Blood Analysis

The work plan for blood analysis is presented in Section 5.1

3.8 Referrals for Health-Related Matters

Performed by: City Health Nurse (To Be Named)

Time Period: 5/1/89 - 6/91

3.8.1 City Health Nurse

One of the responsibilities of the City Health Nurse will be to respond to project participants health-related questions, specifically lead levels in children. As blood lead results become available during each blood collection period, the health nurse will report the PbB to the participants physician or clinic of their choice. If a particular participant's blood lead is elevated (using CDC's guidelines as established in "Preventing Lead Poisoning in Children" 1985) a referral to the Cincinnati Children's Hospital Lead Clinic will be made and a report will be sent to the Cincinnati Health Department. Additionally, the health nurse will keep in contact with the Lead Clinic making sure that appointment is kept.

As the need arises the health nurse will maintain contact with other local health agencies. The Women-Infant Care (WIC) Nutrition Program is of particular interest to our project in terms of nutritional status of project participants. A very high percentage of study participants are expected to participate in WIC. The health nurse will also have available lists of health agency phone numbers and health education pamphlets for project families.

Reporting of elevated lead levels will be part of our quarterly report throughout the length of the project.

3.8.2 The following is an outline of the steps required for **Referrals for Health-Related Matters.**

A. Cincinnati Health Department Nurse

B. Reporting Blood Lead Results

C. Elevated Blood Lead

D. Other Health Agencies

E. Deliverable - beginning 5/1/89 and through each of five collection phases elevated blood lead results will be referred to lead clinic and reported to appropriate individuals.

3.9 Maintaining Subject Contact and Study Participation

Performed by:	**Associate Project Manager**	**JoAnn Grote**
	Recruiter	**To Be Named (TBN)**
	City Health Nurse	**To Be Named (TBN)**
	Clinic Coordinator	**To Be Named (TBN)**
	Temporary Clinic Staff	**To Be Named (TBN)**
		Expected Start Date for TBN - 4/24/89
Time Period:	**5/1/89 - 6/91**	

3.9.1 Methods

Maintaining active participation and cooperation is crucial to the success of the Soil Abatement Project. Attrition rates will be held to an absolute minimum in several ways. First, careful selection of project staff is an essential part of continued subject participation. Once all staff has been hired and the recruitment phase is completed, several types of subject contact methods will be used. Correspondence with participants by means of periodic project newsletters (recruiter), appointments for Interior Monitoring and/or abatement (city R.N.) and birthday cards (temporary staff), will be important means of maintaining subject contact. Phone calls will be made to remind subjects of upcoming appointments (it is expected that approximately 50% of our subjects will have phones). Home visits by 2 person teams (all staff) will be made for subjects who have missed appointments.

Another means for maintaining subject contact is establishing close contact with local health agencies (city R.N.) for referrals, for subject participation and/or a general exchange of information.

The availability of a computerized subject data base will greatly add in the day-to-day subject contact process allowing for immediate, correct and current subject information. Daily updating of the subject file is the responsibility of the recruiter. This equipment will provide over-all efficient use of staff time.

Utilization of various types of subject contact will enhance continuing cooperation of the project participants throughout the length of the project. Maintaining a low attrition rate will allow us to meet the scientific goals of the project.

3.9.2 <u>The following is an outline of the steps required for Maintaining Subject Contact and Study Participation</u>

-Hire and train staff

-Develop several types of subject contact procedures

  -Correspondence

  -Phones

  -Team home visits

-Network with Health Agencies

-Establish Computer Database

-Deliverable - Beginning 5/1/89 and continuing throughout the project, timely contact with project participants will maintain a low attrition rate.

SUBJECT MATTERS

3.10 ATTACHMENTS

A. Form 13 - Initial Census
B. Form 14 - Housing Evaluation
C. Census Notification
D. Census Notification
E. Soil Sampling Notification
F. Clinic Interview
G. Criteria for selection of study areas
H. Neighborhood Contacts
I. Press Release
J. Media Coverage
K. Minutes - Cincinnati Health Department
L. Community News Letter

ATTACHMENT
A

FORM 13

INITIAL CENSUS - DWELLING UNIT INFORMATION

1. City ☐
2. Form Number ☐
3. Date of Data Collection / /
4. Phase (Sequence Number) ☐
5. Record Status ☐
6. Property I.D. Number BOOK ☐ PAGE ☐ PARCEL ☐
7. Dwelling I. D. Number ☐

   Neighborhood I. D. Number ☐

Note: If question is <u>not applicable</u> 'use "N"'

7a Address: Street # ☐ Street Name ☐ Apt. ☐

8. Location of Family within Building (Story) (if more than one floor is occupied by family, code area used as living space) ☐
   (Note. Ground Floor = 1st Floor), Location ☐; 1=R, 2=L; 3=F, 4=Rear
   5=Center (When facing outside front of building)

8a Family Names First Name: ☐

Last Name ☐

9. # of Children > 60 Months (5 yrs - 17 yrs) ☐
10. # of Children 4 yrs of less (≤ 60 months) ☐

Birth Date

/ /
/ /
/ /
/ /

11. # of Adults (≥ 18 yrs of age): ☐
12. How long have you lived here?
    Length of time in This Apartment (mo) ☐
13. Prior Housing History: 1=No Other Resident, 2=Yes Other Resident ☐
14. Do you like living here or do you plan to move within the Next 6 mo? 1=Yes; 2=No; 3=Unknown ☐
15. Is there a basement in building?
    1=Paved, 2=Unpaved; 3=None, 4=Unknown ☐
16. Do you have basement access? 1=Yes; 2=No; 3=Unknown;
    4=Children Spend Time in Basement ☐
17. Is there a laundry facility in bldg? 1=No. 2=Yes; 3=Unknown ☐

PART 18

17a If yes: 1=Inside Entrance; 2=Outside Entrance, N=Not Applicable ☐

18 How is your home heated? Type of central heating:
1=Steam/Hot Water, 2=Forced Air; 3=Other, 4=Electric; 5=Gravity;
6=None; 7=Type Unknown ☐

19. Type of Room Heating Units. 1=None; 2=Gas, 3=Oil; 4=Coal;
5=Fireplace, 6=Wood Stove, 7=Other (Specify); e.g. kitchen stove;
8=Unknown; 9=Electric ☐

19a Number of Room Heating Units Per Dwelling? ☐

20 Do you have an air conditioner. 1=Central,2=Room,3=None,4=Unk'n ☐

21. We are interested in the type of floors kids play on. I'd like to walk through your home and make a note of the kinds of flooring you have.

Type of Flooring:	vinyl	wood	carpet (w. to w.)	arearug (≥6'x8')	throw rug (<6'x8')
(put # of ea. type of floor covering per residence in the appropriate box. Use 0=None, X=Unknown)	☐	☐	☐	☐	☐

22. Furniture (only fabric upholsterd pieces in residence) observation (Use 0=None or X=Unknown)
# of chairs: fully fabric upholstered ☐ partially ☐ unknown ☐
# of couches: fully fabric upholstered ☐ partially ☐ unknown ☐

23. Type of beds (observation):

	# of bedroom	Total # of beds	Total # of Mattresses on fl	Total # Without Bedding
(put # of ea. type in the appropriate box. Use 0=None, X=Unknown)	☐	☐	☐	☐

24. Dogs: 1=No; 2=Yes; 3=Unknown ☐
"(Do you have any pets?")

25. Phone Number:
Contact Number:
Contact person's name

26 Comments: ☐

INTERVIEWER ☐

FORM 12

INITIAL CENSUS - PROPERTY INFORMATION

1. CITY CODE: ☐
2. FORM NUMBER: ☐
3. DATE OF DATA COLLECTION: / /
4. PHASE (OR SEQUENCE NUMBER): ☐
5. RECORD STATUS: ☐
6. PROPERTY ID NUMBER: BOOK: ☐ PAGE: ☐ PARCEL: ☐
   DWELLING ID NUMBER ☐
7. NEIGHBORHOOD ID NUMBER: ☐

NOTE: IF QUESTION IS ***NOT APPLICABLE*** USE "N"

8. ADDRESS STREET NO. ☐ STREET NAME: ☐

9. TYPE OF CONSTRUCTION BRICK=1; ☐
   FRAME=2, SIDING=3; OTHER(SPECIFY
   E.G BRICK & FRAME)=4, NO BUILDING = 5

10. NUMBER OF USEABLE STORIES: 1 STORY=1; 2 STORIES=2; 3 STORIES=3;
    4 STORIES=4; 5 STORIES=5, 6 STORIES=6; 7 STORIES >= 7 ☐

11. COMMERCIAL/INDUSTRIAL SPACE IN BLDG; 1=NO; 2=YES; 3=UNKNOWN ☐

12. TYPE OF HOUSING REHAB=1; PUBLIC=2; OTHER=3 ☐

13. APPROX AGE OF HOUSING: 19TH CENTURY=1; 20TH CENTURY PRE WWII=2;
    20 TH CENTURY POST WWII=3 ☐

14. EXTERIOR CONDITION SATISFACTORY=3, DETERIORATING=4;
    DILAPIDATED=5, (FROM CURBSIDE) ☐

15. EXTERIOR PAINT (TRIM). TIGHHT=1; LOOSE=2, NONE=3 ☐

16. EXTERIOR PAINT (SIDING) TIGHT=1; LOOSE=2, NONE=3 ☐

17. APPROX. DISTANCE OF BUILDING FRONT FROM STREET CURB:
    < 5 METERS=1; 5-10 METERS=2; > 10 METERS=3 ☐

19. TOTAL NUMBER OF UNITS IN BUILDING ☐, • OCCUPIED ☐;
    • VACANT ☐

20 COMMENTS 1=YES; 2=NO ☐

TYPE YOUR MEMO INTO THE FOLLOWING
MEMO FIELD IF YOU HAVE IT:

INTERVIEWER (THREE INTIALS) ☐

UNIVERSITY OF CINCINNATI

WHILE YOU WERE OUT!

WE HAVE BEEN TAKING A CENSUS TODAY FOR A POSSIBLE STUDY THAT COULD IMPROVE YOUR ENVIRONMENT. WE WERE UNABLE TO TALK WITH YOU. WE WOULD LIKE YOU AND YOUR CHILDREN TO BE PART OF OUR CENSUS.

PLEASE CALL JOANN AT 558-4929

ATTACHMENT C

UNIVERSITY OF CINCINNATI

1/13/89

TO: GLENCOE/LEROY CT. AREA RESIDENTS

A research group at the University of Cincinnati is currently looking for small areas of the city for possible inclusion in a study involving young children.

Beginning in mid-January, several people from UC will be knocking on your door taking a mini census. We will also be in your neighborhood collecting small soil samples. If your neighborhood is selected certain environmental benefits may result.

Your help would be appreciated.

If you have any questions, call JoAnn at 558-4929.

ATTACHMENT D

UNIVERSITY OF CINCINNATI

WHILE YOU WERE OUT!

We will be SAMPLING SOIL in your neighborhood beginning _____ for a possible study that could improve your environment. We have contacted the building management & have their o.k. There will be 4-6 people from U.C. getting samples.

If you have any questions, please call the Soil Project at 558-4929.

Date: _____

ATTACHMENT E

ATTACHMENT F

INTERVIEW AT CLINIC

(IN REVISION)

CRITERIA FOR SELECTION OF STUDY AREAS

1. High level of childhood lead poisoning cases.

2. High level of contamination of soil with lead.

3. High number and density of housing that has been rehabilitated, with interior and exterior surfaces having been treated to minimize lead paint contamination problems.

4. High number and density of children less than three years old.

5. Presence of significant amounts of exposed soil in the area.

6. To facilitate communication with the communities, it is desirable that the areas be concentrated within a limited number of neighborhoods.

7. To minimize the costs of the project, there should be few significant barriers (such as hillsides) to the soil removal and re-landscaping of the property.

8. To minimize the costs of the study, the geographic areas should be limited to a size that will produce the required number of study subjects.

9. To minimize the costs of the study, preference should be given to areas that minimize the number of property owners.

ATTACHMENT G

ATTACHMENT H

Potential Contacts in Potential Neighborhood Area Communities

A. General Contact for Pendleton, Findlay and Mohawk areas
- Over-the-Rhine Community Council
- Over-the-Rhine Development Corp.
- Neighborhood Leaders

B. Pendleton:
- Pendleton Area Block Club
- Civic Garden Center
- School for Creative and Performing Arts
- Pottery group
- "Bell Factory" group
- Major landlords
- Churches
- Peaslee Neighborhood Center

C. Findlay Market:
- Churches
- Findlay Market Merchants Association .
- Christ Child Day Care Center

D. Mohawk:
- Community Council
- Churches

E. Back Street:
- Wesley Chapel (church plus housing owner)
- Urban garden group
- Laundry factory

F. Glencoe:
- Glencoe Area Block Club
- Major landlords (MAGHF for Glencoe-Auburn, Inc. and Hillmont Inc.,)
- Christ Hospital-property owner to South and East
- Mt. Auburn Comm. Council

G. Lower Price Hill:
- Lower Price Hill Community Council
- Neighborhood Development Corporation
- Santa Maria Community Center
- Churches: St Michael
- Price Hill Health Clinic

ATTACHMENT I

University of Cincinnati
Medical Center

PUBLIC AFFAIRS

Mail Location 550
Cincinnati, Ohio 45267-0550
Phone (513) 872-4553

UC NEWS

For Immediate Release

CONTACT: Sheryl Hilton

January 22, 1988

LEAD STUDY

UC Medical Center's Department of Environmental Health and the Cincinnati Health Department have been informed that they will receive a $3.4 million grant from the EPA to study the effects of lead-contaminated soil on children.

