PRC Environmental Management, Inc.
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1001584

SAMPLING VISIT WORK PLAN/

QUALITY ASSURANCE PROJECT PLAN

ILD 005 463 344

FOR SAMPLING AT THE

ALLIED-SIGNAL CORPORATION

DANVILLE, ILLINOIS

RCRA PERMITTING BRANCH
OR/WMD
EPA, REGION V
RECEIVED
JAN 31 1989

FINAL QAPP

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	R05018
EPA Region	:	5
Site Number	:	ILD 005 463 344
Date Prepared	:	January 25, 1989
Contract Number	:	68-W9-0006
Prepared by	:	Versar, Inc.
Contractor Project Manager	:	Ed Kriz
Telephone Number	:	312/990-7555
EPA Work Assignment Manager	:	Bob Fuhrer
Telephone Number	:	312/353-4889

65B

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EPA, REGION V

January 29, 1990

Mr. Bob Furher
U.S. EPA Region 5
Hazardous Waste Enforcement Branch (5H-11)
230 South Dearborn Street
Chicago, IL 60604

Subject: EPA Contract No. 68-W9-0006
Work Assignment No. R05018
Final QAPP and Final Sampling Visit Trip Report
Allied-Signal Corporation, Danville, Illinois

Dear Mr. Fuhrer:

PRC Environmental Management, Inc. is submitting three copies of the final quality assurance project plan (QAPP) and the final sampling visit trip report for the above referenced assignment.

Versar Inc., subcontractor to PRC on this work assignment, addressed your written comments and revised the draft reports.

If you have any questions or comments on these reports, please do not hesitate to call me or Laurie Redeker at (312) 856-8700.

Sincerely,

Tom Hahne
PRC's Technical Monitor of Versar

cc: Laurie Redeker, PRC (letter only)
Rich Gnat, Versar (letter only)
Fred Norling

DRAFT

QUALITY ASSURANCE PROJECT PLAN

for

SAMPLING

at

ALLIED-SIGNAL CORPORATION
DANVILLE, ILLINOIS

APPROVED BY:

Edward J. DiDomino — 11/9/89

PRC Environmental Management, Inc.
Quality Assurance Officer — Date

Richard R. Grant — 11/3/89

Versar Program Manager — Date

Robert Fulver — 1/3/90

EPA Work Assignment Manager — Date

Chief, U.S. EPA Illinois
Section of RCRA Permitting — Date

5305WPB.502/11-01-89

QA PROJECT PLAN LOCATOR PAGE

QAPP Item	Quality Assurance Element	Section	Page
1	Title/Approval Page		i
2	Table of Contents		iii
3	Program Description	1	1
4	Program Organization and Responsibility	2	6
5	QA Objectives for Management Data	3	8
6	Sampling Procedures	4	14
7	Sample Custody	5	20
8	Calibration Procedures and Frequency	6	21
9	Analytical Procedures	7	22
10	Data Reduction, Validation, and Reporting	8	23
11	Internal Quality Control Checks	9	24
12	Performance and System Audits	10	27
13	Preventive Maintenance	11	28
14	Routine Data Assessment Procedures	12	29
15	Corrective Action	13	30
16	Quality Assurance Reports to Management	14	31

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Work Assignment Description 1
1.2 Site Description and Background 2
1.3 Solid Waste Management Units 2

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY 6
2.1 Introduction 6
2.2 Project Organization and Line of Authority 6
2.3 Responsible Individuals 6

3.0 QUALITY ASSURANCE OBJECTIVES 8
3.1 Sampling Objectives 8
3.2 Quality Assurance Requirements 8

4.0 PROJECT PROCEDURES AND RATIONALE 10
4.1 Sampling Objectives 10
4.2 RFA Sampling Locations 10
4.3 Quality Assurance/Quality Control Samples 10
4.4 Sample Collection Procedures 14
4.5 Field Documentation 15
4.6 Field Equipment Decontamination 16
4.7 Sample Containerization and Preservation 16
4.8 Sample Documentation and Shipment 17

5.0 SAMPLE CUSTODY 20

6.0 CALIBRATION PROCEDURES AND FREQUENCIES 21

7.0 ANALYTICAL PROCEDURES 22

8.0 DATA REDUCTION, VALIDATION AND REPORTING 23

9.0 INTERNAL QUALITY CONTROL CHECKS 24
9.1 Field QC Checks 24
9.2 Laboratory QC Checks 24
9.3 Document QC Checks 25

10.0 PERFORMANCE AND SYSTEM AUDITS 27
10.1 System Audits 27
10.2 Performance Audits 27

11.0 PREVENTIVE MAINTENANCE 28

12.0 ASSESSMENT OF PRECISION, ACCURACY AND COMPLETENESS 29

13.0 CORRECTIVE ACTION 30

TABLE OF CONTENTS
(continued)

14.0 QUALITY ASSURANCE AND DOCUMENTATION REPORTS 31
14.1 Progress/Status Reports 31
14.2 Sampling Visit Reports 31

15.0 REFERENCES 32

APPENDICES

Appendix A - Target Compound List and Target Analyte List

Appendix B - CLP Sample Documentation and Custody Procedures

FIGURES

Figure 1 - Allied-Signal Site Location Map

Figure 2 - Solid Waste Management Units and Sampling Locations at Allied-Signal

Figure 3 - Organizational Chart, Allied-Signal, Danville, Illinois Sampling Visit

Figure 4 - Document and Report Quality Control Checklist

TABLES

Table 1 - Solid Waste Management Units at Allied-Signal, Danville, Illinois

Table 2 - Summary of Sample Locations and Rationale - Allied-Signal, Danville, Illinois

Table 3 - Sample Containers, Preservation, and Holding Times

1.0 INTRODUCTION

1.1 Work Assignment Description

PRC Environmental Management (PRC), Inc., received Work Assignment No. R05018 from U.S. EPA under Contract No. 68-W9-0006 (TES IX). This work assignment calls for a sampling visit (SV) to be performed as part of an RCRA facility assessment (RFA) at the Allied-Signal Corporation in Danville, IL. PRC Team Member, Versar Inc., will provide technical support and assistance to U.S. EPA to perform this assignment.

The primary goal of a RFA is to identify and gather information on the releases of hazardous constituents from Solid Waste Management Units (SWMUs) to air, surface water, ground water, and soils. A RFA screens from further investigation the SWMUs that do not pose a threat to human health or the environment. Based on the findings of the RFA, further steps in the Corrective Action Program may be required, including a RCRA Facility Investigation (RFI), a Corrective Measures Study (CMS), and ultimately, a Corrective Measures Implementation (CMI).

The U.S. EPA performed an initial RFA of the Allied-Signal Danville facility on April 25, 1989, which included a Preliminary Review (PR) of all available files and a Visual Site Inspection (VSI). Based on the findings of the PR and VSI, a SV was proposed to provide additional information regarding potential releases from the SWMUs at Allied-Signal.

The SV will include collecting environmental samples to access releases from selected SWMUs. The technical approach of this Sampling Visit Work Plan/Quality Assurance Project Plan (Plan) is based on the U.S. EPA Sampling Plan for Allied-Signal dated August, 1989. The Plan describes specific sampling locations, and procedures to be used during the collection, handling and analysis of samples from the Allied-Signal site. Specifically, this plan discusses sampling objectives and responsibilities, procedures for collecting, preserving, and shipping samples, and analytical parameters and procedures.

