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Health and Safety Research Division

**POLLUTANT ASSESSMENTS GROUP  
PROCEDURES MANUAL  
VOLUME I:  
ADMINISTRATIVE AND SUPPORT PROCEDURES**


prepared by  
Pollution Assessments Group  
Oak Ridge National Laboratory  
Grand Junction, Colorado

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## **PREFACE**

**This manual describes procedures currently in use by the Pollutant Assessments Group. The manual is divided into two volumes: Volume 1 includes administrative and support procedures, and Volume 2 includes technical procedures. These procedures are revised in an ongoing process to incorporate new developments in hazardous waste assessment technology and changes in administrative policy. Format inconsistencies will be corrected in subsequent revisions of individual procedures.**

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## INTRODUCTION

### 1.0 PURPOSE

The purpose of the Pollutant Assessments Group Procedures Manual is to provide a standardized set of procedures documenting in an auditable manner the activities performed by the Pollutant Assessments Group (PAG) of the Health and Safety Research Division (HASRD) of the Environmental Measurements and Applications Section (EMAS) at Oak Ridge National Laboratory (ORNL).

The Procedures Manual ensures that the organizational, administrative, and technical activities of PAG conform properly to protocol outlined by funding organizations. This manual also ensures that the techniques and procedures used by PAG and other contractor personnel meet the requirements of applicable governmental, scientific, and industrial standards.

### 2.0 APPLICABILITY

The Procedures Manual describes the functions and procedures used by PAG. The manual's format and arrangement were selected to facilitate its use and to incorporate revisions as may be required. The manual is intended for use as a reference for all operations related to PAG and as a training manual. Copies of the Procedures Manual are provided to individuals having significant responsibilities in the implementation of the pertinent operations, as well as at all appropriate work stations.

### 3.0 SCOPE OF THE MANUAL

The Procedures Manual is sufficiently comprehensive for use by PAG and contractor personnel in the planning, performance, and reporting of project activities and measurements. The Procedures Manual provides procedures for conducting field measurements and includes program planning, equipment operation, and quality assurance elements.

Successive revisions of this manual will be archived in the PAG Document Control Department to facilitate tracking of the development of specific procedures.

Approved by:

Craig Little 9/20/90  
(Date)

Craig Little 9/20/90  
C.A. Little (Date)

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**PROGRAM ADMINISTRATION**

**1.0 PURPOSE**

This section describes the organizational structure developed to administer PAG projects and personnel.

**2.0 APPLICABILITY**

The program administration directs all project management activities and support functions of the PAG.

**3.0 ADMINISTRATION**

The group leader directs overall group activities and interfaces with ORNL section and division heads and outside agencies, with assistance from the program managers. The program managers coordinate project activities and funding.

The functional organizational chart is shown in Appendix 1.

**4.0 DESCRIPTION**

The following mission statement describes the goal of the PAG program:

The purpose of the ORNL Grand Junction Pollutant Assessments Group is to advance the state-of-the-art of hazardous and radiological waste site characterizations, performance assessment, and regulatory compliance verification.

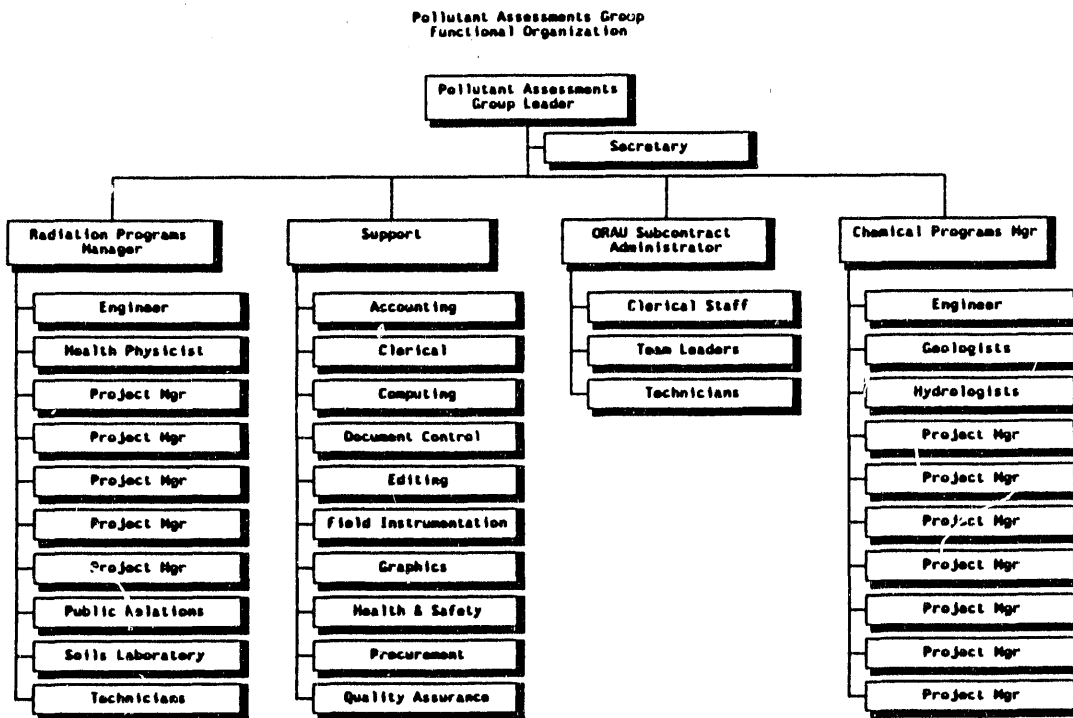
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Craig Little 9/20/90  
(Date)

Craig Little 9/20/90  
C.A. Little (Date)

Appendix 1. Functional Organizational Chart

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## PROJECT MANAGEMENT

### 1.0 PURPOSE

This section describes project organization and provides guidelines for project management.

### 2.0 APPLICABILITY

These organizational structures apply to all PAG projects.

### 3.0 ADMINISTRATION

#### 3.1 PROJECT MANAGERS

Project managers are responsible for management of specific projects, which includes the following responsibilities:

- 3.1.1 Review site-related historical records to estimate the size of the project and determine subcontractor, equipment, and personnel requirements.
- 3.1.2 Establish the project schedule and priorities, adhering to time constraints imposed by the funding agency. Include subcontractor schedules to coordinate subcontractor and field team activities.
- 3.1.3 Identify support function requirements and prepare necessary purchase orders and other documents.
- 3.1.4 Identify quality assurance requirements and prepare quality assurance plans.
- 3.1.5 Generate all plans and reports pertinent to the assigned project.
- 3.1.6 Plan and coordinate all field activities and task assignments for the project.

Approved by:

Craig Little 9/26/90  
(Date)

Craig Little 9/26/90  
C.A. Little (Date)

3.1.7 Select project personnel based on project requirements, individual expertise, and the availability of PAG and subcontractor personnel.

3.1.8 Assure project personnel are fully trained to perform their respective duties.

### 3.2 TECHNICAL PERSONNEL

Technical personnel take direction from the project manager in completing field activities and preparing project reports and graphics. Technical personnel include geologists, hydrologists, engineers, team leaders, and technicians. They may be assigned to more than one project at a time.

## 4.0 DESCRIPTION

PAG projects are administered and funded by the Department of Energy (DOE), the Department of Defense (DOD), other government agencies, and independent organizations. Some of the projects governed by this manual are described below.

### 4.1 ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT (EM)

The Department of Energy (DOE) is fully committed to the assessment and cleanup over the next 30 years of inactive facilities and sites contaminated by wastes generated from past nuclear operations connected with the major DOE program areas of (1) defense programs, (2) nuclear energy, and (3) energy research. Environmental Restoration consists of two fundamental sets of activities: (1) remedial actions, involving potential releases from inactive waste sites, and (2) decontamination and decommissioning (D&D), involving surplus facilities.

#### 4.1.1 Uranium Mill Tailings Remedial Action Project (UMTRAP)

From the early 1940s through 1970, uranium ore was processed at mills owned by private companies under contracts with the Manhattan Engineering District (MED) and the U.S. Atomic Energy Commission (AEC). As these uranium ore bodies were depleted and the demand for  $U_3O_8$  decreased, many of the mills were deactivated. Large quantities processed residue (tailings) were left behind. Following conventional metallurgical industry practices, the tailings were deposited either in ponds or in stockpiles and were allowed to dry. Dried deposits were left unprotected, allowing the wind to broadcast tailings over the surrounding area. The public was allowed access to some deposits and, as a result, some tailings were utilized as a sand substitute or as backfill material in construction projects. These

properties include residences, schools, hotels, hospitals, open land, and commercial buildings, and are referred to as "vicinity properties".

In 1972, Congress passed Public Law 92-314 to provide funds for cleanup of vicinity properties in Grand Junction, Colorado. Also in 1972, the AEC, in cooperation with the U.S. Environmental Protection Agency (EPA), initiated a program to determine the preliminary radiological status and public health effects associated with the inactive uranium mill tailings sites and all associated vicinity properties. In 1978, Congress passed Public Law 95-604, the Uranium Mill Tailings Radiation Control Act (UMTRCA), which required the federal government to perform remedial actions on inactive uranium mill tailings sites that had been used by the federal government and on each site's associated vicinity properties.

The DOE was assigned the responsibility for conducting remedial action at 24 sites, which are located in one eastern and nine western states. The DOE's responsibilities are being met through its Uranium Mill Tailings Remedial Action Project Office (UMTRA-PO) in Albuquerque, New Mexico. The UMTRA-PO is responsible for: (1) identifying candidate vicinity properties, (2) determining the extent of contamination of these properties and their eligibility for remedial action, (3) implementing remedial actions, (4) certifying that the properties have been cleaned in conformance with EPA standards (40 CFR Part 192), and (5) coordinating its activities with appropriate agencies or representatives of the state, tribal, and local governments, the U.S. Nuclear Regulatory Commission (NRC), and the DOE Division of Remedial Action Projects. Details of the UMTRA project policies and guidelines for remedial action activities are given in the Vicinity Properties Management and Implementation Manual (VPMIM). The ORNL/PAG is the Inclusion Survey Contractor for all 24 sites and is the Independent Verification Contractor for the Grand Junction, Colorado site.

#### **4.1.2 Surplus Facilities Management Project (SFMP)**

The Surplus Facilities Management Project (SFMP) was established in 1978 and originally included both civilian and defense projects. Currently, the program administers remedial action for approximately 100 DOE sites which have been declared surplus to government needs. The objectives are to sufficiently decontaminate sites so that they may be used for other purposes and to eliminate any potential hazards to public health and the environment. Waste remediated under SFMP includes tailings, rubble, low-level waste (LLW), and transuranic waste (TRU). PAG currently performs inclusion surveys and site and property verification at Monticello, Utah. PAG has

conducted surveys at the reactor at Hallam, Nebraska, also a SFMP site.

#### **4.1.3 Formerly Utilized Sites Remedial Action Project (FUSRAP)**

Formerly Utilized Sites Remedial Action Project (FUSRAP) sites were used by MED of the Atomic Energy Commission's Manhattan Project to work with nuclear materials. These sites are to be remediated for unrestricted use as practicable. Sites range in character from an ore storage facility to laboratory buildings. Vicinity properties are sometimes associated with these sites. The project is mainly concerned with LLW in the form of soil contamination and contaminated building rubble.

Most of the sites are located in the states of Missouri, New York, and New Jersey. Several groups within HASRD have worked on the FUSRAP sites in Lodi, New Jersey, and Albany, New York.

#### **4.1.4 Defense Decontamination and Decommissioning Program (D&D)**

The EM Program includes the activities of the Defense Decontamination and Decommissioning (D & D) Program. The Defense D & D Program includes approximately 220 radioactively contaminated, DOE-owned facilities remaining in the inventory that have been declared surplus to government needs. These facilities are concentrated in seven locations throughout the United States. Defense D & D facilities include such installations as production reactors, fuel reprocessing plants, laboratories, storage tanks, stacks, pipelines, waste treatment systems, solid waste disposal facilities, ponds, cribs, ditches, and areas contaminated by uranium and thorium from mill tailings. The predominant wastes to be generated by cleanup of D & D facilities are low-level waste (LLW) and mill tailings, but some transuranic waste (TRU) may also be involved.

PAG is the independent verification contractor for the Grand Junction Project Office Remedial Action Project (GJPORAP). The GJPORAP follows SFMP protocol but is administered by the D & D program.

#### **4.1.5 Environmental Restoration Program (ER)**

The DOE Environmental Restoration (ER) Program was initiated in 1987 to manage the radioactive, hazardous, and mixed waste cleanup of inactive facilities at DOE/defense sites. This program was also established to ensure that DOE/defense site cleanup activities are in compliance with regulations of the Resource Conservation and

Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

#### 4.2 INSTALLATION RESTORATION PROJECT (IRP)

The U.S. armed forces, due to its primary mission of defense of the United States, has long engaged in a wide variety of operations dealing with toxic and hazardous materials. This problem has been recognized by the Department of Defense (DOD), and action has been taken to identify the locations and contents of past disposal sites and to eliminate the hazards to public health in an environmentally sound manner. The DOD program is called the Installation Restoration Program (IRP).

Current policy for the IRP is contained in Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5, dated 11 December 1981. The IRP is defined in DEQPPM 81-5 as a four-phased program including problem identification (Phase I), confirmation (Phase II), technology development (Phase III), and planning and implementation of appropriate control measures (Phase IV).



## 6.0 PROCEDURE

- 6.1 Prepare or review the statement of work (SOW).
  - 6.1.1 If the SOW is prepared by PAG, obtain written direction from the sponsor regarding the scope and content.
  - 6.1.2 Review regulatory specifications in the SOW and related guidance documents to ensure that they are consistent.
- 6.2 After agreement with the SOW and notice to proceed are received in writing from the project sponsor, visit the site for scoping purposes.
  - 6.2.1 Make certain the sponsor agrees with the size of the site-visit (scoping) team and the duration of the site visit.
    - a. If the project location is unfamiliar and the project complex, the site visit team may require up to three members.
  - 6.2.2 The following activities shall be included in the site visit:
    - a. evaluation of space requirements, utilities, and impacts of applicable federal, state, and local regulatory requirements;
    - b. development of a general plan to accomplish the objectives of the SOW;
    - c. sketches and appropriate measurements for determining potential interferences due to terrain, weather, or site operations; and
    - d. evaluation of those facility operational procedures which may have an impact on the project.
- 6.3 Develop a detailed preliminary field plan showing numbers of samples, sampling locations and types, and analytes to be determined.
  - 6.3.1 Determine the level of support available from the on-site staff.
  - 6.3.2 Call a meeting of the following people and present the preliminary field plan for their approval:
    - a. the CPM or RPM;
    - b. project hydrologist, if applicable;
    - c. site geologist, if applicable;

- d. health physicist, if applicable;
  - e. health and safety officer; and
  - f. at least one other SPM.
- 6.3.3 If the proposed plan is approved by the assembled group or is subject to minor changes only, document the review, the changes, and the approval of the preliminary plan.
- 6.3.4 If major revisions are required, repeat all of the appropriate steps above to develop and review a new plan.
- 6.4 Develop a schedule and budget for the preliminary plan.
- 6.4.1 Use budget and scheduling software to develop and document the process.
- a. Obtain written direction from the sponsor concerning the format and software to be used.
- 6.4.2 Include the following parameters:
- a. the purpose of the field investigation,
  - b. the estimated scope of work, and
  - c. any applicable milestones.
- 6.4.3 Establish a time frame, using applicable guidance from either RCRA or CERCLA, for field investigation and reporting requirements.
- a. Some slack is built into the schedule based on the amount of time available to complete each individual task and the anticipated availability of resources during peak times (e.g., summer field work).
- 6.4.2 Assign resources on a task-by-task basis.
- a. Include a detailed explanation for each subtask and each resource in the schedule and budget.
  - b. Use an existing resource table, taken from an approved project, as a guideline.
  - c. Each resource table should be project-specific, differing for each site based on drilling contracts, laboratory contracts, etc.

- d. Any significant changes in the resource table after it has been established must be approved by the CPM or RPM and the PAG accounting supervisor.
- 6.5 Check the schedule to identify any resource or milestone conflicts and to ensure that the cost estimate is reasonable.
- 6.6 Submit the completed budget and schedule to the CPM or RPM and the PAG accounting supervisor for their written approval.
- 6.6.1 After approval, submit the budget and schedule to the sponsor.
- 6.7 Document all activities covered by this procedure and include this documentation in the project file.
- 6.7.1 Documentation for site visits includes trip reports and preliminary calculations.
- 6.7.2 Documentation also includes the following:
- a. review meetings,
  - b. budget and schedule reviews, and
  - c. all approvals from the sponsor and PAG reviewers.

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**SUPPORT ACTIVITIES**

**1.0 PURPOSE**

This section describes the support activities performed by PAG personnel.

**2.0 APPLICABILITY**

Support activities are carried out by PAG personnel for tasks requiring specialized skills or knowledge. These tasks fall under the following categories and are performed by one or more individuals within the specific support department:

- |                  |                               |
|------------------|-------------------------------|
| Public Relations | Project Management Assistance |
| Clerical         | Field Instrumentation         |
| Computer Support | Health and Safety             |
| Procurement      | Document Control              |
| Graphics         |                               |

Support activities procedures are described in Section II of this manual.

**3.0 ADMINISTRATION**

The group leader supervises the department head of each support department. The department head supervises other personnel within each support department and coordinates task assignments and schedules according to project requirements. The support staff may work on several projects at any given time and will communicate with project personnel as needed to complete support tasks. Support staff also perform ongoing overhead tasks.

**4.0 DESCRIPTION**

**4.1 PUBLIC RELATIONS**

The public relations department is the main contact between the public and the PAG especially on work for the UMTRA and SFMP projects. The public relations department handles advertising, press releases, homeowner

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Approved by:

<i>Craig Little</i> 9/24/90 _____ (Date)	<i>Craig Little</i> 9/24/90 _____ C.A. Little (Date)
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mailings, community relations plans, consent form acquisitions, and database maintenance.

#### **4.2 CLERICAL**

Clerical staff are responsible for word-processing and reproduction of PAG documents, reports, and correspondence. Clerical staff also perform various overhead administrative tasks.

#### **4.3 COMPUTER SUPPORT**

The computer support department provides hardware and software support, user assistance, network maintenance, and computer documentation for all PAG computer equipment.

#### **4.4 PROCUREMENT**

The procurement coordinator completes all purchase requests sent to Energy Systems procurement, negotiates purchases from local vendors, coordinates work requests and purchase requisitions from Chem-Nuclear Geotech, and assists project managers in preparing statements of work for subcontracts. Procurement staff are the contact between PAG project personnel and Energy Systems procurement, outside vendors, and Chem-Nuclear Geotech procurement.

#### **4.5 GRAPHICS**

Graphics includes the generation of property base maps, cross-sections, trend graphs, and diagrams needed for report completion. Drawings may be completed by project personnel or a graphics technician designated by the project manager. The graphics coordinator assures consistency in graphics standards and procedures.

#### **4.6 PROJECT MANAGEMENT ASSISTANCE**

The project management assistant maintains spreadsheets for all PAG projects showing budgeted and actual costs for work scheduled and performed. Spreadsheets content varies according to the amount of detail required by the projects. The project management assistant tracks personnel hours charged to each project on a weekly and monthly basis.

#### **4.7 FIELD INSTRUMENTATION**

The field instrumentation coordinator maintains all check sources and electronic field measurement instruments. Maintenance includes inventory,

testing, calibration, and repair. Calibration and repair of instruments may be performed by the manufacturer or Chem-Nuclear Geotech.

#### **4.8 HEALTH AND SAFETY**

Health and safety personnel assure that correct safety procedures are followed in the field, that all personnel are adequately trained in health and safety procedures, and that necessary documentation is maintained. In addition to health and safety department staff, project personnel (geologists, technicians, etc.) may be assigned the role of site safety officer and be responsible for meeting all health and safety requirements at project sites.

#### **4.9 DOCUMENT CONTROL**

The document control department manages files and documents relevant to PAG projects including archive files, correspondence, and historical data on microfiche. The document control coordinator maintains a technical reference library for use by PAG personnel.

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**QUALITY ASSURANCE**

**1.0 PURPOSE**

This section describes the integration of Quality Assurance (QA) requirements into the planning and performance of PAG activities.

**2.0 APPLICABILITY**

This QA section applies to all activities conducted by the PAG.

**3.0 ADMINISTRATION**

**3.1 GROUP LEADER**

The group leader has overall responsibility for establishing QA policies, goals, and objectives, ensuring that the PAG projects are developed adequately and are properly implemented. The group leader is assisted in fulfilling this responsibility by the PAG QA coordinator.

**3.2 PAG QA COORDINATOR**

The PAG QA coordinator is responsible for reviewing and monitoring all plans and activities developed in accordance with procedures in this manual to ensure that QA aspects have been adequately and sufficiently considered, addressed, and are in conformance with accepted ORNL QA standards, policies, and practices. The PAG QA coordinator is responsible for conduct and surveillance of the QA program.

**3.3 PROJECT MANAGERS**

Project managers are responsible for incorporating the requirements of QA planning into all activities. The manager shall verify that input data and records used are the latest available sources of information.

Approved by:

Craig Little 9/26/90  
(Date)

Craig Little 9/26/90  
C.A. Little (Date)

#### **4.0 POLICY STATEMENT**

For PAG projects, it is the policy of Martin Marietta Energy Systems, Inc. to perform technical services in accordance with standard quality assurance practices.

#### **5.0 COMMUNICATION POLICY**

During planning of activities, the project managers shall ensure that all project personnel are fully informed of their responsibilities and limitations with respect to contacting and interfacing with outside organizations, subcontractors, and civilian and administrative personnel.

##### **5.1 HASRD**

Communication with the HASRD office is administrative in nature and shall be accomplished through the EMAS head, PAG leader, or program manager. Communication with the section office is not regulated for ordinary matters, i.e. time cards, work direction, procedures, etc.

#### **6.0 PURCHASING**

The PAG leader or the procurement coordinator has the responsibility of interfacing with ORNL procurement, Chem-Nuclear Geotech procurement, subcontractors, and outside vendors.

#### **7.0 SUBCONTRACTS**

Once contractual obligations are established, contact between the PAG project manager or other designated representative and the subcontractor will consist of scheduling, ensuring that services are performed as required by the contract, and ensuring final submittal of required data and reports from the subcontractor.

#### **8.0 QUALIFICATIONS AND TRAINING**

##### **8.1 RESPONSIBILITIES**

###### **8.1.1 Program Managers**

The program managers have the following responsibilities with respect to qualifications and training of personnel assigned to PAG projects:

- a. Establish job descriptions,

- b. Ensure that the employment procedures as defined in the Martin Marietta Energy Systems, Inc. Policy Procedures Manual are followed,
- c. Maintain performance standards and measures of performance, and
- d. Designate project managers based on experience and ability.

#### 8.1.2 Project Managers

The project managers have the following responsibilities with respect to qualifications and training of personnel assigned to their projects:

- a. Obtain information regarding the qualifications of individuals performing projects work, and identify the requirements for additional training.
- b. Schedule workshops, meetings, or training sessions to ensure all pertinent project information is fully understood by all project personnel.
- c. Ensure that technical personnel develop proficiency in necessary field techniques, including equipment operation, sampling techniques, monitoring methods, decontamination procedures, documentation procedures, and QA recordkeeping and conformance.

#### 8.1.3 QA Coordinator

The PAG QA coordinator is responsible for documenting the training of all personnel. The QA coordinator shall document successful completion of training by approved forms in the personnel file.