The study will examine how a cleanup of lead-contaminated soil and dust in the environment will affect lead exposure in children.

Playgrounds where buildings containing high-lead paints once stood and other areas with contaminated soil and dust can pose a serious health threat to children, according to the principal investigators for the study, Scott Clark, PhD, and Bob Bornschein, PhD, both researchers in the UC Department of Environmental Health. Studies have shown that moderate lead poisoning in children causes anemia, impaired development, and learning disorders.

Dr. Bornschein says Cincinnati was chosen as one of only three centers nationwide to carry out the pilot project because of the Department of Environmental Health's "reputation for leading the country in research into the effects of lead on child development." The Department of Environmental Health has a long history of lead research starting with the pioneering work of its founder Dr. Robert Kehoe, dating back to the early 1920s. Today's research is showing that even very low levels of lead in the environment can pose a threat to the fetus and newborn.

-more-

Another reason Cincinnati is an excellent site for the project, according to Dr. Clark, is its large amount of rehabilitated lower-income housing. "Cincinnati is unique in that it has a large number of housing units that were completely rehabilitated during the late 1960s and early 1970s, and are virtually lead-free," says Clark. "That's important to the study, because we must be able to rule out contamination from factors other than soil and dust."

Drs. Clark and Bornschein say the study will begin by selecting 300 children from various neighborhoods in Cincinnati that meet the housing criteria. Cincinnati Health Department will assist in testing the children for extent of lead exposure prior to the study, and at regular intervals throughout. The areas surrounding their homes will be tested for lead contamination, then the lead-contaminated soil will be removed and replaced with lead-free soil with the assistance of the Parks Department. In addition, lead-contamination dust from paved areas near the houses and from inside the houses will be removed. Critical to the study will be the environmental cleanup and monitoring of the area for a period of years to see whether, and how, recontamination occurs.

"The follow-up designed into the study is critical to its success," explains Dr. Clark. "We want to make sure, to the greatest extent possible, that we can permanently reduce this environmental health hazard for the city's children."

Memo to the desk: Drs. Bornschein and Clark will be available to talk to the media about the $3 million lead study at a press conference in room 301 Wherry Hall, 9:30 a.m., Friday morning—January 22, 1988.

Lead study targets effects of cleanup

Cint. Post Jan 23, 1988

By Lisa Cardillo Rose p2-B
Post staff reporter

The University of Cincinnati Medical Center and the Cincinnati Health Department will receive a $3.4 million grant to study the effects of lead-contaminated soil on children.

The study, which is being funded by the Environmental Protection Agency, will examine how a cleanup of lead-contaminated soil and dust in the environment will affect lead exposure in children.

Studies have shown that moderate lead poisoning in children causes anemia, impaired development and learning disorders. Playgrounds where buildings containing high-lead paints once stood can pose a health threat to children, according to researchers in UC's Department of Environmental Health, which will conduct the study.

Bob Bornschein, a researcher in the environmental health department, said Cincinnati was chosen as one of only three centers nationwide to carry out the pilot project because of the department's reputation for research into the effects of lead on children. The department's lead research dates back to the early 1920s, and recent studies show even very low levels of lead in the environment can threaten the fetus and newborns.

Scott Clark, a department researcher, said Cincinnati also has a high level of rehabilitated low-income housing that will be helpful in conducting the study.

The research will begin with selection of 300 children from various neighborhoods in Cincinnati that meet the housing criteria. The Cincinnati Health Department will assist in testing the children for the extent of lead exposure before the study and at regular intervals throughout the study.

The areas around the children's homes will be tested for lead contamination, and contaminated soil will be removed and replaced with lead-free soil. Lead-contamination dust from paved areas near the houses and from inside the houses will be removed.

The neighborhoods will be monitored to find out whether lead contamination occurs again.

ATTACHMENT J

THE CINCINNATI ENQUIRER SUNDAY, APRIL 9, 1989 SECTION B

METRO

UC research grant aimed at lead poisoning in city

In search of

Researchers are searching for neighborhoods with:

- High concentration of housing rehabilitated under various federal programs in the 1960s and 1970s, when lead-based paint would have been covered up or replaced.
- Lots of children, particularly those younger than 5.
- Places where those children have access to dirt, either in a yard, playground or just a vacant lot.

BY ELIZABETH NEUS
The Cincinnati Enquirer

University of Cincinnati researchers hope to get the lead out of some city neighborhoods as part of a two-year, $3.4 million lead poisoning prevention program beginning later this spring.

Those participating in the program will have lead-laced soil removed from their property and their homes cleaned to remove lingering traces of lead dust.

Researchers will also screen at least 200 children mostly under age 5 from those neighborhoods to determine the level of lead in their blood, and will check the children's health through at least 1991.

"We're looking to see if we can decrease their blood levels with environmental improvement," said Dr. Scott Clark, professor of environmental health at the UC College of Medicine. "Dirt and dust appear to be the main source (of lead poisoning)."

Older housing that is still covered with lead-based paint won't be part of the program. "We'd have to entirely rehab the house (to get rid of the lead), and we don't have the funds for that," Clark said.

But neighborhoods that no longer have much lead paint can still be dangerous. The paint may have flaked into dust and worked itself into the soil around the house or the regular house dust inside.

If a child puts a dirty hand into his mouth, he has exposed himself to lead, Clark said. Most lead exposure, intentional or not, comes from ingestion, he said.

"If a kid ate a paint chip a day, he or she would be seriously ill," he said. "Being exposed to lead dust is still awfully dangerous, but at a different level."

In addition to testing the children's blood levels, researchers will also check the child's hand lead levels by wiping the

(Please see LEAD, Page B-12)

Lead

CONTINUED FROM PAGE B-1

child's hands with a wet towel, and checking the towel for lead.

To clean up the neighborhoods, they'll remove contaminated soil to a depth of six inches, and replace it with clean dirt. Houses will be thoroughly cleaned, and some stuffed furniture and rugs may be replaced if they're too thick with lead to clean.

Only two other cities received similar grants from the U.S. Environmental Protection Agency -- the programs in Baltimore and Boston are scheduled to start later this year.

3-40

ATTACHMENT J

ATTACHMENT K

LEAD MEETING
4/26/88

Present: John Adams, CHD
Walter Amrein, San.
Bob Bornschein, UC
Scott Clark, UC
Kim Hitchcock, CHD
Ken Rentschler, Parks
John Ryan, CHD
Diane Smith, CHD

Ken Rentschler informed the group at this meeting that he was contacted earlier today by Jerry Luttenegger of the Law Department, and was told that the Park Board may not be involved in any way in the abatement of private property. The Park Board could take care of pieces that are "park land," but nothing else. Dr. Clark asked if this would include advising on the screening of contractors. There is still some confusion about this, but Mr. Rentschler interpreted the Solicitor's ruling to mean that Parks could handle the small amount of land in question which belongs to the City, which may only be 5%. The rest of the work would have to be portioned out. The Park Board can work on City land other than park land only at the City Manager's discretion. If anything untoward happened during the project that involved liability, the Park Board would have a serious problem, as well as the Solicitor's Office, if Parks is involved.

There may be 25% City land involved, which may or may not be worth Parks' handling. It would probably be cheaper to have a contractor do the entire job rather than 75% of it. Mr. Rentschler has someone working in Parks who is interested in working on the lead project as Horticulturist. UC could hire the same personnel that Parks was planning to hire. There are a few other people in Parks who have also expressed interest in the Horticulturist position, so filling it should not present a difficulty. There was some discussion of this new development. In response to Dr. Clark's question, it would apparently be up to Parks whether or not Mr. Rentschler could be hired to work as a consultant. It seems that the actual physical presence of a Parks representative at the sites poses the problem, but there should not be any difficulty in Parks acting as a consultant. Mr. Rentschler will check into this.

Dr. Clark asked for information about the Tot Lots. Mr. Rentschler will try to get a list of these to him.

The discussion then turned to Public Works, which had recently announced its intention to withdraw from the project. Entry onto private property is the reason in this case also.

The next item discussed was how to go about getting cars moved from streets if they are in the way. Mr. Amrein suggested that UC use the same method that Sanitation uses: contact the Police District in the neighborhood and get signs to post before the area is to be cleared. Anyone who has a need can post signs on a street—no special authority is needed. Notify the police as to the date, and they will enforce the "no parking." No permission is needed to sweep the streets. Contractors will hire a sweeper to clean up after them—there are private companies who do sweeping. Mr. Amrein mentioned that Hatfield Coal Company could be contacted for the name of one private company we might use which does cleaning for them.

Dr. Clark mentioned that the project may be telescoped into two years rather than three in an effort to reduce the budget.

Chuck Schultz of Highway Maintenance was mentioned as a contact person regarding paving of alleys. Also, a City Inspector would have to be on site if any public lands are affected. Dr. Clark will contact Mr. Schultz. He was named as the contact person regarding fences on public land too. Private land will present more of a problem.

There will be a meeting soon between the regional EPA and (US) EPA to decide some of the waste carrying issues.

Toronto has purchased one piece of street cleaning equipment, and have offered to let us test theirs. Also, a company in Racine has made the same offer, and Mr. Amrein will pass their name and number along to Dr. Clark. UC's parking crew has some small cleaners, but these do not have proper filters for our purposes. Another idea was that this staff may be available for our project.

It may actually simplify things to have one contractor doing removal and replacement of the soil at the same time. We need samples of the new top soil that will be used. Allgeier is the only company which has been considered thus far for this job, and UC will be working on this. Perhaps they could add on to the City contract by using Allgeier. Mr. Amrein will still be available to act as consultant to work on getting a good contractor.

There was a discussion of repairs to equipment should it break down. With the time schedule, there cannot be delays due to repairs. The Delivo(?) Company told Mr. Amrein that they have a 72-hour turn-around time on parts delivery. The Municipal Garage does all repair work for Public Works. Paul Smith, the Superintendent of the Garage, will be contacted by Dr. Clark to see if the Garage can take on the maintenance of equipment for this project. This will definitely have to be lined up.

We will need a place to store equipment. Mr. Smith will be asked about this also. When asked if Sanitation/City could "rent" a space to the project, Mr. Amrein expressed the opinion that there really is not any space to rent, and he does not feel that what there is at present is totally secure.

Dr. Clark stated that the proposal is nearly finished, and he hopes to have a new draft by the end of this week.

The next Steering Committee meeting will be May 10, 1988.

Adjournment.

Diane D. Smith

Diane D. Smith, Recorder
THESE MINUTES ARE SUBJECT TO CORRECTION.

ATTACHMENT K

ATTACHMENT L

Lower Price Hill Community Newsletter

Pat McKnight

CONGRESSIONAL HEARING

Can you believe that Lower Price Hill had an "Official Congressional Hearing." Thanks to the untiring efforts of Jack DeGano and Eileen Gallagher in their role as members of the Lower Price Hill Environment Committee.

This hearing was held on December 16, 1988, at the Post Office Building and was conducted by Congressman Thomas A. Luken. Although the results are not all in, you can be assurred that changes will come about.

Another success of this committee is the Board of Health's newly started, "Odor Complaint Procedure."

Thanks, Jack and Eileen for a job well done! There are no words to express the impact this will have for the community.

E.G.

NEIGHBORHOOD HEALTH & ENVIRONMENT SURVEY

Beginning the week of January 9, 1989, Jo Ann Grote, from the University of Cincinnati, and Pat Grady may be knocking on your door. They will be conducting interviews in order to find out how many young children live in our community. If there are enough young children, a detailed study may begin this spring. For further information, or if you have any questions, call Jo Ann at 558-4929, or Pat at 251-3567. If you have no phone, stop by 704 State and talk with Pat.

E.G.

ODOR COMPLAINTS

The Board of Health of the City of Cincinnati and S.W.O.A.P.C.A. have instigated an odor and fume complaint procedure. If you detect an odor or fume, you should note the date, time and what the odor or fume smells or looks like. Also, look around and see if you can determine where it is coming from and call:

4.0 Environmental Monitoring and Abatement

Environmental monitoring and abatement is that section of the Cincinnati Soil/Lead Abatement Demonstration Project that is involved in the collection of environmental samples including interior and exterior dust, soil, handwipes, air, water, and paint. Some of these sampling methods were developed at the University of Cincinnati for previous lead studies while others will be developed or modified for use in this project. Interior and exterior abatement is also explained in this section of the Workplan. Abatement methods will be developed for this project. The following Workplan identifies key personnel, procedures, and time periods for accomplishing this work.

