MARTIN MARIETTA

ENVIRONMENTAL RESTORATION PROGRAM

ORNL/ER-200/R1

Meteorological Monitoring Sampling and Analysis Plan for the Environmental Monitoring Plan at Waste Area Grouping 6, Oak Ridge National Laboratory, Oak Ridge, Tennessee

MANAGED BY
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FOR THE UNITED STATES
DEPARTMENT OF ENERGY
UCN-17560 (6 7-91)

ENERGY SYSTEMS ER

CDM Federal Programs Corporation

contributed to the preparation of this document and should not be considered an eligible contractor for its review.

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Energy Systems Environmental Restoration Program
ORNL Environmental Restoration Program

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OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-8169
managed by
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Meteorological Monitoring Sampling and Analysis Plan for the Environmental Monitoring Plan in Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee Revision 1

Approvals

D. L. Garrett
WAG 6 Project Manager

Date

P. A. Schrandt
Environmental Restoration Quality Assurance Specialist

Date

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ABBREVIATIONS

ASME	American Society of Mechanical Engineers
CDM Federal	CDM Federal Programs Corporation
CFR	Code of Federal Regulations
DM	Data Manager
DOE	U.S. Department of Energy
DSP	data storage pack
EMP	Environmental Monitoring Plan.
ESML	Energy Systems Met Lead
ESP	environmental surveillance procedure
EPA	U.S. Environmental Protection Agency
FOP	field operations procedure
FTM	Field Task Manager
GCO	Generator Certification Official
H&S	health and safety
HD	high density
HP	Health Physics Section
I&C	Instrumentation and Controls
ID	identification
IH	Industrial Hygiene Section
LGWOD	Liquid and Gaseous Waste Operations Department
LMES	Lockheed Martin Energy Systems
MM	Meteorological Monitoring
OREIS	Oak Ridge Environmental Information System
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PC	personal computer
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SHSO	Site Health and Safety Officer
SLLW	solid low-level waste
STL	Sample Task Leader
SWSA	solid waste storage area
WAG	waste area grouping
WMO	Waste Management Operations
WMP	waste management plan

EXECUTIVE SUMMARY

This Sampling and Analysis Plan addresses meteorological monitoring activities that will be conducted in support of the Environmental Monitoring Plan for Waste Area Grouping (WAG) 6. WAG 6 is a shallow-burial land disposal facility for low-level radioactive waste at the Oak Ridge National Laboratory, a research facility owned by the U.S. Department of Energy and managed by Lockheed Martin Energy Systems, Inc. Meteorological monitoring of various climatological parameters (e.g., temperature, wind speed, humidity) will be collected by instruments installed at WAG 6. Data will be recorded electronically at frequencies varying from 5-min intervals to 1-h intervals, dependent upon parameter. The data will be downloaded every 2 weeks, evaluated, compressed, and uploaded into a WAG 6 data base for subsequent use. The meteorological data will be used in water balance calculations in support of the WAG 6 hydrogeological model.

1. INTRODUCTION

1.1 PROJECT OVERVIEW

This document is the Meteorological Monitoring Sampling and Analysis Plan (SAP) for Waste Area Grouping (WAG) 6 at Oak Ridge National Laboratory (ORNL). Note that the document is referred to as a SAP even though no sampling and analysis will be conducted as part of this activity. The term SAP is used for consistency. The procedures described herein are part of the Environmental Monitoring Plan (EMP) for WAG 6, which also includes monitoring tasks for groundwater quality, groundwater levels, seeps and springs, and surface water parameters. Separate SAPs are being issued concurrently to describe each of these monitoring programs.

This SAP has been written for the use of the field personnel who are responsible for implementing the EMP, with the intent that the field personnel will be able to take this document to the field and quickly find the appropriate steps required to complete a specific task. In many cases, Field Operations Procedures (FOPs) or equipment manuals will define the steps required for an activity. The FOPs for the EMP and the equipment manuals are referenced and briefly described in the relevant sections of the plans, and are contained within the FOP Manual. Both these documents (the SAP and the FOP Manual) will be available to personnel in the field.

Information regarding the WAG 6 physical description, geology and hydrogeology, and waste disposal and regulatory history can be found in the *Resource Conservation and Recovery Act Facility Investigation Report for Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee* (Energy Systems 1991), and a description of the purpose and scope of the EMP can be found in the *Environmental Monitoring Plan for Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee* (DOE 1993a).

1.2 METEOROLOGICAL MONITORING SAP OUTLINE AND OBJECTIVE

The purpose of the meteorological monitoring SAP is to provide field workers with information on conducting activities that are unique and essential to accomplishing the task of measuring meteorological parameters. Some information that is important to field workers is contained in other project-level documents. To avoid duplication of this information [which includes project-level quality assurance/quality control (QA/QC) and health and safety (H&S) protocols], other documents have been referenced as appropriate. Table 1.1 displays the organization of this SAP and the relevant reference documents. All documents will be made available to the field workers before the initiation of field activities, and these documents will be available at the field office. Copies of these reference documents will be available to the field workers to carry into the field for direct reference as the need arises.

The objective of the Meteorological Monitoring Program, as defined in the EMP, is to refine risk estimates through water balance calculations. Data on rainfall and evapotranspiration will be used to achieve understanding of the site water balance and to estimate groundwater flow. Field workers should keep this objective in mind when conducting the activities described in this SAP. An understanding of, and a constant adherence to, the objectives of the EMP will ensure the collection of data in quantities and at the quality level necessary to meet the objectives.

Table 1.1. WAG 6 Meteorological Monitoring SAP and project-level document cross-reference

Meteorological Monitoring SAP section	Project-level reference document(s)
Section 1 - Introduction contains limited information on the EMP, summarizes project objectives, and summarizes the meteorological monitoring activities to be conducted.	DOE *Environmental Monitoring Plan*
Section 2 - Task Instructions identifies the specific tasks to be conducted, contains activity-specific instructions on the work to be performed, and lists the procedures to be used at various stages of the work.	DOE *Environmental Monitoring Plan;* WAG 6 *Field Operations Procedures Manual*
Section 3 - Quality Assurance/Quality Control Requirements contains information on the QA/QC requirements specific to meteorological monitoring. This section includes information on documentation.	DOE *Quality Assurance Project Plan for Characterization and Monitoring Activities in Waste Area Grouping 6 at Oak Ridge National Laboratory*
Section 4 - Health and Safety Considerations briefly describes the health and safety aspects of the activity. Activity-specific Instruction Sheets (located in Appendix B) are referenced in this section, and will address specific health and safety issues that are not covered by the Site Health and Safety Plan.	Energy Systems *Site Health and Safety Plan for Waste Area Grouping 6 at Oak Ridge National Laboratory*
Section 5 - Waste Management briefly describes the waste management associated with the meteorological monitoring. The wastes associated with this activity will be restricted to personal protective equipment and other trash items such as used paper towels.	Energy Systems *Waste Management Plan*
Section 6 - Data Management describes the data collection and management activities that will be conducted in the field, and the procedures for collecting these data to ensure that accurate data are transferred into the database.	Energy Systems *Data Management Plan/Functional Systems Design*

The meteorological monitoring system will consist of a stand-alone tower and meteorological instruments connected to an electronic data logger for continuous data acquisition. The WAG 6 Meterological Monitoring Station will be used for this effort. With the exception of the precipitation gauge, which will be mounted at ground level, the meteorological instrumentation will be mounted on the tower.

The following paragraphs describe the instrumentation that will be used to measure the indicated parameters.

Wind speed and direction. The wind speed and direction will be measured with an R.M. Young (YOUNG, Model 0513) combined wind speed and wind direction monitor having a starting threshold of 1.12 miles per hour (mph) and an upper range of 112 mph.

Temperature and relative humidity. The atmosphere dry bulb temperature and relative humidity will be collected with a Rotronic temperature and relative humidity sensor Rotronic MP1000C or MP101C. This sensor uses a thin-film capacitive, relative-humidity-sensing element with a range of -40°C to 80°C. This unit will be placed in a naturally aspirating radiation shield (OMNIDATA, Model EA 130).

Precipitation. Precipitation will be measured using a WEATHERtronics Tipping Bucket Rain Gage (WEATHERtronics, Model 6011-A) having a mercury-wetted reed switch and a resolution of 0.01 in.

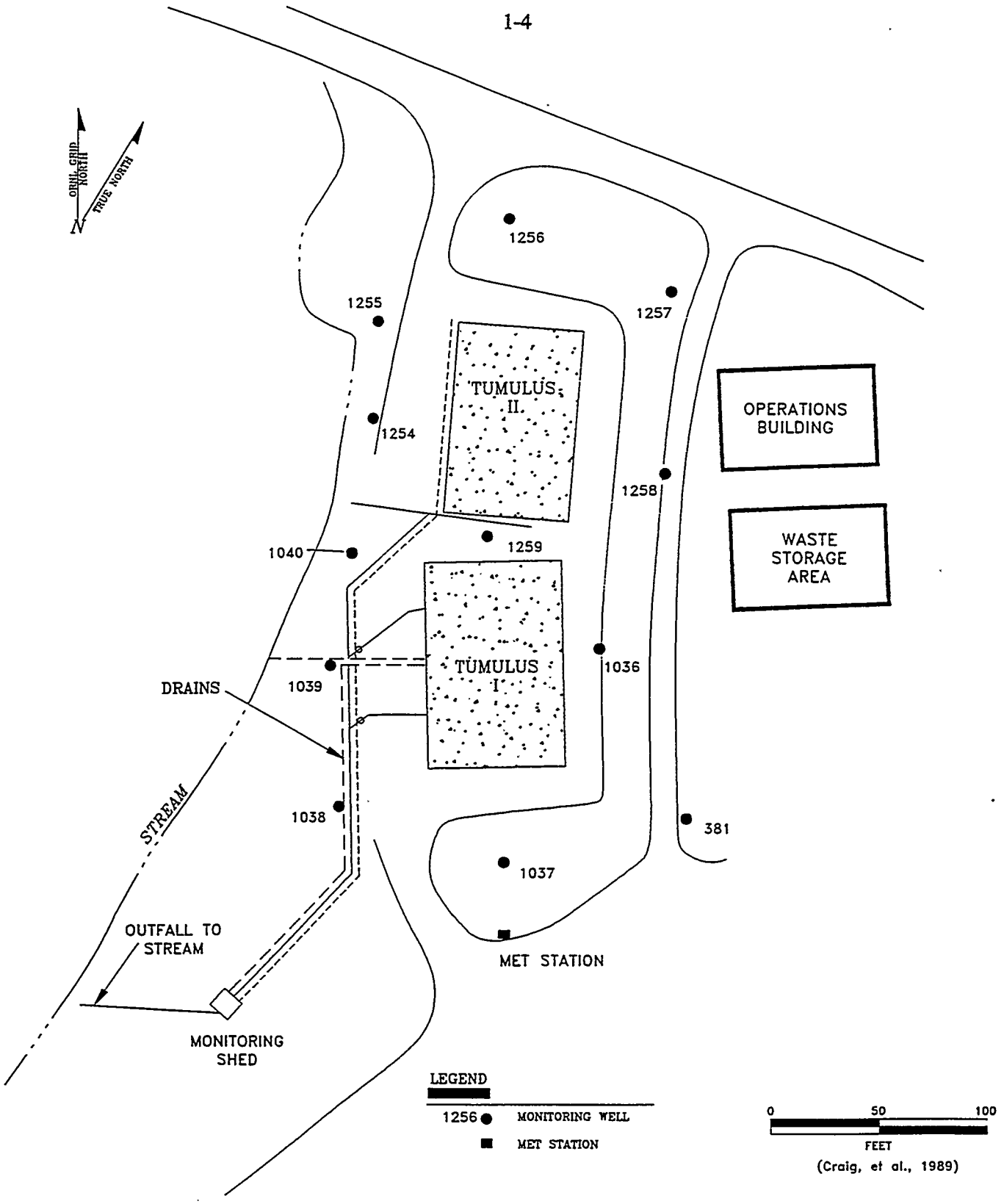
Solar radiation. Solar radiation data will be collected with a pyranometer (Li-Cor Model Li-2005) consisting of a silicon photovoltaic detector mounted in a cosine-corrected miniature head. This instrument measures the combined solar radiation emitted from the sky and sun.