1.2 Site Description and Background

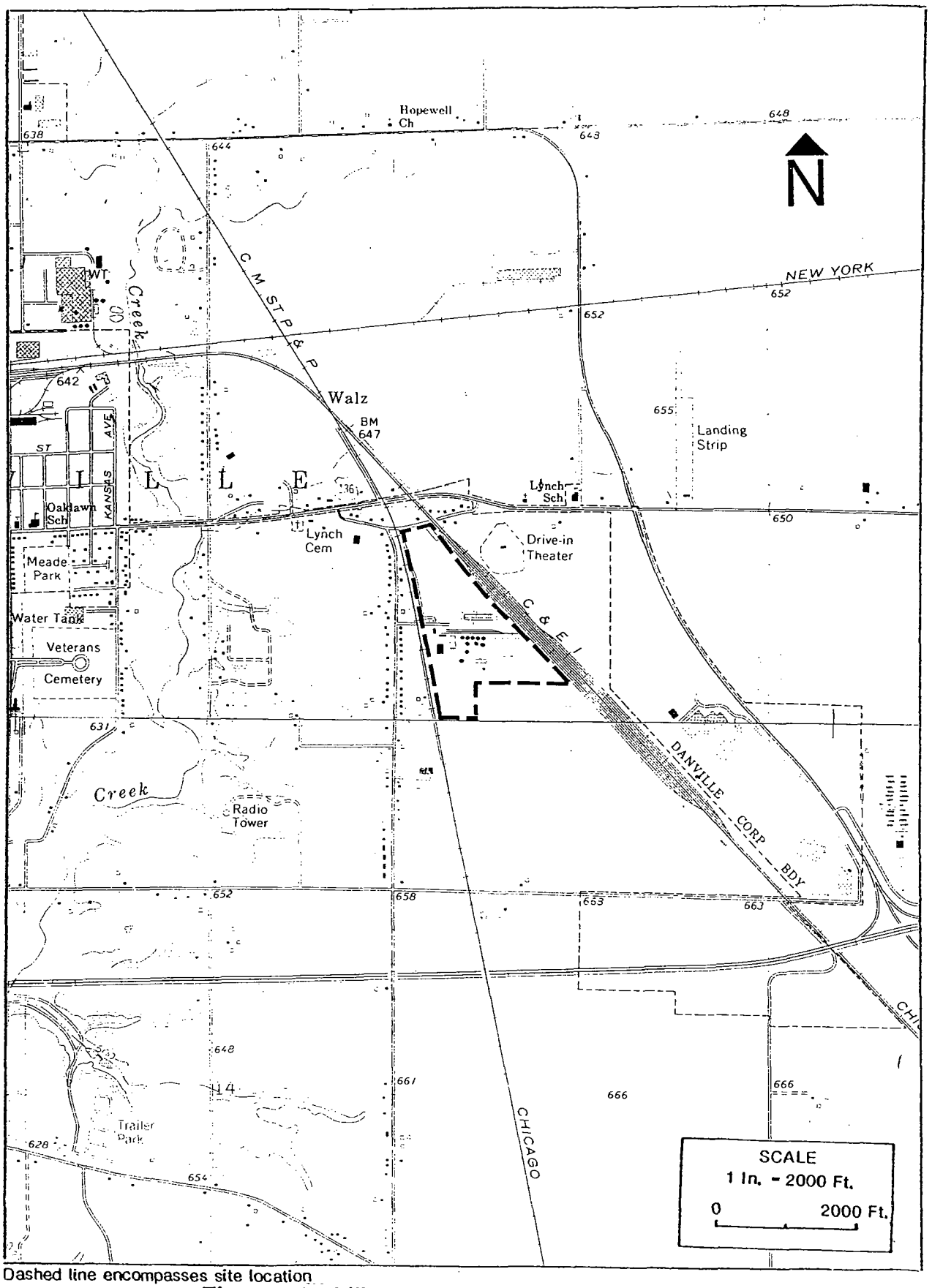
The Allied-Signal property encompasses approximately 80 acres just east of Danville, Illinois (Figure 1). The site is surrounded by farm fields to the north, east, and south. Single family homes are located along a road west of the site. The topography in the vicinity of the site is relatively flat.

The manufacturing facility lies approximately at the center of the property. The major features of the facility include a refrigerants plant, four inactive waste disposal ponds, a urethane foam burial site, and a deep injection well for disposal of plant effluent (Figure 2). The facility currently produces chlorofluorocarbon refrigerants, refrigerant 11/12 and blends and packages other refrigerants. Refrigerants are manufactured by reacting carbon tetrachloride and hydrofluoric acid. Hydrochloric acid is generated as a co-product.

1.3 Solid Waste Management Units

A SWMU is defined as a discernable waste management unit at a RCRA facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for the management of solid or hazardous waste, or both. Nine SWMUs were identified at the Allied-Signal facility during the PR and VSI. These units are listed in Table 1, and are located on Figure 2.

Figure 1



Dashed line encompasses site location

Figure 1. Allied-Signal Site Location Map

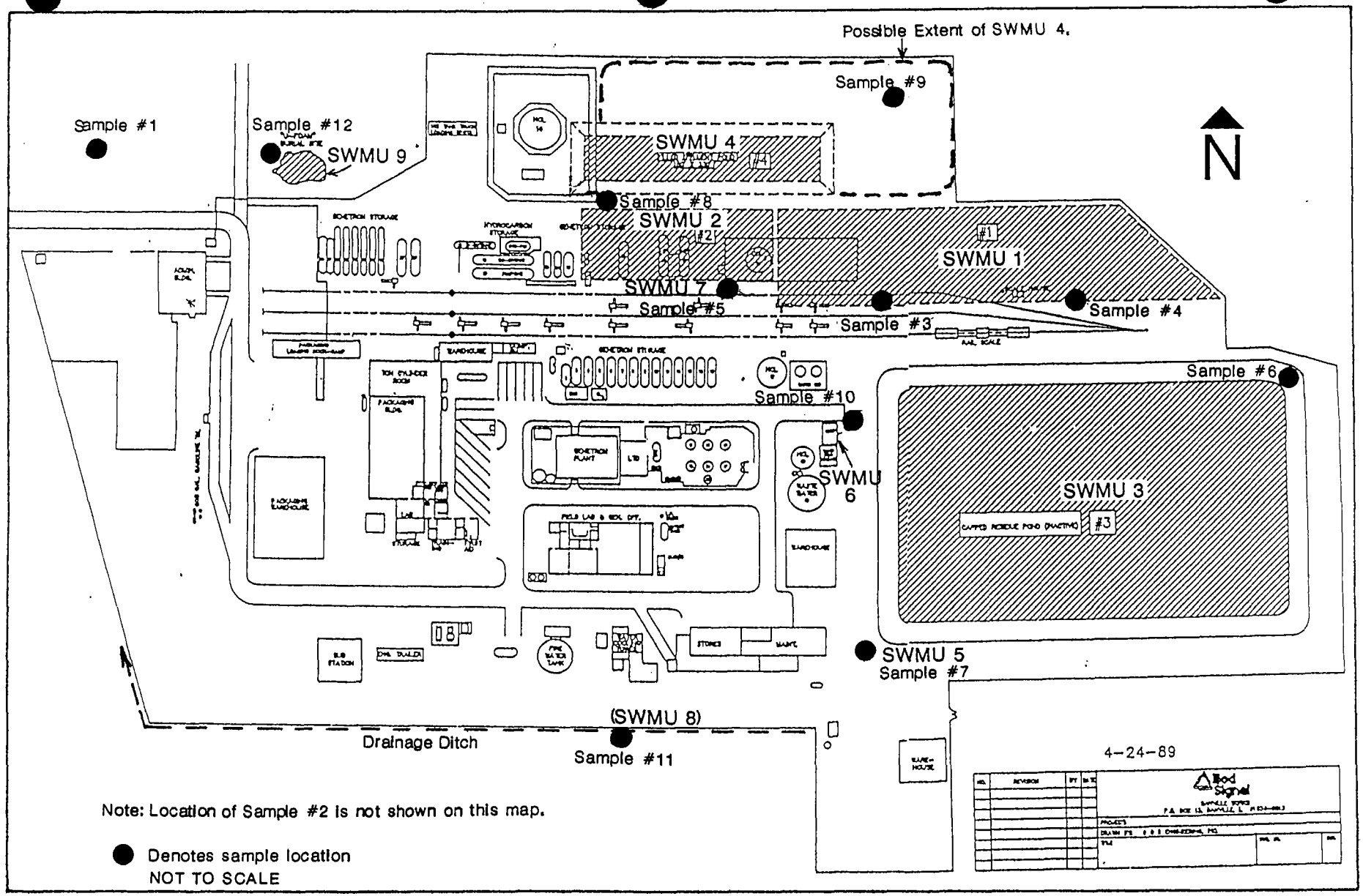


Figure 2.
Solid Waste Management Units and Sampling Locations Allied - Signal, Danville, Illinois
(Modified after Allied - Signal, April 24, 1989)

Figure 2

TABLE 1

SOLID WASTE MANAGEMENT UNITS
AT ALLIED-SIGNAL
DANVILLE, ILLINOIS

UNIT IDENTIFIER[1]	UNIT NAME
1	Inactive Pond #1
2	Inactive Pond #2
3	Closed Pond #3[2]
4	Inactive Pond #4
5	Overhead Injection Line
6	Hazardous Waste Drum Storage Area and Site Drainage Collection Point
7	Main Carbon Tetrachloride Recovery Well Area/General Production Spill Area
8	Drainage Ditch Downstream of Deep Well Injection Facility/Drainage Ditch for Facility Before Secondary Containment System Installed
9	Urethane Foam Burial Site

[1]Numbers correspond to units on facility map (Figure 2).