#### 8.1.4 Technical Personnel

Technical personnel should not perform any task unsupervised unless they have been fully trained for the task. Personnel are responsible for maintaining accurate and legible field data on the applicable forms and protecting the records against loss or damage while in the field.

## 9.0 RECORDS

This procedure describes control of issuance and revision of documents, such as instructions, procedures, and drawings, that describe activities affecting the PAG programs as well as the final issued documents to the DOE or other contracting agency. When possible, all records, data, maintenance manuals, and forms used or referenced in PAG activities shall be identifiable by revision date.

### 9.1 EQUIPMENT OPERATING AND MAINTENANCE MANUALS

Equipment operating and maintenance manuals shall accompany the associated equipment whenever possible. Where this is not practical, the appropriate operating and maintenance procedures shall be provided in the Procedures Manual. As a precaution, a copy of these manuals shall also be maintained in the corresponding records files kept by the field instrumentation coordinator or other responsible manager. Sufficient data shall be recorded to ensure the ability to reorder appropriate information in the event a manual is misplaced or lost.

When changes to operating parameters or maintenance procedures are made for a piece of equipment, changes to the corresponding equipment manuals shall be made. These changes must be identified by revision date.

### 9.2 DATA COLLECTION AND REPORTING FORMS

The use of current forms shall be controlled through periodic surveillances. The project manager or appropriate supervisor shall maintain a separate file of all forms used to report PAG activities and ensure that when forms are revised, all outdated copies are removed from use or destroyed. To aid in this control, the report forms shall have the current revision date and UCN number, preferably in the lower left hand corner.

### 9.3 ARCHIVAL OF FIELD DATA

All original field data shall be copied and maintained in a separate location by the team leader or project manager. The archive files shall be maintained until the project completion or until the contracting agency directs the disposal of the archival files.

## 10.0 PROCUREMENT CONTROL

This procedure applies to items and services required to implement activities associated with the PAG projects. Most items and services are purchased

through the purchasing department of Martin Marietta Energy Systems, Inc., and the ORNL standard practices and guidelines apply. Other items and services may be purchased by Chem-Nuclear Geotech procurement after a written request is initiated by ORNL/GJ. Some items are purchased through local vendors who invoice ORNL; a petty cash request is prepared by PAG to reimburse the vendor. This procedure describes the internal PAG controls to ensure that purchased items and services conform to procurement documents.

## **10.1 RESPONSIBILITY**

### **10.1.1 Group Leader**

The group leader or his designee is responsible for ensuring that all items and services are procured according to the guidelines and standards established in the reference section of this procedure. The group leader or designee is also responsible for approving requests for the procurement of all items and services.

### **10.1.2 QA Coordinator**

The QA coordinator is responsible for reviewing nonconformance reports which document any nonconformance upon visual inspection by a responsible PAG staff member.

### **10.1.3 Procurement Coordinator**

The procurement coordinator is responsible for identifying the requirements for purchased items and services, preparing requests for purchase, obtaining necessary approvals from the PAG project manager, and ensuring the acceptability of items and services received in accordance with procurement documents for PAG projects.

## **10.2 EVALUATION OF CONFORMANCE TO PROCUREMENT DOCUMENTS**

The project manager, assisted by the QA coordinator and procurement coordinator, shall ensure that requirements for the control of purchased items and services are adequately incorporated into procurement activities associated with all projects. An overall review of purchase requests is the responsibility of the HASRD director, and is directly dependent upon established ORNL standard practices and guidelines for procurement.

Where project work requires purchased items and services, the project manager shall remain cognizant of the requirements established in procurement documents. Any deviation or departure from these requirements

shall be reported to the project manager for determination of further action in accordance with internal Martin Marietta Energy Systems guidelines. The QA coordinator may assist the project manager in this determination.

Upon arrival of any item at ORNL/Oak Ridge, procurement, identification and inspection shall be performed before shipment to the the Grand Junction office. All items other than routine office supplies shall be visually inspected by the procurement coordinator. Any nonconformance shall be reported and documented.

## **11.0 IDENTIFICATION AND CONTROL OF MATERIAL AND EQUIPMENT**

This procedure describes the requirements for ensuring the proper identification and control of materials and equipment used in the PAG projects.

### **11.1 EQUIPMENT INVENTORY**

Accountability of high quality equipment assigned to the PAG projects shall be accomplished through the use of inventory records identifying the location of the equipment. These records shall be kept by the person responsible for the equipment.

### **11.2 USE OF UNAUTHORIZED EQUIPMENT**

Improperly identified or unidentified equipment, instrumentation, and/or radioactive sources shall not be used during the performance of activities associated with PAG projects. Any deviation or departure from this requirement shall be reported to the project manager for determination of appropriate action.

### **11.3 INSPECTION, TEST AND OPERATING STATUS**

The inspection, test, and operating status of all electronic measurement equipment is maintained by the field instrumentation coordinator. Non-conforming equipment records are maintained in a separate file, and the non-conforming equipment is physically relocated where it cannot be accessed for use. Conformance testing on equipment is conducted on a regular basis. Equipment shall have stickers in place indicating the inspection schedule. Portable instrumentation is checked each day prior to use.

### **11.4 DEFICIENCIES**

A deficiency is defined as a nonconformance or departure of a characteristic from specified requirements. Deficiencies apply to equipment and

instrumentation that may be damaged, in need of modification, improperly identified, or past the due date for calibration such that the quality of associated tests, analyses, or measurements would be in question. Deficiencies also apply to processes or contracted services which are not performed in a timely or accurate manner.

## **11.5 CONTROL OF DEFICIENT ITEMS**

This section describes the methods for identifying and segregating deficient items and obtaining corrective action. It applies to equipment and instrumentation improperly identified, in disrepair, or in need of calibration.

If it cannot immediately be determined that a deficiency shall cause the quality of associated tests, analyses, or measurements to be in question, the project manager may elect to allow the continued use of the equipment or instrumentation. After repair or calibration an evaluation shall be made to determine if any retesting must be performed.

### **11.5.1 Repair of Damaged Equipment**

The field instrumentation coordinator shall determine the best and most appropriate method of repair. If repair of the item involves modification of the equipment or instrumentation, an evaluation shall be made to determine whether or not any changes to instructions contained in applicable procedures are necessary.

### **11.5.2 Lack of Identification**

If equipment or instrumentation is not properly identified, the ORNL department responsible for its issuance shall be consulted to obtain the necessary information.

### **11.5.3 Corrective Action**

Conditions adverse to quality shall be identified promptly and corrected as soon as practicable. The identification, cause, and corrective action for significant conditions adverse to quality shall be documented on the appropriate form and reported to responsible levels of management. The PAG QA coordinator shall take follow-up action to verify implementation of corrective actions.

## **12.0 SURVEILLANCES/AUDITS**

Planned audits and surveillances shall be performed internally by the PAG QA coordinator, the HASRD QA coordinator, and externally by the DOE, contracting

agency, and the ORNL Quality Department, to verify compliance with all aspects of the QA program and to determine its effectiveness. Subcontractor performance shall also be audited.

## 12.1 RESPONSIBILITY

### 12.1.1 Project Managers

The PAG project managers are responsible for conveying to all project personnel the importance of continued surveillance and monitoring of all activities to ensure that applicable procedures are followed and requirements are met.

### 12.1.2 QA Coordinator

The QA coordinator shall be responsible for the following:

- a. conducting internal audits of the PAG organization and sub-contractors;
- b. assisting the ORNL QA lead auditor in performing audits;
- c. maintaining audit logs for the PAG organization; and
- d. following up on corrective actions resulting from both internal and external audits.

## 12.2 ORNL INTERNAL AUDITS

The ORNL QA lead auditor performs regular QA audits of ORNL research and development divisions, service divisions supporting the research of ORNL projects and other service divisions that provide services for ORNL, in order to verify that the ORNL QA program is effective and to ensure compliance with the ORNL QA program and applicable procedures. Normally, one audit is conducted each month in a division, project, or facility selected by the ORNL QA director.

Audits are conducted in accordance with an announced audit plan and checklist by the ORNL QA lead auditor (chairperson) with a team composed of ORNL staff members. The audit team members are chosen by the lead auditor for their experience and knowledge of QA and/or of the activity being audited. Normally, a member of ORNL management is a member of the audit team.

Audit findings and recommendations of the audit team, as well as agreements and commitments for correction of any deficiencies, are documented by the audit team. The reports are distributed to ORNL and division management, as well as the PAG QA coordinator.

### **12.3 DIVISION INTERNAL AUDITS AND SURVEILLANCES**

The division QA coordinator performs QA audits and surveillances of activities within the division or projects to verify for the division director that the QA project is effective and to assure that the staff is complying with appropriate aspects of the division's QA procedures.

During audits, the following activities are normally documented: notification of audit, audit plan, audit checklist, audit findings, corrective action recommendations, and final summary report to division management.

Audits are normally conducted by an audit team chaired by the division or projects QA coordinator. The QA coordinator reports to the division and/or projects management and is independent of activities being audited.

Surveillances are conducted more frequently than audits. They are normally conducted by the QA coordinator on an individual basis with the responsible individuals in the group being audited.

Audits and surveillances are conducted when scheduled by the QA coordinator or when scheduled by responsible division management.

### **12.4 EXTERNAL AUDITS**

The DOE project office or other contracting agency shall conduct audits periodically with the assistance of the DOE or contracting agency's QA manager. The PAG QA coordinator shall assist in these audits and attend the post-audit meeting. The PAG QA coordinator shall also follow up on all corrective actions resulting from the audit.

### **13.0 OCCURRENCE REPORTING SYSTEM (ORS)**

All personnel must report to PAG management all events, conditions, and problems which could: 1) affect the health and safety of the public; 2) seriously impact the intended purpose of DOE facilities; 3) have a noticeable adverse effect on the environment; or 4) endanger the health and safety of workers. To comply with DOE order 5000.3A, all unusual events, conditions, and problems as noted above are now reported on the Occurrence Reporting System (ORS) form. Copies of this form are located in the PAG QA coordinator's office.

Personnel will complete and return the ORS form to their immediate supervisor, or if unavailable, the next higher level of management within 24 hours of emergency, unusual, and off-normal occurrences. Instructions for completing the ORS form and reporting the occurrence are contained in Martin Marietta Energy Systems General Policy Manual, Document GP-13, which is available in the PAG QA coordinator's office.

#### 14.0 RECORDS

Personnel should note on associated logs and records actions taken to correct deficiencies to clear any questions concerning the validity of tests, analyses, and measurements. Records shall be available for review by the QA coordinator to determine that deficiencies are properly identified and corrective action has been taken.

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: AD-051 Page: 1 of 10 Revision: 0 Date: 11/20/91
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**QUALITY ASSURANCE FOR PREEXISTING CUSTOM SOFTWARE**

**1.0 PURPOSE**

This procedure defines the requirements and responsibilities for quality assurance (QA) and control of preexisting custom software which is unclassified and nonsensitive. It is intended to ensure that acquisition and maintenance of such software is done in a traceable, auditable, and fully documented manner throughout its life cycle in accordance with ASME NQA-2a QA requirements for nuclear facility applications (Reference 3.1.1). This procedure was developed specifically for preexisting custom software by adapting pertinent sections of the Martin Marietta Energy Systems, Inc., Automated Data Processing Systems Development Methodology (Reference 3.1.2) and of ASME NQA-2a.

**2.0 APPLICABILITY**

This procedure applies to preexisting software that is customized for a specific technical purpose rather than that which is mass produced for a wide variety of applications. It does not address classified or sensitive software or software development.

**3.0 OTHER DOCUMENTS**

**3.1 REFERENCES**

- 3.1.1 *Quality Assurance Requirements of Computer Software for Nuclear Facility Applications*, ANSI/ASME NQA-2a, The American Society of Mechanical Engineers, 1990.
- 3.1.2 *Oak Ridge National Laboratory, Automated Data Processing Systems Development Methodology*, (ADP SDM) K/CSD/INF/86-3, Vol.1-R3 and Vol. 2, Oak Ridge, Tenn., 1987.
- 3.1.3 Procedure AD-050, Quality Assurance.

**4.0 DEFINITIONS**

- 4.1 **Acquisition:** procurement of software.

Approved by:

*Jack T. Talbot* 2/4/92  
\_\_\_\_\_  
(Date)

*Craig Little* 2/4/92  
\_\_\_\_\_  
C.A. Little (Date)

- 4.2 **Benchmarking:** verification of software by comparing software simulation results with results from previously verified software.
- 4.3 **Computer programming assistant:** assists the Computer Services Manager (CSM) in assignment and management of software.
- 4.4 **Computer security officer (CSO):** oversees computer and software security, including passwords.
- 4.5 **Computer services manager (CSM):** oversees procurement and assignment of computer hardware and software, works to ensure compatibility of existing and newly acquired products, and ensures that systems have adequate backup.
- 4.6 **Configuration control:** the process of identifying and defining the configuration items in a system, controlling the release and change of these items throughout the system life cycle, and recording and reporting the status of configuration items and change requests.
- 4.7 **Configuration control logbook:** a bound notebook for keeping records of configuration changes and dates, code revision number assignments, and verification test results.
- 4.8 **Custom software:** software developed to address a specific technical problem, as opposed to commercially available, wide-usage software such as word processors or data base managers.
- 4.9 **Principal investigator (PI):** has overall technical responsibility for a project.
- 4.10 **Procedural logbook:** a bound notebook documenting chronological implementation of steps taken for each software acquisition to which this procedure applies.
- 4.11 **Procurement officer:** the material requisitioner for a project.
- 4.12 **Quality control notebook:** a binder for keeping sign-off and approval letters for information submitted during quality control review of the software.
- 4.13 **Software:** computer programs, procedures, associated procedure manuals, computer source codes, and program disks.
- 4.14 **Software validation:** the testing of specific software with respect to the accuracy of decisions or assumptions incorporated into the software.

**4.15 Software verification:** the testing of specific software with respect to the accuracy of numerical algorithms.

## **5.0 EQUIPMENT AND MATERIALS**

- 5.1 Software
- 5.2 Procedural logbook
- 5.3 Configuration control logbook
- 5.4 Quality control notebook

## **6.0 RESPONSIBILITY**

6.1 The principal investigator for the project for which software is acquired is responsible for:

- 6.1.1 Defining software needs and identifying software solutions;
- 6.1.2 Ensuring that installation, testing, operation, modification, and retirement procedures for the software are correctly implemented;
- 6.1.3 Overseeing quality control procedures; and
- 6.1.4 Documenting all tasks outlined within this procedure until the software is retired or responsibilities are transferred to another PI.

6.2 The computer services manager is responsible for:

- 6.2.1 Assisting the PI with identifying software needs and
- 6.2.2 Determining the custom software's compatibility with existing hardware, the operating system, the network system, and other software that it may have to interface with.

6.3 The computer security officer is responsible for defining and overseeing software protection measures.

## **7.0 PROCEDURE**

7.1 Identify the need for software.

7.1.1 The PI examines in detail the problems or opportunities that necessitate software acquisition.

- a. Define the project's purpose, objectives, scope, and constraints in as much detail as possible.

**7.1.2 The PI performs a feasibility study by gathering information about the problem to determine potential software solutions.**

- a. Identify alternative software.**
- b. Document the technical and operational feasibility and benefits and risks of the alternatives.**
- c. Assess any current system as an alternative.**
- d. If necessary, perform an economic analysis. See Reference 3.1.1.**

**7.1.3 The PI defines software requirements.**

- a. Identify all significant requirements pertinent to:
  - 1. input/output,**
  - 2. solution techniques,**
  - 3. calculations which must be performed, and**
  - 4. documentation and testing of the software.****
- b. Define these requirements with consideration of the objectives and constraints previously identified.**

**7.2 Acquire software.**

**7.2.1 The PI issues a request stating the software name and version to the CSM.**

**7.2.2 The CSM formalizes the request through the Procurement Officer who implements appropriate procedures for acquisition.**

**7.2.3 The PI initiates the procedural logbook, preferably a bound notebook, which is used for documenting chronological steps taken for each software acquisition.**

**7.2.4 The procedural logbook includes the following:**

- a. assurance that the software is unclassified and nonsensitive;**
- b. documentation of project objectives, scope, and constraints;**
- c. identification of preliminary alternatives;**
- d. evaluation of technical and operational feasibility;**
- e. preliminary economic analysis or economic feasibility;**
- f. software requirements (code selection criteria);**

- g. hardware requirements; and
- h. vendor identification.

**7.3 Install software.**

**7.3.1 Upon arrival of the custom software, the CSO scans the custom software with a virus-detection program utility.**

- a. Record the results of this scan in the procedural logbook.

**7.3.2 The computer programming assistant documents the software in the computer department records with the following information:**

- a. software name,
- b. version,
- c. serial number,
- d. location of use, and
- e. user (to whom it is assigned).

**7.3.3 The CSO notifies the PI that the software is ready for installation.**

**7.3.4 The PI or designated person installs the software.**

- a. Make copies of the original software and use these for installation.
- b. Install software according to the software installation guide.

**7.3.5 Secure the original software by storing and protecting it from theft, loss, and environmental damage.**

- a. Store a copy of the original software on disk to be used as a backup for the installed copy.
- b. Store the original software in a location remote from the user's computer in case of fire or other catastrophic event.
- c. Control access to all copies of software to protect copyright agreements.
- d. Use software in accordance with passwords assigned to personal computers, directories, and network areas.

**7.3.6 Store user's manuals, software documentation, and source code listings in a location accessible to designated users of the software.**

- a. Do not remove these items from this location without the permission of the PI.

**7.3.7 Establish a configuration control logbook that contains all information needed to manage the configuration of the software.**

- a. Record in the configuration control logbook documentation of the software installation by entering the date of installation, the version installed, and any installation notes.
- b. This logbook should contain the name and telephone number of the PI responsible for this software and the name of the project for which it was purchased.

**7.4 Test software to confirm that the selected software satisfies the objectives and requirements defined.**

**7.4.1 Verify that the software meets the requirements specified regarding input/output, solution techniques, and desired calculations.**

- a. Verify the software's capabilities by comparing analytical solutions of the desired simulation equations for a defined problem with software output to evaluate the accuracy of numerical algorithms.
  - 1. In some cases, comparison of software simulation results with results from previously verified software, termed benchmarking, is acceptable.
  - 2. Although analytical solutions may not exist for more complicated problems, choosing a wide range of simpler test cases will improve confidence in the capability of the software being tested.
- b. Demonstrate that the software meets required input/output specifications.

**7.4.2 Validate software.**

- a. Ultimately, the acceptability of the software will be judged by how well it meets stated objectives.
- b. Test the accuracy of the decisions or assumptions incorporated into the software.

- c. If possible, compare predictions made by the software with real data to assess validity, taking into account any inherent uncertainties in the real systems from which calibration and validation data is gathered.
  - 1. Calibration data sets should not be the same as that to which the software output are compared.
- d. When real data are not available, acceptability can be improved by analysis of output by acknowledged experts in the appropriate field of interest and by benchmarking the software with software that has gained high acceptability by such experts.

**7.4.3 Document all test cases used for verification and validation.**

- a. Record the following in the procedural logbook:
  - 1. test cases used for verification,
  - 2. verification results,
  - 3. validation or benchmarking test cases, and
  - 4. validation or benchmarking results.
- b. Post a summary of verification and validation results, including benchmarking, in the configuration control logbook.
  - 1. This allows tracking of these results for each version of the software that exists.
- c. Record problems in the testing phase, indicating software errors, in the procedural logbook and report these to the PI upon discovery.

**7.4.4 Once the software has been tested, it is referred to as the baseline version.**

**7.5 Implement a configuration control process.**

- 7.5.1 Define a configuration baseline for simulation codes, input data sets, simulation results, and hardware as the tested and approved configuration.
  - a. Label each of these items so that each item is uniquely identified and configurations resulting from revisions of each item are uniquely identified.

- 7.5.2 Document changes to configuration items, including software, input data and simulation results by using the following guidelines.
- a. Software changes to a baseline version must be approved by the PI.
    1. Verify the software, with changes, as described above.
    2. Ensure that changes are properly reflected in software documentation and that the changed document is properly archived.
  - b. Changes to, or creation of new, data sets must be documented in a manner that uniquely identifies each set and corresponding simulation result set.
  - c. Simulation results will usually change with changes to the software or input data set; archive these results in a manner that clearly identifies which code version and input data set they are linked to.
  - d. Document any changes in hardware.
- 7.5.3 Record all information needed to manage a configuration in the configuration control logbook.
- a. Identify the approved configuration using a well-documented naming convention for software, data sets, and simulation results.
  - b. This logbook should be easily decipherable with respect to reflecting modifications made to the various configurations.
- 7.6 Operate and maintain the baseline version of the software.
- 7.6.1 The PI trains personnel to operate the software in order to ensure suitable proficiency.
- a. This training is performed and documented in accordance with Procedure AD-050.
- 7.6.2 Maintain existing production versions of the software to correct errors or adapt to changes in requirements or operating environments.

- a. All maintenance actions must be approved, documented, verified and validated or benchmarked, and controlled.

**7.6.3 Document operation and maintenance activities.**

- a. Record any operational problems or incidents of concern in the procedural logbook.
- b. The PI keeps any necessary written requests and approvals for maintenance actions in a specified location.
- c. Record any resulting modifications in accordance with the configuration control process outlined above.

**7.7 Retire software according to the developer's requirements and guidelines upon completion of life cycle.**

**7.7.1 Archive all documents as needed.**

**7.7.2 Ensure that the retired software is not available for unrestricted use so that future use is in accord with any applicable licensing agreements.**

**7.7.3 Document the steps taken to retire the software in the procedural logbook.**

**7.8 Periodically perform a quality control review to establish that a controlled and appropriate version is being used; that input data are correct; and that established, unique naming conventions are applied.**

**7.8.1 The PI reviews and verifies with the code user that:**

- a. a controlled and appropriate version of the code is being used as the production version;
- b. all input data sets have been verified for accuracy and so documented in the quality control notebook; and
- c. code versions, data sets, and simulation results are uniquely identified and recorded in the configuration control logbook.

**7.8.2 Document quality control procedures.**

- a. Keep quality control documentation in the form of sign-off and approval letters in a separate quality control notebook.

- 7.9 Establish a formal software problem and corrective action reporting procedure.
  - 7.9.1 Use this reporting system to promptly report problems and corrective actions in the form of letters to affected individuals and organizations.
  - 7.9.2 Describe all problems and corrective actions in the procedural logbook.

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: AD-060 Page: 1 of 6 Revision: 1 Date: 01/02/92
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## PREPARATION, CONTROL, AND DISTRIBUTION OF PROCEDURES

### 1.0 PURPOSE

This procedure outlines the structure of the Procedures Manual and provides requirements for the format and standard practices to be used in preparing, revising, distributing, and controlling the procedures in the Procedures Manual.

### 2.0 APPLICABILITY

This procedure applies to the Pollutant Assessments Group Procedures Manual and to the preparation, revision, and distribution of all procedures contained therein.

### 3.0 ADMINISTRATION

All procedures contained in the Procedures Manual require signed approval by a program manager or an appropriate department supervisor and the PAG leader.

Reviewers and editors, designated by program managers or department supervisors, are responsible for reviewing the procedures for proper integration of administrative, QA, project operational activities, and compliance.

The procedures coordinator is responsible for:

- 3.1 Processing all procedure change forms and reviewing all changes in procedures;
- 3.2 Distribution and control of all procedures contained in the Procedures Manual;
- 3.3 Issuing new numbers for procedures; and
- 3.4 Maintaining a current master file of all procedures and an index of the current revisions.