Data from these activities will be collected electronically on various forms (see Appendix A), and in field logbooks.

1.3 SAMPLING LOCATIONS AND FREQUENCIES

The EMP specifies that the tumulus meteorology station, located approximately 50 ft. from the east bank of drainage FB, near the west leg at the french drain, will be used for this monitoring effort (Fig. 1.1). The location of the meteorological tower is such that it will provide representative measurements of local air flow patterns in WAG 6. The location of the tower meets the U.S. Environmental Protection Agency (EPA) specification that no surface obstruction be located within a distance of 10 times the height of the instrument. This minimizes the probability of any air flow obstructions or artificially induced turbulence. The meteorological parameters to be monitored and the frequency of sampling are displayed in Table 1.2.

The meteorological station will be inspected semiweekly (twice weekly) to ensure that all instruments are functioning. The collected data will be downloaded from the various instruments biweekly (every two weeks), reduced and validated, and uploaded into the WAG 6 data base.



LOCATION OF METEOROLOGICAL STATION AT WAG 6

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ORNL WAG 6

FIGURE No. 1.1

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Table 1.2. Meteorological parameters to be monitored[a]

Meteorological parameter	Sample interval	Data logger averaging period
Wind speed	1 min	1 h
Wind direction	1 min	1 h
Dry bulb temperature	1 min	1 h
Relative humidity	1 min	1 h
Solar radiation	1 min	1 h
Precipitation	Pulse counter	5 min

[a] All the data to be gathered in this effort are field data; no laboratory analysis will be involved. Accordingly, the meteorological measurement data are to be considered QC Level I.

2. TASK INSTRUCTIONS

This section identifies the specific meteorological monitoring tasks to be performed to meet the objectives of the EMP. In all cases, fieldwork will be accomplished according to this SAP. Any deviations from this SAP will be documented on a WAG 6—Monitoring Variance Request Form (MV-01) and approved before implementation. If for any reason a task is not completed, the reason also will be documented on a WAG 6—Monitoring Variance Request Form (MV-01) and in the field logbook. Any problem or corrective action taken will be documented on the WAG 6—Site Inspection/Data Collection Form (MM-02) and in the field logbook.

The collection of meteorological data is entirely automated. Field technicians are required only to collect data biweekly from the 32K or 64K EPROM Data Storage Pack (DSP) and to perform periodic calibration on the instruments (see Table 2.1). Inspections of the meteorological station will be conducted semiweekly to ensure that the instruments are functioning.

Because all instruments were originally part of the Tumulus Disposal Demonstration Project (Miller, Black, and Craig 1989), no installation is necessary. The location of the meteorological monitoring station has moved from the original tumulus location to the exsisting location south of RCRA CAP 1, and all instruments were reinstalled on the tower at the new site. Table 2.2 is a list of equipment that is necessary for the monitoring to take place.

A flowchart of the tasks to be conducted as part of this activity is displayed in Fig. 2.1. This flowchart graphically depicts the sequence in which the tasks will be conducted, the decision points associated with conducting the tasks, and when information will be recorded for data collection and management.

2.1 DATA COLLECTION

All meteorological parameters are to be sampled continuously with an OMNIDATA Easy Logger. The number of instruments and the reporting interval are such that a 32K EPROM DSP may be left in the field for as long as one month. However, all data from this instrument will be collected on alternate weeks.

To retrieve and install DSPs, the following equipment is necessary:

- surgical gloves and/or additional personal protective equipment (PPE) as specified by the Site Health and Safety Officer (SHSO) and/or Site Health Physicist,
- Easy Logger field unit (at site),
- key to Easy Logger protective case,
- Easy Logger terminal (hand-held),
- Easy Logger manual,
- 3/8-in. hexagonal wrench,

Table 2.1. Frequencies of meteorological monitoring activities

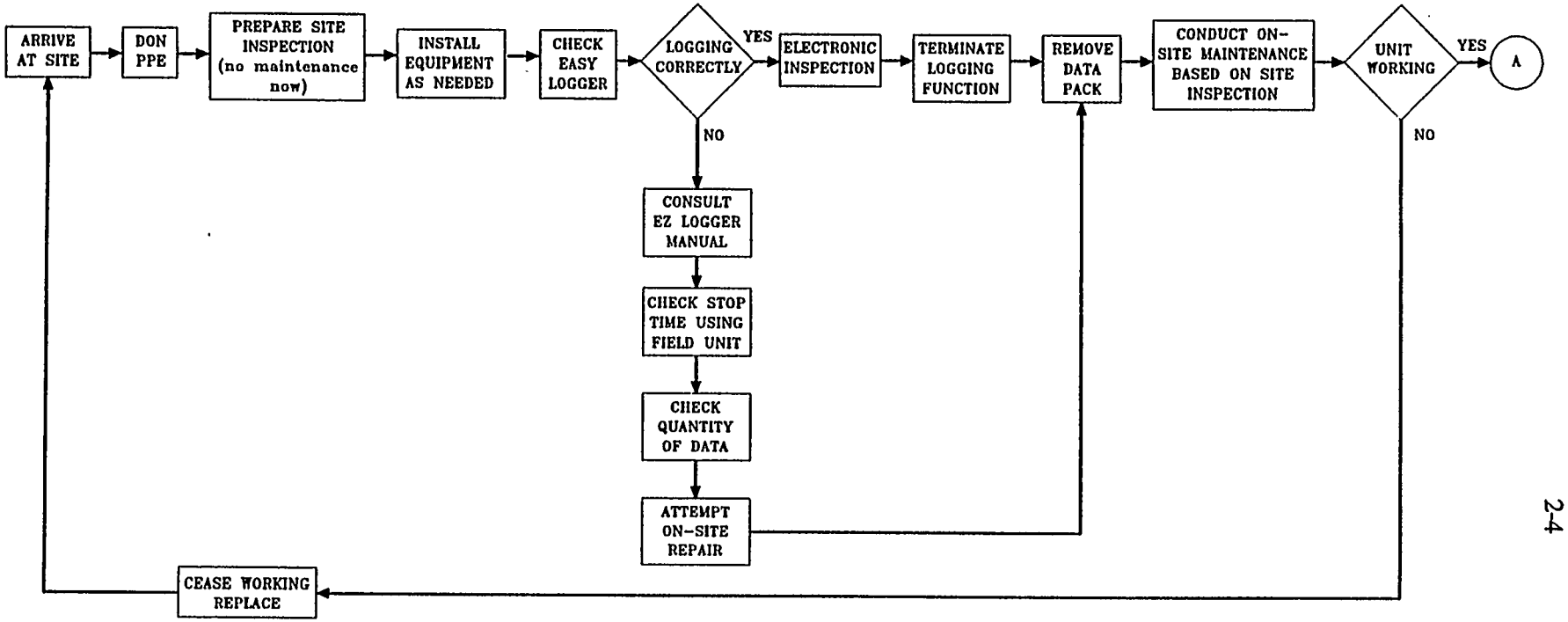
Instrument	Parameter	Data collection frequency	Inspection frequency[a]	Calibration frequency
Wind speed/direction sensor	Wind speed/direction	Biweekly	Semiweekly	Annually
Humidity meter	Temperature and humidity	Biweekly	Semiweekly	Annually
Terrestrial radiation sensors	Solar radiation	Biweekly	Semiweekly	Annually
Tipping bucket rain gauge	Precipitation	Biweekly	Semiweekly	Annually
Data logger	—	—	Semiweekly	Annually

[a] Additional inspections should be performed after electrical storms.

Table 2.2. Critical equipment for meteorological monitoring station

Equipment	Manufacturer	Model #	Total quantity
Hand terminal	Omnidata	EL-820	1
DSP 64K or 32K	Omnidata	EM-064	3
DSP eraser	Omnidata	PL-265T	1
Universal configuration cable	Omnidata	UC-6	1
Desiccant	Omnidata	DC-245	As needed
DSP reader or spare Easy Logger (Office)	Omnidata	EL-800	1
Signal line Zapnots	Omnidata	ES-240	4[a]
Power line Zapnots	Omnidata	EA-242	5[a]
Zapnot bustrack	Omnidata	FEA-11	1
System grounding cable	Omnidata	Copper wire	1
Easy Logger field unit	Omnidata	EL-824	1
Easy Logger multiplexer	Omnidata	EA-110	1
Radiation shield	Omnidata	EA-130	1
Rotronic RH/temperature probe	Rotronic	MP100C-00/2 (R28012)	1
Easy Logger steel enclosure	Omnidata	EA-120	1
Tipping bucket rain gauge	WEATHERtronics	6011-A	1
Solar radiation sensor	Li-Cor	Li-200SZ	1
Wind speed/direction sensor	R.M. Young	05103	1
Meteorological instrument tripod	Omnidata	EA-136	1
12V rechargeable battery	Johnson Controls	JC 1260	8

[a] Four signal line Zapnots and five power line Zapnots must be available to use as spares.



METEOROLOGICAL MONITORING ACTIVITY FLOWCHART

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FIGURE No. 2.1

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- empty EPROM DSP,
- field watch set to Instrumentation and Controls (I&C) Division universal time,
- desiccant,
- bar code labels and bar code scanning equipment,
- field logbook,
- WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02), and
- waterproof black ink pen.

Data collection will take place according to the WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02). The following guidelines should be utilized when retrieving DSPs.

1. When first arriving on site, survey the condition of the station and write notes concerning its condition in the site logbook and on the comments section of the WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02). Items to record include debris lodged in a device, evidence of tampering, or any change in the station since the previous inspection.

   DO NOT ATTEMPT ANY MAINTENANCE OR REPAIR AT THIS TIME.

2. Open the Easy Logger field unit protective case and check the condition of the desiccant (which should be blue) and any ant traps or other environmental control devices. Note any changes necessary on the WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02).

3. Attach the terminal to the field unit. Match the half-moon notch on the cable connector to the cut-out half-moon notch on the field unit. Then push the cable down firmly and turn the outer ring lock on the cable to tighten the connection.

4. Turn the unit on by pressing the on-off key. If the terminal is left on for several minutes during which no keys are pressed, it will turn itself off, but it will save previous entries only after "Enter" is pressed.

5. Confirm that the data logger is in logging mode. The prompt "select an option" should appear with the word "logging" in parentheses beneath it. If it does, continue to step 6. If it does not, record stop time and quantity of data, and consult the Easy Logger manual to attempt repair.

6. Conduct electronic inspection according to the WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02).

7. When retieving a DSP, continue with step 8. While performing a site inspection, continue to step 15.

8. Terminate logging: type **00,** YES (LOG RUN/STOP).

9. Physically remove the old, full DSP.

10. Log out the old DSP on form MM-02. If maintenance indicated by site inspection will disrupt logging (e.g., jostling instruments, unplugging wires), perform maintenance now. If maintenance will not disrupt logging (e.g., cleaning rain gauge, replacing desiccant), complete steps 10 through 12 immediately and then perform maintenance. Note any variances on a WAG 6—Monitoring Variance Request Form (MV-01), in the field logbook, and on a WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02); note any repairs on the WAG 6—Record of Repair Form (RF-01). Check the Easy Logger Programming.