[2]Pond #3 was closed in 1980 under the direction of IEPA

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

2.1 Introduction

This section depicts the project organization, line of authority, and individuals associated with project execution. These individuals are responsible for ensuring the collection of valid sample data and the routine assessment of measurement systems for precision and accuracy.

2.2 Project Organization and Line of Authority

Figure 3 shows the project organization and line of authority for this project.

2.3 Responsible Individuals

EPA Regional Contact	Robert Fuhrer
EPA CLP Coordinator	Judy Kleiman
EPA Central Regional Laboratory	To Be Determined
PRC Program Manager	Edward DiDomenico
PRC Quality Assurance Officer	David Liu
PRC Region V Manager	Bette Ross
Versar Program Manager	Richard Gnat
Versar Corporate Quality Assurance Officer	Arthur Jung
Versar Work Assignment Manager	Richard Gnat
Versar Monitoring Equipment Manager	Benito Castillo
Versar Sampling Team	John Angstmann
Versar Sampling Team	Jeff Rebenschied

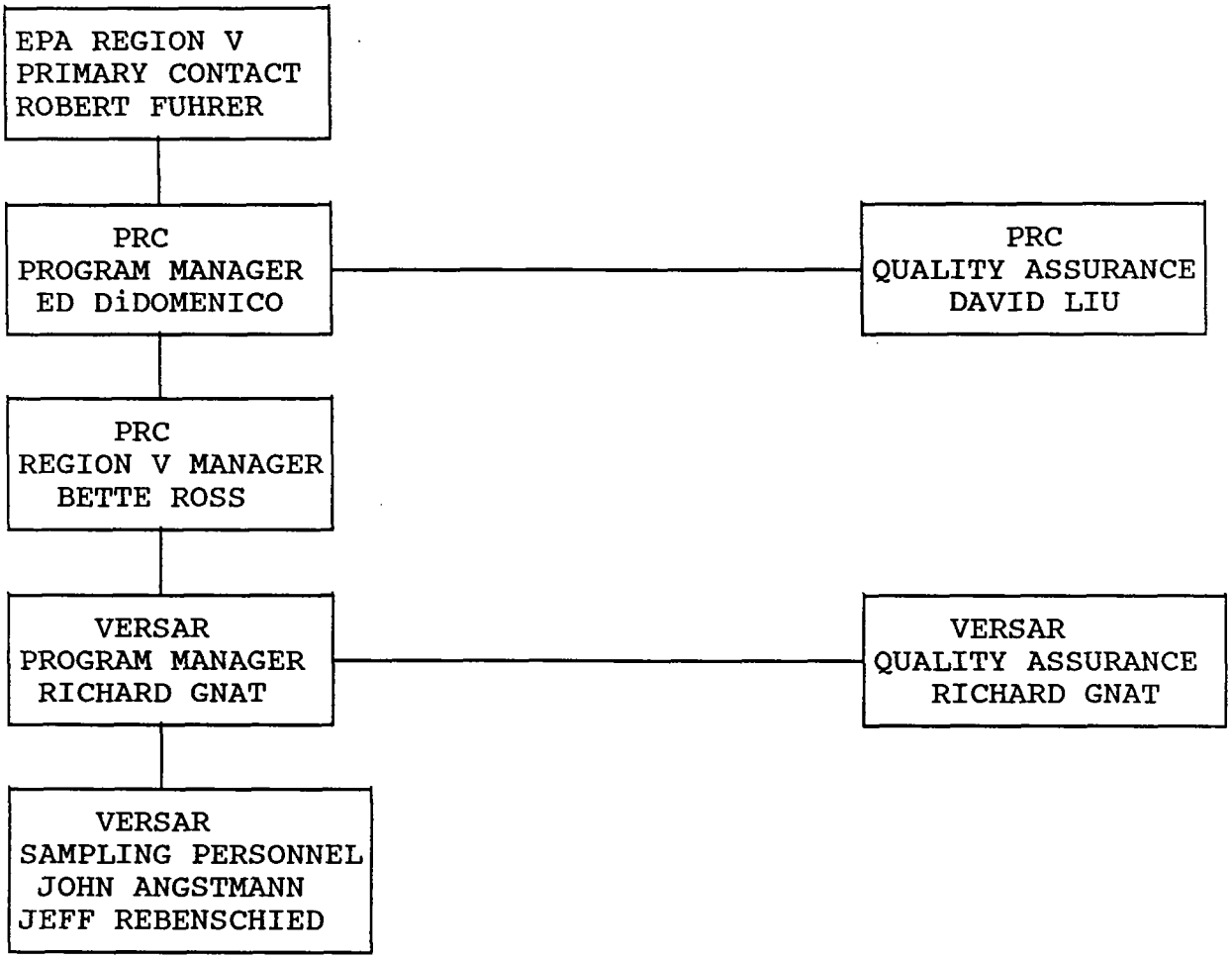


Figure 3
ORGANIZATIONAL CHART
ALLIED-SIGNAL, DANVILLE, ILLINOIS
SAMPLING VISIT

3.0 QUALITY ASSURANCE OBJECTIVES

3.1 Sampling Objectives

Versar will collect subsurface soil samples at the Allied-Signal facility to indicate the potential for release of hazardous waste or hazardous waste constituents from the SWMUs.

Versar will collect all samples using procedures that preserve the integrity of the sample. Specific sampling procedures are provided in Section 4.4 Analyses will be performed using Contract Laboratory Program (CLP) procedures by an assigned CLP laboratory in accordance with:

- U.S. EPA Contract Laboratory Program Statement of Work (SOW) for Organics Analysis: Multi-Media, Multiconcentration; October 1986; revised August 1987. (U.S. EPA, 1987a).

- U.S. EPA Contract Laboratory Program Statement of Work (SOW) for Inorganics Analysis: Multi-Media, Multiconcentration; July 1987; revised December 1987. (U.S. EPA, 1987b).

3.2 Quality Assurance Requirements

The purpose of establishing a quality assurance (QA) program is to ensure the reliability and validity of field and laboratory data quality objectives for this study are defined in terms of precision, accuracy, completeness, representativeness, and comparability.

Accuracy is the degree of agreement of a measurement with an accepted reference. Accuracies specified in the CLP SOW for Routine Analytical Services (RAS) will be suitable for the objectives of this project. (U.S. EPA, 1987a and 1987b). The acceptable accuracy for Special Analytical Services (SAS) will be recovery of laboratory spikes at 100 percent ± 30 percent. Recoveries in the range of 100 percent ± 30 to 60 percent will be acceptable for approximation. Analytical results will also be acceptable if recoveries are beyond these criteria and the

analytical results are greater than four times the spike concentration.

Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision specified in the CLP SOW for RAS will be suitable for the objectives of this project. The acceptable precision for SAS will be a relative percent difference (RPD) of less than 30 percent. Analytical results will be acceptable for approximation if the RPD is within the range of 30 to 60 percent. Analytical results will also be acceptable if RPDs are beyond these criteria and the analytical results are less than five times the detection limit.

Completeness is the measure of all information necessary for a valid scientific study compared to the amount that was expected to be obtained under normal conditions. During the SV, environmental samples will be collected from various locations surrounding the inactive ponds (SWMUs 1-4). The sampling procedures specified in this plan are adequate for the objectives of this task. Versar will make every effort to collect samples from all the locations listed in this Plan.

Representativeness expresses the degree to which the sample accurately portrays the population characteristics of process/ environmental conditions at a given point in time. Samples for all analytical parameters will be collected concurrently from a particular location before moving to another unit.

Comparability refers to the interpretation, presentation, and reporting of data. Comparability of data generated from the samples will be ensured by using the standard CLP analytical procedures, detection limits, and reporting methods as defined in the above referenced SOWs.