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4.1 Property Ownership Determination

Performed by:	**Associate Project Manager**	**-JoAnn Grote**
	Associate Project Manager	**-William Menrath**
	Environmental Monitor	**-Chris Kuettner**

Time Period: **November 1, 1988 - February 28, 1989**

4.1.1 Property Inventory

A complete and accurate inventory of all real estate in the potential study areas is necessary in order to perform the initial soil survey, abatement, environmental monitoring, and subject tracking. For abatement, this information is crucial in order to contact owners, process access agreements for abatement work, and write contracts for the companies performing the abatement work. Similar reasons prevail for the environmental monitoring. Permission is needed from property owners, public and private, in order to collect samples. For subject tracking and recruitment, it is necessary to know street addresses, and often building owners, in order to gain access to locked apartment buildings.

A second need exists for an accurate property inventory; i.e. the need for data linkage. In order to determine the impact of a particular type of abatement it is necessary to link environmental data with subjects in the study. Each subject in the study lives on an identifiable unit of real estate. Each environmental sample will be collected from an identifiable unit of real estate. The most accurate description of each of these units is its book, page and parcel number, the identification system used by county government.

In some instances, rental property is owned by a small partnership or corporation and no owner mailing address is available. In these instances, it is necessary to visit the office of the Clerk of Common Pleas Court to see if a fictitious name form was filed. A second source for this information is the deed on file in the Hamilton County Recorder's Office.

4.1.2 <u>Following is an outline of the steps required for Property Ownership Determination</u>

-Obtain plat maps from Hamilton County Auditor's Office for potential study areas.

-Determine the book, page, and parcel numbers for each parcel of property within the potential study areas.

-Photocopy tax records in Hamilton County Treasurer's Office for each parcel in study areas.

Information obtained:

1. Name of recent or current owner
2. Street address for most parcels
3. Owner address for most parcels
4. Size of parcel
5. Building present or not

-Compare photocopied information with property transfer information in Hamilton County Auditor's Office.

Information obtained:

1. Current owner

-Check Auditor's computerized data base for any missing parcels. These are owned by governmental institutions, churches, and other institutions not subject to taxation.

-Compare information with Auditor's plat maps and Sanborne maps to check accuracy of street address and parcel numbers.

-Obtain final missing owner information from the Clerk of Common Pleas Court.

-Field check each potential study area to compare recorded street address with actual building address.

4.2 Environmental Monitoring and Analysis

Environmental monitoring and analysis includes the development of the sampling protocols, the collection of environmental samples, and the analysis of those samples for lead content. Environmental samples are collected prior to abatement activities and after abatement to determine the effectiveness of abatement and the rate of recontamination. To accomplish this, we must:

- -Set up the necessary laboratories to process soil and dust samples;
- -Develop sampling protocols not presently used in other environmental lead research at the University of Cincinnati;
- -Develop the necessary QAPP's for sampling protocols;
- -Conduct an initial soil survey in the proposed study areas to determine soil/lead concentrations;
- -Collect pre-abatement soil, exterior dust, interior dust, and handwipe samples;
- -Collect post-abatement soil, exterior dust, interior dust, handwipe, water, dustfall, and XRF-paint samples;
- -Process and analyze all environmental samples;
- -Hire and train the necessary staff to collect, process, and analyze the samples.

Performed by:	**Methods Advisor**	**-Shane Que Hee**
	Co-Investigator	**-C. Scott Clark**
	Associate Project Manager	**-William Menrath**
	Environmental Monitor	**-Chris Kuettner**
	Three Temporary Student Assistants	
Time Period:	**November 1, 1988 - April 10, 1989**	

4.2.1 External Dust Collection Method

4.2.1.1 Development

Requirements for the collection of exterior dust samples include: a protocol under which the entire sample can be collected, a sample representative of the exposure in the area, a technique that does not allow for contamination of the sample, and a technique that is repeatable. The Dust Vacuum Method, used in lead-exposure research projects carried out by Drs. Bornschein, Que Hee, Clark, and Ms. Peace has proved to be effective in interior dust sampling. It would not be effective in exterior sampling because of the size of the particles and

volume of sample required. The technique could be used however if a larger sampling device/vacuum, could be used. Air velocity at the cleaning head of a vacuum cleaner is the major factor determining whether or not dirt/dust particles are picked up.

Dr. Que Hee tested a variety of portable, battery operated, vacuum cleaners to determine their suitability and the Ultravac (Trade Name) was determined to be superior with respect to capture velocity. The Ultravac was modified in order to collect the dust and dirt particles on filter paper instead of the bowl of the unit, which decreased the loss of sample. This method is similar to that developed by Dr. Thomas Spitler (USEPA, Region I, Laboratory Director).

This method of collection of exterior dust samples was first field tested in the exterior abatement methods development street cleaner testing program. It became obvious during the first street sweeper test that vacuuming alone was not the most efficient method for collecting the dust sample. Because of the volume of the sample it became apparent that brushing the sample area first and picking that dust up with a spatula and then vacuuming the remaining dust would be the most efficient method.

Another refinement of the original sampling protocol involves the time at which the samples are weighed. During the methods development of street dust abatement, a portable balance was taken to the test site so that the sample bags could be weighed prior to the collection of the sample and again after the sample was placed in the bag. This was done because of concern that some samples might dry more rapidly than others thus giving inaccurate results. This proved to be time consuming and difficult under adverse weather conditions such as high wind. Preweighing of the sample bags in the lab and final weighing of samples in the lab indicated that there was no difference between field weighing and lab weighing.

A final pilot test of the method will be carried out on paved areas near two residences outside of the potential study areas during early April 1989. In this pilot test we anticipate using the sampling pattern described in the QAPP for exterior dust collection.

4.2.1.2 <u>The following is an outline of the steps required for Development of External Dust Collection Method.</u>

-Propose a method for the collection of the samples.

-Field test that method. Evaluate and field test.

-Pilot test the method in an area similar to the abatement areas.

4.2.2 Development of Quality Assurance Project Plans

Performed by:	Environmental Lab Director	Belinda Peace
	Soil XRF and Hematology Lab Dir.	Sandy Roda
	Co-Investigator	Robert Bornschein
	Co-Investigator	C. Scott Clark
	Project Administrator	Linda Conway-Mundew
	Associate Project Manager	JoAnn Grote
	Associate Project Manager	William Menrath
	Statistician/Data Manager	Winkey Pan
Time Period:	October 30, 1988 - August 1, 1989	

4.2.2.1 Development

The Quality Assurance Project Plans for the Cincinnati Soil/Lead Abatement Demonstration Project are being written principally by two individuals. Belinda Peace, who has had extensive environmental monitoring experience in other lead research projects at the University of Cincinnati and is the author of the soil, exterior dust, interior dust, air and water, and paint QAPPs.

Sandy Roda who has extensive laboratory experience in the analysis of blood lead, will be responsible for the development of the Blood QAPP. Since the XRF Kevex Lab is under the direction of Sandy Roda, she also has input into that section of the Soil QAPP that deals with the XRF analysis of the soil and exterior dust sample.

The general process for the development of the QAPPs is as follows: the initial draft is prepared by the person with primary responsibility for the writing of a particular QAPP. That original draft is then forwarded to the Data Manager,

Dr. Winkey Pan, for his initial review. Any suggested revisions are incorporated into the draft subject to discussion with the primary author. Copies of this draft are then forwarded to those Principle Investigators, Drs. Scott Clark, and Robert Bornschein, Project Manager, Linda Conway-Mundew, and Associate Project Managers, JoAnn Grote and William Menrath. These drafts with any comments are returned to the primary author. Suggested changes are then incorporated or discussed and then a revised draft is sent to the Quality Assurance Officer for additional review and comments. Any additional comments by the Quality Assurance Officer are returned to the primary author at which time a final revision will be made. This final draft is then re-distributed to the Co-Investigators, Project Management Group and the Quality Assurance Officer for final review. These drafts, along with any comments and suggested revisions, are then returned to the primary author. The Project Manager and the principal author will make the decision at this time whether to submit the QAPP to EPA or call for an additional meeting for discussion. If there is no need for further discussion, the final draft will be submitted to EPA for approval. Region V EPA may then return the QAPP with comments or correction by conference call and in writing. Soil project staff will then respond to the comments in writing or may request a meeting with Region V EPA Quality Assurance Review personnel for discussion. In either case, comments and concerns will be addressed and resolved by personnel at the Cincinnati Soil Project. These QAPPs are subject to revision and re-approval as needed during the life of the project.

4.2.2.2 <u>The following is an outline of the steps required for Development of Quality Assurance Project Plans.</u>

-Draft copy of QAPP written by primary author.

-Initial draft sent to Data Manager for review.

-Revised draft sent to Management Group

-Revised draft sent to Project Quality Assurance Officer.

-Revised draft sent for final review by Management Group and Quality Assurance Officer.

-Project Manager and author decide to submit to EPA or review.

-Submit QAPP to EPA for comments.

-Respond to EPA comments.

4.2.3 Initial Soil Survey

Performed by:	Co-Investigator	-Robert Bornschein
	Co-Investigator	-C. Scott Clark
	Associate Project Maanger	-William Menrath
	Environmental Monitor	-Chris Kuettner
	Technical Trainer	-Belinda Peace
	Environmental Monitor	-John Centers
	Environmental Monitor	-Rose Linneman
	Six Co-op Student Assitants from Cincinnati Technical College	

Time Period: November 1, 1988 - April 10, 1989

The purpose of the initial soil survey was to determine the concentration of lead in the soil found in the proposed study areas. This information is necessary for two reasons; the selection of the study areas and the development of abatement plans.

4.2.3.1 Identification of Soil Sites

The initial soil survey started with the identification of soil sites in the potential study areas. This was accomplished by first defining the potential study areas on Sanborne maps. These are large scale (1" = 100') city maps that show streets, building outlines and approximate property lines. The next step was to visit each study area to make a visual inspection for soil. All soil areas were then indicated on the Sanborne maps (see attached). Two separate teams of individuals would walk each neighborhood in order to have two independent surveys of each potential study area. Any discrepancies were field checked.

At the conclusion of the field surveys, the locations of soil sites on the Sanborne maps were compared with plat maps from the Hamilton County Auditor's Office in order to determine the book, page and parcel number of each property with soil. It was necessary to make this determination of Book, Page and Parcel in order to find the name of the owner of each soil site (see Property Ownership Determination section 4.1).

The list of soil site property owners fell into two groups; private owners and public owners. To obtain permission to sample soil on the privately owned sites, we contacted those individuals and corporations by letter (see attached). Approximately 15 percent of the owners, responded to our letter by calling the person designated in the letter. The owners who did not respond were contacted by the Associate Project Manager in charge of abatement. Only one owner refused to grant permission to sample soil and that was because the property was involved in litigation. Verbal permission to sample soil was acceptable, according to the Risk Management Office of the Medical Center, if we followed certain guidelines.
Those guidelines were:

- Dates and times of phone contact were recorded.
- Notes were made of phone conversations.
- Only a small number of approved individuals could make owner contact.

A significant amount of property, approximately 20% in the potential study areas is owned by the City of Cincinnati. A right of entry agreement between the City of Cincinnati and the University of Cincinnati was required prior to sampling soil on city-owned property.

In order to process the right of entry agreements we had to make the initial request of the City Government Department responsible for each parcel of property. Those departments were the Recreation Commission, Parks Department, Engineering and Public Works, and Neighborhood Housing and Conservation. Once the individual department approved, the City Solicitor had to approve the document as to form and finally the City Manager had to sign the document. The right of entry document then had to be approved by five separate offices at the University of Cincinnati and signed by a contracting officer.

4.2.3.2 Recruitment and Training of Workers

The next major step in the initial soil survey was the recruitment and training of temporary staff. Two sources were considered for temporary staff; temporary employment agencies which have established contracts with the University of Cincinnati and co-op programs at colleges and universities in the Cincinnati area. Only one college, Cincinnati Technical College (CTC), had a co-op program that matched our anticipated sampling period. CTC is a two-year, State assisted college offering associate degree programs in technical areas. Interviews were held with individuals from the employment agencies and CTC students. Of those interviewed, one student from the University of Cincinnati and five students from Cincinnati Technical College were hired and began training on November 10, 1988.

Training and orientation of temporary and full-time Environmental Monitors was divided into several broad categories; health and safety, project organization, soil sampling instruction, and soil sampling field practice. An outline of the ten-day training program is as follows:

<u>Health and Safety</u>

- Medical exams of Environmental Monitors for the Medical Monitoring Program
- Fitting of safety equipment
- First-aid training by Red Cross Trainers
- Hypothremia Awareness by Health and Safety Officer
- Job Safety Awareness by Health and Safety Officer
- Lead Exposure Awareness by Health and Safety Officer

<u>Project Organization</u>

- University of Cincinnati policies
- Project structure and staff
- Work schedules, pay periods, etc.

Soil Sampling

-Taking the soil core
-Scrapings
-Laying-out the sample pattern
-Site-planning
-Sample numbering and data recording

Sampling Field Practice

-Using the core-tool
-Sampling practice sites on U.C.
-Laying out practice sites
-Sampling practice sites

One of the more important techniques used in the training of Environmental Monitors was the use of video recording equipment. Video tapes were made by Technical Trainer, Belinda Peace, of the soil sampling process. These were used as an instructional tool. In addition, video tapes were made of trainees as they practiced the sampling technique. These tapes were shown in the classroom in order to point out errors and areas for improvement. Because of the timing of blood sampling and environmental monitoring Environmental Monitors work for two periods annually, there will be some expected turnover of employees. Training of replacements should be both expeditious and consistent. Video taping makes this process more functional.