11. Confirm equipment is in working order. If it is, continue to Step 11. If it is not, repair or replace malfunctioning equipment and start process from Step 1.

12. Log in the new, empty DSP on form MM-02.

13. Physically install the new DSP.

14. Resume logging by typing : 01 DELAY LOG, YES, SET TIME, ENTER.

15. Turn off logger by pressing on/off.

16. Disconnect terminal from field unit; close protective box.

17. If any unit is to be retired at this point, the WAG 6—Record of Repair Form (RF-01) must be filed.

NOTE: If the Easy Logger is not logging correctly, consult the Easy Logger manual. Possible causes for incorrect logging include whether it was set for logging last time, the condition of the solar collector and lithium backup battery, and wiring connections. If it cannot be fixed in the field, collect the DSP and consult I&C.

An extra site service inspection the day after a problem has been discovered will be conducted and recorded only in the field logbook to ensure that the problem has been corrected. It is possible that the problem noticed was a symptom of some other problem that was not fixed.

The battery check option applies to the power battery, not to the lithium backup battery. At the meteorological station, the battery is powered by the solar collector and may be greater than 12 V. If it is less than 10.5 V, the rechargeable battery should be replaced.

2.2 CALIBRATION

The Li-Cor Solar Radiation Sensor will be fctory calibrated on an annual basis. All other instruments, including the Easy Logger, will be calibrated by the Energy Systems I&C Division prior to the commencement of EMP data-gathering activities. I&C will also be available to perform calibrations according to the schedule in Table 2.1. I&C must be contacted by the Sample Task Leader to perform these activities. These calibration events must be recorded on the WAG 6—Meteorological Instrument Calibration/Field Check Form (MM-03) and in the equipment maintenance and calibration logbook.

The humidity gauge will be checked against a hand-held humidity gauge on a weekly basis. Other field calibration checks may be performed at any time. One straightforward method is to compare a portable instrument's readings to the last recorded values on the WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02). The equipment manuals provide procedures for field calibrations of the rain gauge and wind speed/wind direction meter. All calibration checks will be documented on the WAG 6—Meteorological Instrument Calibration/Field Check Form (MM-03) and in the field logbook.

Maintenance of the meteorological instruments is anticipated to be minimal. The WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02) provides a checklist for an inspection that will be performed semiweekly and will include basic maintenance items.

3. QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

3.1 OVERVIEW

This section identifies QA/QC aspects of the *Quality Assurance Plan for Characterization and Monitoring Activities at Waste Area Grouping 6, Oak Ridge National Laboratory, Oak Ridge, Tennessee* (CDM Federal 1993) that are required to implement the EMP and this SAP. Subjects addressed in this section include, but are not limited to, monitoring program organization and personnel responsibilities, documentation procedures and protocols, monitoring QC requirements, and equipment calibration and maintenance. The QA/QC considerations presented in this section have been developed to ensure that the data generated during all phases of the EMP will be of known quality and legally defensible.

Work on this assignment will be performed in accordance with the following:

- *Environmental Restoration Quality Program Plan*, ES/ER/TM-4/R3 (Energy Systems 1993);
- *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, QAMS-005/80 (EPA 1983);
- *Quality Assurance Program Requirements for Nuclear Facilities*, ASME NQA-1 (ASME 1989);
- *Quality Assurance Project Plan for the Environmental Monitoring Program in Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee*, DOE/OR/01-1193&D1 (DOE 1993b); and
- *WAG 6 Field Operations Procedures Manual* (CDM Federal 1993b).

This SAP has been reviewed for QA/QC requirements by the Contract QA Manager, who will maintain QA oversight for the duration of the project. In addition, all deliverables will be subject to technical review by CDM Federal Programs Corporation (CDM Federal) technical specialists. All deliverables presenting measurement data will be reviewed by the CDM Federal QA staff. A description of the project Data Quality Objectives can be found in the EMP and in the Quality Assurance Project Plan.

3.2 MONITORING PROGRAM ORGANIZATION

The EMP personnel comprise a sub-task team of the Monitoring and Laboratory Analysis Group, identified in the WAG 6 EMP (DOE 1993a). The principal contractor personnel assigned to conduct the WAG 6 EMP field activities are

- Mitch Goldberg (Project Manager),
- David Johnson (QA Specialist),
- Donnie McCurry [Field Task Manager (FTM)],
- Patrick Gerbic [Meteorological Sample Task Leader (STL)],
- Michael Charko (Field Technician), and
- Richard Stout (Field QC Coordinator).

Figure 3.1 shows the project organization, reporting relationships, and lines of authority for this project. General responsibilities are discussed in the following subsections. Other personnel will be assigned as necessary. The responsibilities of key team members are described in Table 3.1.

3.3 FIELD DOCUMENTATION

Field documentation shall consist of

- one master site logbook (to be maintained at field headquarters),
- an equipment maintenance and calibration logbook,
- a field logbook (to be maintained by the STL),
- a telephone logbook,
- project- and activity-specific field forms (see Appendix A), and
- bar code labels.

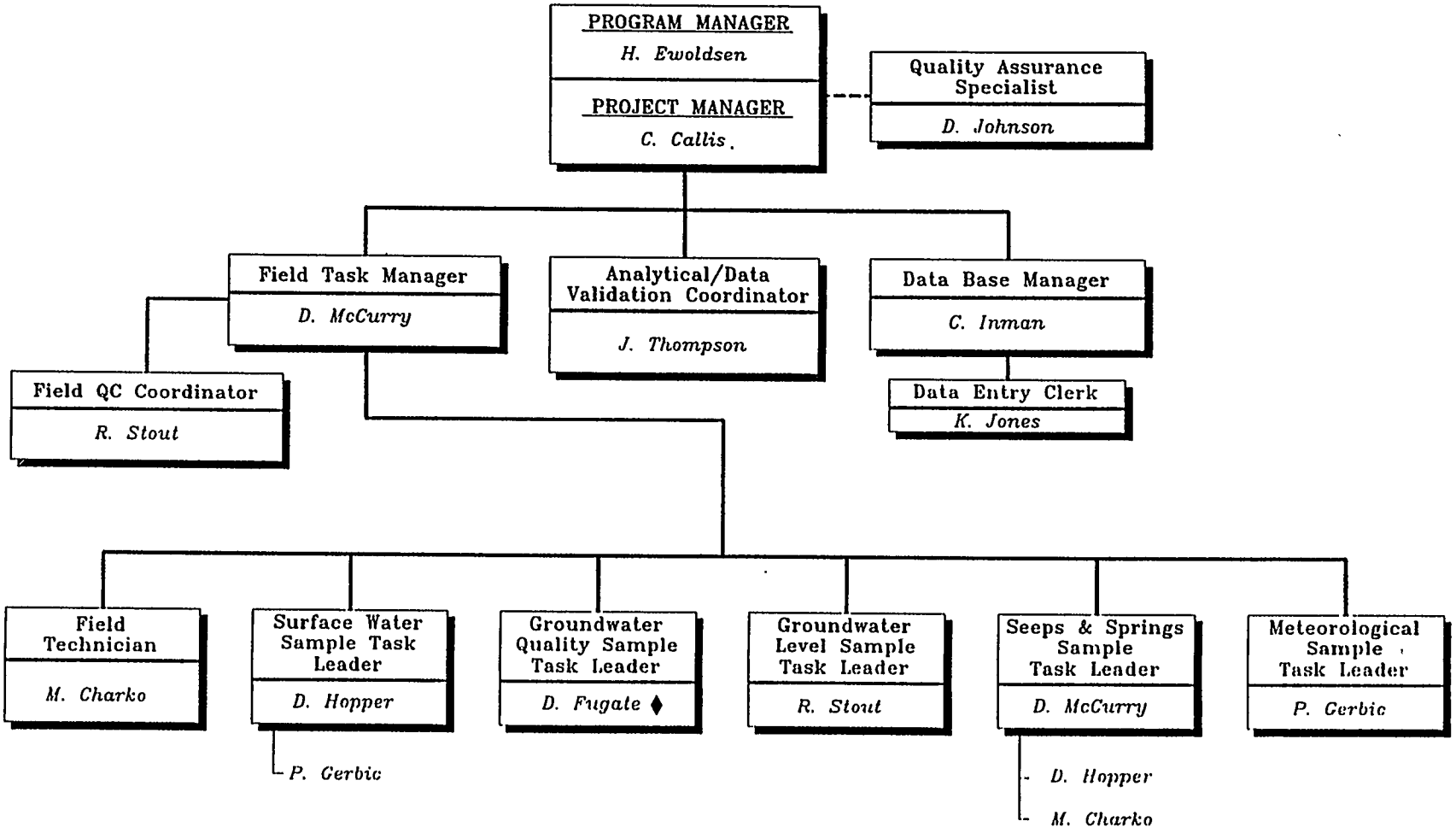
All documentation must be completed in waterproof black ink, and corrections must be marked through with a single line, dated, and initialed. Handwritten documents must be legible. Table 3.2 displays where, and what kind of, information must be recorded.

Field Documentation Forms

EMP field activities will be documented primarily on field documentation forms. The following forms, which are located in Appendix A, are to be used for the specific activities addressed in this SAP:

- WAG 6—Meteorological Monitoring Initialization Form (MM-01),
- WAG 6—Meteorological Site Inspection/Data Collection Form (MM-02),
- WAG 6—Meteorological Instrument Calibration/Field Check Form (MM-03),
- WAG 6—Monitoring Variance Request Form (MV-01), and
- WAG 6 —Record of Repair Form (RF-01).

Any information pertinent to the current field activity or field condition that is not requested on the field documentation form should also be entered in the "Comments" section of the form and in the field logbook. The forms used at each site will be numbered sequentially, using bar codes. The form bar code label will be attached at the bottom right of the form, and also entered into the field logbook. All field documentation forms will be transferred to a hardcover, three-ring, site notebook for temporary storage upon completion. In addition, any charts, oversize pages, and other printed material (e.g., sample times) pertinent to current field activities will be securely attached to the corresponding field documentation form and contained in the notebook. The form number of the corresponding field documentation form must be written somewhere on the attached material and contained in the notebook. On a weekly basis, the completed forms will be taken from the notebook and given to the Data Manager for entry into the data base.



♦ Note that the sampling will be conducted by OECD ESP personnel and that D. Fugate will be responsible for documentation and sample management.