4.0 PROJECT PROCEDURES AND RATIONALE

4.1 Sampling Objectives

The objective of the facility SV is to identify releases of hazardous waste or hazardous constituents from SWMUs or other areas of concern through the collection of environmental samples. As a result of the PR and VSI, the U.S. EPA identified nine SWMUs where current or past waste handling or disposal activities indicate possible releases to the environment. The selection of sampling locations and analytical parameters is based on the sampling plan for the Allied-Signal site developed by the U.S. EPA Work Assignment Manager dated August, 1989.

The results of the SV will be used to determine the need for future work to be performed at the Allied-Signal site under the RCRA corrective action program. Corrective actions may include a RCRA Facility Investigation (RFI), the removal of contaminants and contaminated materials, or a recommendation that no further action be taken at this time. Sample analyses will be performed under guidelines set forth by the CLP to ensure that analytical results can be used for enforcement purposes (refer to Section 3.2).

4.2 RFA Sampling Locations

The U.S. EPA identified ten sampling locations that may indicate the possible release of hazardous waste or hazardous constituents from the SWMUs to the environment. These locations along with the locations of two background samples and associated sampling rationale are provided in Table 2. The locations are marked on Figure 2.

4.3 Quality Assurance/Quality Control Samples

The QA program followed under this sampling activity will use quality control (QC) samples to ensure that all data generated are legally defensible, and scientifically sound. QC samples to be collected will include one field duplicate to be analyzed for all parameters. All soil and QC samples will be analyzed for the same parameters: pH, volatile organic compounds (VOCs), target analyte list (TAL) metals,

TABLE 2
Summary of Sample Locations and Rationale
Allied-Signal, Danville, Illinois

Sample No.	SWMU No.	Location	Sampling Rationale
1	NA	Northwest of facility in an area unaffected by facility operations.	Background soil sample.
2	NA	Near the jog in the west property boundary, approximately 500 feet south of the entrance.	Background soil sample.
3	1	Inside south bank of inactive pond #1 approximately one fourth the distance from the west end of the unit.	The pond was used from 1954 to the late 1960's for the storage of process wastewater, aluminum chloride (AlCl), and aluminum fluoride (AlF). The pond is filled with approximately 5-10 feet of soil and gravel.
4	1	Inside south bank of inactive pond #1 approximately one fourth the distance from the east end of the unit.	Same as above.
5	2 and 7	Along the south bank of pond #2 (SWMU 2) near the main carbon tetrachloride recovery well area (SWMU 7).	Pond #2 was used from 1956 to 1963 for the storage of AlCl which consisted of 27% AlCl and and 2% fluoride. Acid leakage from the lagoon was reported as early as 1956. The lagoon is currently inactive and contains approximately five feet of soil and gravel. Raw product Genetron tanks and a carbon tetrachloride tank are located on the former pond area.

TABLE 2 (Cont.)
Summary of Sample Locations and Rationale
Allied-Signal, Danville, Illinois

Sample No.	SWMU No.	Location	Sampling Rationale
			The recovery well was installed in 1979 for the purposes of removing carbon tetrachloride from the ground water as a result of a tank leak.
6	3	In the drainage ditch near the northeast corner of Pond #3	The pond was used from 1958 to 1980 for the storage of acid wastewater. Acid leakage from this pond has been documented. The pond was certified closed by the Illinois Environmental Protection Agency (IEPA) in 1980. The pond contains approximately 5-10 feet of activated aluminum as fill and is covered with a one foot clay cap.
7	3 and 5	In the drainage ditch area near the southwest corner of pond #3 (SWMU 3) and below the underground injection line (SWMU 5).	Same as above for SWMU 3. The overhead injection line may have leaked since its activation in 1973.
8	4	Near the southeast corner of the hydrochloric acid tank containment wall and south of Pond #4.	The pond was used from 1972-1973 for the temporary storage of process wastewaters. The pond was lined with overlapping polyethylene. The pond is currently inactive and is filled with approximately 5-10 feet of soil and gravel.
9	4	Approximately 50 feet in from the northeast corner fence line of Pond #4 (SWMU 4).	Same as above.

TABLE 2 (Cont.)
Summary of Sample Locations and Rationale
Allied-Signal, Danville, Illinois

Sample No.	SWMU No.	Location	Sampling Rationale
10	6	East of the hazardous waste drum storage area (SWMU 6).	The drum storage area is 25 x 25 foot concrete pad surrounded by a six inch curb and covered by a roof. Waste which may have been stored there include: ignitables (D001), corrosives (D002), arsenic (D004), spent halogenated degreasing solvents (F001), carbon tetrachloride (U211), methylene chloride (U080), and aqueous antimony catalyst from fluoromethanes production (K021). The area is currently used for less than 90 day storage of drummed hazardous wastes.
11	8	On the banks of the south drainage ditch in line with the water cooling tower.	The drainage ditch is downstream of the deep well injection facility (SWMU 8). Prior to installation of the secondary containment system for the facility, this drainage ditch also received facility run-off.
12	9	Northwest of urethane foam burial location.	Aerosol cans containing urethane foam and possible burial of other wastes.

acidity, chloride, fluoride, and sulfate. VOCs and TAL metals are considered RAS parameters, and pH, acidity, chloride, fluoride, and sulfate are considered SAS parameters under the CLP. The SAS program requires different analytical protocols than the RAS program. Versar will attempt to collect the field duplicate sample from an area having the greatest contamination as assessed by either visual means or field screening data. No field or trip blanks will be collected since all samples are of the soil matrix, and although available, soil blanks are not routinely used.

4.4 Sample Collection Procedures

A total of 13 soil samples (ten for SWMU areas, two background soil, and one duplicate) will be collected at the Allied-Signal facility. All samples will be analyzed for TCL VOCs, TAL metals, pH, acidity, chloride, fluoride, and sulfate. Described below are the sampling procedures that Versar personnel will follow during the facility sampling visit.

Two acceptable methods to be used in collecting soil samples for this project are the grab method and the composite (cone and quarter) method. Determining which of these two methods to use depends on the parameters of concern. All soil samples to be analyzed for VOCs will be collected as grab samples. A grab sample is collected from a single sample location at a specific depth. The grab method is preferred for VOCs because this method reduces sample agitation and the time of sample exposure to the atmosphere which, therefore, reduces volatilization of organics in the sample yielding more representative data.

Soil samples which will be analyzed for parameters other than VOCs will be composites of multiple grab samples from a single location. These samples will be stirred and blended to ensure greater homogeneity. Soil composite sampling consists of thoroughly mixing the sample material in a stainless steel bowl, then, if necessary, reducing the

sample material to a required sample volume using the cone and quarter method. This method consists of forming the mixed sample into a mound or cone. If there is much more material than what is required to fill the sample containers, the mound will be reduced by cutting it into quarters. Then, diagonal quarters will be removed until the desired sample volume remains. The remaining two quarters will be remixed thoroughly and scooped into the sample containers, dividing the scoops evenly between containers.

Subsurface soil samples will be collected preferably with a stainless steel auger and a stainless steel scoop. The auger and scoop will be properly decontaminated before use. (Refer to Section 4.6 for decontamination procedures.) The stainless steel auger will be used to reach the desired sample depth. After the sample depth is reached, the auger will be removed from the borehole and emptied. A sample will be collected from the depth of 2 feet (plus or minus six inches). After retrieving the sample, an aliquot for VOC analysis will be collected directly from the auger. Remaining sample material will be placed in a stainless steel bowl and mixed. Nonrepresentative material such as glass fragments or large gravel pieces will be removed before mixing. Upon completion of compositing, sample materials will be transferred directly into laboratory prepared containers.

4.5 Field Documentation

Versar sampling personnel will record daily activities in a bound field nôtebook. The logbook will contain specific information about the day's activities including: date; names and affiliation of all personnel; description of all activities; problems or delays encountered while conducting sampling activities; equipment, and materials used during sampling activities. The following guidelines will be employed in all field logbooks:

1. The logbook itself will be permanently bound, but not spiral bound and all pages (front and back) will be sequentially numbered.

2. The logbook will contain an account of daily activities, conversations with coordinating officials, descriptions of photographs taken during sampling, and field equipment calibrations.

3. All entries will be written in blue or black ballpoint pen.

4. The first page will contain a listing of key project personnel and telephone numbers.

5. Each page of the logbook will be dated and initialed.

6. A new page will be started at the beginning of each day.

7. Entries into the logbook will be chronological -- a time notation (using military time) will introduce each entry.

8. The logbook will be signed at the end of each day. Signatures will be written on a single diagonal line drawn across the blank portion of the page following the day's last entry.