Approved by:

Craig Little 2/4/92  
(Date)

Craig Little 2/4/92  
C.A. Little (Date)

#### 4.0 DESCRIPTION

##### 4.1 PROCEDURES MANUAL FORMAT AND CONTROL

###### 4.1.1 Division of Manual

The *Procedures Manual* is divided into three sections:

a. Section I: Administrative Procedures

These procedures cover the administration of the *Procedures Manual* itself, Program Administration, Project Management, Quality Assurance, and the administration of support activities.

b. Section II: Support Procedures

These procedures cover activities such as AutoCAD and calibration of instrumentation that support the field activities described in Sect. III.

c. Section III: Technical Procedures

These procedures cover all the technical activities including field measurements, sampling, and laboratory analyses performed by the PAG.

###### 4.1.2 Procedure Identification Numbers

Procedures are numbered in the following manner, where XXX signifies sequential numbering from 001 to 999:

a. Sect. I: AD-XXX

c. Sect. II: SU-XXX.

b. Sect. III: TE-XXX

###### 4.1.3 Document and Manual Control

PAG Procedures Manuals are issued as copies of the Master *PAG Procedures Manual* to all program managers, project managers, team leaders, technicians, and other personnel with a demonstrated need. A listing of the location of each manual is kept by the procedures coordinator.

When new and/or revised procedures are issued to each manual, they are accompanied by instructions for updating the manual and also by a revised table of contents showing current procedure revisions and dates of revision. Each manual holder is responsible for maintaining a current, up-to-date manual.

## **4.2 PROCEDURE FORMAT**

### **4.2.1 Administrative Procedures**

The following format is used for all administrative sections:

- 1.0 **PURPOSE:** defines the objective of each section.
- 2.0 **APPLICABILITY:** defines the specific boundaries of each procedure and lists any exceptions.
- 3.0 **ADMINISTRATION:** specifies the individuals responsible for reviewing and implementing administrative sections.
- 4.0 **DESCRIPTION:** defines specific procedures and details related to administrative sections.

### **4.2.2 Technical Activities and Support Procedures**

The following format is used for all technical activities and support procedures:

- 1.0 **PURPOSE:** defines the objective of each procedure.
- 2.0 **APPLICABILITY:** defines the specific boundaries of each procedure and lists any exceptions.
- 3.0 **OTHER DOCUMENTS:** lists, in the following format, documents that are referred to or used in the procedure:
  - 3.1 **REFERENCES**
  - 3.2 **APPENDICES**
  - 3.3 **EXHIBITS**
- 4.0 **EQUIPMENT AND MATERIALS:** all equipment and materials that are used in performing the activity and that are referred to in the procedure are listed in the following way:

**4.1 EQUIPMENT**

**4.2 MATERIALS**

**5.0 RESPONSIBILITY:** those responsible for supervising and implementing the procedure are listed.

**6.0** Section 6.0 may be any or all of the following as needed:

**DEFINITIONS:** any words or acronyms that need to be defined to add to the clarity of the procedure.

**SAFETY:** any safety considerations that need particular attention.

**FREQUENCY:** a recurring time period for which this procedure needs to be performed (e.g., an instrument calibration).

**7.0 PROCEDURE:** the last section of the document, whether this be Section 7, 8, 9, or 10 (see Section 6.0 above), outlines the actual steps to be followed in performing the activity.

**4.2.3 Section Numbering**

Section headings will be numbered, capitalized, and bold-faced according to the following scheme:

**1.0 SECTION HEADING**

**1.1 SUBSECTION HEADING**

**1.1.1 Subsection Heading**

**a. Subsection Heading**

**1. Subsection Heading**

**4.2.4 Appendices**

Appendices are numbered sequentially as they are references in the procedure. They include tables and forms that are pertinent to the procedure.

#### **4.2.5 Exhibits**

Exhibits are numbered sequentially as they are references in the procedure. They include photographs and miscellaneous drawings that are pertinent to the procedure.

#### **4.2.6 Page Headers and Footers**

The procedure number, revision number, revision date, and page number are entered in the heading on the first page of every procedure. Approval signatures are in the footer of page one of the procedure.

### **4.3 PROCEDURE PREPARATION**

A new procedure is prepared as a draft using this procedure as a guideline. The originator ensures that all applicable requirements and correct standards and guidelines have been incorporated. The procedure is submitted to the procedures coordinator who distributes copies to all appropriate personnel for review as necessary.

### **4.4 REVISIONS**

When a procedure is changed, the person responsible for supervising the activities covered by the procedure fills out a Procedure Change Form (see Appendix 1) and submits it to the procedures coordinator. This form is inserted into the Master procedures Manual in front of the affected procedure. This form remains in the Master Manual until the final draft of the revised procedure replaces the earlier version.

One historical copy of each previous revision is retained by the procedures coordinator for each procedure.

APPENDIX 1

PROCEDURE CHANGE FORM

DATE \_\_\_\_\_

PROCEDURE # \_\_\_\_\_ REV. \_\_\_\_\_

PROCEDURE SUBJECT \_\_\_\_\_

REVISION:

(list by section and paragraph number; attach extra pages as needed)

REASON FOR CHANGE:

EFFECTIVE DATE:

APPROVAL: \_\_\_\_\_  
Return to Procedures Coordinator UCN17180 (9/90)

DATE: \_\_\_\_\_

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: SU-010 Page: 1 of 6 Revision: 0 Date: 03/25/91
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## CONTROL OF RADIOACTIVE SOURCES

### 1.0 PURPOSE

This procedure specifies the requirements for control of radioactive sources including handling, storage, and accountability.

### 2.0 APPLICABILITY

This procedure applies to the control of all radioactive sources used by PAG personnel for instrument calibration and field checking. These sources are subject to the federal regulations listed in Reference 3.1.1.

### 3.0 OTHER DOCUMENTS

#### 3.1 REFERENCES

- 3.1.1 Code of Federal Regulations (1989), Title 10 CFR Part 20 "Standards for Protection Against Radiation."

#### 3.2 APPENDICES

- 3.2.1 Appendix 1: Quantities for Determining Exempt and Nonexempt Radioactive Sources

### 4.0 EQUIPMENT AND MATERIALS

None

### 5.0 RESPONSIBILITY

- 5.1 All persons using radioactive sources are responsible for the handling, storage, and accounting practices listed in this procedure.

- 5.1.1 It is the responsibility of all personnel to report any off-normal occurrence involving radioactive sources to their supervisor and the ORNL/PAG safety officer.

Approved by:

W. J. K. Halford 3/19/91  
(Date)

Craig Little 3/20/91  
C.A. Little (Date)

5.2 The ORNL source custodian issues sources, inventories sources and maintains an inventory list, arranges leak-tests for sources, and stores nonissued sources.

5.3 The field source custodian checks out a source from the ORNL source custodian and is responsible for the source until its return.

5.4 The ORNL/PAG safety officer reports any unusual or off-normal occurrence concerning radioactive sources to ORNL-HASRD and to the Geotech Environmental and Radiation Protection (E&RP) Radiation safety officer.

## 6.0 DEFINITIONS

6.1 **Exempt sources:** sources that have activity equal to or less than that specified in Appendix 1.

6.2 **Nonexempt sources:** sources that have activity greater than the levels listed in Appendix 1.

6.3 **Radioactive source:** radioactive material that is manufactured, using a man-made or enhanced radioactive isotope, for the purpose of calibrating or checking the operation of various electronic measuring devices. This does not include reference materials, samples, or reagents.

6.4 **Sealed source:** a discrete amount of radioactive material that is (a) bonded wholly within an inactive material, (b) sealed in an inactive container or capsule, or (c) plated on an inactive material in order to prevent dispersion of the radioactive material during routine use.

## 7.0 PROCEDURE

### 7.1 LABELING

7.1.1 All nonexempt radioactive sources have a unique identification number.

7.1.2 Radioactive sources (except depleted uranium sources used for field surveys) are labeled with the radiation symbol, isotope, and activity.

- a. The radiation symbol may be on the container in which the source is kept rather than on the source itself.

### 7.2 HANDLING

7.2.1 Do not eat, drink, smoke, or chew while handling radioactive sources.

**7.3 STORAGE**

7.3.1 Store all radioactive sources in the instrumentation office cabinet unless in use or permanently affixed to an instrument.

a. The ORNL source custodian controls access to the storage cabinet.

7.3.2 Sources assigned to team leaders for field use are kept in a locked drawer in the field van.

7.3.3 Lock the system check sources for the Opposed Crystal System (OCS) van in the source pig (lead-lined container) of the van when not in use.

**7.4 ACCOUNTABILITY**

7.4.1 All sources must be controlled in such a way that they may be accounted for at all times.

7.4.2 Sources checked out from the ORNL source custodian are documented when removed from the storage cabinet and when returned.

a. A source inventory data base is kept by the ORNL source custodian.

b. Any person checking out a source from the ORNL source custodian becomes a field source custodian and is responsible for that source.

**7.5 DISPOSAL**

7.5.1 Dispose of radioactive sources according to the regulations outlined in Reference 3.1.1

**7.6 LEAK TESTING**

7.6.1 The ORNL source custodian delivers nonexempt sources to Chem-Nuclear Geotech at least once every 6 months for leak-testing.

**7.7 RECORDS**

7.7.1 The ORNL source custodian keeps an inventory record showing assigned location of each radioactive source, field source custodian, and date of last inventory.

7.7.2 An inventory of ORNL/PAG radiation sources is transferred to the Geotech source custodian upon request.

**7.8 TRAINING**

7.8.1 All employees who handle radioactive sources are trained on the job.

7.8.2 Employees using nonexempt sources are provided with source-handling training by the ORNL source custodian.

## Appendix 1. Quantities for Determining Exempt and Nonexempt Radioactive Sources

<u>Material</u>	<u>Microcuries</u>	<u>Material</u>	<u>Microcuries</u>
Americium-241	0.01	Indium-115m	100
Antimony-122	100	Indium-115	10
Antimony-124	10	Iodine-125	1
Antimony-125	10	Iodine-126	1
Arsenic-73	100	Iodine-129	0.1
Arsenic-74	10	Iodine-131	1
Arsenic-76	10	Iodine-132	10
Arsenic-77	100	Iodine-133	1
Barium-131	10	Iodine-134	10
Barium-133	10	Iodine-135	10
Barium-140	10	Iridium-192	10
Bismuth-210	1	Iridium-194	100
Bromine-82	10	Iron-55	100
Cadmium-109	10	Iron-59	10
Cadmium-115m	10	Krypton-85	100
Cadmium-115	100	Krypton-87	10
Calcium-45	10	Lanthanum-140	10
Calcium-47	10	Lutetium-177	100
Carbon-14	100	Manganese-52	10
Cerium-141	100	Manganese-54	10
Cerium-143	100	Manganese-56	10
Cerium-144	1	Mercury-197m	100
Cesium-131	1,000	Mercury-197	100
Cesium-134m	100	Mercury-203	10
Cesium-134	1	Molybdenum-99	100
Cesium-135	10	Neodymium-147	100
Cesium-136	10	Neodymium-149	100
Cesium-137	10	Nickel-59	100
Chlorine-36	10	Nickel-63	10
Chlorine-38	10	Nickel-65	100
Chromium-51	1,000	Niobium-93m	10
Cobalt-58m	10	Niobium-95	10
Cobalt-58	10	Niobium-97	10
Cobalt-60	1	Osmium-185	10
Copper-64	100	Osmium-191m	100
Dysprosium-165	10	Osmium-191	100
Dysprosium-166	100	Osmium-193	100
Erbium-169	100	Palladium-103	100
Erbium-171	100	Palladium-109	100
Europium-152 9.2 h	100	Phosphorus-32	10
Europium-152 13 yr	1	Platinum-191	100
Europium-154	1	Platinum-193	100
Europium-155	10	Platinum-193m	100
Fluorine-18	1,000	Platinum-197m	100
Gadolinium-153	10	Platinum-197	100
Gadolinium-159	100	Plutonium-239	0.01
Gallium-72	10	Polonium-210	0.1
Germanium-71	100	Potassium-42	10
Gold-198	100	Praseodymium-142	100
Gold-199	100	Praseodymium-143	100
Hafnium-181	10	Promethium-147	10
Holmium-166	100	Promethium-149	10
Hydrogen-3	1,000	Radium-226	0.01
Indium-113m	100	Rhenium-186	100
Indium-114m	10	Rhenium-188	100
		Rhodium-103m	100

## Appendix 1. (continued)

<u>Material</u>	<u>Microcuries</u>	<u>Material</u>	<u>Microcuries</u>
Rhodium-105	100	Tellurium-129	100
Rubidium-86	10	Tellurium-131m	10
Rubidium-87	10	Tellurium-132	10
Ruthenium-97	100	Terbium-160	10
Ruthenium-103	10	Thallium-200	100
Ruthenium-105	10	Thallium-201	100
Ruthenium-106	1	Thallium-202	100
Samarium-151	10	Thallium-204	10
Samarium-153	100	Thorium (natural)	100
Scandium-46	10	Thulium-170	10
Scandium-47	100	Thulium-171	10
Scandium-48	10	Tin-113	10
Selenium-75	10	Tin-125	10
Silicon-31	100	Tungsten-181	10
Silver-105	10	Tungsten-185	10
Silver-110m	1	Tungsten-187	100
Silver-111	100	Uranium (natural)	100
Sodium-24	10	Uranium-233	0.01
Strontium-85	10	Uranium-234-Uranium-235	0.01
Strontium-89	1	Vanadium-48	10
Strontium-90	0.1	Xenon-131m	1,000
Strontium-91	10	Xenon-133	100
Strontium-92	10	Xenon-135	100
Sulphur-35	100	Ytterbium-175	100
Tantalum-182	10	Yttrium-90	10
Technetium-96	10	Yttrium-91	10
Technetium-97m	100	Yttrium-92	100
Technetium-97	100	Yttrium-93	100
Technetium-99m	100	Zinc-65	10
Technetium-99	10	Zinc-69m	100
Tellurium-125m	10	Zinc-69	1,000
Tellurium-127m	10	Zirconium-93	10
Tellurium-127	100	Zirconium-95	10
Tellurium-129m	10	Zirconium-97	10

Any alpha emitting radionuclide not listed here or mixtures of alpha emitters of unknown composition: 0.01 microcuries

Any radionuclide other than alpha emitting radionuclides not listed here or mixtures of beta emitters of unknown composition: 0.1 microcuries

Source: Title 10 CFR Part 20, Appendix 3

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: SU-020 Page: 1 of 3 Revision: 0 Date: 10/01/90
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## CALIBRATION OF PORTABLE GAMMA SCINTILLATION DETECTORS

### 1.0 PURPOSE

The purpose of this procedure is to provide a method for the laboratory calibration, field check, and on-site cross-calibration of portable gamma scintillation detectors.

### 2.0 EQUIPMENT AND MATERIALS

- 2.1 Portable Gamma Scintillation Detector (Victoreen Model 490 THYAC III) Ratemeter with 489-55 NaI(Tl) scintillation probe.
- 2.2 Pressurized Ionization Chamber (PIC)
- 2.3 Depleted uranium check source (approximately 21,000 gross cpm using portable gamma scintillation detector).

### 3.0 CALIBRATION FREQUENCY

Primary laboratory calibration will be performed every six months and immediately following any significant adjustment to or maintenance of the instrument. A field operation check is performed daily during use. On-site cross-calibration of instrument readings with PIC exposure rate measurement is performed as necessary.

### 4.0 APPLICABLE STANDARDS

- 4.1 ANSI N323-1978, Radiation Protection Instrumentation Test and Calibration (for guidance only).

### 5.0 PROCEDURE

#### 5.1 LABORATORY CALIBRATION

- 5.1.1 The electronics technician shall collect the instrument and take it to the UNC Electronics Shop for calibration.

Approved by:

Wayne K. Hester 9/20/90  
(Date)

Craig Little 9/19/90  
C.A. Little (Date)

- 5.1.2 Following calibration and upon receipt of the instrument, the electronics technician will verify the instrument identification and probe numbers and that UNC has affixed a calibration tag to the instrument.
- 5.1.3 The electronics technician will enter into the instrument calibration logbook the location, status, date, date of calibration, and date of next calibration.
- 5.1.4 The electronics technician will also enter the above data into the Instrument Inventory and Calibration Control (IICC) computer program as documented in the IICC manual.

## **5.2 FIELD CHECK**

- 5.2.1 Check battery condition by setting range switch to "BAT" position and observing THYAC III meter. Indicator should be in "Battery check" region or battery replacement is mandatory. (See Instruction Manual for Model 490, THYAC III).
- 5.2.2 Set Response switch to "MEDIUM" position and the Range switch to appropriate position (maximum upscale deflection without going off scale).
- 5.2.3 Determine background level and record background cpm in the field van logbook. This is usually done at a reference site for the area to be surveyed.
- 5.2.4 Place probe in contact with the depleted uranium check source and read gross cpm.
- 5.2.5 The net cpm reading must be within laboratory accepted limits (approximately  $\pm 20\%$ ) of the reading taken during the previous field check.
- 5.2.6 If the reading obtained is within the acceptable range, the instrument is now ready for use. If the reading is out of the acceptable range, change batteries and repeat steps 5.2.4 through 5.2.5. If the reading is still out of acceptable range, return the instrument to the PAG electronics technician for repair and recalibration.
- 5.2.7 Enter in the field van logbook the instrument number, source number, net cpm, date, location at which check was made, and initials of person making the check.

### **5.3 CROSS-CALIBRATION WITH PIC (SITES OUTSIDE GRAND JUNCTION)**

- 5.3.1 Set up PIC at an outdoor location that should provide background radiation only.
- 5.3.2 Perform PIC field check according to Procedure SU-021, "Calibration of Pressurized Ionization Chamber".
- 5.3.3 Hold portable gamma scintillator at a height of six inches above the ground. Record gamma scintillator reading in cpm.
- 5.3.4 Place the PIC with the handle up directly on the spot measured with the scintillator, with #1 side position oriented to the north.
- 5.3.5 Record PIC reading in  $\mu\text{R/h}$ .
- 5.3.6 Record data in field van logbook.
- 5.3.7 Repeat the above steps for an indoor location, if necessary.
- 5.3.8 Calculate cross-calibration factor for each location.

### **5.4 LOGBOOK ENTRIES**

All logbook entries should be made in the appropriate logbook in accordance with this procedure and Procedure SU-010, "Radiological Equipment, Inventory, Control, and Maintenance".

The Instrument Inventory and Calibration Control (IICC) computer program is used by the electronics technician to provide automated backup to the instrument calibration logbook. Its use is documented in the Instrument Inventory and Calibration Control Procedures manual located in the instrumentation office.

### **5.5 SYSTEM ADJUSTMENTS**

- 5.5.1 High voltage may be adjusted only by the electronics technician.

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**CALIBRATION OF PRESSURIZED IONIZATION CHAMBER (PIC)**

**1.0 PURPOSE**

The purpose of this procedure is to provide a method for the laboratory calibration and field check of pressurized ionization chambers.

**2.0 EQUIPMENT AND MATERIALS**

2.1 A Reuter-Stokes RSS-111, Area Monitoring System (PIC).

**3.0 CALIBRATION FREQUENCY**

Primary laboratory calibration will be performed biannually by UNC. No field calibration is performed; field operational check is performed before each use.

**4.0 APPLICABLE STANDARDS**

4.1 ANSI N323-1978, Radiation Protection Instrumentation Test and Calibration (for guidance only).

**5.0 PROCEDURE**

**5.1 LABORATORY CALIBRATION**

- 5.1.1 The electronics technician shall notify the team leader to whom the instrument has been assigned that it is due for calibration.
- 5.1.2 The electronics technician shall take it to the UNC Electronics Shop for calibration.
- 5.1.3 Following calibration and upon receipt of the instrument, the electronics technician will verify the instrument identification and probe numbers and that the calibration facility has provided adequate calibration data on the instrument.

Approved by:

Robert K. Helms 9/20/90  
(Date)

C.A. Little 9/19/90  
C.A. Little (Date)

- 5.1.4 The electronics technician will enter into the instrument calibration logbook the location, status, date, date of calibration, and date of next calibration.
- 5.1.5 The electronics technician will also enter the above data into the Instrument Inventory and Calibration Control (IICC) computer program as documented in the IICC manual.

## 5.2 FIELD CHECK

- 5.2.1 This is a battery check only. Electronics technician responsible for periodic check source tests.

NOTE: Make sure all switches are in "OFF" position before connecting or disconnecting cable.

- 5.2.2 Test 300 V dry cell by turning on DISPLAY/RECORDER switch, turn ELECTROMETER switch to zero, MODE switch to "BATT" position, and simultaneously press PUSH TO READ and 300 V push buttons. The percentage of charge status will appear on digital display. If the charge falls below 85%, return instrument to electronics technician.
- 5.2.3 Test -14, +14, and +12 batteries by depressing each of the three push buttons marked -14, +14, and +12 and noting the meter indication on one of the three meters immediately above the push button. If meter indicator is in or near the shaded area of the meter, recharge batteries according to paragraph 4.2 of Reuter Stokes Rss-111 Area Monitor System Operational Manual.

## 5.3 LOGBOOK ENTRIES

All logbook entries should be made in accordance with this procedure and Procedure SU-010, "Radiological Equipment, Inventory Control, and Maintenance."

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: SU-022 Page: 1 of 8 Revision: 1 Date: 12/02/91
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## CALIBRATION OF SOIL LABORATORY GAMMA SPECTROMETRY SYSTEM

### 1.0 PURPOSE

This procedure outlines the steps for calibration of the soil laboratory gamma spectroscopy system.

### 2.0 APPLICABILITY

This procedure applies to the ND-66 gamma spectroscopy system used in the PAG soils analysis laboratory for the analysis of radionuclides in soils.

### 3.0 OTHER DOCUMENTS

#### 3.1 REFERENCES

- 3.1.1 *ND66/76 Multichannel Analyzer/Remote Terminal Operator's Manual, 07-0182, Nuclear Data Instrumentation, Schaumburg, Ill., 1984.*
- 3.1.2 *Instrument Inventory and Calibration Control Instructions, unpublished.*

#### 3.2 APPENDICES

- 3.2.1 Quarterly Calibration

### 4.0 EQUIPMENT AND MATERIALS

#### 4.1 EQUIPMENT

- 4.1.1 ND-66 NaI(Tl) well detector system
- 4.1.2 <sup>226</sup>Ra standard reference materials:
  - a. 5.12 ± 0.2 pCi/g
  - b. 15.12 ± 0.45 pCi/g
  - c. 50.2 ± 1.57 pCi/g

Approved by:

*Jack K. Helfrich* 12/6/91  
(Date)

*Craig Little* 12/6/91  
C.A. Little (Date)

- 4.1.5  $^{232}\text{Th}$  standard reference material
- 4.1.6 Spectrum storage disk
- 4.1.7 Empty sample container for background determination
- 4.1.8 Soil analysis logbook
- 4.1.9 Instrument calibration logbook
- 4.1.10 IBM-PC computer

## 4.2 MATERIALS

- 4.2.1 Rad-Con™ or similar radioactive decontaminant spray
- 4.2.2 Paper towels

## 5.0 RESPONSIBILITY

- 5.1 The extended measurements coordinator is responsible for supervising all laboratory personnel and ensuring that all procedures are followed.
- 5.2 The soils laboratory technician is responsible for performing all calibrations and documenting the calibration data.
- 5.3 The electronics technician is responsible for overseeing total system calibration on both an emergency and quarterly basis. (See Appendix 1.)