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CDM FEDERAL WAG 6 ENVIRONMENTAL MONITORING PLAN IMPLEMENTATION ORGANIZATION CHART

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FIGURE No. 3.1

Table 3.1. General responsibilities of WAG 6 EMP principal contractor personnel

Position	Responsibilities
Project Manager	• Verifying that all appropriate QA requirements, as specified in the WAG 6 QA Plan and in this document, are met in all field monitoring activities; • consulting with the WAG 6 Program Manager and appropriate EMP QA authorities on all quality-related matters; • investigating field-related quality problems (e.g., out-of-control events), determining their root causes, proposing solutions, implementing corrective actions, and obtaining the concurrence of the WAG 6 Program Manager and QA authorities on the appropriateness of any corrective action; • submitting any proposed changes to the SAP, in the form of a WAG 6 - Monitoring Variance Request Form (MV-01), to the WAG 6 Program Manager for approval; • maintaining custody of all original and copied EMP monitoring documentation; • reviewing all field data and documentation for completeness and adherence to QA protocols; • submitting all field data and documentation to the WAG 6 Program Manager for review; and • developing, gaining approval for, and implementing any cost-effective quality improvements.
Field Task Manager	• Implementing relevant requirements contained in the governing documents and plans; • ensuring and documenting that all field and laboratory personnel are properly informed and trained as specified in this SAP; • ensuring that there are adequate numbers of properly trained personnel for implementation of the meteorological monitoring activities; • ensuring that all equipment (including backup equipment) necessary for meteorological monitoring is available for immediate use; • keeping well informed of scheduled interim remedial action and site upgrade construction activities, especially when such activities may hamper meteorological monitoring activities or affect data quality objectives and/or QA objectives; • initiating stop-work actions when the severity of conditions adverse to quality warrants immediate action; • managing or performing inspections and calibrations, and maintaining accurate documentation of all site equipment calibration and servicing activities; • managing or performing field monitoring activities, and ensuring that all such activities are performed and documented in accordance with QA protocols and approved procedures; • submitting all field documentation and electronic site data to the Project Manager for review; • keeping the Project Manager informed of all site activities and quality-related problems;

Table 3.1 (continued)

Position	Responsibilities
	• forwarding field records to appropriate records management centers; and • photocopying field records daily for backup purposes.
QA Specialist	• Advising the contract Project Manager and team members of QA matters; • identifying project QA requirements and preparing QA procedures as required; • reviewing and approving the SAP and all subsequent changes to the SAP; • conducting or arranging scheduled audits or surveillances of task activities; • evaluating quality performance data from quality investigations, audits, and reviews; • preparing monthly QA summary reports for corporate management; • conducting or arranging QA training; • tracking the implementation of QA requirements in this plan and consulting periodically with the Project Manager; • tracking reports on conditions adverse to quality, reviewing corrective actions, and tracking completion; and • initiating, reviewing, and following up on corrective actions as necessary.
Field QC Coordinator	• Implementation and documentation of training requirements, • QC review and verification of field forms and logbooks, and • verification of proper FOP usage.
Field Technician	• Maintenance and calibration of portable equipment and • waste management.
Sample Task Leader	• Performance and documentation of all field activities, • installation and maintenance of all dedicated equipment, • monitoring and data acquisition activities, and • waste management.

Table 3.2. Types of field documentation and the information required for each

Field documentation	Information
Site Logbook	• A list of all field logbooks; • daily temperature, weather conditions, and names and titles of personnel present; • name, title, organization, and purpose of site visitors; • outline of daily activities; • problems, their final resolution, and anticipated impact on the field investigation; and • field changes or variances.
Equipment Maintenance and Calibration Logbook	• Equipment name, serial number, and identification (ID) number, • date of each calibration event, • identity of person performing calibration, and • calibration settings and values.
Field Logbooks	• Date and time task started; weather conditions; and names, titles, and organizations of personnel performing the task; • a description of site activities in specific detail; • a description, in detail, of any field test(s) (and results); • a list of the time, equipment type and serial or identification number, and procedure followed for decontamination activities; • a list of equipment failures or breakdowns; and • a description of calibration activities in the field.
Telephone Logbook	• Date of call, • time of call, • whether incoming or outgoing, • participating parties, and • subject and pertinent information.

3.4 ACTIVITY-SPECIFIC QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

All four meteorological monitoring instruments will be calibrated in accordance with the manufacturer's operating instructions before use. Thereafter, the instruments will be inspected and calibrated according to the following schedule:

Instrument	Inspections	Calibrations
RM Young Wind Speed/Direction Monitor	Semiweekly	Annually
Rotronic temperature and RH sensor	Semiweekly	Annually
Li-Cor Pyranometer	Semiweekly	Annually
WEATHERtronics Tipping Bucket Rain Gage	Semiweekly	Annually

The inspections and calibrations (including calibration results) will be recorded in logbooks for each of the instruments. Additionally, the calibrations will be documented on the appropriate field documentation form.

4. HEALTH AND SAFETY CONSIDERATIONS

The provisions of the project H&S Plan are mandatory for all personnel assigned to the program. In no case may work be performed in a manner that is inconsistent with the intent and cautions expressed in the project H&S Plan. All field personnel will be properly trained in H&S regulations associated with handling hazardous materials and the safe operation of sampling equipment. As specified in 29 CFR 1910.120, all field personnel will have attended Occupational Health and Safety Administration (OSHA) 40-h hazardous waste worker training.

In general, personnel will work in groups or pairs. However, personnel will perform some work activities independently of other members of the WAG 6 field team. At these times, personnel will abide by a "buddy system." Each member of the WAG 6 field team will be responsible for keeping track of personnel working independently. Before leaving the monitoring area, all personnel and conveyed equipment will be checked with a beta-gamma meter for evidence of radiological contamination. Personnel will take precautions to help prevent contact with hazards identified in the project H&S Plan.

Activity-specific H&S considerations are addressed in task instructions located in Appendix B of this SAP. The SHSO and/or Site Health Physicist can modify the PPE required for site activities, tasks, and work zones. The SHSO and/or Site Health Physicist will train all site personnel in PPE donning and doffing procedures before initiating the EMP.

5. WASTE MANAGEMENT

The WAG 6 EMP Waste Management Plan (WMP) states that CDM Federal, as waste generator, will perform waste segregation, packaging, labeling, and transportation activities as required during the project. CDM Federal is not responsible for final disposition of waste.

Anticipated wastes from meteorological monitoring activities include minimal volumes of various trash items such as used paper towels. No soil or purge water waste will be generated.

5.1 ORGANIZATIONAL RESPONSIBILITIES

The following personnel will be responsible for various aspects of WAG 6 waste management.

Laboratory Certification Official

The Laboratory Certification Official has the following responsibilities:

- implementing and managing the ORNL Solid Low-Level Waste (SLLW) Certification program,
- reviewing and approving project WMPs and WMP checklists, and
- providing direction if an unforeseen waste situation is encountered.

Generator Certification Official

The Generator Certification Official (GCO) has the following responsibilities:

- serving as interface between the project, the ORNL Laboratory Certification Official, and the ORNL WMO in addressing generator problems and waste certification requirements;
- initiating preparation of the Waste Pickup Request Form;
- certifying that the waste was packaged in accordance with the ORNL waste acceptance criteria, the ORNL SLLW certification program, and SLLW QA Plan requirements;
- making arrangements with WMO for pickup and transfer of waste packages to the designated storage or treatment facility; and
- assuming other duties as specified in the WMP.

Field Task Manager

The Field Task Manager has the following responsibilities:

- ensuring that site personnel follow the WMP,
- coordinating with Health Physics (HP) and Industrial Hygiene (IH), and

- assuming responsibility for transportation of waste as required.

Sample Task Leader

As the generator, the Sample Task Leader has the following responsibilities:

- properly containerizing, packaging, and segregating all waste generated as part of the project;

- interfacing with the FTM to ensure that any issues pertaining to SLLW characterization are promptly brought to the attention of the responsible individuals and that any new certification requirements are promptly instituted;

- assisting the GCO with the preparation of the Waste Pickup Request Form and the Container Packing List; and

- assuming other duties as specified in the project WMP.

Health Physics and Industrial Hygiene Personnel

HP and IH personnel are responsible for conducting surveys as necessary to determine whether waste contains Resource Conservation and Recovery Act– (RCRA-) regulated or radiologically contaminated materials.

5.2 GUIDANCE DOCUMENTS

The following documents will provide guidance for waste management activities conducted during the implementation of the WAG 6 EMP.

- WAG 6 Project WMP,
- "Waste Management" (ESP-1000),
- *Waste Acceptance Criteria for Radiological Solid Waste Disposal* (WMRA-WMPC-203),
- *ORNL Liquid Waste Treatment Systems Waste Acceptance Criteria* (WM-WMCO-201),
- Waste Item Description (UCN-2109) Form User Instructions,
- Container Packing List (TX-5749) Form User Instructions, and
- *Management of Investigation-derived Waste During Site Investigations* (EPA 1991).

5.3 WASTE CHARACTERIZATION/SEGREGATION

When waste is generated, it will be put into a plastic bag. The bag will be screened by HP to determine its disposition. Table 5.1 shows the various categories into which waste will be segregated for this project, the criteria for segregation, and packaging requirements.

At the end of each day, HP personnel will use portable alpha and beta/gamma detectors to monitor the material removed for the presence of radioactivity. They will designate waste as being "Clean," "Very Low Activity," or "Low Level" Waste.

Table 5.1. WAG 6 waste management

Type of waste	Category of waste[a]	Segregation requirements	Packaging requirements[b]	Accumulation/ staging area	Final disposal[b]
Miscellaneous trash (personal protective equipment, plastics, paper)	5	No α or β/γ; no volatiles	Plastic bags in garbage cans at site	Green dumpster adjacent to personnel trailers	Y-12 landfill
	8	Suspected α or β/γ but no volatiles	Package per Solid Waste Storage Area (SWSA) 6 Waste Area Criteria instructions (WMRA-WMPC-203)	GCO-designated area	Site designated by Waste Management Operations
	14	α or β/γ; no volatiles	Package per SWSA 6 Waste Area Criteria instructions (WMRA-WMPC-203)	GCO-designated area	SWSA 5-box compactor

[a] Categories of waste as delineated by the Project WMP.
[b] According to Tables 3.2 and 3.3 in the Project WMP.

HP personnel will be responsible for scanning all waste entering and leaving WAG 6. If the waste is within LMES standards, the waste will be issued a "green tag," signifying that it is "clean" of radioactive contamination. An on-site dumpster adjacent to personnel trailers will be available for "clean" waste, such as office papers, generated on site.

5.4 WASTE PACKAGING

After waste has been characterized and segregated according to category, waste packets can be created. Waste is packaged by the Sample Task Leader according to guidance provided by the GCO. A Waste Item Description Form is filled out for each packet. One bar code label is placed on the waste packet, and the other is placed on the Waste Item Description Form associated with the specific packet. The bar code label number is then copied onto the Container Packing List. When the container is full, the GCO and the Sample Task Leader will complete a Waste Pickup Request Form to be submitted to WMO by the GCO. The Waste Management forms and their instructions for use, as well as waste acceptance criteria, will be located on site in the WAG 6 project trailers.

5.5 WASTE TRANSPORTATION

LMES personnel will manage and conduct the transportation of waste to locations outside WAG 6 and the transportation of all liquid waste.

6. DATA MANAGEMENT

6.1 INTRODUCTION

The data management team will create "Blank Form Books" filled with previously bar coded forms to be used by the field teams. Each type of form will be stored in a separate book and will have the bar code pre-attached to the bottom right corner of the form. A copy of the appropriate form will be inserted on the outside cover of the "Blank Form Book," and the binder will signify the form number. The form bar code label will be scanned by the STL entering it into the bar code reader for uploading to the data base when using the form. If that form is not used after being taken to the field, the STL will return the blank form to the notebook for use on another day.

The form bar code numbers must be used in sequence for record keeping purposes. The form bar code numbers will serve as identifiers for location of the forms in the files. When the STL returns to the trailer at the end of the day, the forms will be forwarded to the FTM for review. The DM will receive all completed forms and the data diskette downloaded from the bar code reader on a daily basis. The electronic-data-downloading diskettes downloaded from the monitoring equipment will be forwarded to the DM by the FTM on a monthly basis (and more frequently if necessary).

6.2 DATA DOWNLOADING

Field data collected during the WAG 6 Meteorological Monitoring Program will be obtained electronically. Electronic data will be collected by the OMNIDATA Easy Logger and will be downloaded, edited, and screened by the sampling team.

6.2.1 Electronic Data

Raw electronic data generated for meteorological monitoring will consist of hourly averages of wind speed, wind direction, humidity, temperature, and solar radiation, and 5-min averages of precipitation activity. Electronic data will be downloaded, edited, screened and gathered into site report files. Data files will be traced, from downloading to archiving and internal verification, on an electronic data file management worksheet. The following guidelines should be followed when manipulating electronic data. All files will be created, manipulated and archived according to FOP 16.