4.2.3.3 Development of Detailed Sampling Plans

Prior to the collection of soil samples, it was necessary to develop detailed sampling plans. This began with identification of specific soil sites and the determination of the specific parcels of land included in each of those sites. The next step was to determine the specifc characteristics of those sites which influence the way in which samples would be collected (See Soil QAPP). Two methods were used to characterize sites; aerial photographs and field observations. Aerial photographs were useful in locating buildings, fences, paved areas, bare spots, etc. Field observations were necessary for verification of detail and in those cases where detail was not clear on aerial photographs.

In order to specifically assign sampling lines and target areas, it was decided to superimpose property boundaries over aerial photographs. This provided the basis for the assignment of specific sampling lines and could also be used by the Environmental Monitoring teams to assist them in laying out the sampling pattern in the field. These modified aerial photographs were inserted into a three-ring binder labeled for each specific site. Other information in the site field book includes the sample data sheets.

4.2.3.4 Temporary Field Office

There were two reasons for establishing a temporary site field office for the collection and processing of soil samples. The first reason was the shortage of space in the Department of Environmental Health. The second and more compelling reason was the need to be close to the potential study areas. Due to the distance the potential study areas are from the University campus, the number of sampling crews and frequency of trips, it would be much more efficient to operate from a field office.

The selection of the temporary field office was made after considering all of the immediately available facilities. The space at 1400 State Avenue was selected for these reasons:

- Immediately available
- No remodeling (we did add two sinks in the soil sample processing areas)
- We could rent with short-term lease
- It was within budget estimates for rent
- It had a workable floor-plan

A substantial amount of equipment had to be ordered for the State Avenue field office. This included desks, file cabinets, lockers, tables, chairs, lab counters and cabinets, lab chairs, dust hoods, lab carts, shelving and photocopying equipment to name some of the larger items. This equipment was ordered with versatility in mind, knowing that the final selection for a permanent field office had yet to be made. As the equipment arrived, the Environmental Monitors assisted in the organization of the field office, thus getting everything in order for the initial soil survey which began in December 1988.

4.2.4 Environmental Monitoring Surveys

Performed by:	**Co-Investigator**	**-Robert Bornschein**
	Co-Investigator	**-C. Scott Clark**
	Associate Project Manager	**-William Menrath**
	Environmental Coordinator	**-Douglas Dicks**
	Technical Trainer	**-Belinda Peace**
	Environmental Monitor	**-John Centers**
	Environmental Monitor	**-Rose Linneman**
	Six Temporary Environmental Monitors	
Time Period:	**April 15, 1989 - May 15, 1991**	

Environmental monitoring surveys are the periodic measurement of environmental lead available to the subjects in the study. This extensive sampling involves the collection of thousands of environmental samples including soil, exterior dust, interior surface dust, handwipes, interior dust fall, paint XRF, and drinking water.

4.2.4.1 Personnel

The collection of thousands of environmental samples will require the skills of ten Environmental Monitors under the direction of the Environmental Coordinator, Douglas Dicks. The ten Environmental Monitors will be composed of two groups. Three of the Environmental Monitors are presently employed by the University of Cincinnati in the Department of Environmental Health. Two of these employees, John Centers and Rose Linneman have extensive experience in the processing of lead environmental samples; having worked on other lead research projects. A third employee James Buchanan, will be available for transfer from other projects in the Department during those times when the collection of environmental samples will be necessary. Joseph Fletcher is being recommended for a fourth full-time position in the Cincinnati Soil/Lead Abatement Demonstration Project. These members of the full-time staff will be involved in the collection of environmental samples during those times when samples are collected. When they are not collecting samples, they will be involved in the processing of environmental samples, in the Environmental Lab at the Medical Center. The other six (6) Environmental Monitors will be hired for sample collection during the environmental monitoring periods as defined in the project time line.

It is anticipated that most of these temporary employees will be able to return repeatedly for the environmental monitoring sessions. In that regard, one of the principle sources for the temporary Environmental Monitors is the co-op programs at Cincinnati area colleges and universities. There are many co-op programs in which the goal is to produce personnel trained in various technical disciplines. These disciplines include civil engineering, industrial engineering technology, chemical lab technology and other areas of a technical nature. The environmental monitoring surveys will, in some cases, correspond to the co-op periods existing in these colleges. Other sources for potential temporary employees would be individuals looking for part-time employment or part-time temporary employment. A final source for temporary personnel would be the various personnel agencies that exist in the Cincinnati area. Two of these agencies which have existing contracts with the University of Cincinnati are potential sources for the temporary environmental monitors. We expect to have our initial staff selected and available by April 24, 1989.

4.2.4.2 Field Office

If personnel are the most important component of the environmental monitoring surveys, then operational space would be the next most important component. Considerable effort was expended in looking for suitable field office space. There were several major considerations in the selection of this space. The first consideration was close proximity to the potential study areas. Because of the need of the survey crews and other personnel to make frequent trips to the study areas. An initial survey was carried out in November and December of 1988 to determine available space. Other important considerations were the size of space; it had to be large enough to house the functions of the environmental monitoring survey along with abatement and administrative functions of the project. Another component of the project is the clinic where the blood will be drawn. It was considered to be advantageous to house this space within the same facility as the other functions of the project. The other important consideration in selecting project space was the cost.

To summarize; the four major considerations were location, size, availability and cost. The survey resulted in the identification of four potential sites that met the required criteria. The characteristics of these sites were summarized with respect to overall adequacy in regard to space, location,

availability, and cost. The final selection of the Project space at 1142 Main Street was made early in January, 1989. We were able to obtain a commitment for a leas agreement between the owner of the building and the University of Cincinnati.

Planning for the use of this space was a process that begain during the selection process. As part of the selection process, potential floor plans were drawn for each of the spaces under consideration. This planning was accomplished by William Menrath, who has had experience in the construction industry and consequently was the most likely person for this task. The planning process began with an initial consideration of total needs at the field office. These needs included number and size of offices for personnel, size and location of labs, size and location of clinic and space requirements for other functions such as lunchroom, storage, etc. One or more floor plans were drawn for each space under consideration. After these floor plans were completed, personnel who would use/occupy each space were consulted to see how adequate they were. The best plan for each space was then selected. As part of the final selection process, the final floor plan for each site was considered in respect to functional use.

Equipment for the project field office and labs has been ordered and received. It was initially ordered for the State Avenue temporary office. This equipment was ordered with the view that it ultimately would be used in the permanent field office. As the temporary facility used for the initial soil survey was phased out, the equipment and supplies were moved to the space on Main Street.

4.2.4.3 Training

One of the other important components of the environmental monitoring surveys is the training of the Environmental Monitors. This process was initiated with the training of the soil-sampling technicians who were employed to do the initial soil survey. At that time a training program was established to ensure that each technician was trained in all aspects of soil collection. This training was vital because of the need for high standards in the collection and recording of data.

Video recordings were an important component of the training program for the initial soil sampling technicians. This decision was made because of the need to have a standardized training program that could be used as new environmental monitors were hired during the course of the project. This initial training program functioned as a pilot for future training programs.

At the present time, we are developing training programs for other types of environmental sampling that will begin with the first environmental survey. The QAPP for each of the various sampling protocols describes how samples are to be collected. The training program will use this protocol as a basis and expand upon the technique in order to provide sufficient detail so that each Environmental Monitor has a clear understanding of what is expected. The training program will include lectures, written material for each of the sampling techniques and video tapes that show precisely how each sample will be collected. The personnel most directly involved in the production of the training program will be Douglas Dicks, Environmental Coordinator, and Belinda Peace, Technical Trainer. The training programs under development prior to the first environmental monitoring survey are: soil sampling, exterior dust sampling, interior dust sampling, and handwipe collection. The soil sampling training program is being revised slightly because of improvements that became obvious during the initial soil survey.

4.2.4.4 Performance

The final step of the training process will be a final approval for each Environmental Monitor given by Belinda Peace, Douglas Dicks and William Menrath. This final approval will be given only after each environmental monitor has successfully collected and recorded the necessary data for each of the given sample types. No one will be permitted to continue into the sampling phase of the Project unless he/she has been certified at a particular competance level. Once Environmental Monitors are allowed to collect samples as part of a team they will be continually monitored as to performance on a regular basis. This performance evaluation will be based upon the individual following the established protocol completely and upon the accuracy and legibility of data sheets. It will be done on a daily basis by Environmental Coordinator, Douglas Dicks. Belinda Peace, who is the Technical Trainer, will also monitor the performance of the environmental monitors both in the field and in the lab.

William Menrath will, on a regular basis, also make determinations as to the performance of the environmental monitoring teams. The Project quality assurance officer, Dr. Winkey Pan, will also monitor the performance of the environmental monitoring teams.

4.2.4.5 Linking Recruitment and Abatement

The environmental monitoring surveys have to be completed in a timely fashion in order to make an assessment of the effectiveness of the abatement techniques. Environmental monitoring would begin after the initiation of the first blood draw. Once the blood sampling for a subject is completed several things have to follow in a defined sequence. Shortly after the sample is drawn, the initial environmental survey will be carried out for that particular subject. Following the environmental surveys of other properties in that area, abatement will be performed. Following that abatement, there will be an immediate need for a second environmental survey to determine the success of that abatement. The overall coordination of this sequence of events is under the control of the Scheduling Committee, chaired by William Menrath. Other members of the committee include Associate Project Manager for Subject Matters, JoAnn Grote, and Environmental Coordinator, Douglas Dicks. Project Administrator , Linda Conway-Mundew, is an ex-officio member. This committee will initially establish the procedure whereby the environmental monitoring will begin at the proper time and will insure that all subject residences scheduled for abatement are abated. Once subjects are recruited and incorporated into this study, the scheduling committee will meet on a regular basis to monitor the progress of the blood collection, environmental monitoring, abatement, and subsequent environmental monitoring to ensure that everything happens according to schedule.

4.3 Abatement

Abatement inlcudes the development of interior and exterior abatement methods, the development of the abatement strategy, and the performance of the abatement. To accomplish this we must:

- Develop an effective protocol for cleaning of carpets and non-carpeted floor;
- Test a series of street sweepers to determine if some are more effective in removing and controlling dust;
- Determine the protocol for the use of the most effective street sweeper;
- Use the results of the initial soil survey to develop an abatement strategy;
- Develop the necessary owner agreements, tenants agreements, and abatement contracts;
- Award the contracts for the abatement work;
- Inspect and insure that the abatement is performed as specified;
- Develop and implement a plan for the disposal of lead-containing waste.

4.3.1 Interior Abatement Methods Development

Performed by:	**Principle Investigator**	**-C. Scott Clark**
	Methods Advisor	**-Shane Que Hee**
	Graduate Student	**-Lynda Ewers**
	Assoicate Project Manager	**-William Menrath**
	Environmental Monitor	**-Chris Kuettner**
	Environmental Monitor	**-Rose Linneman**
	Three Temporary Student Assistants	

Time Period: **November 1, 1988 - April 17, 1989**

Most of the interior lead-containing dust, available to children less than five years of age, will be found on interior floors. This was demonstrated in the South Riverdale Project in Toronto, Canada. Because the floors in housing in the Cincinnati Project will be primarily wood, vinyl, or carpet, interior abatement methods development was divided into two areas; wood and vinyl floors, and carpet.

4.3.1.1 Vinyl and Wood Flooring

In order to test the effectiveness of cleaning floors with a vacuum cleaner, homes with high lead contamination were needed. Other current research projects being carried out by researchers in the Department of Environmental Health involve subjects with high blood lead concentrations and housing contaminated with lead. The data bank also contains information on flooring type. We were able to generate a list of individuals from those projects meeting the following requirements:

- -recent contact with the Lead Program Project
- -high lead concentrations in interior dust
- -carpet and/or vinyl floor

Because of positive association with U.C. researchers in the past, it was easy to obtain permission from study participants to test two different wood floors and two different vinyl floors.

The testing procedure was as follows:

- -Mark off three separate squares (one meter by one meter) on the surface of the floor.
- -Collect a separate dust sample by the dust vacuum method from within each of these squares (see interior monitoring QAPP).

-A bag for a Nilfisk, HEPA equipped vacuum cleaner is weighed to obtain a tare weight and installed.

-The three squares are then vacuumed with the Nilfisk at the rate of 60 seconds for each square. The bag is weighed after this cleaning.

-An additional dust sample is collected by the dust vacuum method from each of the three squares, and the squares are cleaned again with the Nilfisk. This process is repeated until the squares have been cleaned a total of five times.

-Each of the squares is then washed with 1500 ml. of tap water from the residence. The washing is done by a technician wearing rubber gloves, using a new sponge. An aliquat of 500 ml. is taken from each of the wash buckets. A 500 ml. sample of clean water from a wash bucket is also collected to provide data on background lead levels.

-A final dust sample (dust vacuum method) is collected from each square.

All of the dust samples and water samples are analyzed for lead concentration. The final result of this series of tests should indicate how many passes with a vacuum cleaner at a specified rate will reduce the dust available to children to an acceptable level.