9. If an error is made in the field logbook, it will be corrected by simply crossing a single line through the error and entering the correct information. Errors will be corrected by the person who made the entry. All corrections will be dated and initialed.

4.6 Field Equipment Decontamination

Soil samples will be collected using a hand auger and stainless steel scoops. Versar will perform the following decontamination procedures for all sampling equipment:

1. Thoroughly wash with nonphosphate detergent in hot water.
2. Rinse with tap water.
3. Rinse with deionized water.
4. Rinse with 5-percent nitric acid.
5. Rinse once with deionized water.
6. Wrap in aluminum foil after drying and seal in plastic if possible.

4.7 Sample Containerization and Preservation

During sample collection sample bottles will be filled in the following order: volatile organics, total metals, pH, acidity, chloride, fluoride, and sulfate. To ensure consistency with EPA protocols regarding sample containers, Table 3 lists the selected analytical

parameters and associated container requirements, preservation techniques, and holding times. Pre-cleaned sample containers will be obtained from I-Chem Research. All samples, will be placed on ice and cooled as indicated in Table 3 immediately after collection.

4.8 Sample Documentation and Shipment

All samples will be labeled and tagged in accordance with the procedures outlined in the User's Guide to the Contract Laboratory Program (EPA, 1986). Versar field personnel will keep a copy of this document with them in the field. Labels and tags will be obtained from the EPA Central Regional Laboratory, Chicago, Illinois. Sample numbers, times of collection, and parameters to be analyzed for each sample will be logged in the field logbook by the sampling personnel. During the sampling day, sampling personnel will ensure that all forms (e.g., sample tags, traffic reports) are properly completed and that sample tags and labels are properly affixed.

Versar personnel will adhere to the following protocol when shipping samples to scheduled CLP Laboratories by an overnight mail service:

1. During the sampling day, sampling personnel will ensure that the appropriate samples are preserved on ice, all forms (e.g., sample tags, sample traffic reports) are completed, and sample tags and labels are properly affixed.

2. At the end of the sampling day, the sampling personnel will repack all samples in an ice-filled cooler, verify that all samples are accounted for, and correlate completed sample traffic reports and packing lists with chain-of-custody reports. All forms to be shipped with the samples will be placed in a waterproof pouch and included in the shipping container bearing the original overnight mail airbill. Additional containers will bear overnight mail service, multipackage shipping stickers. Sampling personnel will generate a receipt for sample forms, if necessary.

3. After the shipment has been accepted by overnight mail service, sampling personnel will call the Sample Management Office (SMO) and notify SMO of the shipment.

TABLE 3
SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Parameter	Container	Preservation	Holding[1] Time	Analytical Method
Target Analyte List (inorganics)				
Metals	One 8-oz glass with teflon lined, screw-on cap	Cool 4°C	6 Months	CLP-RAS[2]
Target Compound List (organics)				
Volatiles	Two 120-ml glass with open top, screw-on caps with Teflon faced septa	Cool 4°C	10 Days	CLP-RAS[2]
Other				
Acidity and pH Chloride, Fluoride, and Sulfate	One 8-oz glass container with Teflon lined, screw cap	Cool 4°C	14 Days	CLP-SAS[3]

[1]Holding times from validated time of sample receipt (VTSR).

[2]CLP methods will be used as described in CLP Statements of Work for Organics (U.S EPA 1987a) and Inorganics (U.S. EPA 1987b) Analysis.

[3]SAS methods will be selected at the discretion of the EPA Central Regional Laboratory (CRL)

Samples collected during this SV will be packaged as low-level environmental samples. The samples will be placed in a cooler and packaged carefully to avoid breakage and cross-contamination. The cooler will then be secured with strapping tape. Signed custody seals will be placed on the edge of the cooler to prevent unauthorized opening during shipment to the laboratory. The coolers will be shipped within 24 hours of sample collection by overnight mail service with next day delivery to the appropriate scheduled CLP laboratory. Sample shipment will be coordinated by the Versar work assignment manager, sampling personnel, and the Sample Management Office (SMO). Individual responsibilities are described below.

Versar Work Assignment Manager

The Versar work assignment manager will be responsible for coordinating with the U.S. EPA WAM and CLP Coordinator regarding the CLP laboratory schedule, and acquiring the necessary region-specific sample traffic reports, packing lists, chain-of-custody reports, and sample tags for post-sampling shipment, and analysis.

Versar Sampling Personnel

Versar's sampling personnel are responsible for preparing equipment for sampling, collecting representative samples, collecting field measurements correctly, proper packaging and shipping of samples, and proper decontamination of field equipment. The Versar sampling personnel will be responsible for shipping samples to the scheduled CLP laboratories each day by overnight mail service, notifying the SMO of the shipment, and providing all requested information.

Sample Management Office

The SMO is responsible for tracking all samples shipped from the site. The SMO will be notified daily after the samples have been shipped by the Versar sampling personnel.

5.0 SAMPLE CUSTODY

Versar will strictly adhere to the chain-of-custody procedures outlined in the User's Guide to the Contract Laboratory Program (U.S. EPA, 1986). A standard chain-of-custody form will be maintained for all samples, and will accompany the samples to the laboratory. Each sample will be identified with a unique sample number and tag. Sample tags will be preprinted and provided by U.S. EPA Region V. Until shipment to the laboratory, field personnel will keep all samples within view or in a locked vehicle at all times.

To release samples to another party, a chain-of-custody form will be signed by Versar and the receiving party. In this case, the chain-of-custody will document that samples were released by Versar to another party.

A receipt for samples will also be filled out. The receipt documents that an Allied-Signal facility representative is acknowledging that Versar has collected samples at their facility. Both the chain-of-custody and receipt for samples will include the facility name, the number of samples collected, and the time and date the samples were collected. The receipt for samples form will also be signed by a member of Versar's sampling team.

In addition to chain-of-custody records, sampling personnel will prepare RAS traffic reports and SAS packing lists, in accordance with CLP Region V requirements. The traffic reports and packing lists will accompany the samples to the laboratory and will contain site name, samplers name, sample data, sample location, and identify the parameters to be analyzed for. Traffic reports and packing lists will be provided by Central Regional Laboratory, U.S. EPA, Region V.

6.0 CALIBRATION PROCEDURES AND FREQUENCIES

Calibration of laboratory equipment is specific to the CLP procedures and CLP contract requirements. Versar routinely calibrates all equipment used for field analytical measurement. Calibrations are generally performed each time a particular piece of equipment is issued for field use. Versar field personnel will monitor for total organic vapors using a portable photoionization detector (TIP or HNU-101) or a portable flame ionization detector (OVA-128). All calibration of field equipment will be documented in equipment logs. These equipment logs will provide a historical record of any given field instrument's accuracy. If a piece of equipment cannot be properly calibrated, it will be sent to the manufacturer for repairs, and a replacement will be obtained.

7.0 ANALYTICAL PROCEDURES

Samples will be analyzed using the analytical methods within the Contract Laboratory Program (CLP). The analytical parameters and analytical services (i.e., Routine Analytical Services (RAS), Special Analytical Services (SAS)) are listed in Table 3 in section 4.0.

8.0 DATA REDUCTION, VALIDATION AND REPORTING

Data reduction, data validation and reporting will all be performed within the guidelines and constraints of CLP as described in the CLP Users Guide (U.S. EPA, 1986). Data validation will be performed by a CLP contractor according to Laboratory Data Validation, Functional Guidelines for Evaluating Organic Analyses (U.S. EPA, 1987a), and Functional Guidelines for Evaluating Inorganic Analyses (U.S. EPA, 1987b).

9.0 INTERNAL QUALITY CONTROL CHECKS

9.1 Field QC Checks

Versar will provide field QC by collecting field duplicates. Field duplicates will be collected to help evaluate reproducibility as a result of field collection procedures. Field duplicate samples will be collected by alternately filling each parameter container from each duplicate container set until all containers are filled. These samples will not be labeled as "duplicate" on any of the information which the analyzing laboratory will receive.

9.2 Laboratory QC Checks

The CLP has established a quality control (QC) program for organic and inorganic RAS laboratory analyses to provide consistent results of known and documented quality. Sample data packages contain documentation of QC operations and results to allow an experienced chemist to validate the quality of the data. Additionally, laboratory contracts allow provisions for sample reanalysis when specified QC criteria are not met by the laboratory.