- Download electronic data collected by the OMNIDATA Easy Logger.
- Copy the raw data to a working 3.5-in. high-density (HD) diskette using the extension **.93** (or the appropriate year), and to an archival Bernoulli using the extension **.93a**. Use the working diskette to "clean up" data. Attach a label to the archival Bernoulli and place in temporary storage. Attach a second label on the working diskette and begin processing.
- Take the working diskette to the site office PC.

- Use a DOS editing tool to combine multiple data sets if they were not joined at the time of data downloading. The precipitation data remain in a separate data set from all other data collected.

- Use SPF/PC program to reformat the data and create SAS files containing the original data and additional fields required for data validation.

- Create an electronic file report of the data prior to any data corrections [to be submitted as part of the Energy Systems Met Lead (ESML) data validation package].

- Upload data into the SAS database.

- Use the SAS editor to fill in missing data points and set appropriate validation flags on adjusted data. Use SAS to produce graphs depicting the "before correction" view of the data sets (to be submitted as part of the ESML data validation package).

- Use the SAS graphs provided for the validation of data to determine abnormal data results. Use the SAS editor to correct any abnormal data values and apply data qualifiers according to the data correction rules provided by the ESML.

- Within 5 working days of data collection, the STL will provide to the ESML tabular and graphical reports reflecting "before and after correction" views of the data sets. Create the transmittal form to accompany the data validation package supplied to the ESML.

- The ESML will review the data validation package and, if further corrections are in order, will inform the STL within 5 working days of the necessary changes. When all corrections have been performed and the ESML is satisfied with the quality of the data, the ESML will sign the transmittal form and return to the STL. The STL will then give the signed form to the DM. When the DM is satisfied that all information delivered is correct, the DM will then take the steps to load the data into the WAG 6 Oracle data base (appropriate data validation flags will be set), sign the form and process the form in accordance with prescribed records management.

6.3 PROCEDURES FOR COMPLETING METEOROLOGICAL MONITORING (MM) FORMS

The WAG 6 meteorological monitoring team will be using a bar code reader in the field when available to record most of the information that will be tracked in the WAG 6 project data base. There will be only one monitoring location for the meteorological monitoring process. Therefore, the data base will default that field for entry purposes.

MM-01: WAG 6—METEOROLOGICAL MONITORING INITIALIZATION FORM

Before leaving the trailer, the STL will pull one form MM-01 for each piece of equipment to be initialized that day. Upon arrival at the site, the STL will scan the project task code and monitoring location from a menu card, the STL badge number, the field logbook number, the form bar code label, and the equipment bar code ID of each piece of equipment to be initialized at that location. The reader will prompt the STL to specify the type of initialization (i.e., new or replacement). If replacement event is chosen, the STL will complete Form RF-01 in

accordance with Form RF-01 procedures. The "Comments" field is optional and will not be captured in the reader. If there is anything concerning the event that the STL wants tracked in the data base, the STL will note that information in the "Comments" field of the form. The DM will manually enter the information once the form has been submitted and the field data have been added to the data base.

MM-02: WAG 6—METEOROLOGICAL SITE INSPECTION/DATA COLLECTION FORM

Before leaving the trailer, the STL will pull one form MM-02 for each site to be inspected or downloaded. Upon arrival at the site, the STL will scan the project task code from a menu card, sample team's badges (by role), the field logbook number, and the form bar code label. The "Comments" field is optional. If there is anything concerning the event that the STL wants tracked in the data base, the STL will note that information in the "Comments" field of the form. The DM will manually enter the information once the form has been submitted and the field data have been added to the data base.

MM-03: WAG 6—METEOROLOGICAL INSTRUMENT CALIBRATION/FIELD CHECK FORM

Before leaving the trailer, the STL will pull one form MM-03. Upon arrival at the site, the STL will scan the project task field code, his or her badge number, the field logbook number, the form bar code label, and the equipment bar code ID. If the equipment was temporarily taken out of service, the STL will note that section of the form and send a copy to the DM for entry into the data base. The DM will note the status and will update the data base accordingly. When the equipment is returned, the STL will complete the form and send the original to the DM. The "Comments" field is optional and will not be captured on the reader. If there is anything concerning the event that the STL wants tracked in the data base, the STL will note that information in the "Comments" field of the form. The DM will manually enter the information once the form has been submitted and the field data have been added to the data base.

7. REFERENCES

ASME (American Society of Mechanical Engineers) 1989. *Quality Assurance Program Requirements for Nuclear Facilities*, ASME NQA-1, New York.

CDM Federal (CDM Federal Programs Corporation) 1993. *Quality Assurance Plan for Characterization and Monitoring Activities at Waste Area Grouping 6, Oak Ridge National Laboratory, Oak Ridge, Tennessee.*

DOE (U.S. Department of Energy) 1993a. *Environmental Monitoring Plan for Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee*, ORNL/ER-158, prepared by Science Applications International Corporation, Oak Ridge, Tennessee, September.

DOE (U.S. Department of Energy) 1993b. *Quality Assurance Project Plan for the Environmental Monitoring Program in Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee.* DOE/OR/01-1193&D1, prepared by Gilbert/Commonwealth, Inc., Oak Ridge National Laboratory, Oak Ridge, Tennessee, September.

Energy Systems (Martin Marietta Energy Systems, Inc.) 1991. *Resource Conservation and Recovery Act Facility Investigation Report for Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee*, ES/ER-22/V2&D1.

Energy Systems (Martin Marietta Energy Systems, Inc.) 1993. *Environmental Restoration Quality Program Plan*, ES/ER/TM-4/R3.

EPA (U.S. Environmental Protection Agency) 1983. *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, QAMS-005/80, EPA-600/4-83-004. Washington, D.C.

EPA (U.S. Environmental Protection Agency) 1991. *Management of Investigation-derived Waste During Site Investigations*, EPA/540/G-91/009.

Miller, G. P., K. C. Black, and P. M. Craig 1989. *SWSA-6 Interim Correction Measures, Environmental Monitoring Summary Report*, ECE-89-017, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

APPENDIX A

FIELD FORMS

WAG 6 - METEOROLOGICAL MONITORING INITIALIZATION FORM (MM-01)

Monitoring Location: _____ Field Logbook Number: _____

STL Badge No.: _____ Date: _____

Time: _____

Weather: _____

_____

EQUIPMENT _____ Equipment Bar Code ID: _____

New/replacement Installation: _____ Old Bar Code ID: _____

Date of most recent calibration: _____

Wiring Channel Number _____

Channel Name _____

Sensor Name _____

Sensor Formula(s) _____

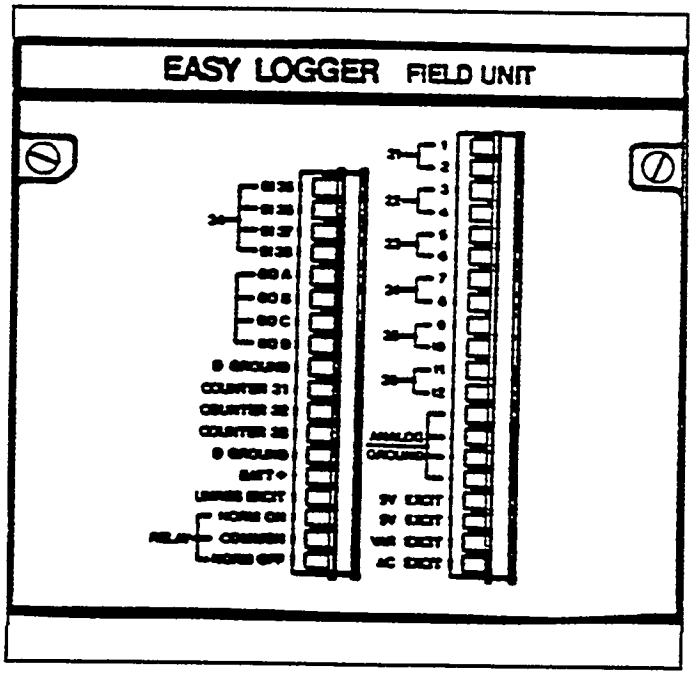
_____

_____

Scan Interval _____

Report Interval _____

Report Number _____



Indicate wiring on above diagram. Write wire color next to port.

Comments: _____

_____

EASY LOGGER Bar Code ID: _____ New or Replacement Installation: _____

Old Bar Code ID: _____

Checklist:

- Lithium Backup Battery _____ Test Batteries (option 32) _____V (must be >10.5 V)
- Dessicant Replaced _____
- Wiring Connected/Checked _____
- Set Clock (option 20) _____
- Set Sensors (option 12) _____
- Set Wiring (option 13) _____
- Set Scantime (option 14) _____
- Set Functions? (option 22) _____ Functions _____
- Set Reports (option 15) _____ _____
- (fill out report table on next page)
- No. of DSP Installed _____

WAG 6 - METEOROLOGICAL MONITORING INITIALIZATION FORM (MM-01)

(NOTE: Give a description of the programming objectives on the back of this page)

REPORT TABLE (Option 15)					
REPORT #	SCAN INTERVAL:			REPORT INTERVAL:	
COLUMN #	C1	C2	C3	C4	C5
1st HEADING					
2nd HEADING					
UNITS					
DATA SOURCE (CHANNEL NAME)					
TYPE					
DECIMAL					

Comments: _____

_____

_____

_____

Sample Task Leader (Signature/Date): _____

Data Entry (Signature/Date): _____

Data Verification (Signature/Date): _____

Form Bar Code Label

WAG 6 - METEOROLOGICAL SITE INSPECTION/DATA COLLECTION FORM (MM-02)

Monitoring Location: _____ Field Logbook Number: _____

STL Badge No.: _____ Date: _____

Time: _____

Weather Conditions: _____

INSPECTION (do not stop logging)

Clean debris from tipping bucket rain gauge screen _____

Check dessicant: If pink, replace Checked/changed? Y/N Logging? Y/N

Show Data (option 40) _____

Logger Battery Voltage (Option 32) _____ V New battery? (if < 10.5 V) Y/N

Show DSP Status (Option 41) _____ %

Show Clock (Option 20) _____ EST (time cannot be changed while logging)

Recording Last Reported Value? Y/N

Air Flow LCA6000 Equipment ID: _____ Psychrometer Equipment ID: _____

Last Recorded Value

Sensor/Instrument	Wind Speed	Wind Dir.	Air Temp.	Rel. Hum.	Sol. Rad.	Rainfall
Reported Value						

Comments: _____

_____

Data Collection

Note: do not remove black strap from DSP

Time logging was stopped _____ (EST) Time logging was started _____ (EST)

Retrieved DSP No.: _____ Installed DSP No.: _____

Comments: _____

_____

Form Bar Code Label

Sample Task Leader (Signature/Date): _____

Data Entry (Signature/Date): _____

Data Verification (Signature/Date): _____

WAG 6 - METEOROLOGICAL INSTRUMENT CALIBRATION/FIELD CHECK FORM (MM-03)

Monitoring Location: _____ Field Logbook Number: _____

STL Badge No.: _____ Date: _____

Time: _____

Weather: _____

Instrument (circle): pyranometer rain gauge temp/rel.humidity wind speed/direction

Equipment Bar Code ID: _____

FIELD CALIBRATION CHECK

As found (Easy Logger reading) _____

Calibration Check Method _____

_____

_____

_____

Comparison Value: _____ Percent Difference: _____

Comments/Action Taken: _____

_____

_____

_____

INSTRUMENTATION AND CONTROLS CALIBRATION

Time & Date Out of Service: _____ I&C Calibration Date: _____

Time & Date Returned: _____ Date Next Calibration Needed: _____

Comments: _____

_____

_____

Form Bar Code Label

Sample Task Leader (Signature/Date): _____

Data Entry (Signature/Date): _____

Data Verification (Signature/Date): _____

WAG 6 - MONITORING VARIANCE REQUEST FORM (MV-01)

(Once completed, insert this form into site notebook. If more than one site is affected, insert a copy of this form into all appropriate notebooks.)