4.3.1.2 Carpeting

To determine the feasibility of cleaning carpets with a vacuum cleaner, three questions were asked:

1) Is there a difference among industrial type, HEPA-equipped, vacuum cleaners in their ability to remove dirt from carpeting?
2) How many passes at a given rate with an industrial-type, HEPA-equipped, vacuum cleaner will reduce the surface lead dust to an acceptable level?
3) Is wet carpet cleaning alone or in combination with dry vacuuming effective in reducing surface lead dust?

In order to test the effectiveness of various industrial-type-HEPA-equipped vacuum cleaners, we first looked at different vacuum cleaners to detrmine what differing characteristics existed. Two differences became apparent: cfm of air and the ability to lift a column of water a specified number of inches.

We selected three different machines that varied in these characteristics:

		CFM	Waterlift
1)	Nilfisk GS80	87	75"
2)	Wap 767	100	90"
3)	Euroclean UZ 930	77	85"

In order to test these cleaners, it was decided to use the ASTM F608-86 Standard Laboratory Method for Evaluation of Dirt Removal Effectiveness of Household Vacuum Cleaners. Analysis of the data indicated the following:

1) There was no significant difference between operators.
2) There was no significant difference between vacuums.

In order to determine the number of passes required to reduce the surface lead dust available to children, lead contaminated carpets were needed. Subjects from the Lead Program Project, with carpets, were contacted and asked if they would like to exchange their existing carpet for new carpet. Those who agreed, 100% of those asked, were offered a choice of carpet from three specified types and colors that a University of Cincinnati-approved vendor had in stock. After the selection was made, the carpet was ordered with edges bound. The exchange was scheduled with the participant. A crew of three performed the exchange which began with the collection of dust samples (dust vacuum method) from the old carpet and the new carpet. A sheet of 6 mil polyethylene was placed over the old carpet for the purpose of not contaminating the top of the carpet with dirt or dust from the floor or bottom of the carpet Enough plastic was left at the edges and end to seal the carpet in the polyethylene in order to prevent contamination of workers, transport vehicles and hallways at U.C.'s Kettering Laboratory. After the carpet was removed, the floor was vacuumed with a HEPA-equipped vacuum cleaner. The dust was saved for analysis on the Kevex XRF. The new carpet was unrolled and the furniture was put back in place. Photo and time records were made of the process for use in the development of specifications for the abatement contractors.

The lead-contaminated carpets were then taken to Room 407 in Kettering Laboratory where graduate students vacuumed one-meter square areas at fixed rates of speed. Dust samples were taken between each vacuum treatment. These tests

indicated that even after five passes with a Nilfisk, there was significant surface lead dust present.

In order to test the effectiveness of steam cleaning, we rented a Rug Doctor steam cleaner manufactured by The Rug Doctor Co. of Fresno, California and performed a series of tests in which carpets were first dry vacuumed and then steamed cleaned, and other tests in which carpets were steam cleaned and then dry vacuumed. The results indicated that neither sequence was adequate to remove surface lead dust to an acceptable level.

The final conclusion reached from this series of tests on carpets is that it is more economically advisable to replace carpet than to clean carpet.

Earlier data from Ewers, Clark and Peace[1] have demonstrated that just as it is difficult to remove lead from carpet, it is also difficult to remove lead from upholstered furniture. Because of this, and because of our recent data on carpets, it was decided not to do a pilot study on the removal of lead from furniture.

1. Ewers, L., C. Scott Clark, Belinda Peace. Analysis of Cleaning Efficiency In Homes Contaminated by Lead Dust Transported by Foundry Workers. Proc. of Amer. Ind. Hyg. Conf. 1989

4.3.2 Exterior Abatement Methods Development

Performed by:	**Methods Advisor**	**-Shane Que Hee**
	Co-Investigator	**-C. Scott Clark**
	Associate Project Manager	**-William Menrath**
	Environmental Monitor	**-Chris Kuettner**
	Three Temporary Student Assistants	

Time Period: **November 1, 1988 - April 10, 1989**

Lead-containing dust exists in the exterior environment on a variety of surfaces. The most common of these surfaces are streets, alleys, sidewalks, parking lots, steps and porches. The largest surface areas to be cleaned are the streets, alleys, and parking lots. Street sweepers would be the obvious equipment for use in cleaning these large areas. Small walk-behind units or vacuum cleaners appear to be the most efficient equipment for sidewalks and other small areas.

The first step in determining the most efficient street sweeper available for abatement of exterior dust was to determine the scope of available equipment. An initial survey of all street sweeper manufacturer's marketing products in the United States indicated four different classes of equipment. The four classes are distinguished by the particular mechanism used to remove dust and debris from paved surfaces. These four mechanisms are as follows:

1) Broom sweepers
2) Vacuum-assisted broom sweepers
3) Vacuum sweepers
4) Regenerative air sweepers

The broom-type sweeper operates by one or more rotating brushes which move the dirt and debris from the pavement to a conveyor, which then carries the material to a hopper. This represents the first generation of mechanical street sweepers and has been used to clean city streets for decades. These sweepers generally use water spray to control dust.

Vacuum-assisted broom sweepers represent a further advancement of this concept. These machines operate by means of one or more rotating brushes which loosen dirt and debris from pavements and move it toward a hopper. At this point the process is assisted by means of moving air or vacuum which pulls the dirt and debris into the hopper. These machines sometimes use water spray to help control dust. The air is filtered by a variety of filter types, some of which are effective in removing particles as small as 2-3 microns.

Vacuum sweepers operate principally by means of an extremely powerful vacuum system. Some of these sweepers will also use a rotating brush to move debris and dust from the curb to the head of the vacuum apparatus. In order to control dust generated by the rotating curb brooms, a fine water spray is often used. The exhaust air from the vacuum system can be filtered through a wide range of filter sizes. Most manufacturers provide a final filtration range between 2-8 microns.

The final type of pavement sweeper is the regenerative air machine. This machine operates by means of a recirculating air system. The blower part of the system directs a blast of air into the paved surface, and the vacuum part of the system pulls the same air back up into the hopper. The blast of air loosens material on the paved surface and the vacuum pulls that material back into the hopper. No filtration system is needed for this machine because the air is recirculated through the system. Brushes are available to move material from curb areas into the path of the recirculating air system.

Because of the large number of manufacturers and the variety of machines made by each manufacturer, it became apparent that we would not be able to test all of the machines. It was decided to test the different classes of machines. Because of the lack of dust-control system on the broom-type sweepers, this class of machines was eliminated from consideration.

We tested vacuum sweepers, vacuum-assisted broom sweepers, and regenerative air machines in order to see if one class of machines cleaned better or more efficiently than others. We also tested several different machines within each class.

Each test of a particular machine required 2 to 3 people and 3 to 4 hours of time. The test consisted of finding a "worst-case" section of pavement, i.e., a section of pavement outside of the designated potential study areas, but similar to the worst kind of pavement within the study areas. the "worst-case" was the brick-paved alleyways. By testing the machines on these surfaces it would be possible to determine any differences that exist among the machines. The test consisted of delineating four 1-meter square areas in a row on the designated pavement surface. The 1-meter squares were divided into four quadrants, designated A,B,C, and D. The four quadrants marked "A" were then cleaned by scraping and vacuuming in order to determine the initial loading on the surface. The material removed from each "A" quadrant was then weighed. The sweeper was then driven across the four squares. Quadrants marked "A" were then recleaned with our sampling vacuum and any dirt removed from those quadrants was weighed to determine the amount of dirt/debris redistributed during the street-sweeping process. The four quadrants marked "B" were cleaned and the dirt/debris was weighed to determine the amount of material picked up by one pass of the street sweeper. The sweeper was then driven across the four squares for a second time. After this pass, quadrants marked "A" were brushed and cleaned with our small sampling vacuums and the material was weighed again to determine any redistribution of material. The quadrants marked "B" were then cleaned, and the material weighed as before, and finally the quadrants marked "C" were cleaned, and the material was weighed as before.

This test was repeated 3 times on one machine from each class of street sweepers. Two to three machines from each class were tested at least one time with this described method.

Analysis of the data collected from these tests indicated that the regenerative air machine is the most effective in cleaning surface dust from paved surfaces. Further analysis of data will establish the number of passes by the machine required to effectively remove the dust loading.

Similar tests were carried out on walk-behind type pavement sweepers and industrial type vacuum cleaners in order to determine the most effective machine available for cleaning smaller paved surfaces.

4.3.3 Waste Disposal Method Determination

Performed by: **Associate Project Manager** **William Menrath**

Time period: **April 1 1989 - May 1, 1989**

The Ohio EPA-approved landfill nearest to the potential study areas for the Cincinnati Soil/Lead Abatement Demonstration Project is the ELDA landfill operated by Waste Management, Inc. This corporation has a general policy that prohibits the use of laboratories other than those approved by Waste Management, Inc. for the analysis of waste which they will accept. There are two Waste Management approved laboratories in Southwestern Ohio. Either of these will perform the EP Toxicity Test. Waste Management, Inc. will require a soil sample to be taken from each of the abatement sites. These samples are then submitted to an approved laboratory.

In addition to this EP Toxicity Test requirement, Waste Management, Inc. may remove samples from trucks coming from our abatement sites to the landfill. These samples will be analyzed with the EP Toxicity Test.

4.3.4 Assignment of Abatements By Neighborhoods

Performed by:	**Co-Investigator**	**-Robert Bornschein**
	Co-Investigator	**-C. Scott Clark**
Time Period:	**February 1, 1989 - April 15, 1989**	

The assignment of abatements by neighborhoods began with the initial identification of the potential study areas. These study areas were selected on the basis of the presence of large numbers of rehabilitated housing units. The design of the Cincinnati Soil/Lead Abatement Demonstration Project specified that children in rehabilitated housing; i.e., housing in which the immediate lead paint sources had been removed or covered, still have an exposure to lead through the dust that migrates into the housing from a lead source in exterior soil and dust. Several potential study areas were selected because of high concentrations of such rehabilitated housing. These study areas would be included in the research project if two other conditions were present. Those conditions were the presence of a minimum number of children under four years of age and the presence of lead-contaminated soil. These two conditions were evaluated through a census carried out in each potential study area and an initial soil survey of the soil sites in each area. The forms (12 & 13) developed for the census are Attachments A & B in Subject Matters Section 3. The census began in November of 1988 and was carried out by two census teams under the direction of JoAnn Grote (Associate Project Manager/Subject Matters).

Every residential unit, including single family residences and apartments, was visited by a census team consisting of two individuals. In many cases residences had to be revisited several times in order to find the resident at home. As each home was visited, interviews were held if the resident was agreeable. The interview was necessary in order to determine the number of individuals living in each unit and the ages of the children, particularly those children under five-years of age. The census process continued through April of 1989. In addition to interviewing residents, additional questionnaires were filled out by the census teams to record data relating to the housing stock in each of the study areas. Residential units were evaluated as to type of housing; rehabilitated, renovated, deteriorated, dilapidated, or post-World War II satisfactory, by a method developed for a previous study.

The second important factor in the determination of abatement neighborhoods was the presence of lead-contaminated soil. An initial soil survey was carried out to characterize the lead concentration in the soil in the potential study areas. This survey was begun in December of 1988 and completed by April 15, 1989, with the majority of sites having been sampled by March 1, 1989. Soil samples were collected by the environmental monitoring teams and sieved at the temporary field office at 1400 State Avenue. The sieved samples were sent to the Kevex (XRF) Soil Lab at the UC Medical Center. The samples were analyzed to provide preliminary data for characterizing the lead content in the soils in the potential study areas. These samples would be analyzed, again on the Kevex (XRF), for a final determination of soil lead concentration.

The combined data from the census and the initial soil survey would provide sufficient information necessary to make a determination of potential study areas. In those areas where sufficient children were found, and sufficient soil lead values were present, initial abatement treatments were assigned to each area taking into consideration other factors such as area size and associate workload and other logistical considerations.

4.3.5 Development of Abatement Plans by Property

Performed by:	**Co-Investigator**	**Robert Bornschein**
	Co-Investigator	**C. Scott Clark**
	Associate Project Manager	**William Menrath**

Time Period: **March 1, 1989 - April 21, 1989**

There are three abatement strategies for soil depending upon the concentration of lead in the 15cm core; removing and replacing, followed by sodding, cultivating, followed by sodding and re-sodding. If the average lead concentration in the soil in the 15cm column is 500ppm, regardless of the adequacy of the grass cover, the soil will be removed and replaced and the area re-sodded. If the average lead concentration in the column is less than 500ppm but the average concentration in the top 2cm is 500ppm or higher regardless of its grass cover, the area will be cultivated, to reduce the concentration in the top 2cm to less than 500ppm, and re-sodded. For areas where grass cover is adequate and the lead concentration is less than 500ppm in both the top 2cm and in the column, no abatement will occur. If the soil lead concentration in the top 2cm is 300ppm but less than 500ppm, the average concentration in the column is less than 500ppm and the grass cover is inadequate the area will be re-sodded. No soil abatement will occur in areas where the grass cover is inadequate but the concentration in the top 2cm is less than 300ppm and in the column is less than 300ppm and in the column is less than 500ppm.