## 6.0 DEFINITIONS

- 6.1 **ADC:** analog to digital converter; electronic equipment which sorts the pulses received from the amplifier.
- 6.2 **Counting accuracy check:** comparison of results calculated from counting a standard reference material to the known concentration of that standard.
- 6.3 **Detector:** sodium iodide (NaI) crystal used to detect photon emissions from unstable radioactive samples.
- 6.4 **Efficiency calibration:** adjustment of the ND-66 system to set the measured counts equivalent to the known concentration of a standard reference material.
- 6.5 **Energy calibration:** adjustment of the ND-66 system to ensure the correct channel number lies at the corresponding energy and that the energy to channel relationship is linear.

## **7.0 FREQUENCY**

### **7.1 Perform an energy calibration:**

- 7.1.1 at the start of a counting session,**
- 7.1.2 when system operation is suspect, and**
- 7.1.3 immediately following maintenance or adjustment of the instrument.**

### **7.2 Perform an efficiency calibration once a week after the first energy calibration for that week.**

### **7.3 Perform a counting accuracy check:**

- 7.3.1 after the efficiency calibration,**
- 7.3.2 after the energy calibration,**
- 7.3.3 after every seventh cycle of samples through the three lead pig counting systems, and**
- 7.3.4 whenever system operation is suspect.**

### **7.4 Notify Geotech electronics laboratory personnel and/or the electronics technician that the system needs recalibration when operation is suspect.**

## **8.0 SAFETY**

### **8.1 Do not eat, drink, or smoke in the soils analysis laboratory.**

### **8.2 Wear a thermoluminescent detector (TLD) at all times while working in the soils analysis laboratory.**

## **9.0 PROCEDURE**

### **9.1 Initialize the ND-66 system.**

#### **9.1.1 Enter the system password.**

#### **9.1.2 The main menu will appear. Enter the correct time and date.**

#### **9.1.3 Select option 1, "Soils Program."**

#### **9.1.4 After the acknowledgement header is displayed, press any key, and the next menu will appear.**

#### **9.1.5 Select option 1, "Initialize ND."**

- 9.1.6 Press any key to advance the interface routine between the user's terminal and the ND-66.
  - 9.1.7 Notice the ND-66 display. This subroutine enters the correct date, time, channels, regions of interest, and count time. If all data have been accepted, the program will return to the main menu.
  - 9.1.8 If any piece of data is missing from the ND-66 display, select option 1, "Initialize ND" again. Repeat this step until all data is accepted.
- 9.2 Perform the energy calibration.
- 9.2.1 Clean the lead pigs with Rad-Con and a clean paper towel.
  - 9.2.2 Place a  $^{40}\text{K}$  standard in pig 1.
  - 9.2.3 Begin data acquisition using procedures described in "Keyboard Commands," Reference 3.1.1.
  - 9.2.4 Set cursor at channel 243.
  - 9.2.5 Observe gamma spectrum on the monitor.
  - 9.2.6 Adjust the "fine gain" control on the front panel of the amplifier for ADC #1 so that the 1.460 MeV gamma peak is centered on the cursor (channel 243).
  - 9.2.7 Remove the  $^{40}\text{K}$  standard from the pig and place a  $^{137}\text{Cs}$  standard in pig 1.
  - 9.2.8 Set cursor at channel 111.
  - 9.2.9 Observe gamma spectrum on the monitor.
  - 9.2.10 Check to see that the 0.661 MeV gamma peak is at  $111 \pm 1$  channel.
  - 9.2.11 Adjust the fine gain control if needed.
  - 9.2.12 If the peak is still not within the given channel ranges, notify the PAG electronics technician.

9.2.13 Repeat the above steps for pigs 2 and 3 and their corresponding amplifiers.

9.3 Perform the efficiency calibration.

9.3.1 Place the spectrum storage disk in the B: drive.

9.3.2 Place the empty sample container for background determination in pig 1.

9.3.3 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.

9.3.4 Choose option 2, "Background and Reference Menu."

9.3.5 Choose option 1, "Background."

9.3.6 When data acquisition has ceased, press 1 on the keyboard for pig 1. The spectral data is automatically stored on disk. The background and reference menu will appear.

9.3.7 Place the  $^{226}\text{Ra}$  50.1 pCi/g standard in the detector.

9.3.8 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.

9.3.9 Choose option 2, "Radium reference."

9.3.10 When data acquisition has ceased, press 1 on the keyboard for pig 1. The  $^{226}\text{Ra}$  reference table will appear on the screen.

9.3.11 Input the following data:

- a. Sample weight \_\_\_\_ g
- b.  $^{226}\text{Ra}$  50.1 pCi/g
- c.  $^{232}\text{Th}$  0.0 pCi/g
- d.  $^{40}\text{K}$  0.0 pCi/g

9.3.12 Press return to bring up the background and reference menu.

9.3.13 Place the  $^{232}\text{Th}$  standard in the detector.

9.3.14 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 board.

- 9.3.15 Choose option 3, "Thorium reference."
- 9.3.16 When data acquisition has ceased, press 1 on the keyboard for pig 1. The  $^{232}\text{Th}$  reference table will appear on the screen.
- 9.3.17 Input the following data:
- Sample weight \_\_\_\_\_ g
  - $^{226}\text{Ra}$  1.24 pCi/g
  - $^{232}\text{Th}$  71.2 pCi/g
  - $^{40}\text{K}$  1.87 pCi/g
- 9.3.18 Press return to bring up the background and reference menu.
- 9.3.19 Place the  $^{40}\text{K}$  standard in the detector.
- 9.3.20 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.
- 9.3.21 Choose option 4, "Potassium reference."
- 9.3.22 When data acquisition has ceased, press 1 for pig 1.
- 9.3.23 The  $^{40}\text{K}$  reference table will appear on the screen. Input the following data:
- Sample weight \_\_\_\_\_ g
  - $^{226}\text{Ra}$  0.617 pCi/g
  - $^{232}\text{Th}$  0.368 pCi/g
  - $^{40}\text{K}$  104.6 pCi/g
- 9.3.24 Repeat the steps above for pigs 2 and 3.
- When data acquisition is complete, enter 2 or 3 for the appropriate pig.
- 9.3.25 Upon completion of efficiency calibration, press any key to return to the main menu.
- 9.4 Perform a counting accuracy check for each detector.
- 9.4.1 Enter the sample analysis mode by selecting option 3 on the main menu. Upon entering this mode, the printer will print a sample header.

- 9.4.2 Place a  $^{226}\text{Ra}$  15 pCi/g standard in pig 1.
- 9.4.3 Begin data acquisition by pressing the acquire and initialize keys on the ND-66 keyboard.
- 9.4.4 When data acquisition has ceased, press 1 on the keyboard for pig 1. The spectral data will be printed on the screen and the data is automatically stored on disk.
- 9.4.5 The user is prompted for sample information. Notice that at the top of the screen the sequence number is displayed along with the current reference file number. Input all data requested, naming the sample Ra-15.
- 9.4.6 When asked whether the data are ok, type "Y" to continue execution of the program. Any other response will return the user to the first requested data input.
- 9.4.7 The sample concentration will appear on the screen. Record the result in the soil analysis logbook.
- 9.4.8 The  $^{226}\text{Ra}$  15 pCi/g concentration should lie within approximately  $\pm 0.5$  pCi/g.
- 9.4.9 Repeat the above steps for the  $^{226}\text{Ra}$  5 pCi/g standard. Name the sample Ra-5.
- 9.4.10 The  $^{226}\text{Ra}$  5 pCi/g concentration should lie within approximately  $\pm 1.0$  pCi/g.
- 9.4.11 Repeat the above steps for pigs 2 and 3.
- 9.4.12 If both standards fall within the guidelines, begin sample analysis.
- 9.4.13 If the value for either standard falls outside the guidelines repeat the energy and efficiency calibrations.

Appendix 1. Quarterly Calibration

1. Every 3 months the electronics technician notifies the Chem-Nuclear Geotech electronics laboratory that calibration is due.
2. Chem-Nuclear Geotech personnel perform zero intercept, high-voltage settings, initial amplifier settings, and other adjustments by using procedures described primarily in the ND-575 Operating Manual. Other maintenance is performed according to device-specific procedures.
3. The Chem-Nuclear Geotech electronics laboratory maintains an electronics maintenance logbook for the PAG soil counting system.
4. The electronics technician:
  - a. checks the Chem-Nuclear Geotech data sheet for accuracy,
  - b. files it in calibrated instrument file, and
  - c. enters the status, date, date of maintenance, and date of next maintenance into the instrument calibration logbook.
5. The electronics technician enters the above data into the Instrument Inventory and Calibration Control (IICC) computer program as described in the IICC manual.

<b>OAK RIDGE NATIONAL LABORATORY</b> Health & Safety Research Division	<b>PROCEDURE</b>  Pollutant Assessments Group	Number: SU-025 Page: 1 of 11 Revision: 1 Date: 02/03/92
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## QUALITY CONTROL OF SOIL ANALYSIS LABORATORY SAMPLES

### 1.0 PURPOSE

The purpose of this procedure is to describe the quality control measures used by the PAG soil analysis laboratory.

### 2.0 APPLICABILITY

This procedure applies to the PAG soil analysis laboratory.

### 3.0 OTHER DOCUMENTS

#### 3.1 REFERENCES

- 3.1.1 Procedure TE-026, Beta-Gamma Radiation Measurement.
- 3.1.2 Procedure SU-022, Calibration of Soil Laboratory Gamma Spectrometry System.

#### 3.2 APPENDICES

- 3.2.1 Appendix 1: Soil Quality Check Form
- 3.2.2 Appendix 2: Request for Analytical Services
- 3.2.3 Appendix 3: Chain of Sample Custody/Soil Sample Analysis Form
- 3.2.4 Appendix 4: Contamination Survey Form

### 4.0 EQUIPMENT AND MATERIALS

#### 4.1 EQUIPMENT

- 4.1.1 Soils laboratory computer system
- 4.1.2 Beta-gamma probe

#### 4.2 MATERIALS

- 4.2.1 Soil analysis laboratory logbook
- 4.2.2 Soil quality control notebook

Approved by:

Jack K. Halford 2/3/92  
(Date)

Craig Little 2/4/92  
C.A. Little (Date)

- 4.2.3 Soil quality check forms
- 4.2.4 Chem-Nuclear Geotech soil ticket number booklet
- 4.2.5 Rad wipes
- 4.2.6 Sample containers

## 5.0 RESPONSIBILITY

5.1 The extended measurements coordinator is responsible for:

- 5.1.1 Reviewing the monthly sample set results;
- 5.1.2 Directing corrective action for samples that fail the computer analysis of the cross-check results;
- 5.1.3 Informing project managers of suspect analysis results.

5.2 The soils laboratory technician is responsible for:

- 5.2.1 Selecting samples for cross-check analysis;
- 5.2.2 Preparing samples for analysis by the Chem-Nuclear Geotech environmental laboratory;
- 5.2.3 Entering the cross-check analysis results in the database;
- 5.2.4 Performing the computer analysis of the cross-check data, using the true-false test and the paired t-test.

## 6.0 DEFINITIONS

6.1 **Cross-check:** refers to having samples analyzed by two independent laboratories or methods to determine validity or accuracy of results.

## 7.0 FREQUENCY

7.1 Send a minimum of 5% of analyzed soil samples to the Chem-Nuclear Geotech environmental laboratory for cross-check analysis monthly.

## 8.0 PROCEDURE

8.1 Select cross-check samples.

- 8.1.1 Choose at least one sample from each well-crystal system used each day.

- 8.1.2 Select a representative sample from the low, medium, and high pCi/g ranges for each day.
- 8.1.3 Note the analyzed samples selected for cross-check in the comments column of the soil analysis laboratory logbook and on the Soil Quality Check Form. (See Appendix 1.)
- 8.2 Store in a container separate from other samples.
- 8.3 At the end of the month, prepare the samples for shipment to the Chem-Nuclear Geotech (hereafter called Geotech) environmental laboratory for cross-check analysis.
  - 8.3.1 To provide a laboratory identification number, assign each sample a Geotech soil ticket number from the soil ticket booklet provided by Geotech.
  - 8.3.2 Fill out a Geotech Request for Analytical Services (Appendix 2).
  - 8.3.3 Fill out a Chain of Sample Custody/Soil Sample Analysis Form (Appendix 3).
  - 8.3.4 Place the samples in a container for transmittal to Geotech.
  - 8.3.5 Check container for contamination.
    - a. Refer to Procedure TE-026, Beta-Gamma Radiation Measurement, for the operational check instructions for the beta-gamma probe.
    - b. Complete Part A of the Contamination Survey Form (Appendix 4).
    - c. Wipe the outside of the container with rad wipes.
    - d. Perform a 1-min count on the rad wipe using the beta-gamma probe.
    - e. Record the gross count rate (cpm) on the Contamination Survey Form, Part B, Smear Survey.
    - f. Subtract the background count (cpm) from the gross count to obtain the net count rate (cpm) and record.

- g. If the net count rate is less than 30% above background, initial the form for approved release of the samples and container. Proceed to 8.4.
  - h. If the net count rate is greater than 30% above background, rewipe the box with a rad wipe and take a second net count rate as above.
  - i. If the net count rate is less than 30% above background, initial the form for approved release of the samples and container. Proceed to 8.4.
  - j. Perform a direct survey of the container by slowly moving the beta-gamma probe over all surfaces of the container.
  - k. Record data on the Contamination Survey Form, Part B, Direct Survey.
  - l. Using a radwipe, take a smear where the highest gross count was detected.
  - m. Count the radwipe for 1 min with the beta-gamma probe. If the smear exceeds the above criteria, obtain a different container and begin again the check for contamination.
- 8.4 Send the samples to the Geotech environmental laboratory.
- 8.4.1 Include the following paperwork:
    - a. Geotech Request for Analytical Services Form (Appendix 2).
    - b. Chain of Sample Custody/Soil Sample Analysis Form (Appendix 3), and
    - c. Contamination Survey Form (Appendix 4).
  - 8.4.2 Obtain the signature of the Geotech employee receiving the samples on the Chain of Sample Custody/Soil Sample Analysis Form.
  - 8.4.3 Retain a copy of the Chain of Sample Custody/Soil Sample Analysis Form for the file in the soil analysis laboratory, pending release of the samples from Geotech.

- 8.5 After receiving the cross-check sample results, enter the data into the soil quality control data base.
  - 8.5.1 Transfer the results from the report received from the check laboratory to the Soil Quality Check Form (Appendix 1).
  - 8.5.2 Turn on the computer, monitor, and printer.
  - 8.5.3 Change directories to "QC."
  - 8.5.4 At the C:\QC> prompt type "QC."
  - 8.5.5 Hit the escape key to use a color monitor.
  - 8.5.6 Enter the QC program password.
  - 8.5.7 Select menu option FILE.
  - 8.5.8 The program will default to path: C:\QC\ORIG. Return.
  - 8.5.9 Select file SOILQC01.DBF.
  - 8.5.10 Using the right arrow key, choose menu option RECORD.
  - 8.5.11 Choose the option "Add New Record."
  - 8.5.12 Enter the new sample ID.
  - 8.5.13 Enter the sample data from the Soil Quality Check Form (Appendix 1).
  - 8.5.14 Press the PgDn key to save the data.
  - 8.5.15 Hit the escape key to return to the main menu.
- 8.6 Run the true-false test and t-test.
  - 8.6.1 Using the right arrow key, choose menu option STATISTICS.
  - 8.6.2 Choose the option, "Paired t-test, from database."
  - 8.6.3 Enter the sample set (e.g., A37).
  - 8.6.4 Hit any key to generate t-test values.

- 8.6.5 Press F2 to print the sample set data , including true/false and t-test data.
- 8.6.6 Choose menu option EXIT to exit program.
- 8.7 Place the printed report in the soil quality control notebook.
- 8.8 Take corrective action if the sample set fails the t-test according to the following priority:
  - 8.8.1 Re-analyze the nonagreeing analysis pairs by both laboratories and compare the results.
    - a. Use true/false data to choose samples for re-analysis.
  - 8.8.2 If nonagreement still exists, schedule recalibration of the PAG NaI well-crystal. See Procedure SU-022.
  - 8.8.3 Reanalyze all samples analyzed during the month that analytical results are in question.
- 8.9 Inform project managers immediately of any samples that are affected by re-analysis.



Appendix 2. Request for Analytical Services  
**Request for Analytical Services**

Date Submitted: 1991 / 4 / 7      Requisition Number: \_\_\_\_\_  
Year      Month      Day  
 Date Required: 1991 / 6 / 7      Project Number: 6R0004-210  
Year      Month      Day  
 Site Code (lab use only): \_\_\_\_\_  
 Final Report to: G A Pierce ORNL      Copy to: \_\_\_\_\_

**Elemental Analyses (Indicate by symbol):**


**Isotope Analyses (Indicate by symbol):**

$Ra^{226}$	$K^{40}$	$Th^{232}$	$Cs^{137}$								

**Other Analyses:**

- EPTOX Metals   
  Volatiles   
  Semivolatiles   
  Ignitability   
  pH  
 PCBs   
  Herbicides   
  Pesticides   
  BETX   
  Alkalinity  
 Other: \_\_\_\_\_

Extraction:   
 Total   
 EPTOX   
 3050   
 Other: \_\_\_\_\_

Special Instructions: A80 March 1991 QC sample set

Sample Disposition:   
 Return   
 Store   
 Destroy

G A Pierce      4/7/91  
 Submitter's Signature      Date

Appendix 2. (continued)

Sample List

Requisition Number: \_\_\_\_\_

Sample ID Number	Matrix	For Lab Use	Sample ID Number	Matrix	For Lab Use
1					
MJM 848	MS0055152A				
MJM 849	MS00351 X1				
MJM 850	MS00351 X5				
MJM 851	MS00426 X3				
5			30		
MJM 852	MS00361 X5				
MJM 853	MS00361 X3				
MJM 854	GJ3897+C6A				
10			35		
15			40		
20			45		
25			50		



Appendix 4. Contamination Survey Form

**OTTL**

Contamination Survey

Date 2/8/91 Site ID No. 6770 Health Physics Technician S. B. [Signature]  
 Address OTM Sample Properties  
 Part A. Beta-Gamma Radiation Survey Instrument Data  
 Ludlum 2211  
 Meter Model No. 5153 Serial No. 73672 Detector Model No. 74-2 Serial No. 22067707  
 Calibration Factor 5.2 Calibration Due Date 6/17/91 Battery Check  Alarm Check   
 Radioactive Source ID 6-9296 Isotope Tc-99 Activity ~0.35 uCi  
 Source Count Rate(cpm) 3853 Background Count Rate(cpm) 55 Net Count Rate(cpm) 3828  
 Acceptance Criterion: 3 Sigma of Net Average Source Activity  
 Lower Limit(cpm) 3691 Upper Limit(cpm) 4075 Observed Activity 3828

Part B. Survey Data

Item Surveyed	Location Surveyed	Direct Survey		Smear Survey		Remarks
		Gross Count Rate(cpm)	Net Count Rate(cpm)*	Gross Count Rate(cpm)	Net Count Rate(cpm)*	
Boxes of Samples	Accessible Areas	NI	NI	45	0	Background only

\* Net Count Rate = Gross Count Rate Minus Background Count Rate.

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**COMPUTER EQUIPMENT CONTROL, MAINTENANCE, AND INVENTORY**

**1.0 PURPOSE**

The purpose of this procedure is to provide a method to ensure that all new computer equipment meets its intended performance specifications prior to initial use in the PAG project and to provide a method for maintenance and inventory.

**2.0 APPLICABILITY**

This procedure applies to all new computers, and peripheral equipment to be utilized in the PAG project. The computers and peripherals include commercially available, custom made, and ORNL prototype devices.

**3.0 PROCEDURE**

**3.1 NEW COMPUTER EQUIPMENT CHECK-IN AND SETUP**

Check in procedure of new computer equipment falls into three general classes.

**3.1.1 Check In and Tracking Number Assignment**

Prior to use in the PAG project, all new computers and peripherals are assigned an ORNL tracking number and are appropriately marked by the computer technician or other designated individual. A preliminary check is made of the equipment to ensure conformance to design specifications and performance requirements. Maintenance records are established by use of the ORNL tracking number system. All of the pertinent information should be entered into the ORNL inventory data base (see sample data base entry, Appendix 1).

**3.1.2 Setup, Electronic Checkout, Burn In, and Installation**

The computer or peripheral should be setup according to the needs of the end user. After all peripherals are attached to the computer,

Approved by:

Tim W. [Signature] 26 Sept 90  
(Date)

Craig Little 9/26/90  
C.A. Little (Date)

the equipment is turned on, and all operating parameters are checked. If unit appears to be operating correctly, a five hour burn in is required before the equipment is ready to be installed. All operating parameters are checked again at the end of the burn-in time. If the equipment is operating correctly, it is ready for installation.

### **3.1.3 Disposition Options In Case of Nonconformance**

In the event the computer or peripheral fails any required performance test or fails to meet design specifications, the device is returned to the vendor with a notation to that effect.

## **3.2 COMPUTER EQUIPMENT MAINTENANCE LOGS**

**3.2.1** The computer technician performing the maintenance function on PAG maintained computers and equipment is responsible for incorporating the maintenance entry into the log folder.

**3.2.2** Maintenance logs for computer equipment include three categories.

**a. Preventative Maintenance Inspection (PMI) Diagnostic Testing**

All computer and peripheral preventive maintenance is entered into a log folder maintained by the computer technician. Each computer workstation has a unique log folder for the computer and associated peripherals. The computer technician has total responsibility for all entries which pertain to PMI routines and diagnostic testing. See PMI forms, Appendices 2, 3, 4 and 5.

**b. Equipment Failure and Corrective Action Taken**

All computer and peripheral failure and corrective action information shall be entered into the workstation log folder. This information shall include the following: date, parts repaired or replaced, diagnostic testing completed, and initials of the technician. If any equipment was sent to an outside vendor for repair, all pertinent information should be included in the log folder.

**c. Upgrades and Field Modifications**

All equipment upgrades and field modifications information shall be included in the log folder. This information shall include the following: date, parts required, diagnostic testing completed,

and initials of the technician. If the equipment is sent back to the manufacturer for upgrade, all pertinent information should be included in the log folder.

### **3.3 COMPUTER EQUIPMENT FOR FIELD USE**

**3.3.1** The computer technician performing the pre- and post-checkout function on PAG computers and equipment is responsible for incorporating the sign out and in procedure.

**3.3.2** Computer equipment for field use shall include two categories:

**a. Electronic Checkout, Pre- and Post-Field Work**

All computers and peripherals shall be setup and all operating parameters checked out before they are signed out for field work. The PMI schedule should be checked to be sure that no PMI's will fall due while the equipment is in the field.

Upon return from the field, all computer equipment is to be checked for damage and setup to check operating parameters. After equipment is checked and needed repairs, if any, are made before it is returned to storage.

**b. Computer Check Out**

All travel computers and peripherals shall be checked out prior to being taken for field work. The checkout form (Appendix 6) should be filled out by the designated individual.

All equipment will be shipped in approved containers only.

### **3.4 COMPUTER SUPPLIES INVENTORY**

The computer technician will make daily spot checks of the consumable supplies inventory. Any supplies that are below set levels (Appendix 7) will be ordered through normal procurement channels.

Appendix 1

Sample ORNL Inventory Data Base

Computer #NCR1 Model #0617  
Serial #15-18566428 DoeX #x183029  
System board #017-0037169B

LOCATION:

Bldg #53B Rm #7 Usr KHW

INSTALLED RAM:

System bd 000 kb Adapter bd 2048 kb

COMMENTS:

ACAD STATION 80387-16 MATH COPROCESSOR  
MONITOR MODEL JC-1501VMA  
THIS COMPUTER WAS UPGRADED FROM A 286  
TO A 386-16.