Matrix:

ID of affected site(s):
Name and title of person making request:
Date:
Document very specifically the variance being requested. Be sure to identify all pertinent Data Quality Objectives that are affected by this variance:
Document the reasons for requesting the variance:
Document the time scale of the variance. Include dates at which this variance will start and end (if applicable):

Variance approval signature:	STL:	Date:
	FTM:	Date:
	WAG 6 Project Manager:	Date:

Form Bar Code Label

Data entry signature/date: _____

Data verification signature/date: _____

WAG 6 - RECORD OF REPAIR FORM (RF-01)

DATE: _____ EMPLOYEE BADGE NO.: _____

EQUIPMENT BAR CODE NO.: _____

EQUIPMENT STATUS: (circle one) IN-USE AVAILABLE TEMPORARILY OUT-OF-SERVICE RETIRED

Disposition of unit: _____

Comments: _____

Was damage discovered during routine site inspection? Yes _____ No _____

If yes, list inspection form number or logbook number. _____

Nature of damage if known: _____ Date found: _____

Was unit repairable in situ? Yes _____ No _____

If yes, list repairs made and person making them. _____

_____

Did in situ repairs include replacing any parts/accessories? Yes _____ No _____

If yes, list and describe. _____

_____

Was equipment sent to offsite vendor for repair? Yes _____ No _____

If yes, list:

Vendor: _____ Address: _____

Airbill No. (if shipped): _____

Work Order No: _____

Date Sent: _____ Initial: _____

Date returned: _____ Received by: _____

Type of repair: _____

Was unit returned in good working condition? Yes / No

If no, please describe: _____

_____

Returned Equipment Status: _____

Form Bar Code Label

Sample Task Leader Signature/Date: _____

Data Entry Signature/Date: _____

Data Verification Signature/Date: _____

APPENDIX B

SITE-SPECIFIC HAZARD EVALUATION ADDENDUM FOR WAG 6 METEOROLOGICAL MONITORING

SITE-SPECIFIC HAZARD EVALUATION ADDENDUM FOR WAG 6 METEOROLOGICAL MONITORING

S. D. Van Hoesen 12/10/93
S. D. Van Hoesen
ER WAG 6 Project Manager

B. L. Morgan 12/14/93
B. L. Morgan
ORNL Construction Engineer

A. W. Saulsbury 12-10-93 approval contingent on changes marked on draft 12-10-93
A. W. Saulsbury
ORNL HAZWOPER Program Coordinator

S. N. Burman 12/10/93
S. N. Burman
Site Safety and Health Manager

W. C. Hayes 12-11-93
W. C. Hayes
ORNL Applied Health Physicist

K. A. Wilson 12/14/93
K. Wilson
WAG 6 Facility Manager

J. D. Miller * See note on B-8 12/15/93
J. D. Miller
ORNL Industrial Safety

M. M. Slater 12/16/93
M. M. Slater
ORNL IH Construction Oversight

J. S. Abercrombie 12-14-93
J. S. Abercrombie
Laboratory Protection

C. Clark, Jr. 12/10/93
C. Clark, Jr.
Environmental Restoration Office

J. Sweeney 12/16/93
J. Sweeney
DOE ERD Project Manager

SITE-SPECIFIC HAZARD EVALUATION ADDENDUM FOR WAG 6 METEOROLOGICAL MONITORING

This Site-specific Hazard Evaluation Addendum is for the performance of the Waste Area Grouping (WAG) 6 meteorological monitoring. The work will be conducted by CDM Federal Programs Corporation (CDM Federal) and associated Oak Ridge National Laboratory (ORNL) environmental, safety, and health support groups. This activity will fall under the scope of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER). The purpose of this document is to establish site-specific health and safety guidelines to be followed by all personnel involved in conducting work for this project. Work will be conducted in accordance with requirements as stipulated in the ORNL HAZWOPER Program Manual and applicable ORNL, Martin Marietta Energy Systems, Inc., and U.S. Department of Energy policies and procedures. The Environmental (Site) Safety and Health Plan (SSHP) serves as an extension of the ORNL HAZWOPER Program Manual; combined, they fulfill the requirements of 29 CFR 1910.120.

The levels of protection and the procedures specified in this plan are based on the best information available from historical data and preliminary evaluations of the area. Therefore, these recommendations represent the minimum health and safety requirements to be observed by all personnel engaged in this project. Unforeseeable site conditions, changes in scope of work, or hazardous conditions not previously considered will warrant a reassessment of protection levels and controls stated. Minor changes, such as downgrade of personal protective equipment (PPE) or change in the model of a site instrument, may be justified and documented in the site logbook by the Site Safety and Health Officer (SSHO). Significant changes will require revision of the SSHP and must have approval by the appropriate safety and health discipline and the HAZWOPER Program Coordinator (HPC) before restart of site operations.

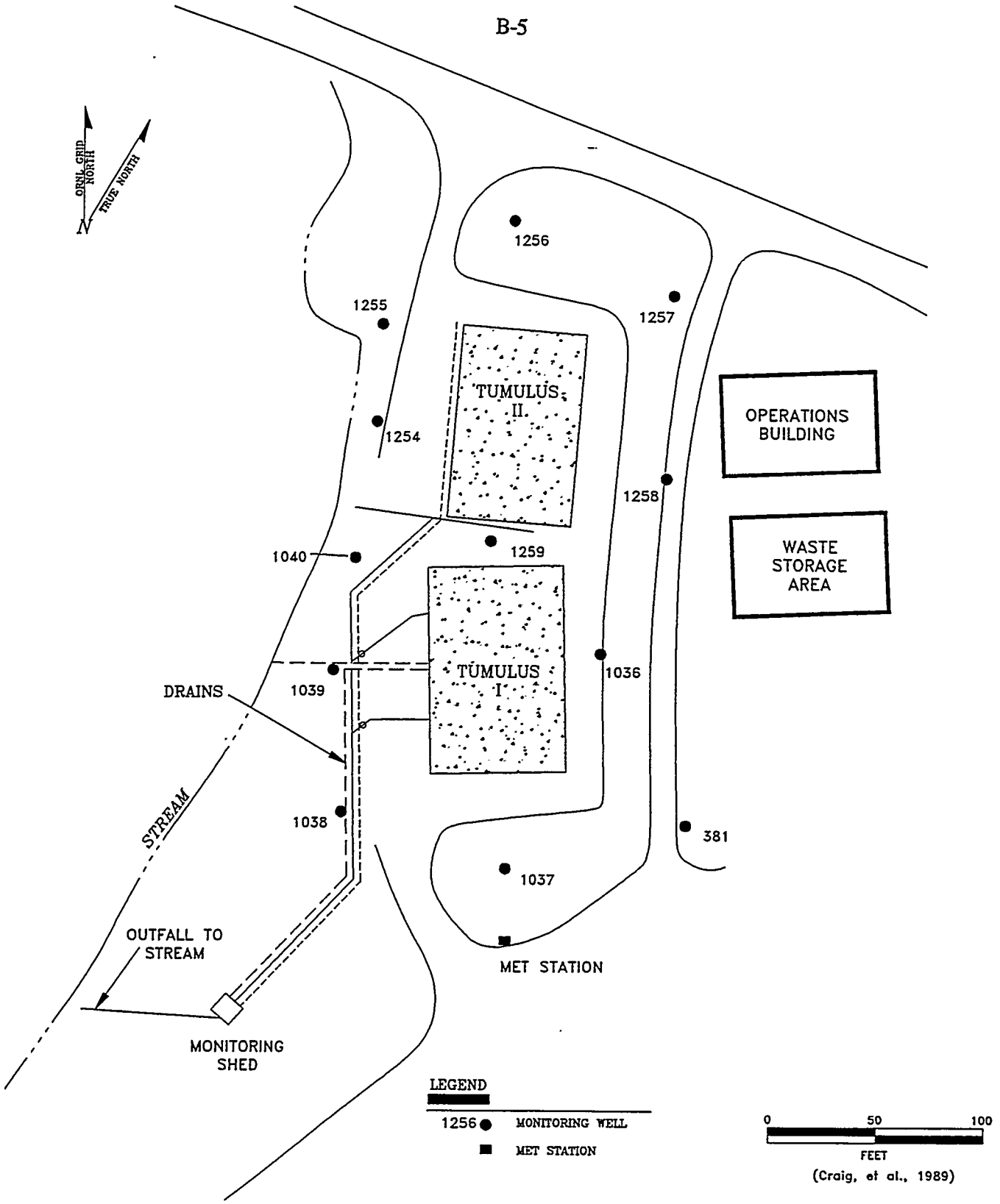
1. PROJECT AND SITE DESCRIPTION

1.1 PROJECT DESCRIPTION

The meteorological data that will be collected include wind speed and direction, dry bulb temperature, relative humidity, solar radiation, and precipitation. These parameters will be monitored at the Tumulus Meteorology Station located south of the Tumulus 1 Pad and will be sampled continuously using an OMNIDATA Easy Logger equipped with a 32K EPROM Data Storage Pack. The instructions and guidelines for retrieving the DSP and processing the data are located in Sect. 2 of the Meteorological Monitoring Sampling and Analysis Plan. The following figure, taken from the sampling and analysis plan, shows the location of the meteorological monitoring station.

1.2 SITE DESCRIPTION

Information regarding the WAG 6 site description can be found in the *Draft RCRA Facility Investigation Report for Waste Area Grouping 6 at Oak Ridge National Laboratory, Oak Ridge, Tennessee*, ES/ER-22/V2&D1 (Energy Systems, September 1991).



(Craig, et al., 1989)

LOCATION OF METEOROLOGICAL STATION AT WAG 6

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

OAK RIDGE NATIONAL LABORATORY
ORNL WAG 6

A503/16DEC93/1.5

2. SITE ORGANIZATION AND COORDINATION

The work will be performed by CDM Federal. ORNL Industrial Hygiene (IH), Industrial Safety (IS), and Radiation Protection (RP) will provide appropriate health and safety services oversight.

The following section details the organizational structure for this project. Key personnel and their project responsibilities are listed. Measurement Applications & Development will serve as the Site Safety and Health Officer (SSHO) and alternate SSHO.

2.1 SITE SAFETY AND HEALTH OFFICER

The SSHO is the primary on-site contact for safety and health during field activities. The SSHO oversees the on-site execution of all field activities regarding safety and health procedures, and has the authority to stop all work if conditions are judged to be hazardous to on-site personnel or to the public. The SSHO will remain at the project site at all times while workers are performing site activities. Other specific responsibilities are as follows.

1. Ensures that all on-site project personnel meet the required level of training, meet medical requirements including respirator fit test (as required), attend a pre-entry briefing on project and potential site hazards, and review the Work Plan and SSHP. Maintains copies of documentation of the above at the project site and ensures that documentation is available for on-site review. Note: The ORNL Special Access Training Badge may be used as verification of training.

2. Requires personnel to obtain immediate medical attention in the case of a work-related injury or illness.

3. Denies access to all or any portion of the work area as warranted.

4. Orders work to cease, orders evacuation of the work area by all personnel, and reestablishes safe working conditions, as needed.

5. Controls access to the site by visitors and unauthorized personnel. Advises visitors and unauthorized personnel of their responsibilities and ensures that they meet access requirements before entry into the contamination reduction zone or exclusion zone is allowed.

6. Ensures the correct field execution of the Work Plan and SSHP.

7. Ensures that this Work Plan and SSHP are revised and approved if there are changes in site conditions or tasks.

8. Advises emergency response personnel in an emergency.

9. Coordinates with IH, IS, and RP to establish site work zones, level of required personnel protection, monitoring, and other controls.