In order to assign the specified abatement strategies to the sites in the study areas, the preliminary soil lead concentrations from the initial soil survey will be superimposed over the original site maps that were used for sampling. The specific lead concentrations will be written on the sampling lines shown on the site maps. Since parcel boundaries are also indicated on the site maps, we will be able to tell which particular parcels will need to be abated by each specified method. On sites where there is only one parcel it is clear what form of abatement will be used. On sites consisting of more than one parcel we will use the following criteria:

- If all soil-lead concentrations on all parcels indicate the same method of abatement, the entire site will be abated in that manner.

-If the lead values in the column indicate different methods of abatement for individual parcels on a multi-parcel site, then we use the most extensive method of abatement for any parcel requiring that method of abatement. In addition, any parcels immediately adjacent to a parcel requiring the most extensive method of abatement will be abated in that manner. For example: A site containing five parcels numbered 1, 2, 3, 4, and 5, where parcel 3 has lead values in the column requiring removal of the soil and parcels 1, 2, 4 and 5 require tilling of the soil as a form of abatement, then parcels 1 and 5 would be tilled and parcels 2, 3 and 4 would have the soil removed.

4.3.6 Owner Agreements

Performed by: **Associate Project Manager** **William Menrath**

Time period: **March 1, 1989 - April 15, 1991**

Owner Agreements are the contracts between the University of Cincinnati and property owners or tenants on property where abatement will occur. These agreements will grant permission to the University of Cincinnati to have outside contractors perform abatement work including soil removal, soil cultivation exterior dust abatement and interior dust abatement. The contracts will describe the rights of the owners and tenants and the responsibility of the University of Cincinnati. No work will be performed on private property without prior execution of these agreements.

The development of these Owner Agreements will be a joint effort of three (3) departments at the University of Cincinnati. William Menrath will write the contract. The document must then be approved by personnel in the Business Office of the Department of Environmental Health. It will then go to the Risk Management Office of the U.C. Medical Center. Attorneys in this department will make an assessment of any risk to the University and may change the wording of the document if necessary. Initial discussions with an attorney in the Risk Management Office indicate that they are sensitive to both the needs of the University and the needs of the owners and/or tenants who will be asked to sign these contracts.
The next department in the development of the Owner Agreements is the U.C.

Legal Advisory Service. An attorney in that office will consider the documents from other legal viewpoints. They will make certain that the contract is clear in regard to the obligations on the part of the University and the rights of the property owners and tenants.

After the Owner Agreements are completed, the next step will be to execute those agreements with the owners. This will principally be done by William Menrath. He will contact the individual owners to make an appointment for a meeting. Prior to the meeting, general information as to the goals of the project and a copy of the Owner Agreement will be forwarded to each owner. This will provide time for the owner to consider the proposal prior to the meeting. In some cases owners may wish to contact an attorney for advice and this would allow time for them to do so. At the meeting, any questions the owner has will be answered and hopefully the agreement can be signed.

The principal reason for having one person contact the owners and present information and answers to them is the need for accuracy, consistency, and efficiency. Because of the nature of the research project, it is necessary to make certain that all parties are in agreement about the outcome and expectations.

4.3.7 Preparaton of Contracts for Bidding

Performed by: **Associate Project Manager** **William Menrath**

Time Period: **March 1, 1989 - April 21, 1989**

Separate contracts will be necessary for the three types of abatement; soil abatement, exterior dust abatement, and interior dust abatement. The three contracts will have some parts in common, such as bidder notices, general proposals, bid guarantee, contract bond, and contract form. Since the University of Cincinnati is a state institution, the format of some of these sections is determined by the State of Ohio. The contracts will differ in the section referred to as the "specifications". Specifications for the abatement work will be determined by the various abatement methods development work that will conclude on April 15, 1989. This work will specify, for example, the type or types of street cleaners that may be used to abate exterior dust in parking lots and on the streets.

The development of the abatement contracts will begin with the initial writing of the contracts and specifications by William Menrath. As with other contracts, the abatement contracts will be reviewed by personnel in the Business Office in the Department of Environmental Health, the Risk Management Office of the Medical Center, and the Legal Advisory Services of the University of Cincinnati. Once the format of the bidding documents is approved, the next step will be to go through the purchasing department of the University which has an established bidding process for work contracted by the University. (Described in Section 2.0 Attachment E, Memorandum No. 27).

4.3.8 Selection of Contractors

Performed by: **Associate Project Manager** **William Menrath**

Time Period: **April 10, 1989 - May 15, 1989**

We expect have a minimum of three contractors performing abatement in the 1989 abatement period, two contractors in the 1990 period and three contractors 1991. The selection of these contractors will be made through an established University of Cincinnati policy. This policy is implemented through the Purchasing Department. Some University policies may serve to eliminate some contractors because they may not be able to meet established regulations. Some of these regulations that may serve to restrict the number of contractors bidding on the abatement work are:

- Any contract over $4,000.00 will require the payment of prevailing wages.
- Bidders will be required to post a ten (10) percent bid bond.
- The contract will require the posting of a one hundred (100%) performance bond along with separate material and labor bonds.
- Contractors will be required to conform with Ohio State Affirmative Action regulatons.

An additional requirement that will be imposed by the management of the Soil/ Lead Project will be a liquidated damages clause in the contract. This may also serve to limit the number of interested and qualified contractors.

Contractors who can generally meet the requirements established by the University will have equal opportunity to submit the low bid and be awarded the contract. Soil Project management can establish some policies which can influence the final selection of the abatement contractors. We are able to construct the bidding documents such that we can retain the right to reject a low bidder based upon that bidder's reputation or previous experience with the University of Cincinnati. Management can also influence the selection of contractors by requiring that all contractors bidding on the abatement work attend a pre-bid conference. This conference can serve to assure that the contractors totally understand the requirements of the project. In addition, we can require the contractors to submit proposals for the manner in which they will perform the

abatement work. These proposals can be weighed and used in the evaluation of how bidders may perform if awarded the contract. These proposals may also be used in the selection process. Soil Project Management will evaluate all contractors based upon previous performance on jobs performed for the University of Cincinnati, other institutions, companies, and individuals.

4.3.9 Conduct of Abatement

Performed by:	**Associate Project Manager**	**William Menrath**
	Abatement Assistant	**David Winfough**
	Site Inspector	**Chris Kuettner**
	Administrative Assistant, III	**To Be Named**
	Senior Sanitarian	**To Be Named**
Time Period:	**June 1, 1989 - June 30, 1991**	

As part of the specifications for the abatement work, there will be a time period of ten work days during which abatement work must begin. There will also be a requirement that the contractor have a minimum number of employees on the job site at any given time. Another requirement integral to the performance of the abatement work will be the time allowed the work. There will be no exceptions to this time requirement for interior abatement but exterior abatement may be extended beyond the specified time in the event of excessive inclement weather.

Contractors will perform their work under the supervision of their own superintendent, who will be responsible for the day-to-day operation of the abatement work. All of the abatement will be inspected by soil project personnel responsible for such inspections, i.e. Site Inspectors. The Site Inspectors will have the responsibility of informing the contractors' field superintendent of the time at which abatement may begin in any area. The Site Inspector will also have the authority to stop work in any given area for just cause. Abatement work may be stopped in the event of physical hazard to property or personnel or failure to perform work according to specfications. The Site Inspector is not responsible for the day-to-day supervision of the contractors' employees.

Abatement will be carried out in a specified sequence that is integrated with the environmental monitoring in the areas where abatement will occur. The pre-abatement environmental monitoring will be completed in an area prior to the beginning of abatement. The particular sequence of abatement is soil abatement, exterior dust abatement and finally interior abatement.

4.3.9.1 Soil Abatement

The soil abatement may be accomplished in one of three ways depending upon the concentration of lead in the soil column. Some soil may require re-sodding or, in some cases, the addition of topsoil to a site or part of a site prior to re-sodding. The purpose of the topsoil is to provide a base for the sod or perhaps to fill in the depressed areas, so that proper drainage can occur. In those cases where tilling is the appropriate method of abatement, tilling will be required for a specified period of time. After the required tilling, soil samples will be taken by the Environmental Monitors and analyzed for lead concentration. This analysis will take place in one of two ways. The soil will be processed in the XRF Soil Lab at the University of Cincinnati Medical Center, or it will be analyzed in the mobile XRF laboratory we plan to borrow from the EPA laboratory in Reno, Nevada. The mobile unit would allow for more rapid processing of the soil samples. This would permit the completion of each site in a more timely fashion. In either case, the results of the XRF analysis may require an additional period of tilling of the soil.

On those sites where the concentration of lead requires the removal of soil, the soil will be excavated to a depth of six (6) plus inches and replaced with topsoil having a lead concentration of less than 50 parts per million (PPM), if such soil is available. Where excavation is required the soil will be removed by mechanical equipment; either loaders or backhoes. It will be loaded into hoppers or dump trucks and transported to an appropriate dump site. During transport, hoppers or dump trucks will be covered with tarps. Prior to loading of hoppers or dump trucks, 2ml-thick polyethylene will be placed in the hoppers or dump trucks to prevent soil from being spilled through cracks in the tailgate or beds of the transport vehicles. In order to ensure that the soil is transported to the appropriate dump site, all trucks will be logged off of the abatement site by the Site Inspectors and logged into the appropriate dump site by officials at the dump site. Appropriate techniques will be used to prevent spills of contaminated soil at the abatement along with techniques for the containment of dust. Excessively dry soil will be moistened with water to control dust. Sites will not be permitted to remain open for more than 24 hours except in the case of inclement weather. No site will remain open over a weekend period.

Replacement of soil will be accomplished with a different set of equipment in order to prevent contamination of replacement soil by soil or dust remaining on equipment used for excavation. All sites will be re-sodded within two days of the replacement of topsoil. A program for the watering of sod will begin immediately after its placement and will be continued throughout the summer months. Appropriate barriers will be placed at all times during soil abatement in order to protect people from injuries resulting from construction equipment. Barriers are also necessary to prevent potential additional exposure to the residents in the area.

4.3.9.2 Exterior Dust Abatement

Exterior dust abatement will occur immediately after soil abatement has been completed in a particular area. This work will be carried out by contractors possessing the specified equipment and expertise in cleaning large paved areas. Soil project personnel will coordinate the scheduling of abatement work so that areas scheduled for abatement can be posted to prohibit parking. Streets will generally be abated one side at a time, principally because of the requirement that the street be free of parked cars for complete abatement to occur. The potential study areas generally have more on-street than off-street parking and it would not be practical to restrict parking on both sides of a street at any given time. We are therefore going to be required to abate one side per day and the alternate side the following day.

4.3.9.3 Interior Abatement

Interior abatement will follow the completion of exterior abatement in an area. Interior abatement will occur after the residents have been oriented by Soil Project personnel. This preparation will consist of an explanation of what will occur and at the same time, the resident will be asked to select the color and texture of the carpeting that will be used to replace existing carpeting. Residents with one child in the study will be provided with replacement carpeting for one common room, i.e., living room, family room, etc., and the child's bedroom. Residents with two or more children in the study will get an additional carpet for a total of three carpets. Residents with a child in the study will also be eligible for the replacement of one standard sofa and one standard chair. Soil project staff will be responsible for insuring that the carpeting and furniture is available at the time of the interior abatement. The interior

abatement contractor will be responsible for vacuuming the dust from all ledges including basesboards, windowsills, door frames, etc. The contractor is also responsible for vacuuming all of the floors at a specified rate, removing the carpet and furniture that is to be replaced, and installing the new carpeting and furniture. These contractors will also be monitored or inspected by the site inspectors and the Cincinnati Health Department personnel.

4.3.9.4 Coordination With Other Activities In Abatement Areas

Because exterior abatement will frequently occur on public property, it will be necessary to coordinate our activities with other agencies and utilities who commonly do work on public areas. These agencies include the Sewer Department, Water Department, Highway Department, Cincinnati Gas and Electric Company, Cincinnati Bell Telephone Company, and private contractors who occasionally will do work on public property. In addition, we would like to be aware of any private construction projects planned or anticipated in the abatement areas. The reason for this is that we do not want to be in the middle of an abatement procedure and have that process interrupted by private or public construction crews who may excavate an area that was just abated or block a street which we need for abatement activities.

The major part of this coordination activity will be performed by personnel assigned to the Abatement Soil Project by the Cincinnati Health Department. These two individuals, and Admininstrative Assistant III and a Senior Sanitarian will have the primary responsibility for this coordination. This coordination will begin prior to the onset of abatement. This process will begin by first establishing contacts with the various utilities and with the Highway Department. Additional contacts will be established with the Cincinnati Building Department. After these contacts are established we will determine what the short-range and long-range plans are for the potential abatement area. Once this information is collected we will be able to establish our abatement plans with some assurance that there will be no interruptions, or at least the interruptions will be anticipated. There may be very short-term operations that may have to be performed by various utilities or the Highway Maintenance department. These short-term emergencies may result from water main or gasoline breaks or emergency road repairs. These problems may occur and we will not have control over their occurence. But we will establish a system whereby we will

be notified as soon as possible. If an emergency occurs, we may have to alter our abatement procedure to allow for such work.