It is the responsibility of the laboratory to document, in each data package submittal, that both initial and ongoing instrument and analytical QA criteria have been met. The laboratory must demonstrate that instrument calibration criteria have been met, interferences from the analytical system are under control, and spike recoveries falling outside contract acceptance windows are attributable to sample matrix interferences and not to laboratory analytical errors. Any samples analyzed when contract QC have not been met will be reanalyzed by the laboratory.

9.3 Document QC Checks

Versar incorporates internal quality control procedures for all documents and reports, including preliminary draft reports, work plans, and final reports. A copy of Versar's Document and Report Quality Control Checklist is included as Figure 4. At a minimum, each report will receive a technical and editorial review.

Page ___ of ___

Versar INC.

DOCUMENT AND REPORT QUALITY CONTROL CHECKLIST*

REPORT TITLE _____

JOB NO. _____ DIVISION NO. _____ TASK MANAGER _____

AUTHOR(S) _____

IS THIS DOCUMENT

DRAFT ☐

FINAL ☐

DOCUMENT NO. _____

DISK NO. _____

IDENTIFY THE SECTIONS THE DOCUMENT COVERED BY THIS CHECKLIST:

_____

_____

_____

DATE AND TIME SUBMITTED TO WP	PERSONNEL CODE (Indicate your primary function)	TYPING: ORIGINAL	TYPING: SPELLING VERIFIER	TYPING: CORRECTIONS, REVISIONS	TYPING: CONTENT	TYPING: COMPLETENESS	TECHNICAL REVIEW: CALCULATIONS (If checked)	TECHNICAL REVIEW: MEETS QC SPECS.	TECHNICAL REVIEW: PROOFREAD.	TECHNICAL REVIEW: CHECK TABLES, FIGURES, PAGE NO.	TECHNICAL REVIEW: EDITORIAL REVIEW	TECHNICAL REVIEW: IDENTIFY SECTIONS (If any) THAT WERE REWRITTEN	TECHNICAL REVIEW: REVIEW TYPED REVISIONS	TECHNICAL REVIEW: PROOFREAD CORRECTIONS	TECHNICAL REVIEW: OTHER PRODUCT CHECKS (Specify)	SIGN
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PERSONNEL CODES

1-TYPIST
2-AUTHOR
3-TASK MGR
4-PROJECT MGR
5-TECH.REVIEW
6-TECH.EDITOR
7-DIV.DIRECTOR
8-QA/QC OFFICER
9-OTHER (Specify)
A_____
B_____

FINAL Due Date _____

COMMENTS _____

SUBMITTED TO _____

DATE SUBMITTED _____ METHOD OF DELIVERY _____

COPIES _____

DOCUMENT RELEASE AUTHORIZATION: TASK MANAGER _____

PROJECT MANAGER/DIVISION DIRECTOR _____

*RETURN COMPLETED FORM TO QUALITY ASSURANCE OFFICE

QAO: REVISED 11/84

Figure 4

10.0 PERFORMANCE AND SYSTEM AUDITS

As a contractor under the Technical Enforcement Support Contract (EPA Contract No. 68 W9-0006), Versar is subject to the requirements of the TES Quality Assurance Program dated March 1988 and incorporated by reference in the contract. Versar initiates internal system and performance audits and is subject to external audits performed by PRC or EPA. Deliverable dates, adherence to project objectives, and adherence to Versar Standard Operating Procedures (SOPs) are monitored in a monthly status report prepared by Versar.

10.1 System Audits

System audits are qualitative reviews of project activity to check that the overall quality assurance program is functioning and that the appropriate QC measures are being implemented. All Versar internal QC measures will be checked in a system audit. System audits will be performed every four months with audit findings reported to the PRC Program QC Director. A system audit may be conducted by RPC.

10.2 Performance Audits

Performance audits are quantitative checks on different segments of project activities, and are most appropriate to environmental sampling, analysis, and data processing activities. Performance audits may be initiated by PRC. Performance audit techniques include checks on sampling equipment, volume measurements, and analysis of QC samples as well as review of field log books. The Equipment Manager is responsible for performing quarterly audit checks on sampling and monitoring equipment, maintenance procedures, and calibration logs.

11.0 PREVENTIVE MAINTENANCE

All nondisposable sampling equipment (i.e., augers) will be decontaminated between each use to prevent cross-contamination between sample points. Decontamination procedures are listed in Section 4.6.

Versar's monitoring equipment will be checked in the field prior to each day's use. If any battery-operated equipment is not showing full charge, the batteries will be replaced or recharged. If any of the units are found to be defective, they will be red-tagged and repaired or decommissioned. Any preventive or remedial maintenance will be described and documented quarterly on standardized maintenance records.

According to CLP Statements of Work, preventive maintenance procedures for laboratory operations should be clearly defined and written for each measurement system and required support equipment. When maintenance activity is necessary, it should be documented on standard forms maintained in logbooks. A history of the maintenance record of each system serves as an indication of the adequacy of maintenance schedules and parts inventory.

12.0 ASSESSMENT OF PRECISION, ACCURACY AND COMPLETENESS

Samples will be analyzed by laboratories in the Contract Laboratory Program. The U.S. EPA Contract Laboratory Program has defined the procedures for the assessment of data precision, accuracy, and completeness in the CLP Statement of Work for organic and inorganic sample analysis (U.S. EPA, 1987a and 1987b). Any laboratory data not following standard protocol for assessing data precision, accuracy, or completeness must be handled on a case by case basis.

13.0 CORRECTIVE ACTION

The corrective action process includes (1) recognizing problems, (2) initiating corrective actions, (3) following-up on the action to verify change, and (4) documenting and reporting the corrective action to management. Corrective action may occur as a result of equipment malfunctions, calibration/maintenance problems, data management errors, internal or external QC problems, systems audits, or deviation from SOPs. Questionable data or information will be identified and the Versar project manager notified. The project manager will be responsible for initiating and following any corrective actions to ensure an effective remedy. All corrective actions initiated by the project manager will be brought to the attention of the TES IX QA Coordinator. The corrective action process will be documented in the field logbook and on a standard Versar corrective action form.

14.0 QUALITY ASSURANCE AND DOCUMENTATION REPORTS

14.1 Progress/Status Reports

As work on the assignment progresses, Versar will contact the U.S. EPA WAM frequently with verbal project status reports. These verbal reports will include any QC problems encountered. If significant changes to the Plan are made in the field, Versar will notify the EPA Regional Project Officer or Primary Contact.

In the event CLP space is not available and Versar's laboratory is contacted to perform the analysis, the project manager or his designee will receive periodic verbal status reports on the sample analysis. Items which may be discussed during these verbal updates will include QA/QC problems (e.g., blank contamination, holding time violations, high detection limits), analytical problems (e.g., complex samples, delays, equipment needs), and significant results.

14.2 Sampling Visit Reports

Versar will prepare a Draft Sampling Visit Report to document activities at the Allied-Signal Danville facility. The report will be submitted to U.S. EPA three weeks after field activities are completed. The report will include the following:

1. Versar's sampling activities
2. Problems and resolutions
3. Schedule changes
4. Future activities
5. Deviations from the Plan

15.0 REFERENCES

U.S. Environmental Protection Agency (EPA), 1986. User's Guide to the Contract Laboratory Program. Office of Emergency and Remedial Response, Washington, D.C. December 1986.

U.S. Environmental Protection Agency (EPA), 1987a. U.S. EPA Contract Laboratory Program Statement of Work (SOW) for Organics Analysis: Multi-Media, Mulitconcentration; October 1986, revised August 1987.

U.S. Environmental Protection Agency (EPA), 1987b. U.S. EPA Contract Laboratory Program Statement of Work for Inorganics Analysis: Multi-Media, Multiconcentration; July 1987; revised December 1987.