10. Coordinates and minimizes the number of personnel and amount of equipment in the work zones.

11. Coordinates accident prevention by oversight of field activities and by being aware of all site operations.

12. Ensures that needed work permits are obtained and made available on site.

13. Ensures that the HPC, IH, IS, and RP are contacted before commencement of site work (1) to notify of intent to begin work and (2) to schedule monitoring support, as needed.

14. Conducts daily inspection of the work site.

15. Provides the HPC with a list of personnel participating in site activities to determine the need for inclusion in the hazardous-waste-worker medical surveillance program.

16. Ensures that appropriate fall protection measures are in place, as warranted.

17. Ensures that an approved hoisting and rigging plan is available, as warranted.

18. Ensures that appropriate measure have been taken to prevent spills.

2.2 FIELD PERSONNEL

Specific responsibilities are as follows.

1. Take all reasonable precautions to prevent injury to themselves and to their fellow employees; be alert to potentially harmful situations.

2. Perform only those tasks that they believe they can do safely and immediately reporting any accidents and/or unsafe conditions to the SSHO.

3. Notify the SSHO of any special medical conditions (e.g., allergies, diabetes).

4. Prevent spills to the extent possible. If spills occur, contain the spill, notify the SSHO, and clean up immediately using safe cleanup measures as directed by the SSHO. Note: Do not engage in spill containment or cleanup if conditions are not safe and if the cleanup cannot be accomplished with supplies available at the site. Evacuate the area. All spills must be reported to the ORNL Environmental Interface (574-8770).

5. Avoid splashing materials to the extent possible.

6. Practice good housekeeping by keeping the work area neat, clean, and orderly to the extent possible.

7. Report all injuries, no matter how minor.

8. Comply with the work plan and SSHP as well as with postings and rules at the project site.

2.3 RADIATION PROTECTION (Jim Ed Irwin)

ORNL Radiation Protection will be responsible for oversight and approval of personnel protection requirements related to radiation protection. A representative from the Office of Radiation Protection will review and approve the Work Plan and SSHP before commencement of field activities. ORNL RP will be consulted before entry into any posted radiological area and will instruct field participants on requirements for that area, including the need for a Radiation Work Permit, appropriate monitoring, dosimetry, and PPE. The RP representative will be contacted for all radiological concerns at the site.

2.4 INDUSTRIAL HYGIENE (Margaret Slater)

The ORNL Industrial Hygiene Section and the HPC will be responsible for the oversight and approval of personnel protection related to IH and the requirements of 29 CFR 1910.120 (HAZWOPER). The IH Divisional Representative and the HPC will review and approve the Work Plan and SSHP before commencement of field activities. The IH representative and the HPC will provide guidance regarding PPE and IH monitoring and sampling requirements. The IH Section will be contacted for all industrial hygiene and HAZWOPER concerns at the site.

2.5 INDUSTRIAL SAFETY (Doug Miller)

The ORNL Industrial Safety Section will be responsible for oversight and approval of personnel protection related to safety. A representative from IS will review and approve the Work Plan and SSHP before commencement of field activities. IS will provide guidance regarding potential safety hazards, PPE and safety requirements. The IS Section representative will be contacted for all safety concerns at the site.

A complete organizational structure and description of resposibilities may be found in Sect. 3 of the SSHP.

3. PROJECT HAZARD EVALUATION

Task: Meteorological monitoring

The meteorological monitoring task has no physical hazards, safety/construction hazards, chemical hazards, ionizing or non-ionizating radiation hazards, or biological hazards associated with it.

3.1 PHYSICAL HAZARDS

( ) Heat stress	( ) Cold stress	( ) Noise
( ) Confined space	( ) Enclosed space	( ) Manual lifting
( ) Tripping/falling	( ) Ergonomic	( ) High pressure
( ) Oxygen deficient	( ) Explosives/flammables	( ) Vibration

3.2 SAFETY/CONSTRUCTION HAZARDS

( ) Trenching	( ) Excavating	( ) Heavy equipment operation
( ) Demolition	( ) Elevated work	( ) Welding/cutting
( ) Hoisting/rigging	( ) Underground hazards	( ) Overhead hazards

3.3 CHEMICAL HAZARDS

( ) Volatile organics	( ) Inorganics	( ) Carcinogens
( ) Corrosives	( ) Reproductive toxicants	( ) Metals
( ) Mutagens	( ) Asbestos	
( ) OSHA specific		

3.4 IONIZING RADIOLOGICAL HAZARDS

( ) Internal exposure ( ) External exposure

3.5 NON-IONIZING RADIOLOGICAL HAZARDS

( ) UV	( ) RF	( ) Microwave
( ) Laser	( ) High voltage	

3.6 BIOLOGICAL/VECTOR HAZARDS

( ) Wildlife	( ) Plants	( ) Medical waste
( ) Bacteria	( ) Parasites	

3.7 DESCRIPTION OF HAZARDS AND CONTROLS

3.7.1 Sanitation

Task: Meteorological monitoring

A clean zone located on WAG 6 provides workers with an eating area, toilet facilities, washing facilities (hand wash and emergency eye wash only), and a changing room.

Potable water required? Not permitted on work site

Nonpotable water used? None

Eating, drinking, chewing, use of tobacco permitted?
Location: As stated above.

Toilet facilities required?
Location and number: As stated above. Available in WAG 6

Washing facilities required?
Location: As stated above.

Change rooms required?
Specify: As stated above.

3.7.2 Illumination

Task: Meteorological monitoring

Additional illumination needed? ( ) Yes (X) No ( ) NA

All field activities will be performed during daylight hours. No additional illumination will be required.

4. TASK BREAKDOWN

4.1 TASK DESCRIPTION

Task: Meteorological monitoring

Type of Work: ( ) Intrusive (X) Nonintrusive

Engineering Controls: N/A

Administrative Controls (e.g., required permits, training): Training required for meteorological monitoring can be found in the WAG 6 Training Program.

4.2 INITIAL LEVEL OF PERSONAL PROTECTIVE EQUIPMENT

Level of Protection: ( ) A ( ) B ( ) C (X) D (X) Modified

Respirator: ( ) SCBA ( ) Full-face ( ) Half-face respirator
( ) PAPR ( ) Other
Cartridge: _____

Protective Clothing:
( ) Encapsulating suit (X) Tyvek [if upgraded]
( ) Saranex ( ) Splash suit
( ) C-zone (X) Company clothing (khakis)
( ) Other

Head/eye/ear:
( ) Hard hat (X) Safety glasses ( ) Goggles
( ) Splash shield ( ) Ear plugs ( ) Ear muffs
( ) Other

Gloves:
( ) Nitrile ( ) Neoprene ( ) PVC
( ) Latex ( ) Vinyl ( ) Leather
( ) Other

Footwear:
(X) Steel-toed leather ( ) Chemical overboots
( ) Steel-toed rubber ( ) Other

Describe the donning/doffing steps:
Donning and doffing procedures can be found in Sect. 5 of the SSHP; no additional requirements are warranted.

Modifications allowed:
All upgrades of PPE must be approved by the SSHO and by the appropriate safety and health representative. Downgrades in PPE will be justified and documented in the site logbook by the SSHO.

Additional PPE information may be found in Sect. 8 of the SSHP.

5. MONITORING REQUIREMENTS

5.1 DIRECT READING INSTRUMENTS

	Task(s)	Monitoring Frequency	Action Guidelines
LEL meter			
O_2 meter			
Colorimetric indicator tubes			
Photoionization detector (PID)			
Flame ionization detector (FID)			
Alpha meter			
Beta/gamma meter			
Area radiation monitors			
Noise meter			
Other (Specify)			

5.2 PERSONAL MONITORING

	Task(s)	Monitoring Frequency	Action Guidelines
Whole-body dosimetry	MET	Continuously	Contact HP
Extremity dosimetry	NA		
Whole-body count	MET	Yearly	Contact HP
Urinalysis/bioassay	MET	6 months	Contact HP
Chemical air sampling	NA		
Radiation air sampling	NA		
Personal sampling pumps	NA		

Instruments used by the IH representative will be calibrated and maintained in accordance with IH Standard Operating Procedures. Instruments used by the Office of Radiation Protection are calibrated and source-checked in accordance with established Health Physics procedures.

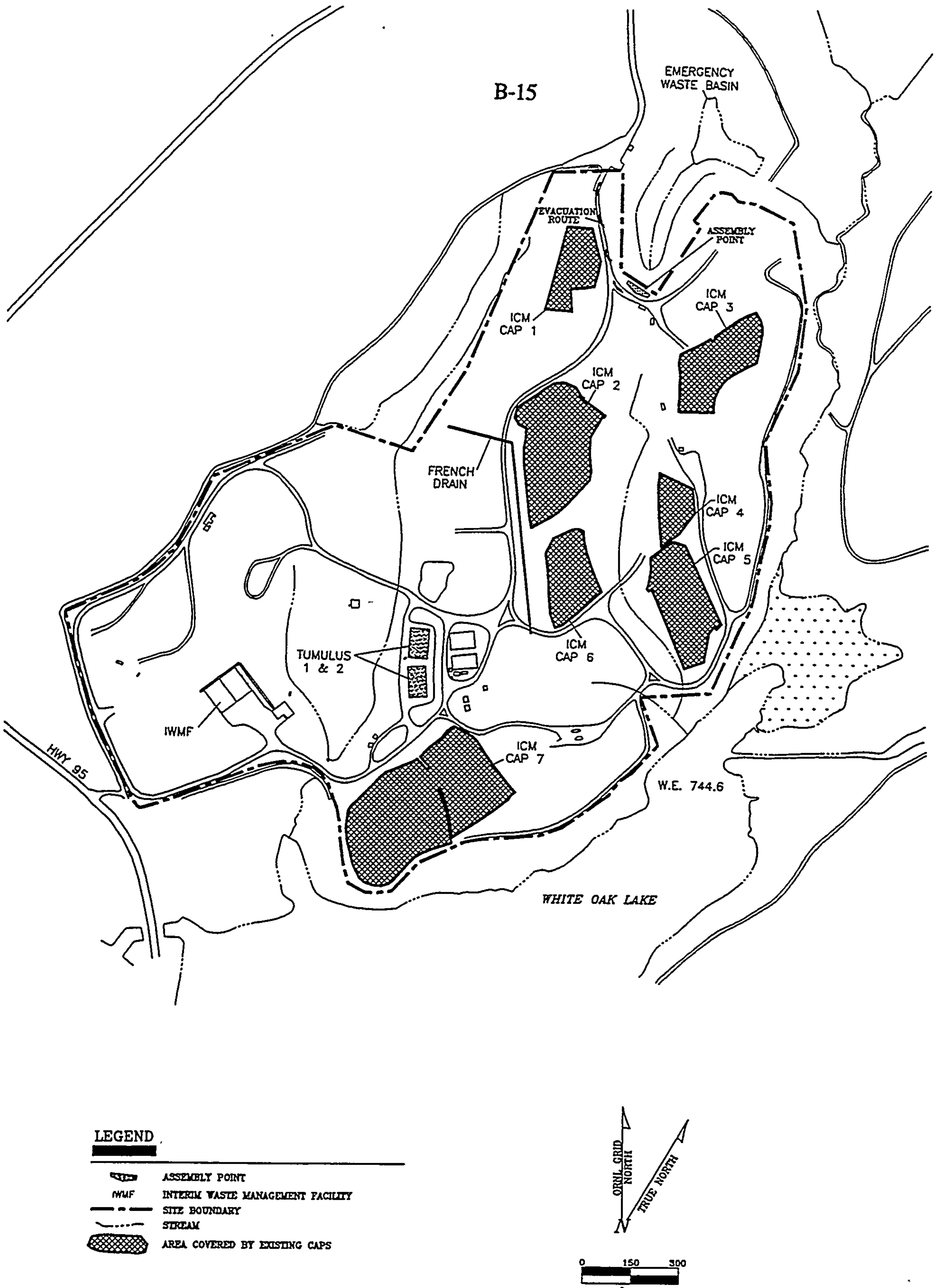
Site monitoring requirements may change based on site conditions. All changes must be documented in the site logbook.