In the short time since we initiated the census and the initial soil survey, several changes have occured in the potential study areas. In one case, a vacant lot was paved to provide off-street parking and in another potential study area a vacant buidling was demolished. These projects have not impacted upon our preliminary studies and because we did not have the coordination system in place, we were unaware that they would occur. Once the coordination system is established we would be made aware of these kinds of activities. In both of these instances the Building Department would have provided this kind of information. The processing of permits for these types of construction work takes approximately one to three weeks. Had we been notified immediately upon the application for a building permit or a demolition permit, we would have had that much time to plan for those activities.

4.3.9.5 <u>The following is an outline of the steps required for the Conduct of Abatement</u>

- After abatement contract is awarded, schedule the start of work with the contractor.
- During the period between awarding of contract and start of work, establish the sequence of properties to be abated.
- Prior to beginning abatement, The Cincinnati Health Department Staff assigned to Soil Project will prepare owners and tenants for the start of abatement. For soil abatement this will consist of information about dates, safety issues, what to expect, and requests for removing material from yards. For interior abatement this will consist of the same general information, an opportunity to select carpet and furniture pieces, instructions about storage of personal items.
- For exterior dust abatement, project staff will provide a schedule for the posting of no-parking signs and work with residents to seek cooperation.
- Prior to abatement project staff will check all documents and photorecords of property for completeness.
- Prior to and during abatement, project staff will monitor the activities of utilities, City agencies, and private contractors to determine other activities which may have an impact on abatement progress and success.

5.0 ANALYTICAL LABORATORY

5.1 BLOOD ANALYSIS

5.1.1 Laboratory Set-up

5.1.2 Data Entry

5.1.2.1 Blood Chemistry Data Form

5.1.2.2 Sample Custody Form - Clinic

5.1.2.3 Chain-of-Custody - Laboratory

5.1.2.4 Reporting System

5.1.3 Quality Control

5.1.4 Training

5.1.5 Analyses

5.2 SOIL/DUST ANALYSIS

5.2.1 Laboratory Set-up

5.2.2 Staff Training

5.2.3 Soil QAPP

5.2.4 Data Reporting System

5.2.5 Deliverables

5.0 Analytical Laboratory

The analytical laboratory, consisting of a Laboratory Director, (Ms. Sandy Roda), and Associate Director, (Ms. Belinda Peace) and a staff of four research assistants (John Centers, Ann Coley, Mary Kelsey, and Rose Linneman), is charged with developing methods and carrying out analytical procedures associated with the measurement of lead in blood and environmental media such as soil, dust, water, paint and air. To meet this objective, they will set up and maintain appropriate laboratory facilities, establish necessary quality assurance program plan (QAPPs), maintain a staff of well trained research assistants and process samples in a timely fashion while maintaining the highest standards of quality in sample analysis. All equipment procurement methods development and training of personnel will be accomplished before the first blood samples are obtained (May 1989).

5.1 Blood Analysis

Performed by:	**Laboratory Director**		**Sandy M. Roda**
	Technical Staff		**Mary Kelsey**
			Ann Coley
Time Period:	**Phase 1**	**5/89 - 6/89**	
	2	**10/89 - 11/89**	
	3	**4/90 - 6/90**	
	4	**10/90 - 11/90**	
	5	**4/91 - 6/91**	

5.1.1 Laboratory Set-up

Establishment of the analytical facility for the Soil Lead Abatement Demonstration Project involves the identification of necessary analytical lab space for sample preparation, storage and analysis. Two labs have been identified which have the required space, electrical supply, hoods, desk space and proximity to the Lab Director's Office. Major analytical equipment needs were identified. It was necessary to order an anodic stripping voltammeter (ASV) for blood lead determinations. This instrument has been received and its operating characteristics are currently being evaluated. Measures have been instituted in the labs to reduce sources of lead contamination to an absolute minimum.

5.1.2 Data Entry

Development of data forms and chain-of-custody forms, as well as development of the data entry system are an important aspect of the analytical lab workplan. The following steps will be accomplished before Phase 1 (5/89-6/89) of the blood collection begins:

5.1.2.1

Blood chemistry data forms will be developed to accompany each blood sample and will contain comments about problems encountered during the blood drawing procedure.

5.1.2.2

A sample custody form will be provided at the clinic for sample sign out from that area. The person transporting the samples will sign over the custody of the blood samples to a laboratory technician. The technician will also sign that they have received them. Once at the laboratory, the samples will be logged into the master log book.

5.1.2.3

A within laboratory chain of custody form will be used for stored samples. They will be signed in or out, as needed for the specific analytical test to be performed.

5.1.2.4

Guidelines must be specified for recording subject information and data. A data reporting system must be established and will include assembling sample results into a laboratory notebook, entering results into a personal computer within the laboratory and transferring this to the data manager who is responsible for the compilation of all data. The final complete data file custodian has been designated to be Dr. Scott Clark.

5.1.3 Quality Control

The lab director will be responsible for development of the Blood Lead QAPP and any necessary revisions. Key aspects of the program to maintain accuracy and precision involve participation in several proficiency programs, and the use of reference and control blood samples to aid us in assuring the accuracy and precision of the PbB and FEP methods. These include samples provided by the U.S. Public Health Service, Centers for Disease Control (CDC) and the State of Pennsylvania (Pa.) which will be analyzed for blood lead (PbB) and protoporphyrin (FEP). The CDC will provide us with three unknown bloods per month per analyte, while the Pa. program provides four samples every three months per analyte. In these programs, our results are compared to the consensus values established by reference and participating laboratories. In the fall of 1987 we enrolled in a program sponsored by the College of American Pathologist in Skokie, Illinois. This proficiency program is recommended by OSHA.

In addition to these programs, several other procedures are used to validate the quality of the PbB measurements. Human blood samples, whose lead values have been previously determined by isotope dilution mass-spectroscopy (IDMS), the definitive method for lead determination, are incorporated into the analysis of the unknowns. In these instances, IDMS bloods are analyzed "blind", that is given a fictitious name. For the soil project there will be 2 analyzed per run or per 60 unkowns analyzed. In an additional check, human blood samples drawn from the same individual are split, given two different names and submitted to the lab for the complete series of analyses (field duplicate). For the soil project these will be collected at a rate of 2 individuals or 4 samples per week. Duplicate samples of two different reference bloods (8 ug/dl and 55 ug/dl) are also analyzed with each set of unkowns. Control charts documenting performance over extended intervals will be maintained for these samples.

Samples will also be sent to Environmental Sciences Associates, Inc. (ESA) for split-sample analysis (2 samples/week). Aliquots from one in every 20 samples will be labeled and frozen for later reanalysis should any questions arise regarding accuracy of Pb analyses.

All aspects of the quality control program are covered in the Blood QAPP (3/30/90)

5.1.4. Training

It is the objective of the Clinical Hematology Laboratory to establish a high degree of excellence by maintaining a high level of analytical precision and accuracy in all hematological tests. The hematological parameters to be measured in the Soil Lead Demonstration Project are blood lead (PbB), free erythrocyte protoporphyrin (FEP), hematocrit (Hct), hemoglobin (Hgb), serum iron (SFe) and total iron binding capacity (TIBC). It is realized that to achieve our goals, specimen quality, homogeniety and proper sample handling are important factors in determing the accuracy of any of the hematological tests. Therefore, training of phlebotomists and good communication between them and the laboratory staff will be established and maintained. Analytical staff training involves a progression of steps to familiarize the research assistants with both instruments and procedures. The assistants charged with carrying out various hematological assays already are experienced in many of the procedures and are familiar with the equipment. However, the specific analytical steps of sample handling and analysis as outlined in the blood QAPP will be reviewed by each research assistant, under the direction of the Lab Director prior to each blood collection and analysis phase of the project.

5.1.5 Analyses

There are five blood drawing sessions that will occur over the next 2 1/2 years with each session lasting approximately six weeks. There will be approximately 250 study subjects recruited into the project. Since each one will be seen five times, a total number of 1250 blood sample draws is projected. In addition, it is estimated that 225 family members or adults will request their blood be drawn over the course of the study. Samples that could be defined as field duplicates will be collected at a rate of 4 per week. These samples will consist of duplicate samples drawn from 2 individuals, and submitted as "blind controls or field duplicates". These will add an additional 120 samples to the total. Thus, the estimated number of samples to be analyzed over the term of the Soil Lead Demonstration Project is 1595.

It is estimated that between the phases of blood collection, all samples will be analyzed, data reported and all results re-checked. Also during this time a quality assurance report will be prepared by the laboratory director. This will include an analysis of performance data from the CDC, Pennsylvania State and CAP propficiency programs. A compilation of reference sample data for each analyte as well as the results from blind analysis will also be reported to the Quality Assurance Manager.

5.2 Soil/Dust Analysis

The primary means of assessing the lead content of soil and exterior dust will be by x-ray fluorescence spectroscopy (XRF). Mr. Paul Keers will be responsible for daily operation and maintenance of the XRF system. He will also collect, record and file all data. Ms. Sandy Roda is responsible for initial methods development and, with the assistance of Ms. Belinda Peace, development and implementation of the Soil QAPP.

Performed by:	**Laboratory Director**	**Sandy Roda**
	Laboratory Associate Director	**Belinda Peace**
	XRF Operator	**Paul Keers**
	Technical Staff	**Rose Linneman**
		John Centers

Time Period: **January 1, 1989 - August 31, 1991**

5.2.1 Laboratory Set-up

A Kevex Delta XRF Analyst System was selected as the instrument to be used for soil lead analyses. Instrument selection operating condition and quality control procedures are being established in concert with the EPA and investigators in Boston and Baltimore who are conducting similar studies.

A laboratory dedicated solely to this system has been identified. It has the necessary power supply, air filtration system, bench space, desk space and temporary sample storage space to carry out the project's work. The Kevex system was delivered in December, 1988. Preliminary analytical shakedown runs are underway. All necessary supporting lab supplies have been ordered and are in place.

5.2.2 Staff Training

Ms. Sandy Roda, who has completed a four day KEVEX training session, is finalizing laboratory procedures and operation training plans. Ms. Roda will attend a one week training workshop at the KEVEX factory in the near future.

5.2.3 Soil QAPP

Ms. Belinda Peace has developed the Soil QAPP which was submitted to EPA on April 6, 1989. The Soil QAPP documents the analytical methods and procedures to be used in this project. It will serve as the basis of staff training and will be reviewed by any and all instrument operators during the course of the study.

5.2.4 Data Reporting System

The Laboratory Director and Data Manager have developed a system of laboratory notebooks and computer files to document results of all analyses, including control samples, and an audit trail of all changes to the initial data base which indicates who, why and when changes were made while at the same time retaining a record of the original value. Similar procedures are in place throughout the project.

5.2.5 Deliverable

The soil analysis laboratory anticipates analyzing about 11,000 samples over the course of the project. Although sample will be collected in discrete "phases" (see timeline Section 1.7, Attachment B), the laboratory anticipates that sample analysis will be carried out on a more continuous basis. Interim reports will be prepared at the end of analyses associated with each phase. Quality assurance reports will be submitted to the QA Officer on a quarterly basis for inclusion in the quarterly progress report to EPA.

6.0 DATA MANAGEMENT

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6.0 Work Plan for Data Management

This work plan summarizes what has been done already and what additional data management plans await. This work plan consists of two parts. The first part is for personnel hiring and equipment purchase. The second part is a step by step plan for data management from creating data collection forms to final data analysis.

Performed by:	**Data Manager/Statistician**	**-U.-Q. Winkey Pan**
	Co-Principle Investigator	**-Robert Bornschein**
	Programmer/Data Entry	**-Chih-Yu Chen**
	Programmer/Data Entry	**-JianLiang Zhang**

Time Period: **August 20, 1988 - August 31, 1991**

6.1 Personnel and Purchase of Software and Hardware

6.1.1 Hiring and Training New Personnel

Hiring completed January 1, 1989

- -Mr. Jianliang Zhang, a graduate student in the Department of Environmental Health is identified as the project's major data entry person.
- -Miss Chen, an employee at the University of Cincinnati, will be available for programming/data entry for 10 hours per week.

Training of the above New Personnel

- -Training of basic Apple Macintosh Operation was complete by March 15, 1989.
- -Training of using basic FoxBASE and Mac skills will be complete by April 15, 1989.
- -Training in the creation of the Data base managment system and FoxBASE/Mac programming will be given when time is available.

6.1.2 Purchase of New Equipment/Supplies

Computer Hardware Purchase Completed by March 10, 1989

Evaluation of computer systems to be used in soil abatement project was completed in December, 1988.
The final choice is Apple Computer's Macintosh computer.

Two Apple Computer's Macintosh IIx with two ImageWriters were ordered in December and received early this year. These two units will be used in data base management. Six Macintosh Pluses, Image Writers and external hard disks were ordered in February 1989 for day-to-day project management use. Two external hard disks were also ordered at the same time for data base management use. The above computer equipment was purchased from a minority dealer after extensive market research.

Computer Hardware to be Purchased:

- A digitizer for a computerized geo-mapping system will be purchased by May 1, 1989.
- Two Apple computer laser printers will be purchased by May 1, 1989.