MONITOR:

Mnt Code #11 Mnt DoeX #x000

Mnt Serial #79C00895A

Screen Type COLOR

Mnt Manufacturer NEC Multisync+

PRINTER:

Prt Code #04 Prt DoeX #x000

Prt Serial #ZA 21513

Prt Manufacturer Toshiba

Prt Model P-351SX

CODE #	MANUFACTURER	NAME
01	Powersource	Keyboard
03	Tecmar	QIC-60Tape unit
08	Calcomp 2500	Tablet
14	Hayes 2400	Modem(MM001413)
18	Intel	Math Copro.
23	MicroSpeed	RollerBall

SLOT	CODE#	NAME	MAKE
01	43	Video 7	Vega
02			
03	01	PC Net Blossom	Orchid
04	33	Serial/Parallel	IBM
05	52	386 Memory Bd.	NCR
06	53	386 System Bd.	NCR
07	11	Host Adapter	QIC
08	40	Controller	NCR

DRIVE	CODE	MANUFACTURER	SIZE
A	02	DFC	1.2MB
B	13	Toshiba	720KB
C	20	Priam	130MB

**Appendix 2. Computer PMI Form.**

Date \_\_\_\_\_

Computer PMI  
SN \_\_\_\_\_

<u>Maintenance activity</u>	<u>Comments</u>
Vacuum Dust	_____
Clean ckt. board contacts	_____
Check power supply voltages	_____
General case cleaning	_____
Clean floppy drive heads	_____
Check for proper grounding	_____
Run diagnostics	_____

Initials \_\_\_\_\_

**Appendix 3. TI Printer PMI Form.**

Date \_\_\_\_\_

T.I. Printer PMI  
SN \_\_\_\_\_

<u>Maintenance activity</u>	<u>Comments</u>
Vacuum Dust	_____
Clean ckt. board contacts	_____
Clean carriage rod & rollers	_____
Clean print head	_____
Adjust print head	_____
Replace ribbon (if necessary)	_____
Barberpole test & check out	_____

Initials \_\_\_\_\_

**Appendix 4. HP Laser Jet Printer PMI Form.**

Date \_\_\_\_\_

Laser Jet Printer PMI  
S.N. \_\_\_\_\_

<u>Maintenance Activity</u>	<u>Comments</u>
Vacuum dust & print powder	_____
Clean transfer guide	_____
Clean primary corona wire	_____
Clean transfer corona wire	_____
Clean fusing roller	_____
Check separation belt (replace if worn)	_____
Check the E.P. cartridge	_____
Clean outside case	_____
Run check out	_____

Initials \_\_\_\_\_

**Appendix 5. Miscellaneous Equipment PMI Form.**

Date \_\_\_\_\_

Misc. Equipment PMI  
SN \_\_\_\_\_

<u>Maintenance activity</u>	<u>Comments</u>
Vacuum Dust	_____
Clean ckt. board contacts	_____
Check power supply voltages	_____
General case cleaning	_____
Check Misc. parameters	_____
Check for proper grounding	_____
Run diagnostics	_____

Initials \_\_\_\_\_

Appendix 6. Computer and Peripheral Check-out Form.

ORNL

Computer check out form

Description of Computer and Peripherals

Name (nown) \_\_\_\_\_  
ORNL Tracking # \_\_\_\_\_  
Serial # \_\_\_\_\_  
DOE X # \_\_\_\_\_

Location where equipment will be used.  
\_\_\_\_\_  
\_\_\_\_\_

Approx. date of return.  
\_\_\_\_\_

Checkout Date  
\_\_\_\_\_

Signature  
\_\_\_\_\_

Appendix 7. Computer Supplies Inventory Levels.

Exhibit 99.4-1. Computer supplies inventory levels

Item	Quantity Required	Quantity On Hand	Supplies Needed
Laser JetII Cartridges	3	_____	_____
Laser Jet+ Cartridges	3	_____	_____
T.I. Printer Ribbons	10	_____	_____
Toshiba Printer Ribbons	10	_____	_____
Floppy Drive Cleaning Kits	5	_____	_____
Antistatic fluid	1 Gal.	_____	_____
Antistatic Dispenser's	4	_____	_____
QIC Tape Cleaner Kits	3	_____	_____
409 Cleaner	1 Gal.	_____	_____
Vacuum cleaner bags	2	_____	_____
Isopropyl Alcohol	1 pint	_____	_____
Cotton swabs	100	_____	_____

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## DATABASE MANAGEMENT

### 1.0 PURPOSE

The purpose of this procedure is to provide guidance in handling KMAN software and its applications. This procedure applies to the creation and maintenance of KMAN software and its data base applications.

### 2.0 KMAN PAG/RADIOLOGICAL APPLICATIONS

Most PAG data base management is accomplished with the commercial software package called KNOWLEDGEMAN (KMAN). These applications are designed, updated and stored by the computer department. All other commercial software programming is the responsibility of the individual programmer.

### 3.0 PROCEDURE

KMAN data base programming is done in order to input, store, update and output data. Application programming is done on an as-needed basis. It is up to the user to contact the programmer and request a job. The job is recorded in a data base and prioritized with all the other outstanding jobs. Time frames are negotiated between the user and the programmer. Jobs are re-evaluated and reprioritized at least weekly.

#### 3.1 SECURITY

Security is implemented during the time when application programs are being written. KMAN software offers an internal type of security which allows the data files to be accessed by people with the matching codes. The PAG Local Area Network's (LAN's) security can limit access of specific users to specific areas. Network security is implemented with the physical location of the data. Access to specific parts of data bases is determined by general consensus of personnel involved.

#### 3.2 TESTING

Approved by:

Kim M. Waples 24 Sept 90  
(Date)

Craig Little 9/24/90  
C.A. Little (Date)

While in the development stage, programs are tested off-line as many ways as feasible. Program testing is done at the discretion of the programmer.

### **3.3 DOCUMENTATION**

Programs are documented with the following:

1. Hardcopy output of programs are stored in a binder with all the related programs. This hardcopy contains the program title, programmer name, date written, date of the latest update, all associated files and variables used, a brief description of its function, and all prior revisions. The program also has status comments throughout the code.
2. Flowcharts are usually made showing program to program flow with all associated files. These flowcharts are drawn up in ACAD. They are stored in an off-line ASCII file and in hardcopy form.
3. Synopses are made which outline programs and their functions. One copy is sent to the computer manager, one copy is kept with the rest of the documentation and an ASCII file is kept off-line for future updates.

### **3.4 BACKUP**

Application programs are backed-up, off-line on a computer hard drive in their ASCII state for easy access on future revisions. Also, the scrambled version is backed up on floppy for easy restoration in the event of LAN failure. The hardcopy printout serves as a programmer reference tool and backup in case the original backup is destroyed. All off-line programs are put on a tape for one to two month storage to protect them in the case of hard drive failure.

### **3.5 TRAINING**

There are two types of training: 1. After applications are written and installed for one or more users, one-on-one training is used to show how the particular application works. 2. For the people who prefer to do their own KMAN programming, user assistance is provided for any aspect of the programming process. All maintenance, backup and documentation is the responsibility of the programmer.

### **3.6 MAINTENANCE**

Program maintenance and ad-hoc queries are provided on the following application programs: UMTRA/ISC data bases, verification data base, document control data base, procurement data base, hardware data base,

QA data bases, soil data base, maintenance order data base, project cost accounting data base, and the time accounting data base. Refer to the appropriate Procedures Manual sections for more information on these data bases. Data bases can be added or dropped from existence according to the user's needs and demands.

**3.7 KMAN SOFTWARE HANDLING**

The original commercial KMAN software is stored in a locked file cabinet in the computer room that is also locked during off hours. The original software is copied onto blank disks. This copy is used to install the software. Software versions should be upgraded if cost and time spent will benefit the data base systems. Upgrading includes configuring to the network and each specific personal computer. Software is ordered through procurement.

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## GRAPHICS FOR INCLUSION SURVEYS OF VICINITY PROPERTIES

### 1.0 PURPOSE

This procedure provides the methods and standards for ensuring that all maps and drawings produced by PAG personnel in support of inclusion surveys are correctly drawn and consistent throughout all reports and documents.

### 2.0 APPLICABILITY

This procedure applies to all graphics produced as part of the Uranium Mill Tailings Remedial Action (UMTRA) project or the Monticello Vicinity Properties project for reports and documents. Graphics are produced using AutoCAD (computer aided drafting) methods described in the AutoCAD manual, Reference 3.1.1.

### 3.0 OTHER DOCUMENTS

#### 3.1 REFERENCES

3.1.1 Autodesk, Inc., *AutoCAD™ Reference Manual*, 1986

#### 3.2 APPENDICES

3.2.1 Appendix 1: ISC Layer Names

#### 3.3 EXHIBITS

3.3.1 Exhibit 1: ISC Drawing with Detail

3.3.2 Exhibit 2: ISC Detail Drawing with Key Insert

### 4.0 EQUIPMENT AND MATERIALS

#### 4.1 EQUIPMENT

4.1.1 Personal computer linked to the network

4.1.2 Digitizer tablet and mouse

Approved by:

*Kim M. Wapinski*  
29 Jan 92

(Date)

*Craig Little* 2/3/92  
C.A. Little (Date)

- 4.1.3 Plotter or laser printer
- 4.1.4 AutoCAD software

## **4.2 MATERIALS**

- 4.2.1 Plotter or printer paper
- 4.2.2 Plotter pens
- 4.2.3 Drafting tape

## **5.0 RESPONSIBILITY**

- 5.1 It is the responsibility of the graphics coordinator to approve and implement changes in standards and procedures for all graphics drawings.
- 5.2 The graphics technician is responsible for creating base maps from field measurements or published maps and editing completed drawings for updated information and editorial changes.
- 5.3 Computer support personnel are responsible for archiving drawings by saving electronic and paper copies of certain drawings temporarily and then permanently.

## **6.0 PROCEDURE**

### **INCLUSION SURVEY PROPERTY MAPS**

- 6.1 Begin a new drawing on AutoCAD using ORNL20 or other appropriate default drawing with predefined limits.
  - 6.1.1 Use the largest scale that will fit on an 8.5 × 11 in. sheet, leaving a 1-in. margin on the left side and ½-in. margins on all other sides.
  - 6.1.2 Name the drawing using the property location number, for example, GJ12345.
- 6.2 Tape the field property sketch to the digitizer tablet and calibrate it by using two widely spaced points.
- 6.3 Reproduce the drawing using the layer names in Appendix 1 for drawing components.
  - 6.3.1 Accuracy should be to the nearest foot.
- 6.4 Include a 7 × 10 in. border if possible.

- 6.4.1 The border can be eliminated or made slightly larger but should not be smaller
- 6.5 Draw large properties using details and detail layers (see Appendix 1 for use of detail layers).
  - 6.5.1 A property with detail may be drawn in three ways (see Exhibits 1 and 2):
    - a. Draw the property on one sheet, indicating the location of the detail, and the detail on another sheet.
    - b. Draw the property, showing the detail in one corner if there is room.
    - c. In the corner of the full-sheet detail drawing, include a small drawing of the entire property showing the detail location.
  - 6.5.2 The scale of the detail drawing should be as large as possible and still fit on an 8.5 × 11 in. sheet.
- 6.6 Text height should be 0.1 × the scale of the drawing (2 for a 1 in. = 20-ft-scale drawing, 3 for a 1 in. = 30-ft-scale drawing, etc.)
  - 6.6.1 Use the Standard style and Greek font for all text.
- 6.7 Indicate concrete using the MUDST hatching pattern rotated 45° to the object being hatched.
  - 6.7.1 Use a scale of 5 to 10 for hatching a 20-scale drawing, 10 to 15 for 30-scale, etc.
- 6.8 Insert a north arrow and bar scale.
  - 6.8.1 Blocks for north arrows and bar scales are inside the default drawing and can be recalled by using the INSERT command.
    - a. Block names are NORTH20, NORTH30, BAR20, BAR30, etc., corresponding to the scale of the drawing.
  - 6.8.2 The north arrow should point up or to the left or may be rotated in the second quadrant to produce a better fit.
  - 6.8.3 Place the north arrow and bar scale in the lower right-hand quadrant of the drawing outside the property boundaries.

- a. If necessary, these may be placed in another part of the drawing or inside the boundary of an unusually shaped property.
- 6.9 Insert the location number and the complete address, including the city and state, beneath the bar scale.
  - 6.10 Place a caption at the bottom of the drawing, indicating figure number and map name.
  - 6.11 Edit the drawing, adding radiation contamination information on the layers indicated in Appendix 1.
  - 6.12 Hatch radiation contamination using the hatch pattern DOTS.
    - 6.12.1 Use a scale of 10 to 30 for a 20-scale drawing, varying according to the scale of the drawing, size of the deposit, and magnitude of contamination.
    - 6.12.2 Deposits with higher concentrations of contamination are hatched more densely than less-contaminated areas.
  - 6.13 Draw areas of contamination inside a structure (interior deposits) on a separate map.
    - 6.13.1 Label this drawing Figure 1b.
      - a. Figure 1b is on the same computer drawing file but next to the exterior map and is plotted separately using the window option of the PLOT command.
    - 6.13.2 Show only contaminated structures on Figure 1b, using a larger scale than the original drawing.
    - 6.13.3 Figure 1b may be a duplicate of the original property map if the structure is large enough to accurately identify the contaminated region on the map.
    - 6.13.4 When the only elevated reading in a structure is a point source, show this on the original property map; no interior map is necessary.
  - 6.14 Show all radiation readings with appropriate units.

- 6.14.1 Show a HOG (high outdoor gamma) location on all exterior maps and a HIG (high indoor gamma) location on all interior maps.
- 6.14.2 Note the locations of PIC readings, delta counter measurements, samples, and boreholes.
- 6.15 Date and initial the drawing.
  - 6.15.1 Place the date of sketching and initials of the sketcher and the date of completion and initials of the person creating the AutoCAD map drawing in the lower right-hand corner outside the border.
    - a. If the initials are outside the printing area of the completed drawing, they may be placed inside the border.
    - b. Use a scale of  $0.5 \times$  the text height.
- 6.16 Save the drawing to the TEAMS or RAD subdirectory on the network.
  - 6.16.1 Use the DOS MAP command to determine the current subdirectory locations.
- 6.17 Plot the drawing on an 8.5 × 11 in. sheet using a plotter or laser printer.
  - 6.17.1 Use a plotting scale of 1 in. = 20 ft or 1 in. = 30 ft, etc., as appropriate.
  - 6.17.2 Turn off detail layers to print or plot an overall property drawing.
  - 6.17.3 Turn off nondetail layers to plot the detail.
- 6.18 Archive the drawing by giving a paper copy of the base map to computer support personnel in charge of archiving ACAD drawings on tape.
  - 6.18.1 Computer support archives the file by performing the following steps:
    - a. Date and file the paper copy in a three-ring binder specific to the project.
    - b. Copy the computer file from the subdirectory to the archive hard drive.
    - c. Delete the file from all subdirectories.

- d. After 30 to 60 days, archive the file to tape and delete from the network drive.

**Appendix 1. ISC Layer Names**

<u>Layer</u>	<u>Color</u>	<u>Entities</u>	<u>Linetype</u>
O2TX	1	Notes	Continuous
OBLD	2	Buildings	Continuous
OBODR	2	Page border	Continuous
OBDRY	3	Property lines	Phantom
OLNA	4	Location no., address	Continuous
ONAB	4	North arrow & bar scale	Continuous
OTEX	4	Text	Continuous
OCON	5	Concrete	Continuous
OCONH	5	Concrete hatching	Continuous
ODIT	5	Ditches, creeks	Divide
OFEN	6	Fences	Dashdot
OMISC	8	Misc. lines & objects	Continuous
OWRK	8	Temporary working layer	Continuous
ORAD	6	Radiation contamination	Continuous
ORADH	6	Contamination hatching	Continuous
ORADTX	1	Contamination text	Continuous

Detail layers correspond to regular layer names with the addition of D's to create a name with seven letters. OTEX becomes OTEXDDD on a detail drawing, OCONH becomes OCONHDD, ORADTX becomes ORADTXD, etc.

Appendix 1 (continued)

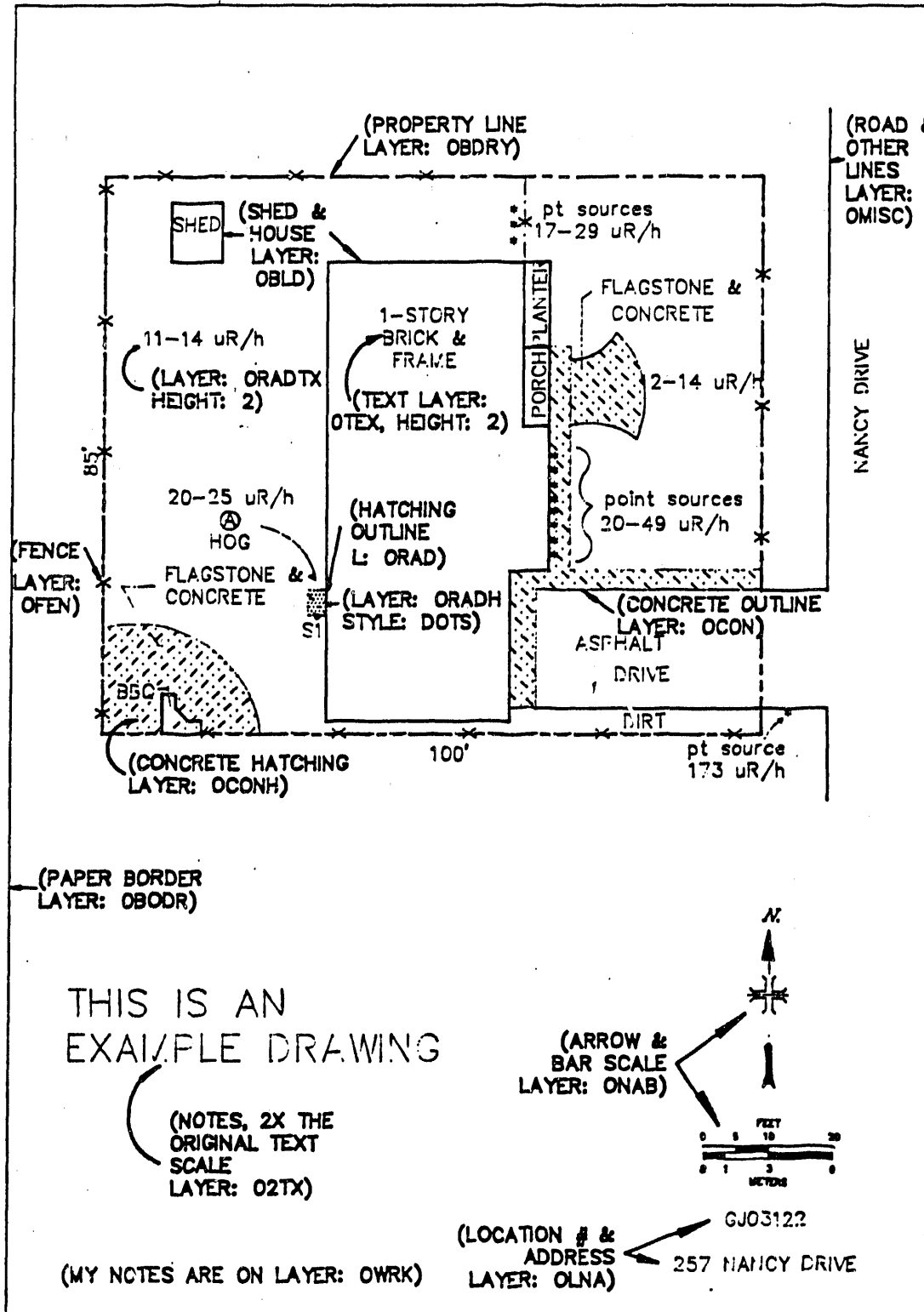


Exhibit 1. ISC Drawing with Detail

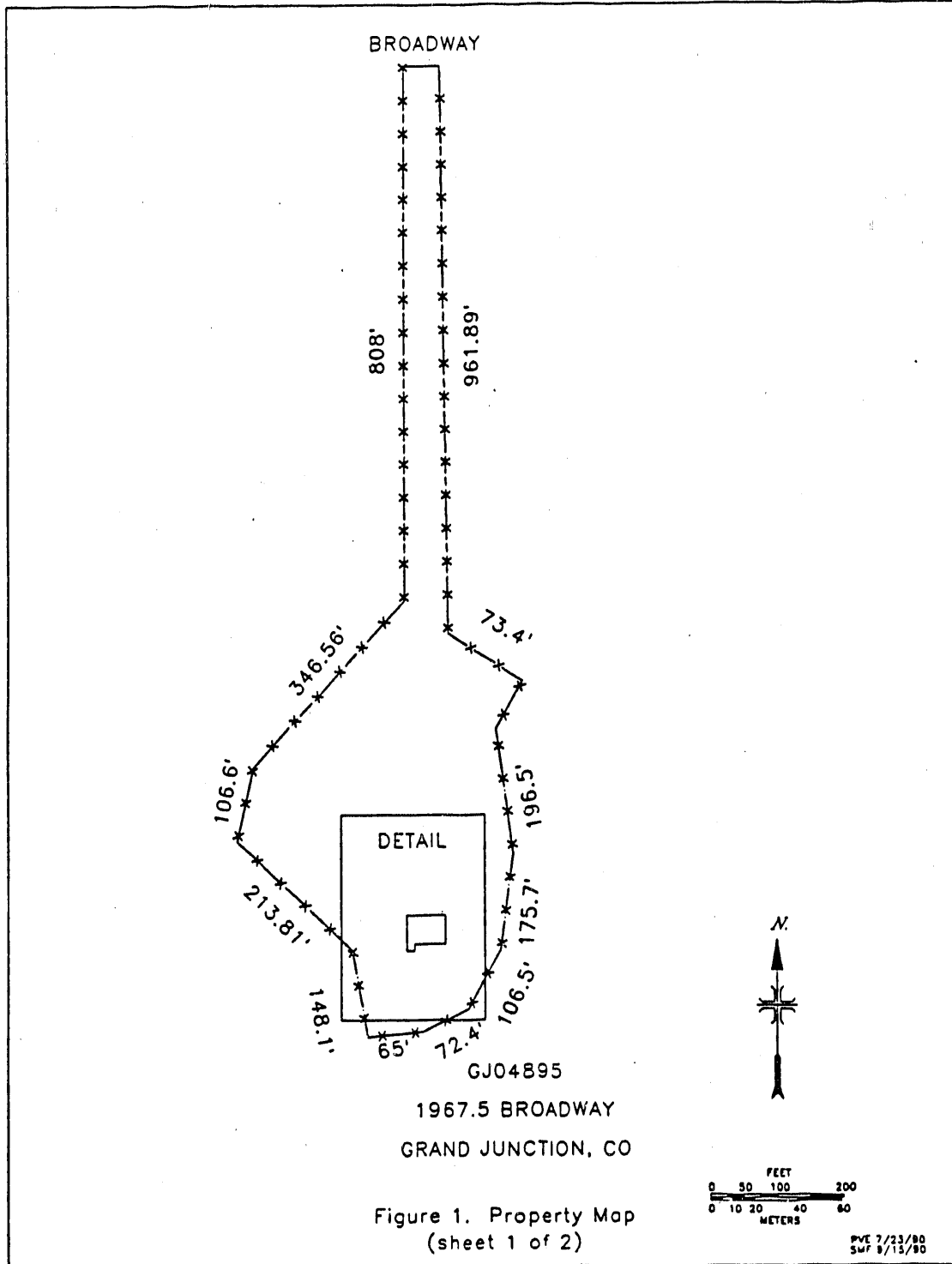


Figure 1. Property Map  
(sheet 1 of 2)