APPENDIX A

TARGET COMPOUND LIST AND TARGET ANALYTE LIST

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)[a]

	Volatiles	CAS Number	Quantitation Limits[b] Water ug/L	Low Soil/Sediment[c] ug/Kg
1.	Chloromethane	74-87-3	10	10
2.	Bromomethane	74-83-9	10	10
3.	Vinyl chloride	75-01-4	10	10
4.	Chloromethane	75-00-3	10	10
5.	Methylene chloride	75-09-2	5	5
6.	Acetone	67-64-1	10	10
7.	Carbon disulfide	75-15-0	5	5
8.	1,1-Dichloroethene	75-35-4	5	5
9.	1,1-Dichloroethane	75-34-3	5	5
10.	1,2-Dichloroethene (total)	540-59-0	5	5
11.	Chloroform	67-66-3	5	5
12.	1,2-Dichloroethane	107-06-2	5	5
13.	2-Butanone	78-93-3	10	10
14.	1,1,1-Trichloroethane	71-55-6	5	5
15.	Carbon Tetrachloride	56-23-5	5	5
16.	Vinyl Acetate	108-05-4	10	10
17.	Bromodichloromethane	75-27-4	5	5
18.	1,2-Dichloropropane	78-87-5	5	5
19.	cis-1,3-Dichloropropene	10061-01-5	5	5
20.	Trichloroethene	79-01-6	5	5
21.	Dibromochloromethane	124-48-1	5	5
22.	1,1,2-Trichloroethane	79-00-5	5	5
23.	Benzene	71-43-2	5	5
24.	trans-1,3-Dichloropropene	10061-02-6	5	5
25.	Bromoform	75-25-2	5	5
26.	4-Methyl-1-2-pentanone	108-10-1	10	10
27.	2-Hexanone	591-78-6	10	10
28.	Tetrachloroethene	127-18-4	5	5
29.	Toluene	108-88-3	5	5
30.	1,1,2,2-Tetrachloroethane	79-34-5	5	5
31.	Chlorobenzene	108-90-7	5	5
32.	Ethyl benzene	100-41-4	5	5
33.	Styrene	100-42-5	5	5
34.	Xylenes (Total)	1330-20-7	5	5

Notes:

a Specific quantitation limits are highly matrix-dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

b Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on a dry weight basis as required by the contract, will be higher.

c Medium soil/sediment contract required quantitation limits (CRQL) for volatile TCL compounds are 125 times the individual low soil/sediment CRQL.

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)[a]
(Continued)

	Semivolatiles	CAS Number	Quantitation Limits[b] Water ug/L	Low Soil/Sediment[c] ug/Kg
35.	Phenol	108-95-2	10	330
36.	bis(2-Chloroethyl) ether	111-44-4	10	330
37.	2-Chlorophenol	95-57-8	10	330
38.	1,3-Dichlorobenzene	541-73-1	10	330
39.	1,4-Dichlorobenzene	106-46-7	10	330
40.	Benzyl alcohol	100-51-6	10	330
41.	1,2-Dichlorobenzene	95-50-1	10	330
42.	2-Methylphenol	95-48-7	10	330
43.	bis(2-Chloroisopropyl) ether	108-60-1	10	330
44.	4-Methylphenol	106-44-5	10	330
45.	N-Nitroso-di-n-dipropylamine	621-64-7	10	330
46.	Hexachloroethane	67-72-1	10	330
47.	Nitrobenzene	98-95-3	10	330
48.	Isophorone	78-59-1	10	330
49.	2-Nitrophenol	88-75-5	10	330
50.	2,4-Dimethylphenol	105-67-9	10	330
51.	Benzoic acid	65-85-0	50	1600
52.	bis(2-Chloroethoxy) methane	111-91-1	10	330
53.	2,4-Dichlorophenol	120-83-2	10	330
54.	1,2,4-Trichlorobenzene	120-82-1	10	330
55.	Naphthalene	91-20-3	10	330
56.	4-Chloroaniline	106-47-8	10	330
57.	Hexachlorobutadiene	87-68-3	10	330
58.	4-Chloro-3-methylphenol (para-chloro-meta-cresol)	59-50-7	10	330
59.	2-Methylnaphthalene	91-57-6	10	330
60.	Hexachlorocyclopentadiene	77-47-4	10	330
61.	2,4,6-Trichlorophenol	88-06-2	10	330
62.	2,4,5-Trichlorophenol	95-95-4	50	1600
63.	2-Chloronaphthalene	91-58-7	10	330
64.	2-Nitroaniline	88-74-4	50	1600
65.	Dimethylphthalate	131-11-3	10	330
66.	Acenaphthylene	208-96-8	10	330
67.	2,6-Dinitrotoluene	606-20-2	10	330
68.	3-Nitroaniline	99-09-2	50	1600
69.	Acenaphthene	83-32-9	10	330
70.	2,4-Dinitrophenol	51-28-5	50	1600
71.	4-Nitrophenol	100-02-7	50	1600
72.	Dibenzofuran	132-64-9	10	330
73.	2,4-Dinitrotoluene	121-14-2	10	330
74.	Diethylphthalate	84-66-2	10	330

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)[a]
(Continued)

	Semivolatiles	CAS Number	Quantitation Limits[b] Water ug/L	Low Soil/Sediment[c] ug/Kg
75.	4-Chlorophenyl-phenyl ether	7005-72-3	10	330
76.	Fluorene	86-73-7	10	330
77.	4-Nitroaniline	100-01-6	50	1600
78.	4,6-Dinitro-2-methylphenol	534-52-1	50	1600
79.	N-nitrosodiphenylamine	86-30-6	10	330
80.	4-Bromophenyl-phenylether	101-55-3	10	330
81.	Hexachlorobenzene	118-74-1	10	330
82.	Pentachlorophenol	87-86-5	50	1600
83.	Phenanthrene	85-01-8	10	330
84.	Anthracene	120-12-7	10	330
85.	Di-n-butylphthalate	84-74-2	10	330
86.	Fluoranthene	206-44-0	10	330
87.	Pyrene	129-00-0	10	330
88.	Butylbenzylphthalate	85-68-7	10	330
89.	3,3'-Dichlorobenzidine	91-94-1	20	660
90.	Benzo(a)anthracene	56-55-3	10	330
91.	Chrysene	218-01-9	10	330
92.	bis(2-Ethylhexyl)phthalate	117-81-7	10	330
93.	Di-n-octylphthalate	117-84-0	10	330
94.	Benzo(b)fluoranthene	205-99-2	10	330
95.	Benzo(k)fluoranthene	207-08-9	10	330
96.	Benzo(a)pyrene	50-32-8	10	330
97.	Indeno(1,2,3-cd)pyrene	193-39-5	10	330
98.	Dibenz(a,h)anthracene	53-70-3	10	330
99.	Benzo(g,h,i)perylene	191-24-2	10	330

Notes:

a Specific quantitation limits are highly matrix-dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

b Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on a dry weight basis as required by the contract, will be higher.

c Medium soil/sediment contract required quantitation limits (CRQL) for semivolatile TCL compounds are 60 times the individual low soil/sediment CRQL.

TARGET COMPOUND LIST (TCL) AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)[a]
(Continued)

	Pesticides/PCBs	CAS Number	Quantitation Limits[b] Water ug/L	Low Soil/Sediment[c] ug/Kg
100.	alpha-BHC	319-84-6	0.05	8.0
101.	beta-BHC	319-85-7	0.05	8.0
102.	delta-BHC	319-86-8	0.05	8.0
103.	gamma-BHC (Lindane)	58-89-9	0.05	8.0
104.	Heptachlor	76-44-8	0.05	8.0
105.	Aldrin	309-00-2	0.05	8.0
106.	Heptachlor epoxide	1024-57-3	0.05	8.0
107.	Endosulfan I	959-98-8	0.05	8.0
108.	Dieldrin	60-57-1	0.10	16.0
109.	4,4'-DDE	72-55-9	0.10	16.0
110.	Endrin	72-20-8	0.10	16.0
111.	Endosulfan II	33213-65-9	0.10	16.0
112.	4,4'-DDD	72-54-8	0.10	16.0
113.	Endosulfan sulfate	1031-07-8	0.10	16.0
114.	4,4'-DDT	50-29-3	0.10	16.0
115.	Methoxychlor	72-43-5	0.5	80.0
116.	Endrin ketone	53494-70-5	0.10	16.0
117.	alpha-Chlordane	5103-71-9	0.5	80.0
118.	gamma-Chlordane	5103-74-2	0.5	80.0
119.	Toxaphene	8001-35-2	1.0	160.0
120.	Aroclor-1016	12674-11-2	0.5	80.0
121.	Aroclor-1221	11104-28-2	0.5	80.0
122.	Aroclor-1232	11141-16-5	0.5	80.0
123.	Aroclor-1242	53469-21-9	0.5	80.0
124.	Aroclor-1248	12672-29-6	0.5	80.0
125.	Aroclor-1254	11097-69-1	1.0	160.0
126.	Aroclor-1260	11096-82-5	1.0	160.0

Notes:

a Specific quantitation limits are highly matrix-dependent. The quantitation limits listed herein are provided for guidance and may not always be achievable.

b Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on a dry weight basis as required by the contract, will be higher.

c Medium soil/sediment contract required quantitation limits (CRQL) for pesticide/PCB TCL compounds are 15 times the individual low soil/sediment CRQL.

