Department of Energy
Oak Ridge Operations
Weldon Spring Site
Remedial Action Project Office
Route 2, Highway 94 South
St. Charles, Missouri 63303

June 14, 1990

Addressees

ENVIRONMENTAL DATA ADMINISTRATION PLAN

Enclosed for your review and comment are two copies of the above plan. The Environmental Data Administration Plan (EDAP) identifies the approach and conduct of all activities related to the collection, analysis and administration of documentation of all data gathered at the Weldon Spring Site. The EDAP discusses methods used for acquiring data, programs for quality assurance, and maintenance of the data. This includes sampling plan preparation, data verification and validation, data base administration and data archiving.

Please provide any comments by July 6, 1990.

Sincerely,

Stephen H. McCracken
Project Manager
Weldon Spring Site
Remedial Action Project

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As Stated

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DOE/OR/21548-119

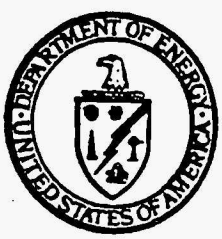
(CONTRACT NO. DE-AC05-86OR21548)

ENVIRONMENTAL DATA ADMINISTRATION PLAN

For the
Weldon Spring Site Remedial Action Project
Weldon Spring, Missouri

Prepared by MK-Ferguson Company and Jacobs Engineering Group

MAY 1990 REV. 0



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EDAP/TXTJOANN

DOE/OR/21548-119

Weldon Spring Site Remedial Action Project

Environmental Data Administration Plan

May 1990

Revision 0

Prepared by

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and
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7295 Highway 94 South
St. Charles, Missouri 63303

Prepared for

U.S. DEPARTMENT OF ENERGY
Oak Ridge Operations Office
Under Contract DE-AC05-86OR21548

EDAP/TXTJOANN

ABSTRACT

Environmental monitoring and surveillance activities at Weldon Spring Site Remedial Action Project (WSSRAP) result in data and documentation that is used to develop remedial action alternatives and demonstrate compliance with U.S. Department of Energy (DOE) environmental protection policies.

This Environmental Data Administration Plan (EDAP) summarizes standard operating procedures and data quality objectives developed for use in the collection and analysis of environmental data. Data quality review programs are conducted to ensure data integrity and validity. The EDAP describes administration procedures adopted at WSSRAP to manage the use of environmental data.

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1 INTRODUCTION

Environmental monitoring, surveillance, and characterization activities are conducted at the Weldon Spring Site (WSS) as part of the Weldon Spring Site Remedial Action Project (WSSRAP). These activities are described in detail in numerous sampling plans, monitoring programs, and permits. Environmental monitoring activities are conducted at the WSS to ensure that any potential public exposure is documented and quantified in an effort to protect the health and safety of the public. These activities are also required to demonstrate compliance with regulatory requirements and U.S. Department of Energy (DOE) environmental protection policies (MKF and JEG, 1990a).

Two major types of information are collected and evaluated during the environmental monitoring activities: documentation (field notes, data quality reviews) and data (analytical). The information collected is used to support an evaluation of alternative remedial actions. Future environmental sampling activities will provide data on which to evaluate remedial efforts, public and worker safety and protection of the environment.

Data quality objectives (DQOs) have been established in accordance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) guidelines for environmental data. DQOs are qualitative and quantitative statements which specify characteristics of the data required to support U.S. Environmental Protection Agency (EPA) decisions during remedial action activities (EPA, 1987). The DQOs identify specific goals for WSSRAP data which include Precision, Accuracy, Representativeness, Completeness and Comparability (PARCC). The DQO plan reviews these goals and is presented in Appendix A. The WSSRAP DQOs are standard in their application and are used as a guideline for WSSRAP.

Standard Operating Procedures (SOPs) have been developed to provide consistency in methodology, reporting of data, and documentation of environmental activities. SOPs include procedures for sample collection and identification and for data quality review. SOPs are detailed in controlled copies of the WSSRAP Procedures Manual (MKF and JEG, 1989). The procedures are reviewed periodically and updated as necessary to record changes in procedures. All manuals are updated and distributed as changes are made.

1.1 PURPOSE

The purpose of this Environmental Data Administration Plan (EDAP) is to identify the approach and conduct of all activities related to the collection, analysis and administration of documentation and data gathered to make environmental decisions at WSSRAP.

The EDAP discusses methods used for acquiring technical data, programs for quality assurance and maintenance of documents and data. The plan establishes a foundation for gathering and examining data prior to its incorporation for use at WSSRAP.

1.2 SCOPE

The EDAP provides guidance on the management of environmental documentation and data resulting from monitoring, surveillance, and characterization at the WSSRAP. All phases of data collection, analysis, and quality are performed as detailed in this plan. This includes sampling plan preparation, data verification and validation, database administration, and data archiving. This plan does not govern worker protection monitoring activities or the quality of data as a result of these activities.

1.3 HISTORICAL OVERVIEW

Analytical data collected from 1987 to 1989 by the Project Management Contractor (PMC) have been managed on an investigation-by-investigation basis. Sampling plans included quality control measures to ensure data integrity. Under the DQO program, data were examined by PMC personnel to test their adherence to PARCC requirements. This review provided a first step to addressing data quality under the DQO program.