Exhibit 1 (continued)

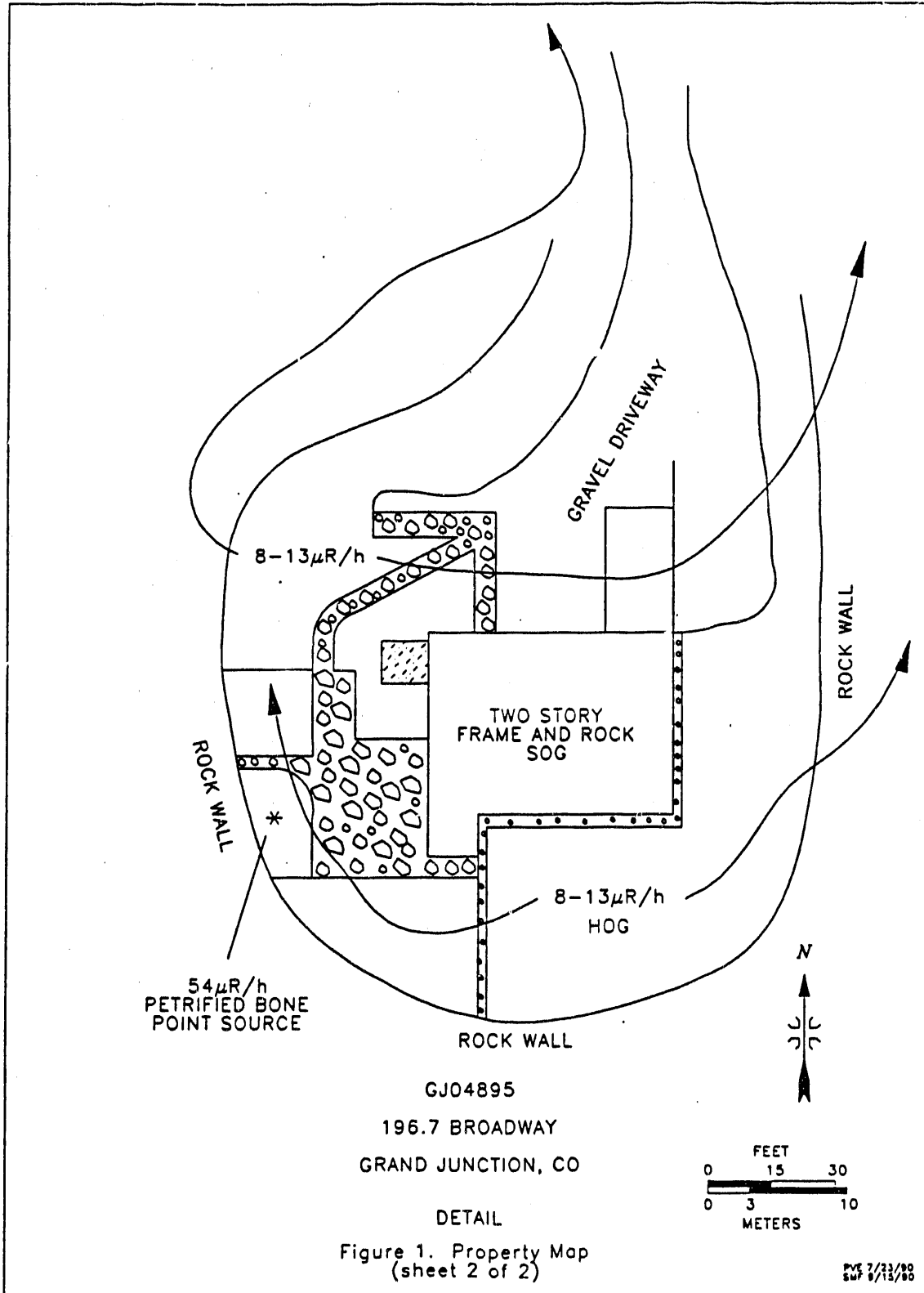


Figure 1. Property Map  
(sheet 2 of 2)

PVS 7/23/00  
SWP 8/13/00

Exhibit 2. ISC Detail Drawing with Key Insert

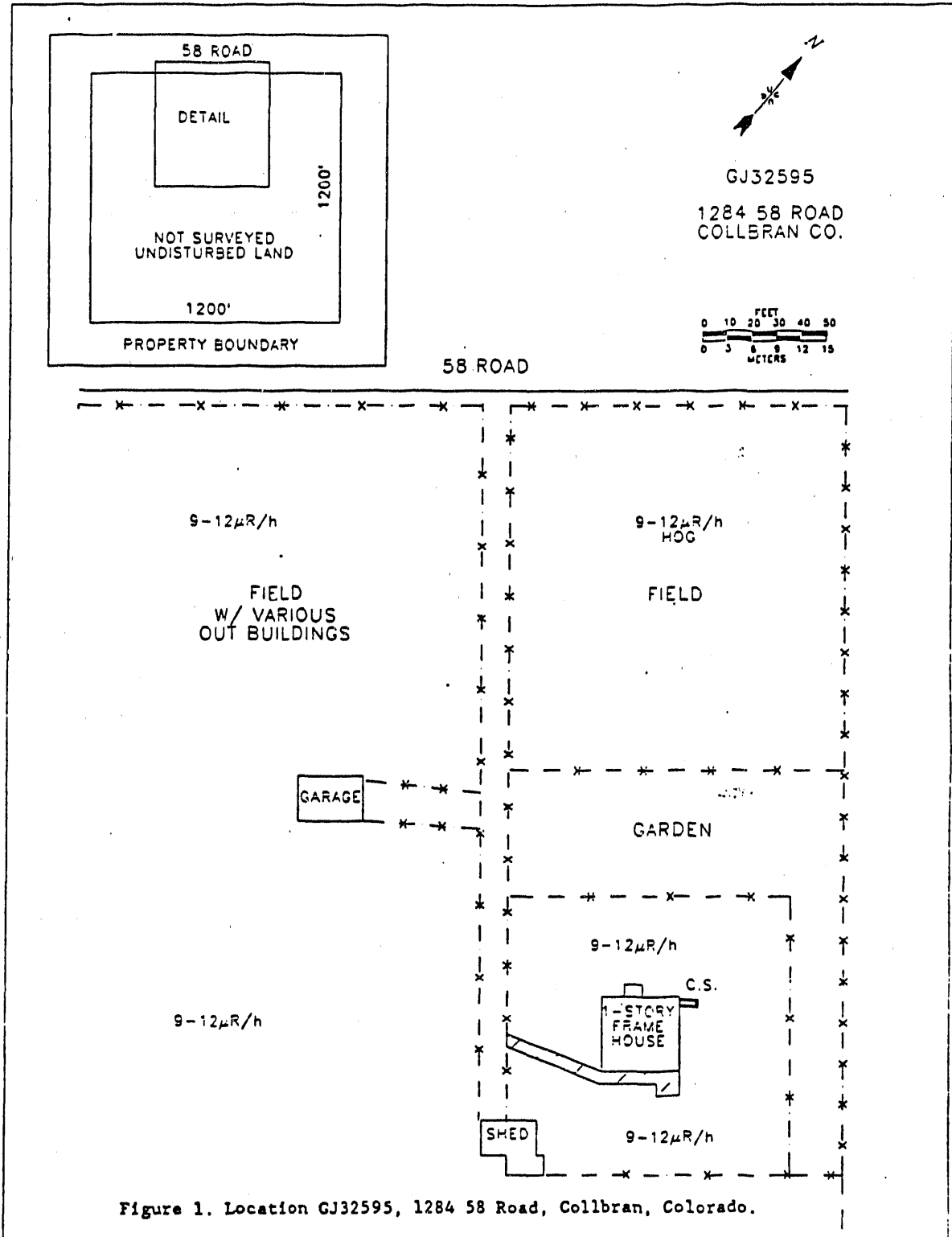


Figure 1. Location GJ32595, 1284 58 Road, Collbran, Colorado.

<b>OAK RIDGE NATIONAL LABORATORY</b> Health & Safety Research Division	<b>PROCEDURE</b>  Pollutant Assessments Group	Number: SU-062 Page: 1 of 9 Revision: 0 Date: 02/03/92
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## GRAPHICS FOR VERIFICATION OF VICINITY PROPERTIES

### 1.0 PURPOSE

This procedure provides the methods and standards for ensuring that all maps and drawings produced by PAG personnel in support of inclusion verification tasks are correctly drawn and consistent throughout all reports and documents.

### 2.0 APPLICABILITY

This procedure applies to all graphics produced as part of the Uranium Mill Tailings Remedial Action (UMTRA) project and the Monticello Vicinity Properties project. Graphics are produced using AutoCAD (computer aided drafting) methods described in the AutoCAD manual, Reference 3.1.1.

### 3.0 OTHER DOCUMENTS

#### 3.1 REFERENCES

- 3.1.1 Autodesk Inc., *AutoCAD™ Reference Manual*, 1986.
- 3.1.2 Procedure SU-061, Graphics for Inclusion Survey Properties.

#### 3.2 APPENDICES

- 3.2.1 Appendix 1: IVC Layer Names

#### 3.3 EXHIBITS

- 3.3.1 Exhibit 1: IVC Drawing with Detail

### 4.0 EQUIPMENT AND MATERIALS

#### 4.1 EQUIPMENT

- 4.1.1 Personal computer linked to the network
- 4.1.2 Digitizer tablet and mouse

Approved by: \_\_\_\_\_

Kim M. Boyarske  
29 Jan 92  
 (Date)

Craig Little 2/3/92  
 C.A. Little (Date)

- 4.1.3 Plotter or laser printer
- 4.1.4 AutoCAD software

#### **4.2 MATERIALS**

- 4.2.1 Plotter or printer paper
- 4.2.2 Plotter pens
- 4.2.3 Drafting tape

#### **5.0 RESPONSIBILITY**

- 5.1 It is the responsibility of the graphics coordinator to approve and implement changes in standards and procedures for all graphics drawings.
- 5.2 The graphics technician is responsible for creating base maps from field measurements or published maps and editing completed drawings for updated information and editorial changes.
- 5.3 Computer support personnel are responsible for archiving drawings by saving electronic and paper copies of certain drawings temporarily and then permanently.

#### **6.0 PROCEDURE**

- 6.1 If Chem-Nuclear Geotech is the remedial action contractor (RAC) for the remediated property, check out the property folio from Geotech's Records Management department.
- 6.2 Locate the drawing file with the needed information from the diskette in the front of the folio.
  - 6.2.1 The correct drawing file is usually labelled G#####.DWG, but it may be necessary to check the other drawings on the RAC diskette and possibly use one of them.
  - 6.2.2 Some older folios may not contain drawings on AutoCAD; in this case, an AutoCAD drawing of the property is created by PAG personnel. See Procedure SU-061.
- 6.3 At the computer, go to W:\VERFRAD and copy the file to the VERFRAD subdirectory.
  - 6.3.1 VERFRAD is the subdirectory where all verification drawings should be stored.

- 6.3.2 Change the file name to GJ#####.dwg for ORNL drawings.
- 6.3.3 Return the floppy disc to the folio.
- 6.4 Call up AutoCAD and enter the name of the drawing without the extension, .dwg.
- 6.5 Convert RAC layers in the drawing to ORNL layers using the script file VUNC1.
- 6.5.1 If the program comes to a stop at any time during the conversion process, enter the command RESUME.
- 6.5.2 The following are the layers resulting from this conversion process. See Appendix 1 for further explanation.
- |        |                     |      |                          |
|--------|---------------------|------|--------------------------|
| OBLD   | (buildings; yellow) | OTEX | (text; cyan)             |
| OBDRY  | (boundary; green)   | OLNA | (address; cyan)          |
| OBO DR | (border; yellow)    | ONAB | (bar and arrow; cyan)    |
| OC ON  | (concrete; blue)    | ODIT | (ditch; blue)            |
| OMISC  | (misc.; grey)       | ORAD | (contamination; magenta) |
| ORADH  | (hatching; magenta) | OFEN | (fence; magenta)         |
- 6.6 Purge the drawing of unused blocks and layers except for ORNL layers.
- 6.6.1 Since the PURGE command works only if it is the first command issued after entering the drawing editor, SAVE the drawing, QUIT the drawing editor, and then return to the drawing editor.
- 6.6.2 When the drawing comes up on the screen, purge the RAC layers with the very first command.
- 6.7 Properties too large to fit 40 scale on 8 x 11 in. paper should be completed with a detail map. See Procedure SU-061.
- 6.8 Insert a verification legend.
- 6.8.1 **Vleg** and **wleg** are the two legend blocks that have already been created.
- Vleg** is elongated on the X-axis and is used when there is insufficient space to insert the vertical legend.
  - wleg** is a vertical legend elongated in the Y-axis and should be appropriate in many drawings.

- 6.8.2 X and Y scales should be 2 for 20-scale drawings, 3 for 30-scale, etc.
- 6.9 When applicable, insert the radon symbol to indicate the location of the radon daughter concentration (RDC) measurement.
  - 6.9.1 Copy the radon symbol from the legend to the part of the building where the detectors were located.
- 6.10 Insert the north arrow and bar scale.
  - 6.10.1 Erase the RAC north arrow and bar scale.
  - 6.10.2 Insert the appropriate ORNL bar scale, using block BAR20 for 20 scale, block BAR30 for 30 scale, etc.
  - 6.10.3 Insert the ORNL north arrow at the same angle as the RAC arrow, using the block NORTH20 for 20 scale, NORTH30 for 30 scale, etc..
    - a. If it is necessary to rotate the north arrow, use the ROTATE command.
- 6.11 Digitize the field map to the tablet using TABLET command.
- 6.12 Add rad data to the drawing using the ORNL field map as the primary source.
  - 6.12.1 Draw the boundaries of excavations in layer ORAD with a pline width of 0.4 to 0.6.
    - a. Both indoor and outdoor excavations are normally drawn on this map, although sometimes a separate indoor drawing may be appropriate.
    - b. Indoor drawings are almost always drawn to a 10 scale.
  - 6.12.2 Use the OTEX layer to enter gamma exposure rate ranges.
    - a. Copy the V box and symbol (area identifier) from the legend and place it in each appropriate excavated area.
      - 1. For multiple V areas, use the MULTIPLE option of the COPY command.

2. Pick the V box only, copy it to each excavated area, and add the appropriate area identifier using the TEXT or DTEXT command.
  - b. If an area excavation is too small, place a V box and symbol off to the side and draw a line to the excavation.
  - c. Make a column within the border of the drawing of all V boxes and their scan ranges.
- 6.13 Using layer ORADH, hatch excavations.
  - 6.13.1 Pick both the border of the excavation and the border of the V box to avoid hatching through the V box.
- 6.14 Use the OTEX layer to add text for the address and GJ number.
  - 6.14.1 Denote biased sample locations, marked on the map by solid circles, as B1, B2, etc.
  - 6.14.2 Date and initial a completed drawing in the lower right-hand corner.
    - a. Text height should be half the regular text scale.
- 6.15 Save the drawing to subdirectory VERFRAD.
- 6.16 Print the completed drawing using a laser jet printer or a plotter.
  - 6.16.1 Examine the printed drawing for errors and make any necessary changes.
- 6.17 Archive the drawing by giving a paper copy of the printed drawing to computer support personnel for backup archiving.
  - 6.17.1 Computer support archives the file by performing the following steps:
    - a. Date and file the paper copy in a three-ring binder specific to the project.
    - b. Copy the computer file from the subdirectory to the archive hard drive.
    - c. Delete the file from all subdirectories.

- d. After 30 to 60 days, archive the file to tape and delete from the network drive.

Appendix 1. IVC Layer Names

<u>Layer</u>	<u>Color</u>	<u>Entities</u>	<u>Linetype</u>
O2TX	1	Notes	Continuous
OBLD	2	Buildings	Continuous
OBODR	2	Page border	Continuous
OBDRY	3	Property lines	Phantom
OLNA	4	Location no., address	Continuous
ONAB	4	North arrow & bar scale	Continuous
OTEX	4	Text	Continuous
OCON	5	Concrete	Continuous
OCONH	5	Concrete hatching	Continuous
ODIT	5	Ditches, creeks	Divide
OFEN	6	Fences	Dashdot
OMISC	8	Misc. lines & objects	Continuous
OWRK	8	Temporary working layer	Continuous
ORAD	6	Radiation contamination	Continuous
ORADH	6	Contamination hatching	Continuous
ORADTX	1	Contamination text	Continuous

Exhibit 1. IVC Drawing with Detail

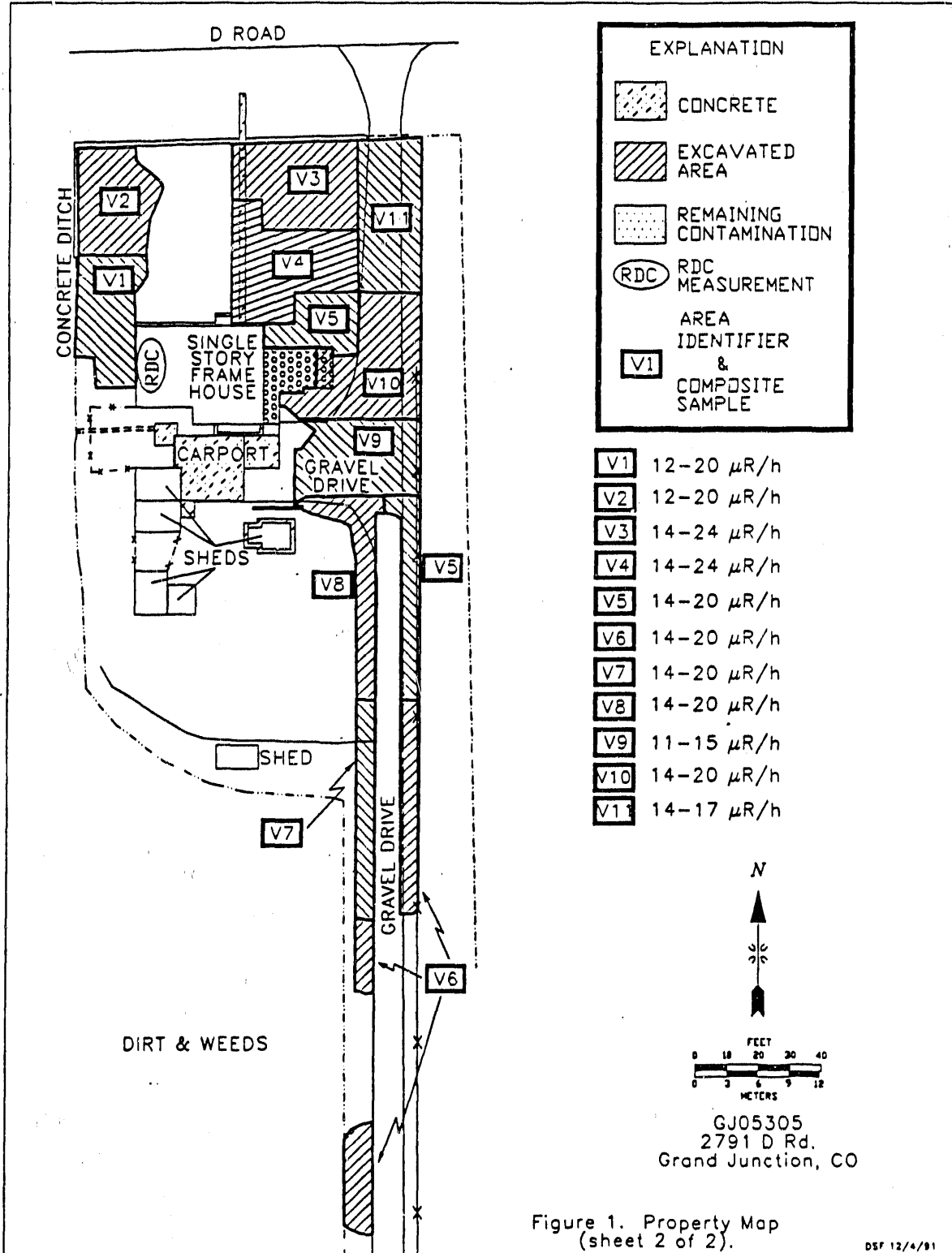


Figure 1. Property Map  
 (sheet 2 of 2).

Exhibit 1 (continued)

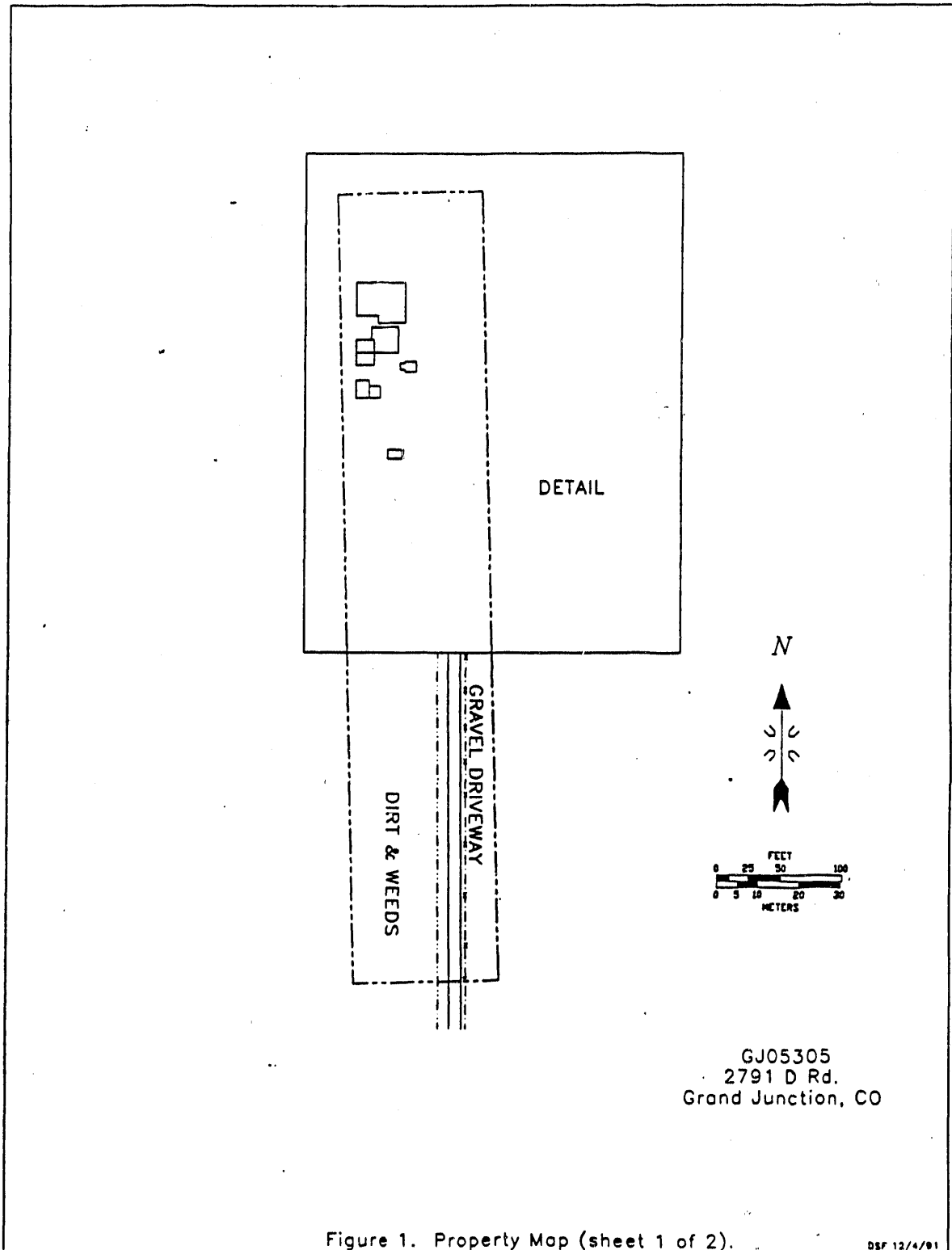


Figure 1. Property Map (sheet 1 of 2).