INORGANIC TARGET ANALYTE LIST (TAL)

Analyte	Contract Required Detection Limit [a,b] (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5,000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	5
Magnesium	5,000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5,000
Selenium	5
Silver	10
Sodium	5,000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

Notes:

(a) Subject to the restrictions specified in the first page of Part G, Section IV of Exhibit D (Alternate Methods - Catastrophic Failure) in the CLP SOW, any analytical method specified in SOW Exhibit D may be used as long as the documented instrument or method detection limits meet the Contract Required Detection Limit (CRDL) requirements. Higher detection limits may only be used in the following circumstance.

If the sample concentration exceeds five times the detection limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Detection Limit. This is illustrated in the example below:

For lead:

Method in use -- ICP	
Instrument Detection Limit (IDL) --	40
Sample concentration --	220
Contract Required Detection Limit (CRDL) --	5

The value of 220 units may be reported even though the instrument detection limit is greater than CRDL. The instrument or method detection limit must be documented as described in Exhibit E of the CLP SOW.

(b) The CRDLs are the instrument detection limits obtained in pure water that must be met using the procedure in Exhibit E. The detection limits for samples may be considerably higher depending on the sample matrix.

APPENDIX B

CLP SAMPLE DOCUMENTATION

AND CUSTODY PROCEDURES

USER'S GUIDE TO THE CONTRACT LABORATORY PROGRAM

DECEMBER 1986 CHAPTER III, SECTION C.

ABBREVIATIONS

SMO:	Sample Management Office
RAS:	Routine Analytical Services
RSCC:	Regional Sample Control Center
AR:	Authorized Requestor

SAMPLE DOCUMENTATION

Each sample processed by the CLP must be properly documented to ensure timely, correct, and complete analysis for all parameters requested, and most importantly, to support use of sample data in potential enforcement actions concerning a site. The CLP documentation system provides the means to individually identify, track, and monitor each sample from the point of collection through final data reporting. As used herein, a sample is defined as a representative specimen collected at a specific location of a waste site at a particular point in time for a specific analysis, and may reference field samples, duplicates, replicates, splits, spikes, or blanks, that are shipped from the field to a laboratory. Specific CLP sample documentation requirements are described in the following sections.

Whenever questions arise, samplers should contact SMO for direction and clarification concerning the proper completion and distribution of Case paperwork for a sampling effort.

Sample Traffic Report (TR)/Usage, Distribution, Ordering

The sample documentation system for the RAS organic program is based on the use of EPA sample Traffic Report, a four-part carbonless form printed with a unique sample identification number. One Traffic Report and its preprinted identification number is assigned by the sampler to each sample collected. The type of TR currently is use is the Organic Traffic Report (OTR).

To provide a permanent record for each sample collected, the sampler completes the OTR, recording the case number, site name or code and location, site/spill ID, analysis laboratory, sampling office, dates of sample collection and shipment, and sample concentration and matrix. Numbers of sample containers and volumes are entered by the sampler beside the analytical parameter(s) requested for particular sample portions.

After completing the OTR, the sampler includes the bottom two copies in the sample shipment to the laboratory. Following sample shipment, the sampler returns the top copy of the completed OTR to SMO. The second copy is the sampler's file copy. Upon receipt of samples,

the analytical laboratory documents sample condition and signs the OTR, returning the signed copy to SMO and keeping a laboratory file copy. Copies of the laboratory-signed OTRs are provided to the RSCC as part of the data package.

A strip of adhesive sample labels printed with the OTR sample number is for the sampler's use in labeling sample bottles. The sampler affixes one of these number labels to each container making up the sample. In order to protect the label from water and solvent attack, each label must be covered with clear waterproof tape. The sample labels, which bear the OTR identification number, permanently identify each sample collected and link each sample component throughout the analytical process.

Organic Traffic Report forms are provided by SMO to each Region through the RSCC. One of the RSCC ARs should contact SMO two or more weeks in advance to order additional OTRs for the Region.

Sample Tag

To render sample data valid for Agency enforcement uses, individual samples must be traceable continuously from the time of collection until the time of introduction as evidence during litigation. One mechanism utilized in the CLP to comply with this enforcement requirement is the use of the "sample tag." Each sample removed from a waste site and transferred to a laboratory for analysis is identified by a sample tag containing specific information regarding the sample, as defined by the EPA National Enforcement Investigations Center (NEIC). Following sample analysis, sample tags are retained by the laboratory as physical evidence of sample receipt and analysis, and may later be introduced as evidence in Agency litigation proceedings. Sample tags can be obtained through the Regional office.

The information recorded on an EPA sample tag includes:

- CLP Case No. -- The unique number assigned by SMO to identify the sampling event. (Entered under "Remarks" heading.)
- CLP Sample No. -- The unique sample identification number (from the OTR or PL) used to document that sample. (Entered under "Remarks" heading.)
- Project Code -- The number assigned by EPA to the sampling project.
- Station No. -- A two-digit number assigned by the sampling team coordinator.

- Date -- A six-digit number indicating the month, day, and year of collection.
- Time -- A four-digit number indicating the military time of collection.
- Station Location -- The sampling station description as specified in the project plan.
- Samplers -- Signatures of samplers on the project team.
- Remarks -- Case and sample numbers are entered here, and any pertinent comments indicated.
- Tag No. -- A unique serial number pre-printed or stamped on the tag.
- Lab Sample No. -- Reserved for laboratory use.

Additionally, the sample tag contains appropriate spaces for noting that the sample has been preserved and indicating the analytical parameter(s) for which the sample will be analyzed.

Each sample tag is completed and securely attached to the sample container. Samples are then shipped under chain-of-custody procedures as described in the following section.

Chain-of-Custody Record

Official custody of samples must be maintained and documented from the time of sample collection up to introduction as evidence in court, in accordance with Agency enforcement requirements. The following custody documentation procedure was developed by NEIC and is used in conjunction with CLP sample documentation (i.e., Traffic Report) for all samples processed through the CLP.

A sample is considered to be in an individual's custody if the following criteria are met: (1) it is in your possession or it is in your view after being in your possession; (2) it was in your possession and then locked up or sealed to prevent tampering, or (3) it is in a secured area. Under this definition, the team member actual performing the sampling is personally responsible for the care and custody of the samples collected until they are transferred or dispatched properly. In follow-up, the sample team leader reviews all field activities to confirm that proper custody procedures were followed during the field work.

The Chain-of-Custody Record is employed as physical evidence of sample custody. Chain-of-Custody Record forms can be obtained through the Regional office. The sampler

completes a Chain-of-Custody Record to accompany each cooler shipped from the field to the laboratory.

Similar information to that entered on the sample tag is recorded on the Chain-of-Custody Record. Header information includes the project number, sampler's signature, and the CLP Case No. (entered on the upper right of the form). It does not include the commonly known name of the site, as CLP laboratories may perform work for the responsible party of that site. For each station number, the sampler indicates date, time, whether the sample is a composite or grab, station location, number of containers, analytical parameter, CLP sample number(s) (from OTR or PL), and sample tag number(s). When relinquishing the samples for shipment, the sampler signs the space indicated at the bottom of the form, entering the date and time the samples are relinquished. The sampler enters shipper name and airbill number under the "Remark" section on the bottom right of the form.

The custody record is completed using waterproof ink. Any corrections are made by drawing a line through and initialing the error, then entering the correct information. Erasures are not permissible.

The top, original signature copy of the Chain-of-Custody Record is enclosed in plastic (with CLP sample documentation) and secured to the inside of the cooler lid. A copy of the custody form is sent to the SMO.

Shipping coolers are secured and custody seals are placed across cooler openings. As long as custody forms are sealed inside the sample cooler and custody seals remain intact, commercial carriers are not required to sign off on the custody form.

The laboratory representative who accepts the incoming sample shipment signs and dates the Chain-of-Custody Record to acknowledge receipt of the samples, completing the sample transfer process. It is then the laboratory's responsibility to maintain internal logbooks and records that provide a custody record throughout sample preparation and analysis.