Computer Software Purchasing Completed or Ordered by March 10, 1989

Data Base Management System

A FoxBASE/Mac development system was purchased for development of a computerized database on Apple Macintosh computers. FoxBASE/Mac Run Time was also purchased for unlimited distribution of our developed database programs.
The most powerful terminal emulation software package, Versa-Term PRO, was purchased. It will be used to transfer data between Macintosh and main frame computers. Its excellent text throughput and graphic emulation will make data transfer to main frame computers easy.

Several computer utility software packages were also purchased to optimize the performance of our computer system.

Project Management

-A software package to keep track of contacts, activities, and times (C.A.T. by software publisher Chang's Lab) was purchased for project's day-to-day management.
-Two copies of Microsoft Excel/Mac were purchased for spread sheet computation, financial planning, and data entry. A copy of WordPerfect/Mac was ordered. A copy of SuperPaint was purchased. Several other software packages are under evaluation and may be purchased soon.

Geographic Information System

-The best geographic information system for personal computers PC ARC/INFO was ordered. This will be used in soil project day-to-day management and data analysis.

6.2 Data Management

6.2.1 The following is an outline of the steps and estimated time needed for each data set from its creation to finishing the final statistical analysis. A data log book and its instructions are given after this outline to track the custody of the project's data sets.

-Complete the layout of "paper" work sheet (1 day, prepared by data originator)
-Complete variables' definition (variable name, variable definition, variable length) (0.5 day, prepared by data originator)
-Complete the programming of computer screen data entry form (1-2 days)
-Complete the setup and programming of computer data entry system for a given form (1-3 days)

-Data entry, error checking, and data report (3-10 days)
-Error checking by data originator (1-3 days)
-Error correction and data report (1 day)
-Distribute entered accurate data set to each interested management team and lab, and set up the data retrieval system (.5 day)
-Convert data to ASCII file, transmit data to mainframe computer, generate reports from main frame and make backup copy of master data set. (.5 day)
-File manipulation and disk management (.25 day)
-Statistical data analysis (as needed)

6.2.2

For this project, it is estimated 5 data collection forms will be used in Subject Matters and 10 forms will be used in Abatement and Environmental Monitoring during each phase of this project. In order to have a computer data entry system ready to use for the first phase of this project, we must finish the generation of computer screen data entry forms by April 30, 1989. Based on this, we should have all the data dictionaries and all the layouts of "paper" work sheets by April 15, 1989 to generate computer screen data forms.

We will repeat the above steps over and over again during each phase of this project. The number of data collection forms may vary for different phases but the steps will be the same. In general, we should have the data dictionaries and the layouts of "paper" work sheets for each phase ready before the beginning of each phase. After the data dictionaries and all the layouts of "paper" work sheets are received by the data base manager, he can follow the above steps easily.

6.3 Attachments

A. Instructions for Log Book - Data Management

B. Example of Log Book

ATTACHMENT A

Instructions for Log Book - Data Management

1. Form
   a) Name: The name of data "work sheet", i.e., the name of data set.
   b) Part: If "all" is specified, a complete data set (all work sheets) is received for data entry. Otherwise, which part of data set is received for data entry will be given here.
   c) Phase: The phase of this project.

2. Who
   a) From: The three initials of the person who carry the raw data work sheets from data originator to data lab.
   b) To: The three initials of the person in data lab who receives the raw data work sheets.

3. Time
   a) Time: The hour and minute when the raw data work sheets are received.
   b) Date: The date when the raw data work sheets are received or, The date that a data lab member is entering a given data set.

4. Chen The last name of a data lab member
   a) From: The beginning time in a day to enter a given data set.
   b) To: The last minute and hour in a day in entering a given data set.

5. Zhang The last name of a data lab member
   a) From: The beginning time in a day to enter a given data set.
   b) To: The last minute and hour in a day in entering a given data set.

6. Pick up
   a) From: The three initials of the person in data lab who gives the data report to the data report carrier.
   b) To: The three initials of the person (report carrier) who picks up the data report from data lab and carries it to data originator (or management team).

ATTACHMENT B

LOG BOOK - DATA MANAGEMENT

	FORM		WHO		TIME		CHEN		ZHANG		PICK UP		REMARK
	Name	Part	Phase From	To	Time	Date	From	To	From	To	From	To	
1													
2													
3													
4													
5													
6													
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7.0 QUALITY ASSURANCE

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7.0 Work Plan for Quality Assurance

Quality assurance programs are used to ensure the quality and integrity of project performance. Besides the internal quality control procedures which are already in place at the soil and blood labs, several QAPPs are being prepared and submitted to EPA for approval. These QAPPs will be followed during the course of this project. The following is the work plan for quality assurance. A log book for each QA/QC visit and its instructions are given after this work plan.

Performed by:	**QA Official (interim)**	**-U.Q. Winkey Pan**
	Blood QAPP Preparation	**-Sandy Roda**
	Soil QAPP Preparation	**-Belinda Peace**
	Dust QAPP Preparation	**-Belinda Peace**

Time Period: **September 1, 1988 - August 31, 1991**

7.1 Development of QAPPs

7.1.1 Soil QAPP

The Soil QAPP was prepared by Belinda Peace. The first draft of the Soil QAPP was submitted to EPA on November 15, 1988 and the comments from EPA were received on January 19, 1989. The second revision of soil QAPP was submitted on April 5, 1989 to EPA.

7.1.2. Blood QAPP

The Blood QAPP was prepared by Sandy Roda. The first draft of the Blood QAPP was submitted to EPA on February 6, 1989 and the comments from EPA were received on February 27, 1989. The second revision of blood QAPP was submitted on March 31, 1989 to EPA.

7.1.3. Dust QAPP

The Dust QAPP is being prepared by Belinda Peace. The first draft of Dust QAPP will be submitted to EPA on April 14.

7.1.4 Air QAPP

Air QAPP is being prepared by Belinda Peace. The first draft of air QAPP will be submitted to EPA on April 21.

Other QAPPs, paint, water and etc. will be submitted to EPA when the drafts are ready. The overall time schedule for all anticipated QAPP is attached (Attachment A).

7.2 Internal Quality Control within Lab

There is a quality assurance plan to be carried out by each lab's supervisor and staff. The protocols and guidelines, which are listed in the QAPPs, are set to obtain accurate, precise, and reliable data.
The Lab supervisor is responsible in achieving QAPPs goals. For each clinic or lab, an internal monthly progress report is required and is to be submitted to the project QA official. He will review it and check to see if this report is correct and the QAPP is followed.

7.3 Quality Assurance Plan to be Carried Out by QA Official

The following visits will be done on quarterly basis to ensure that the QAPP is properly followed and the QAPP's goals are achieved.

-Field and site visit
Check if QAPP and internal quality control procedures are followed.
Check the accuracy, representativeness, and completeness of samples taken from each site.

-Clinical Visit
Check if internal quality control procedures are followed.
Check the recruitment of subjects.
Check the collection of blood samples.
Check the chain of custody of samples.

-Soil and Dust Preparation Lab Visit
Check if QAPP and internal quality control procedures are followed.
Check the chain of custody of samples.
Check if sample preparation is carefully done to prevent contamination.

-Soil and Dust Analytical Lab Visit
Check if QAPP and internal quality control procedures are followed.
Check the chain of custody samples.
Check the value of control samples.

-Blood Lab Visit
Check if QAPP and internal quality control procedures are followed.
Check the chain of custody of samples.
Check the value of control samples.

Other Visits
Other visits will be done when needed.

7.4 Report for Each Visit

A report will be prepared after each visit.

7.5 Quarterly QA Report

A quarterly report for quality assurance will be prepared and submitted to EPA.

7.6 ATTACHMENTS

A. Timetable for Quality Assurance Project Plan (QAPP)

B. Instructions for Log Book

C. Example of Log Book - QA/QC

ATTACHMENT A

Quality Assurance Project Plans (QAPPs)
for
Cincinnati Soil Lead Abatement Demonstration Project

REVISED TIMETABLE
(February 13, 1989)

LIST OF QAPPs:

Soil Sample Collection and Analysis (Soil).
Dust, Paint and Air: Includes Interior Dust Sample Collection and Analysis: surface dust, windowsill/windowwell dust, dustfall and handdust; Exterior Dust Sample Collection and Analysis; Air Sample Collection and Analysis; and Paint Sample Collection and Analysis
Blood Collection and Analysis (Blood)
Water (Water)

TIMETABLE:

QAPP	Draft Submitted	Comments Received From EPA	Revised QAPP Submitted	Approval Given
1. Soil	11/15/88	1/19/89	4/6/89	12/02/88 Sample Collection Only (4/24/89) *
2. Blood	2/6/89	2/27/89	3/30/89	(4/17/89)*
3. Dust	(4/14/89)*	(5/1/89)*	(5/5/89)*	(5/15/89)**
4. Air and Water	(4/21/89)*	(5/8/89)*	(5/15/89)*	(5/30/89)*
5. Paint	(6/1/89)*	(6/23/89)*	(6/30/89)*	(7/26/89)*

*Estimated dates
**Estimated date of approval of sampling portion of QAPP; date of approval of analysis portion could be up to one month later.

ATTACHMENT B

Instructions for Log Book - QA & QC Visit

1. LAB/SITE/CLINIC
   The lab or field site or clinic to be visited by project QA official

2. DATE
   The date of visit

3. TIME
   The time of the visit

4. BY WHOM
   The person who visits the lab/site/clinic

5. ITEM
   The items checked during the visit.
   The number of items to be checked will depend on the need of QAPP and QA official.

ATTACHMENT C

LOG BOOK - QA&QC VISIT

	LAB/SITE/CLINIC	DATE	TIME	BY WHOM	ITEM 1	ITEM 2	ITEM 2	ITEM 3	ITEM 4
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8.0 SITE SAFETY AND HEALTH PLAN (SSHP)

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8.3	TIME FRAME AND DESCRIPTION OF TASK FOR SSHP	8-4

8.0 Site Safety and Health Plan (SSHP)

OSHA's rule (29 CFR 1910.120) on Hazardous Waste Operations and Emergency Response requires that "each employer shall develop and implement a safety and health program for its employees engaged in hazardous waste operations" (b.1.). Although this demonstration project is not considered a hazardous waste operation, the SSHP follows the general requirements of that standard. The applicability of other OSHA standards (lead, construction, respiratory protection) is also considered. Additionally, the EPA requires a SSHP as a condition of financial support.

Performed by:	**Site Safety and Health Officer**	**Barb Poppe-Smith**
	Industrial Hygiene Graduate Student Assistants	**Annette Coparoz** **Don Seiler**
Time Period:	**11/88 - end of project**	

8.1 Procedure

The initial SSHP was implemented on 11/14/88 and covered personnel involved in soil sampling. As new positions are created and/or job functions change, the SSHP will be revised. Additionally, it will be revised when new facilities are added and/or when the work processes in the space are changed.

This document describes the process and procedures for review of job functions, personnel and facilities for possible inclusion in the SSHP for the Soil Lead Abatement Demonstration Project. This will determine the workplan.

Before any work commences, exclusive of administrative activities, the proposed work environment are reviewed by the Safety and Health Officer, Ms. Poppe-Smith. Ideally, this requires at least two months from receipt of materials to the onset of the job functions.

Section 8.2 describes the positions which have been reviewed and the status of each with respect to the SSHP. Section 8.3 describes the time frame and procedures for modifications of the SSHP and implementation of the revised plan.

8.2 Positions which have been reviewed for possible inclusion in the SSHP and findings of the review:

JOB TITLE	STATUS
Soil Sampling Technicians	Included, 11/14/88
Technical Trainer	Included for tasks related to soil sampling, 11/14/88
Environmental Coordinator	Included for tasks related to soil sampling, 11/14/89
Subject Recruiter	Exempted, 11/14/88
Graduate Student Research Asst. for Interior Abatement Methods	Included, 2/89
Environmental Monitors	Included, 4/89
Abatement Contractors	Under review, 4/89

8.3 Tentative time frame and description of tasks for SSHP.

Tentative Time Frame	Task
Week 1	A. Supervisor submits the following to Safety and Health Office: 1. Position description and names of employees, if known 2. Description of tasks to be performed. 3. List of potential health and safety concerns associated with the tasks. 4. Brief description of facility and equipment. 5. Timetable for implementation
Week 2	B. The Safety and Health Officer reviews the materials, meets with the supervisor, visits proposed work space and makes a recommendation to the Project Directors regarding inclusion or exemption from the SSHP.
Week 3	C. If the preliminary recommendation is to proceed, the Safety and Health Officer revises SSHP to include the proposed position and/or job functions.
Week 4	D. The revised SSHP is reviewed by Project Directors, Industrial hygiene consultant and medical consultant.
Week 5	Review Continues

Week 6	E. Revised SSHP is implemented by Project Staff. This may include: 1. Modification of work space 2. Employee Training 3. Provision of personal protective equipment 4. Medical surveillance 5. On-site reviews
Week 7	F. Concurrently, the revised SSHP is submitted to the EPA and the U.C. Safety Officer
Week 8	G. Proposed job functions can be undertaken
On-going	H. Reviews of work practices and work environment are made by the Safety and Health Officer to assure compliance with SSHP and permit modification of it. (See SSHP for complete descriptions) These may include: 1. Environmental Monitoring 2. Personal Monitoring 3. Walk-through Visits 4. Safety Meetings 5. Reports to Administrative staff