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**DOCUMENT CONTROL**

**1.0 PURPOSE**

The purpose of this procedure is to provide information relevant to management of the files and documents.

**2.0 PROCEDURE**

**2.1 FILING**

**2.1.1 ISC Recommendation Reports - UMTRA Project.**

After the inclusion/exclusion recommendation report is submitted to the DOE, a property file, containing documents leading to the recommendation, is retained by the ISC. This hard file is forwarded to the Public Relations Department where the date of recommendation is entered in the data base and owner/property information is verified. The hard file is then forwarded to Document Control.

At Document Control, the property file is identified as a "current" file and is filed in the "current" section. The file becomes a "closed" file after the DOE reviews the ISC recommendation report and prepares an official inclusion or exclusion form memo with a copy to the ISC. Receipt of this memo "closes" the file and the folder is transferred to the "closed" category.

**2.1.2 Filing of Current ISC Property Files**

Current files are filed alphabetically by UMTRA site and numerically by location number for each site. They are retained in the "current" section.

**2.1.3 Filing of Closed ISC Property Files**

When the official DOE inclusion/exclusion letter is received, the date of the letter is entered in the computer data base. Information

Approved by:

Sally Ann Tighe 9-24-90  
(Date)

Craig Little 9/24/90  
C.A. Little (Date)

contained in the inclusion/exclusion letter is verified with information in the data base as well as with information in the hard file. Any discrepancies are corrected and appropriate persons notified. The inclusion/exclusion letter is placed in the folder which is then moved to the "closed" category. These files are filed numerically by location number under the appropriate site.

#### **2.1.4 Colorado Department of Health Files and Microfiche**

Some properties have historical data from the Colorado Department of Health (CDH) radiological studies. These hard files were transferred to the ISC from CDH. The CDH file, when present, is combined with the ISC property file when it is initiated. Microfiche files of CDH data are also maintained and, occasionally, information is available on microfiche that is not available in the hard files.

CDH hard files and microfiche files are filed numerically by location number.

#### **2.1.5 Property Drawings - RAC Land Survey Department**

Original property drawings are loaned to the RAC Land Survey Department upon request so that the RAC does not have to duplicate land survey efforts.

Property drawings are removed from ISC report files and a color-coded card is placed in the file folder. A computer program has been established to track the following information: location number, borrower's name, and check-out and return dates. A printout of outstanding drawings is periodically sent to the RAC.

#### **2.1.6 RAC Spillovers**

When the RAC requests a spillover inclusion, the data base is checked to see whether or not the location number is in the system. The ISC then either creates a new file or retrieves the active file. If the ISC has to create a new file, the Public Relations Department is requested to enter a new record in the data base and initiate a file folder for the property. The words "UNC Spillover" are entered in the data base in the "Recommendation Basis" field. The spillover folder is then filed in a separate drawer and held until an official DOE inclusion letter is received, at which time it is filed in the "closed" category.

**2.2 FILE CHECK-OUT SYSTEM**

- 2.2.1** An out-card is filed in the drawer where the file has been removed. The card shows the location number, name of person, and date the folder was checked out. The out-card is removed when the file is returned.
- 2.2.2** Files that are removed from Document Control are also tracked on the computer. The computer record shows the location number, person's initials, date file removed, and date returned. Periodically, a printout is run and issued to each individual who has outstanding files. The printout is returned to Document Control with notations that the files are still in their possession or that they have been given to someone else. The computer data base is updated accordingly. When the file is returned to Document Control, the date of return is input into the computer which cancels the computer record.

**2.3 PREPARATION OF FILES FOR MICROFILMING AND ARCHIVING**

- 2.3.1** As part of the DOE UMTRA Project Office plan for archiving UMTRA documents, the ISC, as requested, prepares ISC files for transmittal to the RAC or TAC.
- 2.3.2** When the DOE requests files for a specific UMTRA site, the hard files are pulled from the drawers and information contained in each file is verified with information in the computer data base. Duplicates and all unnecessary papers are removed from the file folder, as are paper clips, staples, etc. Complete files relating to vicinity properties at all UMTRA sites except Grand Junction and Edgemont are forwarded to the TAC. In the case of Grand Junction and Edgemont, only those documents which the RAC does not have in their files will be forwarded with an index sheet listing the items being sent.

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## SUBCONTRACT PLANNING AND ADMINISTRATION

### 1.0 PURPOSE

The purpose of this procedure is to provide complete information and sources to enable procurement of services and equipment required to meet project objectives.

### 2.0 RESPONSIBILITY AND DIRECTION

The PAG leader or the PAG project managers shall prepare and integrate this procedure into the PAG projects. To successfully conduct the PAG projects, material and services are needed to assist in various capacities and at various times and sites. Either alone or together, the group leader and/or the project managers will determine when procurement services are required. When needed, they shall select from the following avenues of procurement, depending upon the type of material or service needed, cost of item, date needed, availability, and other project-related considerations.

1. In-house - Oak Ridge National Laboratory (ORNL) or United Nuclear Commission (UNC) Geotech,
2. Blanket Purchase Order (BPO) (Grand Junction and vicinity),
3. UCN-14715C, Purchase Requisition ORNL computerized form,
4. UNC-90, Purchase Requisition form through UNC Geotech Procurement,
5. UCN-1127, Request for Individual Consultant or Research and Development Subcontract, and
6. Purchasing while on business travel.

When the need for material or services is determined and avenue of procurement selected, the individual initiating the procurement becomes the requester. The responsibility of processing the request for any necessary material or services is a

Approved by:

Josue E. Chavarria 9/17/90  
(Date)

Craig Little 9/19/90  
C.A. Little (Date)

joint effort of the requester and the procurement coordinator following procedures set forth below.

### 3.0 PROCEDURE

#### 3.1 IN-HOUSE

Most office supplies and some laboratory or field supplies can be obtained from the UNC Geotech stores located on the compound. Material should be ordered from the UNC store whenever possible. Stores catalogs and order form supplies are maintained by the Procurement Coordinator.

3.1.1 Required item should be listed on the appropriate stores order form (UNC-1669) and described by catalog number, quantity desired, unit of issue, and description. The correct charge number should be supplied by the requester or appropriate project manger.

3.1.2 The form should be submitted to the procurement coordinator for processing. All forms will go through the procurement coordinator before they are sent on to UNC Geotech stores. An order normally takes five to seven days to be filled.

3.1.3 Some items such as forms, clothing, etc. are available only at the stores facility located at ORNL in Oak Ridge. These items are ordered by the procurement coordinator through Oak Ridge and are shipped to Grand Junction.

#### 3.2 BLANKET PURCHASE ORDER

Office, field, drafting and computer supplies may be purchased through a local vendor (see list below naming a few). Prior approval must be obtained by the Grand Junction Office group leader or project manager. Nothing shall be purchased without prior approval.

1. Coast to Coast
2. Mountain West Office Products
3. Valley Office Supply
4. Plaza Engineering
5. Coakley Laundromat
6. L & K Surveying

7. Computerland
8. Connecting Points
9. Cognitive Systems
10. Energy Equipment & Supply

### **3.3 UCN-14715C, PURCHASE REQUISITION**

This form is to be used by the procurement coordinator in Grand Junction and Subcontracts Coordinator in Oak Ridge for initiating any necessary equipment and materials that needs to be procured through the Martin Marietta Energy Systems Procurement Division.

### **3.4 UNC-90, PURCHASE REQUISITION**

This form is to be used by the procurement coordinator in Grand Junction for initiating any necessary equipment and materials that needs to be procured through the UNC Geotech Procurement Division.

#### **3.4.1 Requester**

- a. Requests preparation of UCN-14715C form and provides required technical specifications, suggested vendors, and estimated cost;
- b. Provides sole source or other justifications if necessary;
- c. Serves as technical contact;
- d. Informs procurement coordinator/OR if material or equipment is unacceptable for any reason after delivery.

#### **3.4.2 Procurement coordinator/Grand Junction, Colorado and subcontracts coordinator/Oak Ridge, Tennessee**

- a. Prepares UCN-14715C form and associated paperwork;
- b. Secures approvals;
- c. Forwards forms to Subcontracts Coordinator/OR for additional approval routing, and submission to Procurement Division;
- d. Tracks status on computer database;

- e. Receives and inspects incoming shipments;
- f. Notifies materials requisitioner/OR that orders are completed so he can issue a receiving report;
- g. Sends all original invoices, shipping receipts and any other pertinent information to the appropriate office.

### **3.5 UCN-1127, REQUEST FOR INDIVIDUAL CONSULTANT OR RESEARCH AND DEVELOPMENT SUBCONTRACT**

This form is required when a written agreement between Martin Marietta Energy Systems, Inc. and another company or individual is necessary to obtain consultant services, research and development services, and other professional and technical services. Typical subcontractor needs may include but are not limited to:

- 1. land surveying,
- 2. technical support,
- 3. aerial or ground surveys,
- 4. video taping support,
- 5. drilling,
- 6. analysis (soil, air, etc.), and
- 7. training courses.

#### **3.5.1 Wage Scale Information**

The PAG materials requisitioner is responsible for submitting, on a case-by-case basis, a request to Martin Marietta Energy Systems Purchasing Division to obtain the wage scales in parts of the country where field work is expected to be accomplished.

#### **3.5.2 Responsibility**

The initiation of these services is the responsibility of the requester and the materials requisitioner. The person who initiates a request for a subcontract shall refer to the ORNL standard procedures for purchasing and subcontracting. The requester and materials requisitioner are jointly responsible for the following duties:

- a. Submit request for wage determination to Procurement Division,
- b. Provide statement of work to reflect administrative and technical direction, deliverables, cost estimates, suggested vendors, and other information pertinent to contract negotiations and completion,
- c. Provide sole-source justification if required,
- d. Secure approvals,
- e. Forward to subcontracts coordinator/OR and procurement division personnel for review and comments,
- f. Interface with subcontracts coordinator/OR, section accounting clerk, division finance office, and procurement division personnel, and
- g. Assist procurement division personnel in proposal evaluation, if required.

### **3.5.3 After subcontract is awarded**

Subcontracts create a legally binding obligation of federal funds, and therefore, Federal Acquisition Regulations (FAR), Department of Energy Acquisition Regulations (DEAR), Martin Marietta Energy Systems purchasing policies and or UNC Technical Services purchasing policies must be followed. Designated approvals must be obtained.

After contract award the requester is responsible for administration and quality control functions as listed below:

1. Serve as the source of technical documents and direction for the subcontractor,
2. Initiate and provide technical support for a subcontract modification when required,
3. Prevent potential subcontractor from starting work in advance of official authorization from Martin Marietta Energy Systems Purchasing,
4. Direct the technical performance of the vendor in required task; ensure that performance of the tasks is properly completed and that quality assurance has been effected according to the subcontractor requirements.

5. Interface with the procurement coordinator/GJ, subcontracts coordinator/OR, and/or procurement division personnel if problems arise in administration of the contract,
6. Keep the PAG management and requisitioners informed of the status of the subcontracted job and follow any directives,
7. Review and approve the subcontractor's final report, daily log, invoice, etc.,
8. Provide confirmation of work completed to satisfaction according to specified deliverables of contract to ensure vendor payment, and
9. Advise management of accounting status.

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: SU-085 Page: 1 of 1 Revision: 0 Date: 10/01/90
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**PROPERTY MANAGEMENT**

**1.0 PURPOSE**

The purpose of the following procedure is to provide guidelines for Property Coordinator for the Pollutant Assessments Group/Grand Junction Office (PAG).

**2.0 APPLICABILITY**

This procedure applies to all ORNL and UNC furniture assigned to the PAG and its associated location.

**3.0 PROCEDURE**

When furniture is moved from one location to another location, a written memo describing which furniture was moved from what location to new location and furniture I.D. number shall be generated and forwarded to the property coordinator.

The property coordinator is responsible for the overall coordination of all office furniture, and has the following responsibilities:

1. Receive furniture list from Oak Ridge National Laboratory Tennessee through UNC Geotech,
2. Enter all DOE/ORNL and UNC furniture into data base,
3. Assign a tracking number to all property,
4. Maintain a data base with the following parameters: building location, room number, employee name, furniture name and I.D. number,
5. Visit each office and generate from the data base a list of all furniture assigned to that office, and
6. Update the property data base on an as-needed basis and file a hard copy list in an appropriate storage file.

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Approved by:

Dolene E. Chaverra 9-17-91  
(Date)

Craig Little 9/19/90  
C.A. Little (Date)

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	<b>PROCEDURE</b>  Pollutant Assessments Group	Number: SU-090 Page: 1 of 4 Revision: 0 Date: 10/01/90
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**IDENTIFICATION OF PROPERTIES FOR INCLUSION SURVEYS**

**1.0 PURPOSE**

The purpose of this procedure is to describe the methods by which vicinity properties are identified as candidates for inclusion surveys in the UMTRA Project.

**2.0 PROCEDURE**

Many properties have been identified and designated for consideration by the UMTRA Project based on the results of earlier aerial radiological surveys and information obtained from earlier mobile and on-site surveys. Additional properties may be identified as candidates for inclusion based on:

1. detection of anomalous gamma radiation levels by the scanning van on properties not previously listed,
2. information from knowledgeable sources, and
3. requests from property owners or from the other project participants.

**2.1 RADIOLOGICAL SCANNING VAN**

When conducting or analyzing the results of any mobile gamma survey, the PAG staff will be alert to the possibility that some uranium mill tailings deposits may not have been found during earlier survey activities.

In the event that a previously unreported deposit is detected, the mobile scan team leader will report the location of the deposit and pertinent information to the project manager. The project manager will notify the UMTRA-PO and the TAC of the findings and will request that the property be added to the list of properties to be surveyed.

Approved by:

*Caroline Skelton* <sup>9-19-90</sup>  
\_\_\_\_\_  
(Date)

*Craig Little* 9/19/90  
\_\_\_\_\_  
C.A. Little (Date)

## 2.2 INFORMATION FROM KNOWLEDGEABLE SOURCES

Properties potentially contaminated with uranium mill tailings may be identified by various knowledgeable sources, including federal, state, or local officials, and citizens who can reliably recollect transport or placement of tailings on properties. The public relations coordinator, in cooperation with the TAC, will encourage such sources to come forward by making personal contact, holding public meetings, and advertising in the media. If properties are identified in this manner, the project manager or the TAC, as is appropriate, will request the UMTRA-PO to add these properties to the list to be surveyed.

## 2.3 OWNER REQUESTS

Property owners who suspect that their properties are contaminated with mill tailings are encouraged to request the DOE to survey their properties. Media advertising and public meetings also serve to alert these property owners.

## 2.4 TYPES OF PROPERTIES

There are basically three types of properties which the ISC will have occasion to survey and/or evaluate for inclusion into the UMTRA project:

1. properties which have qualified for possible remediation under the state managed Grand Junction Remedial Action Program (GJRAP),
2. properties which only qualify for the DOE sponsored UMTRA program and have thus been designated for ISC surveys,
3. properties adjacent to an UMTRA designated property, which upon ISC investigation are determined to contain a "spillover" of the tailings deposit located on the UMTRA designated property.

### 2.4.1 GJRAP Properties

The GJRAP was initiated before the UMTRA project and is managed by the State of Colorado. Remediation under GJRAP has been completed and the files closed out. The GJRAP differed significantly from the UMTRA project in that remediation was conducted on structures only - vacant lots were not eligible for cleanup. In addition, the standards upon which the properties were evaluated were different. The ISC has no jurisdiction over the interior of structures that were remediated under GJRAP, and will perform outdoor measurements only. GJRAP historical data are available and team

leaders are responsible for reviewing the data prior to an ISC survey.

#### **2.4.2 Dovetail Properties**

Dovetail properties are properties that were still "active" under GJRAP; "active" meaning that the GJRAP remediation on the structure(s) had not yet been closed out. For greater cost and time effectiveness as well as lessened inconvenience for the property owner, GJRAP and UMTRA attempted to "dovetail" their efforts and perform any indoor and outdoor remediation concurrently. Surveys on dovetails were conducted by both the ISC and ARIX, a local subcontractor. ARIX provided its survey results to the ISC and the ISC evaluated the data and submitted a summary report/recommendation to the DOE. All remediation under GJRAP has been completed.

#### **2.4.3 UMTRAP Properties**

The UMTRA project was authorized six years after inception of GJRAP and is managed by the DOE. UMTRA cleans up all eligible vicinity properties, including open land. The criteria for inclusion are more stringent and remediation is performed on both the indoors and outdoors. These DOE designated properties have not been considered for cleanup under any other programs.

#### **2.4.4 Spillover Properties**

On occasion an outdoor gamma scan will reveal a deposit which extends from the currently surveyed property onto an adjacent property(ies). This "spillover" must be notated on the field map as such and investigated further. The team leader should attempt to acquire a consent for the spillover property. The address of the spillover property must be recorded and the public relations staff notified. The public relations staff will determine whether or not this adjacent property has already been designated and if not, will initiate proceedings to do so. A copy of all data and the field map of the surveyed property must be inserted into the newly created spillover property file.

**a. Surveyed property deposit is includable.**

If the surveyed property can be included on its own merit (does not depend on survey of adjacent property to deem the deposit includable), the report can be written immediately. The report

may also be initiated if it appears that a consent cannot be obtained for the spillover property within a reasonable time period. The adjacent property should be referenced by address and location number in the report.

**b. Surveyed property deposit is not includable.**

If the contamination on the surveyed property is insufficient to be included on its own merit, the file should be retained until a consent can be obtained on the spillover property. Once this subsequent survey is conducted, both reports can be written concurrently. Both reports should reference the other property by address and location number.

**c. Spillover property has historical data.**

If the spillover property has already been designated, the team leader should check to see if historical data is available. If previous outdoor radiological data indicates elevated gamma levels in the same area as the deposit on the surveyed property, the spillover property can be included without conducting an ISC walk-on survey. However, a consent form must still be obtained. This type of inclusion is a "spillover inclusion" and differs from a "standalone" or ISC survey-determined inclusion.

OAK RIDGE NATIONAL LABORATORY Health & Safety Research Division	PROCEDURE Pollutant Assessments Group	Number: SU-091 Page: 1 of 17 Revision: 0 Date: 10/01/90
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## CONSENT FOR ACCESS TO SURVEY

### 1.0 PURPOSE

The purpose of this procedure is to describe the steps taken by the PAG/UMTRA to obtain signed consent-for-access agreements from property owners and tenants.

### 2.0 OTHER DOCUMENTS

#### 2.1 APPENDICES

2.1.1 Appendix 1: Example of Consent-For-Access Transmittal Letter

2.1.2 Appendix 2: Example of Consent-For-Access Agreement

2.1.3 Appendix 3: Data Entered in the PAG/UMTRA Data Base

2.1.4 Appendix 4: Stage 1 Refusal Letter

2.1.5 Appendix 5: Record of Final Decision Enclosure

2.1.6 Appendix 6: Cover Letter for Signed Refusal

2.1.7 Appendix 7: Signed Refusal

2.1.8 Appendix 8: Cover Letter for Record of Final Contacts With Vicinity Property Owner(s)

2.1.9 Appendix 9: Record of Final Contacts With Vicinity Property Owner-GJ

### 3.0 RESPONSIBILITIES

The UMTRA Project is a cooperative program between the Federal Government and the affected states and Indian tribes. The responsibility for acquiring consent-for-access agreements, as well as the contents of the agreements, are

Approved by:

Caroline D. Pedalago 9-19-90  
(Date)

Craig Little 9/19/90  
C.A. Little (Date)

determined by the individual states and tribes in cooperation with the DOE. The following is a listing of the entities responsible for obtaining consent-for-access agreements for various property locations.

<u>Property Location</u>	<u>Responsible Entity</u>
Colorado	PAG/UMTRA
Idaho	PAG/UMTRA
Navajo Tribal Lands	The Navajo Nation
New Mexico	PAG/UMTRA
North Dakota	PAG/UMTRA
Oregon	PAG/UMTRA
Pennsylvania	PAG/UMTRA and State of Pennsylvania
South Dakota	UNC and PAG/UMTRA
Texas	PAG/UMTRA
Utah	State of Utah and PAG/UMTRA
Wyoming	PAG/UMTRA

The public relations staff is responsible for acquiring consent-for-access agreements that are to be obtained by PAG/UMTRA and is responsible for keeping records of all consents-for-access that have been obtained or have been refused.

#### 4.0 PROCEDURE

The procedure used to acquire a consent-for-access agreement depends on the location of the property being considered. In general, seven steps are involved:

1. location of property and its owners and tenants,
2. preparation and mailing of a consent-for-access agreement package,
3. property file initiation,
4. processing returned consent-for-access agreements,
5. processing signed refusals for access and nonresponses,
6. processing partial-access properties, and
7. follow-up on consent-for-access agreements that are undeliverable.

#### 4.1 LOCATION OF PROPERTY AND ITS OWNERS AND TENANTS

This procedure applies only to properties for which PAG/UMTRA has the responsibility to obtain consent-for-access agreements. For a property in Mesa County, CO, the public relations staff consults the Mesa County Tax Assessor's files that are contained on the UNC computerized database. If the computer listing is outdated, the Mesa County Tax Assessor's Office is contacted directly. If these two contacts fail to identify and locate the property owner, all historical data are thoroughly researched, and, if necessary, a member of the public relations staff will visit the property or will pursue any possible leads.

For properties outside Mesa County, their respective communities are visited. During this visit, the public relations staff obtains the necessary information from city or county records or from personal contacts with knowledgeable persons. This visit also allows the staff to resolve problems concerning the location and ownership of a property that is vaguely described on the designation listing. Consent-for-access agreements often are obtained in conjunction with these visits.

#### **4.2 PREPARATION AND MAILING OF A CONSENT-FOR-ACCESS AGREEMENT**

This procedure applies only to properties for which PAG/UMTRA has the responsibility to obtain consent-for-access agreements.

Once the necessary property location and ownership information is in hand, the public relations staff prepares the consent-for-access agreement package and mails it, certified. This package contains a transmittal letter; two copies of the agreement form; instructions for completing the agreement form; a stamped, self-addressed envelope; and an UMTRA brochure containing information on the cleanup of vicinity properties. The owner's name and address are typed as the inside address on the transmittal letter. The location number, property address, and parcel number are typed on each copy of the agreement form. Example of the transmittal letter and consent-for-access agreement form are illustrated in Appendices 1 and 2.

#### **4.3 PROPERTY FILE INITIATION**

This procedure applies only to properties for which the PAG/UMTRA has the responsibility to obtain consent-for-access agreements.

Prior to mailing the consent-for-access agreement, the location number, which is used as the primary record control, is verified. All needed property data are entered into the PAG/UMTRA database (see Appendix 3). A folder is used to contain the property file and a label with the location number is made. When the consent-for-access agreement package is

mailed, the folder is then placed in the "consent form mailed" drawer of the location file cabinet.