6. SITE CONTROL

Site work zones are required to reduce the accidental spread of hazardous substances from contaminated areas to clean areas. In accordance with the ORNL HAZWOPER Program Manual, three zones will be established: (1) the exclusion zone, (2) the contamination reduction zone, and (3) the support zone. The identification of the zones will provide for control of operations and flow of personnel. The HPC will provide signs to be posted at the site for HAZWOPER requirements. The HP will determine radiological postings. Should additional barriers (e.g., rope, tape) or signs be required, HP, IH, and IS will be consulted. The HPC may modify the zones for short-term, transient-type projects. The modification would include use of the HAZWOPER barrier tape or A-frame sign only. Additional information regarding site control may be found in Sect. 7 of the ORNL HAZWOPER Program Manual.

Personnel accessing the zones must meet access requirements as stated in this plan and at the entrance of the zones. Entrance and exit points for the zones will be clearly marked. Perimeter monitoring of the zones will be conducted periodically to ensure correct placement of the zones. The SSHO is responsible for ensuring that all workers and visitors meet site access requirements. Section 9 is a record of site access requirements and personnel qualifications.

A site map is provided at the end of this section that includes the assembly point locations and emergency evacuation routes.



EMERGENCY ASSEMBLY POINT AND EVACUATION ROUTE

OAK RIDGE NATIONAL LABORATORY
ORNL WAG 6

A496/250C193/A5G

7. DECONTAMINATION

The purpose of decontamination is to prevent contaminants that may be present on protective clothing and equipment from coming into contact with personnel as they doff PPE. Also, decontamination protects workers from hazardous substances that may contaminate and eventually permeate the PPE used on site; it protects personnel by minimizing the transfer of harmful materials into clean areas. Combining decontamination with the correct sequential method of removing personal protective equipment will prevent exposure to personnel leaving the work areas as well as off-site migration of contaminants. Generally, decontamination is accomplished by starting with the most heavily contaminated item and progressing to the least contaminated item.

Personnel will remove any disposable PPE and dispose of it in provided containers before leaving the contamination reduction zone. The steps for doffing and disposal of PPE can be found in Sect. 5 of the SSHP.

Equipment decontamination will not be required for this task.

8. EMERGENCY PREPAREDNESS

The responsibility for day-to-day implementation of this information lies primarily with the SSHO. During an actual emergency response situation, the SSHO will serve as the Emergency Coordinator until the Laboratory Shift Superintendent (LSS) or emergency response team arrives.

Medical assistance will be provided by the Health Division, which is located at Building 4500N. The LSS will provide emergency response personnel and coordinate emergency assistance. The radio number for the LSS is Station 295. The telephone number for the LSS is 574-6606. The nearest telephone and fire alarm box is located at the tumulus site. In the event that the LSS is not available, emergency services may be reached at the telephone numbers shown below.

The SSHO will perform the following pre-emergency tasks before starting field activities and will coordinate emergency response with the LSS.

1. Locate nearest telephone and alarm station.
2. Confirm and post emergency telephone numbers.
3. Post site map of work areas marked with evacuation routes.
4. Inventory and check out on-site emergency equipment and supplies, as warranted.

In the event of an emergency, a fire extinguisher, medical kit, and emergency eye wash kit are located in the CDM Federal vehicles and in the clean zone. In addition, spill control kits may be found in the permanent decontamination area located outside the clean zone.

In the event of an emergency that requires evacuation of the site, verbal instruction will be given by the SSHO to evacuate the area. Personnel will exit to a predesignated support area. At this point, the SSHO will account for all personnel, ascertain information about the emergency, and give further instructions to the on-site personnel. In all situations that require evacuation, personnel shall not reenter the work area until the conditions causing the emergency have been corrected; the hazard reassessed; the Work Plan and SSHP revised, approved, and reviewed with on-site personnel; and instructions given for reentry.

Emergency Personnel	Phone	Radio #
ORNL Emergency Response	**911**	
Laboratory Shift Superintendent	**574-6606**	295
Fire Department	574-5678	
Medical Center	574-7431	
Security	574-7199	
Industrial Hygiene	576-7059	
Industrial Safety	574-6679	
Radiation Protection	599-1338	
Environmental Compliance	574-7294	
Emergency Communication Center	574-6646	295

The SSHO will brief workers on emergency response procedures and the evacuation route in the pre-entry briefing.

9. TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

List applicable training/medical requirements for this project. All site personnel and visitors requiring access to the work zones (both contamination reduction zone and exclusion zone) will be required to meet these access requirements.

9.1 PROJECT TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

Training

_____ 24/40-h HAZWOPER (SARA/OSHA) training
__X__ 40-h HAZWOPER (SARA/OSHA) training
__X__ Current HAZWOPER 8-h Annual Refresher (as applicable)
__X__ 8-h HAZWOPER Supervisor training
__X__ Radiation Worker Training
__X__ Respirator fit test/training
_____ Confined space entrant
_____ Confined space attendant
_____ Other (list)

Medical Surveillance

_____ ORNL Hazardous Waste Worker Medical Surveillance Program (only for individual meeting criteria as specified in Sect. 9 of the ORNL HAZWOPER Program Manual).

__X__ Other: Yearly physical

Note: If site conditions change or if other hazards are detected, the training and access requirements will be revised accordingly.

9.2 SITE PERSONNEL QUALIFICATIONS

Name: Patrick Gerbic Badge number: 626002
Assigned tasks: Meteorological monitoring

	YES	NO	DATE
40-h training:	(X)	( )	8/93
24-h training:	( )	( )	NA
Annual Refresher Training:	( )	( )	NA
Supervisor Training:	(X)	( )	10/93
Confined Space Entry Training:	( )	( )	NA
Radiation Worker Training:	(X)	( )	9/93
Respirator fit tested/trained:	(X)	( )	8/93
Medical Surveillance Program:	(X)	( )	8/93

Other training: General Employee Training (GET), Satellite Accumulation, RCRA Cap Access, Waste Generator, Hazardous Waste Characterization

Table B.1. Pre-Baseline Sampling

Site ID	CLP Volatiles	CLP Semivolatiles	CLP Pest/PCBs	Herbicides	CLP Metals	Gross Alpha	Gamma Scan	Tritium	Strontium-90	Anions, DIC/DOC,[a] Alkalinity	Rinseate[b]
SS-003	X				X	X	X	X	X		
SS-005	X				X	X	X	X	X		
SS-006	X, T				X	X	X	X	X		
SS-007	X,F[d],M				X,F,M	X,F,M	X,F,M	X,F,M	X,F,M		X
SS-008	X				X	X	X	X	X		
SS-009	X				X	X	X	X	X		
WSS-025–WSS-030	X, T				X	X	X	X	X		
WSS-023A	X				X	X	X	X	X		
WSS-033	X, T				X	X	X	X	X		
WSS-045	X				X	X	X	X	X		X
WFD	X, T				X	X	X	X	X		
SFD	X, F				X, F	X, F	X, F	X, F	X, F		

[a] DIC/DOC = dissolved inorganic carbon/dissolved organic carbon.

[b] This sampling schedule assumes that a dipper will be needed to collect samples 100% of the time. The actual number of rinseate blanks may differ from what is depicted here. However, they will always be taken at a rate of 1/10 or fewer samples.

[c] T = Trip blank. The actual number of trip blanks may vary, but one trip blank will be present in each cooler in which samples for volatiles analyses are present.

[d] F = Field duplicate, M = matrix spike/matrix spike duplicate (MS/MSD). Field duplicates will be taken at a rate of 1/10 or fewer samples. MS/MSD samples will be collected at a rate of 1/20 or fewer samples.

Table B.2. First Quarter Sampling

Site ID	CLP Volatiles	CLP Semivolatiles	CLP Pest/PCBs	Herbicides	CLP Metals	Gross Alpha	Gamma Scan	Tritium	Strontium-90	Anions, DIC/DOC,[a] Alkalinity	Rinseate[b]
SS-003	X	X	X	X	X	X	X	X	X	X	
SS-005	X	X	X	X	X	X	X	X	X	X	
SS-006	X, T	X	X		X	X	X	X	X	X	
SS-007	X,F[d],M	X,F,M	X,F,M	X,F,M	X,F,M	X,F,M	X,F,M	X,F,M	X,F,M	X,F,M	X
SS-008	X	X	X,F,M	X,F,M	X	X	X	X	X	X	
SS-009	X	X	X,F,M	X,F,M	X	X	X	X	X	X	
WSS-025–WSS-030	X,T	X	X,F,M	X,F,M	X	X	X	X	X	X	
WSS-023A	X	X	X,F,M	X,F,M	X	X	X	X	X	X	
WSS-033	X,T	X	X,F,M	X,F,M	X	X	X	X	X	X	
WSS-045	X	X	X,F,M	X,F,M	X	X	X	X	X	X	X
WFD	X,T	X	X,F,M	X,F,M	X	X	X	X	X	X	
SFD	X,F	X,F	X,F	X,F	X,F	X,F	X,F	X,F	X,F	X,F	

[a] DIC/DOC = dissolved inorganic carbon/dissolved organic carbon.

[b] This sampling schedule assumes that a dipper will be needed to collect samples 100% of the time. The actual number of rinseate blanks may differ from what is depicted here. However, they will always be taken at a rate of 1/10 or fewer samples.

[c] T = Trip blank. The actual number of trip blanks may vary, but one trip blank will be present in each cooler in which samples for volatiles analyses are present.

[d] F = Field duplicate, M = matrix spike/matrix spike duplicate (MS/MSD). Field duplicates will be taken at a rate of 1/10 or fewer samples. MS/MSD samples will be collected at a rate of 1/20 or fewer samples.

Table B.3. Second Quarter Sampling[a]

Site ID	CLP Volatiles	CLP Semivolatiles	CLP Pest/PCBs	Herbicides	CLP Metals	Gross Alpha	Gamma Scan	Tritium	Strontium-90	Anions, DIC/DOC[b], Alkalinity	Rinseate
Selected Seeps	X				X	X	X	X	X	X	X
WFD	X, T				X	X	X	X	X	X	
SFD	X, F	F			X, F	X, F	X, F	X, F	X, F	X, F	

[a]Based on the flow of the seeps, several seeps will be selected as permanent monitoring points in addition to the two french drain outlets. Field duplicates, trip blanks, MS/MSD, and rinseate samples for seeps samples will be obtained at the same rates as for first quarter sampling, but for fewer sampling points.
[b]DIC/DOC = dissolved inorganic carbon/dissolved organic carbon.

Table B.4. Third and Fourth Quarter Sampling[a]

Site ID	CLP Volatiles	CLP Semivolatiles	CLP Pest/PCBs	Herbicides	CLP Metals	Gross Alpha	Gamma Scan	Tritium	Strontium-90	Anions, DIC/DOC[b], Alkalinity	Rinseate
Selected Seeps	X				X	X	X	X	X	X	X
WFD	X, T				X	X	X	X	X	X	
SFD	X, F				X, F	X, F	X, F	X, F	X, F	X, F	X

[a] Based on the flow of the seeps. Field duplicates, trip blanks, MS/MSD and rinseate samples for seeps samples will be obtained at the same rates as for First Quarter sampling, but for fewer monitoring points.

[b] DIC/DOC = dissolved inorganic carbon/dissolved organic carbon

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