#### **4.4 PROCESSING RETURNED CONSENT FORMS**

When the public relations staff receives a signed consent for access, it is date stamped. The date of receipt, any revised owner information, and the consent status are entered in the PAG/UMTRA data base. On properties with granted access, the property file is pulled and merged with the CDH file (when present). The file is then placed in the "ready for drawing assignment" drawer.

The property files are assigned for drawing by the public relations staff according to priorities. Files are pulled and the location number, date assigned, and person assigned to complete the drawing are entered in the data base and in a logbook. A copy of the consent is sent to the graphics staff, and the property file is placed in the "assigned for drawing" drawer.

When completed drawings are received from the graphics department, the date of completion is entered in the PAG/UMTRA data base. The property file is pulled, and the "property tracking form" is printed out from data in the data base and stapled inside the property folder. The folder is placed in the "ready to be surveyed" drawer.

Property files are pulled, assigned for survey, and distributed to appropriate team leaders. Assignment dates and team leaders' initials are entered in the data base and on the tracking sheets. Survey dates, provided by team leaders, are entered in the data base on a weekly basis by public relations staff.

#### **4.5 PROCESSING SIGNED REFUSALS**

This procedure applies only to properties for which the PAG/UMTRA has the responsibility to obtain consent-for-access agreements.

In cases where the owner signs a refusal for access, the ISC forwards property files to the Department of Energy. The DOE makes a final attempt to acquire consent by sending the Stage 1 Refusal Letter to the Owner. An enclosure to the letter is the "Record of Final Decision," an example of the Stage 1 Refusal Letter and enclosure is shown as Appendices 4 and 5.

The original signed refusal is forwarded to the DOE with a cover letter. These are placed in an official location folder with the CDH folder (when present) attached. Copies of the signed refusal and cover letter are

retained by the ISC in the property folder. The ISC property folder is filed in a drawer marked "Refusals Mailed to DOE." The location number is noted in a logbook when the folder is forwarded to DOE. The consent status, date of the signed refusal, and the date the file was forwarded to DOE are entered in the ISC data base. Examples of the cover letter and the signed refusal are shown as Appendices 6 and 7.

#### **4.6 PROCESSING PARTIAL ACCESS PROPERTIES**

Occasionally the ISC recommends exclusion of a property without having had access to all structures and the property is excluded from the UMTRA Project. If the DOE requires additional data on the property, the DOE acquires consent for access. The ISC is requested to return to the property to survey the previously inaccessible structure(s) and submit an addendum to the original report.

##### **4.6.1 File Preparation**

The DOE forwards the signed consent to the ISC. A file is initiated with a blue label and the words "Partial Access" stamped on the folder. The first recommendation report is pulled from the "closed" files in Document Control, copied, and placed in the newly initiated file folder. The original file folder which resides in the "closed" category is also stamped with the words "Partial Access." The newly created file folder with blue label is assigned to a team leader to acquire additional data. An addendum report is written and submitted to DOE. When the ISC receives the DOE decision memo which closes the file, the addendum report (in blue-labeled folder) is filed with the original recommendation report in the "closed" file category in document control. Appropriate information is entered in the data base.

#### **4.7 FOLLOW-UP ON CONSENT-FOR-ACCESS AGREEMENTS NOT RETURNED**

##### **4.7.1 First Attempt**

Consent-for-access packages that the postal service is unable to deliver are returned to the Public Relations department. A search of the most recent property files at the appropriate tax assessor's office then is initiated to locate and identify the current owner of the property. If this search fails to yield the required information, searches are made quarterly until the required information is obtained. Then a new consent-for-access package is mailed to the newly identified property owner.

**4.7.2 Second Attempt**

If no response to the original mailing is received within 60 days, a second package is sent.

**4.7.3 Third Attempt**

If no response to the second mailing is received within 60 days, an attempt is made to contact the property owner by telephone. If such contact cannot be made within 15 days, a personal visit is made to the property. This visit is intended to obtain information of the property owner from tenants, and if necessary, from neighbors. Any information obtained will be used to contact the property owner by mail or by telephone.

**4.8 RECORD OF FINAL DECISION**

If after at least three attempts by the ISC to acquire consent the owner does not respond, the ISC completes a "Record of Contacts" form. The dates on which the owner was contacted are documented on the form, and the form along with a cover letter are forwarded to DOE in an official file folder. Copies of the "Record of Contacts" and cover letter are retained by the ISC in the property folder. The ISC property folder is filed in a drawer marked "Nonresponders Referred to DOE." The location number is noted in a logbook when the folder is forwarded to DOE. The consent status and date the file was forwarded to DOE are entered in the ISC data base. Examples of the cover letter and "Record of Final Contacts" are shown as Appendices 8 and 9.

When the DOE receives a signed Record of Final Decision it is forwarded to the ISC in the official location folder. Documents contained in the official location folder are copied and placed in the ISC property folder. Both file folders are stamped with the words "Record of Final Decision." If the Record of Final Decision is a consent, the property file is placed in a drawer marked "Refusals Returned from DOE" and the ISC proceeds with the inclusion survey and recommendation. The inclusion survey report and recommendation are forwarded to the DOE in the official location folder along with the CDH folder (if present). If the Record of Final Decision is a signed refusal, the DOE writes a closeout memo. The memo and all documents in the official location folder are filed in the ISC property folder which is filed in the "closed" category in Document Control. The appropriate information is entered in the data base.



**CONSENT FOR ACCESS TO SURVEY**Number: SU-091  
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## Appendix 1 Example of Consent-For-Access Transmittal Letter.

**OAK RIDGE NATIONAL LABORATORY**  
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.GRAND JUNCTION OFFICE  
P O BOX 2567  
GRAND JUNCTION, COLORADO 81502

Dear Property Owner:

This letter is to request access to your property by representatives of the U.S. Department of Energy (DOE) and the Colorado Department of Health, for purposes described below.

The Uranium Mill Tailings Radiation Control Act, Public Law 95-604, was passed by Congress in 1978. It authorized the Department of Energy (DOE) to carry out the Uranium Mill Tailings Remedial Actions (UMTRA) Project. On October 19, 1981, DOE and the State of Colorado entered into a cooperative agreement to implement the UMTRA Project and accomplish remedial action at the nine Colorado mill sites and their associated vicinity properties. The vicinity properties include any residential and commercial structures and open lands contaminated with mill tailings derived from the mill sites. The objective of the UMTRA Project is to remove or control uranium mill tailings and ensure that the standards published by the Environmental Protection Agency (EPA) for the protection of the public health, safety and the environment are met.

DOE is now evaluating properties to determine potential eligibility for inclusion in the UMTRA Project. Previous radiological surveys by State and Federal agencies suggest the possible presence of uranium mill residues on your property. Even though your property may have been surveyed in the past under the Grand Junction Remedial Action program, another survey may be required to ensure that the radiation levels do not exceed the standards established by the EPA for UMTRA.

Staff of the Oak Ridge National Laboratory, under contract to DOE, need to visit your property, located at:

to take instrument readings and, possibly, air and soil samples to decide whether or not your property is eligible for remedial actions under the UMTRA Project.

Enclosed for your signature are two copies of a Consent form granting access to your property. Please note that a signature block is provided in the Consent form for your approval or disapproval of DOE's survey of your property. In either case, you should sign both copies of the Consent, retain one copy for your information, and return the second copy to DOE. A stamped, self-addressed envelope has been provided for your convenience.

## Appendix 1 (continued)

2

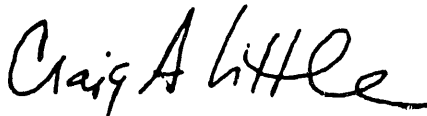
If you consent to the DOE survey of your property, and upon our receipt of the signed Consent, you will be contacted by a survey team to schedule entry onto your property. You will be notified of the results of the tests and whether or not your property is eligible for remedial action. Any remedial action recommended, will be with your knowledge and consent, and at no cost to you.

If it is determined that your property is eligible for remedial action, DOE and the State of Colorado will transmit to you a remedial action agreement setting forth the terms and conditions for such remedial actions.

Please be advised that, in the event you do not consent to the DOE survey program, either by your signature in the appropriate space or by not returning the Consent form, DOE and the State might not contact you again regarding radiological survey of your property. Consequently, your property may not be included in the remedial action program.

If you have questions about the consent form and anything else mentioned in this letter, please feel free to contact Dr. Craig Little at 303/242-8621.

Sincerely,



Craig A. Little, Ph.D.  
Oak Ridge National Laboratory



Albert J. Hazle  
Colorado Department of Health

CAL/ovj

**Appendix 2 Example of Consent-For-Access Agreement.**

**CONSENT FOR ACCESS TO CONDUCT SURVEYS AND ENGINEERING STUDIES**

VICINITY PROPERTY NO.:

PROPERTY ADDRESS:

PROPERTY PARCEL NUMBER OR DESCRIPTION:

I (We) acknowledge that I (We) own the property described above, and grant permission to employees, contractor and subcontractor personnel, and other representatives of the U.S. Department of Energy and the State of \_\_\_\_\_ to enter upon the property at a reasonable time or times during the next 36 months to conduct radiation surveys to determine the nature and extent of any radioactive material that might be present. In addition, permission is given to perform engineering assessments, if necessary, to evaluate the remedial measures that might be taken, as well as to evaluate the extent of the work required and the cost.

I (We) understand that DOE's and the State's responsibility for any damage or disturbance to my (our) property caused by its activities shall be any backfilling, seeding, sodding, landscaping, rebuilding or repair of the property required prior to restore it to a condition comparable to its apparent physical condition immediately prior to entry upon the property.

I (We) understand that the DOE and the State of \_\_\_\_\_ are not obligated to perform remedial action upon the property. I (We) understand that no remedial action shall be performed until the DOE, the State, and the property owner have entered into a separate written agreement setting forth terms, conditions, and plans for remedial action.

I (We) understand that the DOE and the State have the right to disclose to the public, in the form of technical data and reports, the results of its data-gathering on the above-described property.

I grant access for the conduct of surveys and engineering studies as provided in this Consent-for-Access.

\_\_\_\_\_  
Signature of Owner(s) \_\_\_\_\_  
Date

I have decided not to participate in the UMTRA Project.

\_\_\_\_\_  
Signature of Owner(s) \_\_\_\_\_  
Date

**OWNER DATA: (PLEASE PRINT CLEARLY)**

NAME \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
HOME PHONE (\_\_\_\_) \_\_\_\_\_  
BUS. PHONE (\_\_\_\_) \_\_\_\_\_

**TENANT DATA: (IF APPLICABLE)**

NAME \_\_\_\_\_  
HOME PHONE (\_\_\_\_) \_\_\_\_\_  
BUS. PHONE (\_\_\_\_) \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
\_\_\_\_\_

APPENDIX 3

DATA ENTERED IN THE PAG/UMTRA DATA BASE

<u>Entry</u>	<u>Meaning</u>
LOCNO	TAC-assigned property location number
STREETNO	Number in property address
STREETNAME	Name of street in property address
CITYSTATE	City, State, and ZIP code in property address
TYPE	Type of property
OWNRLAST	Last name of property owner
OWNRFIRST	First and middle name or initials of property owner
OWNRSTREET	Street address of property owner
OWNRCITY	City in which owner lives
OWNERSTATE	State in which owner lives
TENANT	Name of tenant
DOEREQDATE	Date on which DOE designated the property or asked that survey be conducted
ACCLTRSENT	Date on which access agreement form was sent
NEXCONTACT	Date of next contact with property owner
FUPSENT	Date on which follow-up letter was sent
RESPONDATE	Date of owner's response
CONSTATUS	Owner's response (CONSENT or DENIAL)
SURVEYDATE	Date on which inclusion survey was conducted
RECMDATION	PAG/UMTRA recommendation to DOE (INCL or EXCL)
RECBASIS	Type of information on which recommendation was based (walk-on, van, or historical)
LTRDOE	Date on which recommendation and survey report to DOE
INCLDATE	Date on which DOE decided to include the property
OTHRLOCNO	Other assigned property location numbers, if any

Appendix 4 Stage 1 Refusal Letter.



Department of Energy  
Post Office Box 2567  
Grand Junction, Colorado 81502-2567

June 6, 1988

Location No.: GJ00000

Address: 254 Remedial Road  
Grand Junction, CO

ORNL/GJ  
JUN 9 '88  
RECEIVED

Mr. John R. Citizen  
254 Remedial Road  
Grand Junction, CO 81502

Dear Mr. Citizen:

The U. S. Department of Energy (DOE), in cooperation with the State, is currently performing remedial actions at certain residences, open lands, and commercial structures in the Grand Junction, Colorado, area that have been determined to contain uranium mill tailings derived from the inactive uranium mill site in Grand Junction. Remedial actions are those actions deemed necessary by DOE and the State to excavate and remove uranium mill tailings and otherwise clean up a property so that radiation levels do not exceed the standards promulgated by the U. S. Environmental Protection Agency (EPA), 40 CFR Part 192.

Previous aerial and mobile radiation measurements and historical records indicate that uranium mill tailings may be present on your property, and therefore, remedial action may be required. In order to make such a determination, the DOE has contracted Oak Ridge National Laboratory (ORNL) to take on-site radiation measurements. If the measurements confirm levels in excess of the standards set by the EPA, then the DOE will include your property as eligible for remedial action. Further, UNC Geotech, DOE's Remedial Action Contractor, will perform radiological and engineering surveys in order to define the remedial action required. Subsequently, the DOE will notify you and provide, for your execution, a Remedial Action Agreement identifying the nature and extent of tailings contamination and the remedial measures to be effected. However, should the measurements by ORNL indicate no tailings contamination in excess of the EPA standards, the DOE will notify you and no further action will be taken by the DOE with respect to your property.

As you can see, we have a pressing need for full access to your property. On Enclosure 1 you have indicated that you choose not to participate in the UMTRA Project. Inasmuch as this cleanup program is voluntary in nature, I feel it is incumbent on me to bring to your attention four items for reconsideration.

First, I have enclosed a copy of a brief analysis of the potential health effects of uranium mill tailings and the associated decay chain (Enclosure 2).

Second, it is our understanding that under a recent Colorado State case law, the owner/seller of a property may be held liable in tort if he or she fails to disclose to prospective purchasers a known latent defect, such as the presence of uranium mill tailings. While you may have no plans to sell your property, it is possible that any tailings contamination could have implications with respect to any future sale.

## Appendix 4 Continued.

John R. Citizen

Page 2

June 6, 1988

Third, any remedial action required on your property will be performed at no expense to you. We have initiated remedial action in the Grand Junction area and we would be glad to share information regarding the nature of those remedial actions.

Fourth and finally, in order to meet our schedule for a timely completion of our remedial action activities in Grand Junction, we need to initiate remedial action on all suspect properties, such as yours, immediately. Once our project is complete, responsibility for cleanup of mill tailings at properties which have not been cleaned up may rest with the owners of affected properties. At this time, we cannot predict whether license or management requirements will be imposed by the State or the Nuclear Regulatory Commission.

Please note that the State will be provided information concerning the radiological status of your property for action that they deem appropriate which may include the annotation of land records.

In light of these issues, I request that you reconsider participation in the UMTRA Project. I have enclosed for your signature a Record of Final Decision (Enclosure 3) which would authorize the DOE contractors to access your entire property as necessary to ensure compliance with the EPA standards. I would appreciate your prompt review and execution of the form and return of the same to my office in the enclosed postage-paid pre-addressed envelope.

If you have any questions or concerns regarding the UMTRA Project or your property, please call me at 303/242-8621, Ext. 220.

Sincerely,

*R. Eldon Bray*  
R. Eldon Bray  
Project Engineer

## Enclosures (4):

- Enclosure 1 - Record of Contacts
- Enclosure 2 - Health Effects
- Enclosure 3 - Record of Final Decision
- Enclosure 4 - Self-addressed Envelope

cc: w/o enclosures:  
C. Little - ORNL  
G.A. Franz - CDH

refus.ltr/EB

CONSENT FOR ACCESS TO SURVEY

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Appendix 5 Record of Final Decision Enclosure.

ENCLOSURE 3

RECORD OF FINAL DECISION

LOCATION NO.: GJ-12214  
ADDRESS: 2040 Orchard Avenue  
Grand Junction, CO

I, \_\_\_\_\_, (property owner), have reconsidered my decision and choose to participate in the Uranium Mill Tailings Remedial Action (UMTRA) Project.

DATED: \_\_\_\_\_

I, \_\_\_\_\_, (property owner), am in full understanding of the UMTRA Project and do not wish to participate.

DATED: \_\_\_\_\_

Appendix 6 Cover Letter for Signed Refusal.

**OAK RIDGE NATIONAL LABORATORY**

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

GRAND JUNCTION OFFICE  
PO. BOX 2567  
GRAND JUNCTION, COLORADO 81502

Mr. Eldon Bray, Project Officer, GJPO  
U.S. Department of Energy  
Grand Junction Project Office  
P.O. Box 2567  
Grand Junction, CO 81502

Dear Mr. Bray:

Record of Contacts with Vicinity Owner - GJ

The Inclusion Survey Contractor has made at least three attempts to secure a signed consent from the owner of subject vicinity property. The owner either has refused to sign a consent approving or denying access, or has not responded to any letters or other attempts to secure a consent. In accordance with provisions set forth in the VPMIM, a record of the contact is attached.

This information is being forwarded to the DOE who will make further attempts to secure a signed consent for access from the property owner. If the DOE is successful in obtaining an approved consent, please forward the original to ORNL and we will proceed with the radiological survey.

Sincerely,

Craig A. Little, Ph.D.  
Pollutant Assessments Group Leader

Enclosure  
Record of Contacts

CDR/eps

Appendix 7 Signed Refusal.

**CONSENT FOR ACCESS TO CONDUCT SURVEYS  
AND ENGINEERING STUDIES**

VICINITY PROPERTY NO.: GJ00000  
 PROPERTY ADDRESS: 254 Remedial Road, Grand Junction, CO  
 PROPERTY PARCEL NUMBER OR DESCRIPTION:

I (We) acknowledge that I (We) own the property described above, and grant permission to employees, contractor and subcontractor personnel, and other representatives of the U.S. Department of Energy and the State of Colorado to enter upon the property at a reasonable time or times during the next 36 months to conduct radiation surveys to determine the nature and extent of any radioactive material that might be present. In addition, permission is given to perform engineering assessments, if necessary, to evaluate the remedial measures that might be taken, as well as to evaluate the extent of the work required and the cost.

I (We) understand that DOE's and the State's responsibility for any damage or disturbance to my (our) property caused by its activities shall be any backfilling, seeding, sodding, landscaping, rebuilding or repair of the property required to restore it to a condition comparable to its apparent physical condition immediately prior to entry upon the property.

I (We) understand that the DOE and the State of Colorado are not obligated to perform remedial action upon the property. I (We) understand that no remedial action shall be performed until the DOE, the State, and the property owner have entered into a separate written agreement setting forth terms, conditions, and plans for remedial action.

I (We) understand that the DOE and the State have the right to disclose to the public, in the form of technical data and reports, the results of its data-gathering on the above-described property.

I grant access for the conduct of surveys and engineering studies as provided in this Consent-for-Access.

\_\_\_\_\_  
Signature of Owner(s) Date

I have decided not to participate in the UMTRA Project.  
John R. Citizen 12-31-84  
Signature of Owner(s) Date

**OWNER DATA:** (PLEASE PRINT CLEARLY)

NAME John R. Citizen  
 STREET 254 Remedial Road  
 CITY Grand Junction, CO  
 STATE \_\_\_\_\_ ZIP 81502  
 HOME PHONE ( 303 ) 900-0000  
 BUS. PHONE ( ) \_\_\_\_\_

**TENANT DATA:** (IF APPLICABLE)

NAME \_\_\_\_\_  
 HOME PHONE ( ) \_\_\_\_\_  
 BUS. PHONE ( ) \_\_\_\_\_  
 COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Appendix 8 Cover Letter for Record of Final Contacts  
With Vicinity Property Owner(s).

OAK RIDGE NATIONAL LABORATORY  
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

GRAND JUNCTION OFFICE  
P O BOX 2567  
GRAND JUNCTION, COLORADO 81502

Eldon Bray, Project Officer, GJPO  
U.S. Department of Energy  
Grand Junction Project Office  
P.O. Box 2567  
Grand Junction, CO 81502

Dear Mr. Bray:

Record of Contacts with Vicinity Property Owner - GJ-00683

The Inclusion Survey Contractor has made at least three attempts to secure a signed consent from the owner of subject vicinity property. The owner either has refused to sign a consent approving or denying access, or has not responded to any letters or other attempts to secure a consent. In accordance with provisions set forth in the VPMIM, a record of the contact is attached.

This information is being forwarded to the DOE who will make further attempts to secure a signed consent for access from the property owner. If the DOE is successful in obtaining an approved consent, please forward the original to ORNL and we will proceed with the radiological survey.

Sincerely,

Craig A. Little, Ph.D.  
Pollutant Assessments Group Leader

Enclosure  
Record of Contacts

CDR/cg

Appendix 9 Record of Final Contacts With Vicinity  
Property Owner - GJ.

RECORD OF CONTACTS WITH VICINITY PROPERTY OWNER(S)

IDENTIFICATION NO.: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

OWNER NAME: \_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

CONTACTS:

DATE CONSENT MAILED: _____	CERTIFIED	YES	NO
	[ ]	[ ]	[ ]

---

DATE CONSENT MAILED: _____	CERTIFIED	[ ]	[ ]
----------------------------	-----------	-----	-----

---

DATE OF PERSONAL CONTACT: (PHONE) \_\_\_\_\_  
(VISIT) \_\_\_\_\_

RESPONSE FROM PERSONAL CONTACT: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

---

NEW OWNER INFORMATION:	YES	NO
[ ]	[ ]	[ ]

OWNER NAME: \_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ON-DPL: YES [ ] NO [ ]

RESPONSE TO AD OR OWNER REQUEST: YES [ ] NO [ ]

OTHER: \_\_\_\_\_  
\_\_\_\_\_

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| 10. P. V. Egidi     | 27. M. J. Wilson            |
| 11. D. B. Ertel     | 28. Brown van               |
| 12. M. L. Espegren  | 29. Red van                 |
| 13. F. G. Gardner   | 30. OCS van                 |
| 14. D. K. Halford   | 31. Dark-blue extended van  |
| 15. R. R. Knott     | 32. Baby-blue extended van  |
| 16. N. E. Korte     | 33. U2CRT                   |
| 17. B. J. Krall     | 34. Blue Cherokee           |
| 18. C. A. Little    | 35. Blue Pickup             |
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56. Office of Assistant Manager for Energy Research and Development, Oak Ridge Field Office, P.O. Box 2001, U.S. Department of Energy, Oak Ridge, TN 37831-8600
57. W. L. Beck, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117
58. D. E. Brown, Senior Environmental Protection Specialist, Allied-Signal, Inc., 200 E. 95th St., Kansas City, MO 64131
59. T. J. Harvey, Office of Technical Services, H & R Technical Associates, 12800 Middlebrook Rd., Suite 207, Germantown, MD 20874
60. P. Keary, U. S. Department of Energy, Kansas City Area Office, 2000 E. 95th St., Kansas City, MO 64131
61. D. N. Mackenzie, Office of Technical Services, H & R Technical Associates, 12800 Middlebrook Rd., Suite 207, Germantown, MD 20874
62. D. Robertson, HAZWRAP, P.O. Box 2003, Oak Ridge, TN 37831-7606
63. B. Stanley, HAZWRAP, P.O. Box 2003, Oak Ridge, TN 37831-7606
64. M. Wade, HAZWRAP, P.O. Box 2003, Oak Ridge, TN 37831-7606
- 65-66. Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831

**END**

**DATE  
FILMED**

**8 / 7 / 92**