While data from 1987 to 1989 were reviewed for PARCC compliance, a separate effort to assess and document the validity of analytical results was also made. The results of this effort are currently being presented in a document scheduled for issue in October 1990: "Data Validation Review."

Data verification and validation programs described in this EDAP were initiated in 1989 for environmental sampling activities. These programs establish additional quality control measures and are detailed in this plan.

1.4 MAINTENANCE

The EDAP will be reviewed annually and revised as necessary to ensure compliance with DOE orders and the overall mission of the WSSRAP. All documents and data will be maintained in accordance with procedures described in Section 4.0 of this plan.

2 DATA COLLECTION

2.1 SAMPLING AND ANALYSIS PLANS

Sampling and analysis plans are developed and prepared for all site activities requiring field collection and laboratory analysis of samples. These plans range in size from one-page memos to multi-paged, self-supporting documents. The plans are activity-specific, describing the objectives and details of the individual sampling efforts and the ultimate uses of the data generated. Sampling and analysis plans specify the types, locations, and frequency of samples to be collected, as well as the sampling protocol and procedures. The plans also detail the specific QA/QC measures to be taken during sampling and analysis effort and reference the requirements of the Quality Assurance Program Plan (QAPP) for the Weldon Spring Site Remedial Action Project (WSSRAP). Sampling plans specify detailed Data Quality Objectives (DQOs) which may take precedence over the standard DQOs.

2.2 SAMPLE COLLECTION AND DOCUMENTATION

Samples are collected using standard operating procedures (SOP) from specific, preplanned locations as detailed in the WSSRAP sampling plans.

Two forms of documentation are used during sample collection to define data reporting requirements that characterize sampling efforts and ensure consistent data records. The field log books are maintained by the field sampling personnel to record details such as dates, times, personnel, weather conditions, deviations from sampling protocol or any other information potentially impacting the specific sampling event. The level of detail should be sufficient to

understand and re-create the activity at a later date, even in the absence of the field personnel.

The sampling field data form is completed for each sample location at the time of sample collection. These forms are specific to the common types of samples collected at the WSSRAP, i.e., soils, groundwater, surface water, etc. The field sampling forms record the sample identification numbers assigned to the sample collected based on location and date (SOP ES&H 4.1.1). This unique ID number is used throughout documentation and reporting of data. The forms also initiate the tracking of laboratory performance and evaluation of data quality. Additionally, these forms document that field personnel collected samples in accordance with WSSRAP procedures, preserved samples properly, and collected QA/QC samples, and other vital information. An example of a typical sampling field data form is shown in Figure 2-1.

2.3 CHAIN-OF-CUSTODY

Sample custody is an integral part of quality and field laboratory operations. Sample possession must be traceable from the time each is collected until it is disposed of or placed in final storage. A sample is under custody if one or more of the following criteria are met:

- the sample is in the actual possession of the responsible party
- the sample is in the view of the responsible party, after being in possession
- the sample was in the responsible party's possession and then that person locked it up or sealed it to prevent tampering

WELDON SPRING SITE REMEDIAL ACTION PROJECT (WSSRAP)
7295 Highway 94 South, St. Charles, MO 63303
Telephone (314) 441-8080 Telecopy (314) 447-0803

GROUNDWATER SAMPLING FIELD DATA FORM 4.4.1.1

WELL #: MW-2010 DATE: MAY 4, 1990 SAMPLE ID#: GW-2010-Q290
PERSONNEL: JWD

TIME
0810 Well secure: (yes) no Total depth: 79.10 ft.

0817 Static water level: 53.42 ft.
Length of water column: 25.68 ft.
Diameter of well: (2") 4", or 6"
Volume of water column:
16L for 2", .65L for 4", 1.5L for 6" 4.1 gal.

0822 Begin evacuation Method: DEDICATED PUMP (BLADDER)
Rate of recharge: v. slow, (slow) mod. fast, or v. fast

0930 Number of volumes removed: 3+ (14.5 GAL)

0935 Temperature: 12.4 C Instrument used:
pH: 6.89 Ø11
Conductivity: 540 RC-16C
Water conditions: CLEAR

1005 Completed sampling Method: SAME AS ABOVE

1007 Temperature: 12.6 C Instrument used:
pH: 6.77 Ø11
Conductivity: 525 RC-16C

1012 Final water level: 68.44 ft.
Comments/Duplicates:
TOOK DUPLICATE ⇒ GW-2110-Q290

Parameters collected: NAT. URANIUM, NITROAROMATICS
Samples filtered: yes no
Samples preserved: X Radiological pH<2 (HNO_3)
__ Metals pH<2 (HNO_3)
X Others packed in ice

FIELD DATA FORM

FIGURE 2-1

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/001/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90

- the sample is in a designated and identified secure area under control of the ES&H Department.

All samples are collected according to SOPs for the particular sample type. The field personnel are responsible for the collection, care and custody of the sample until the sample is properly transferred or dispatched. An Environmental Chain-of-Custody form (Figure 2-2) is completed for each sample or group of samples. The Chain-of-Custody (COC) form includes sample identification numbers, number of containers, sample matrix, analytical parameters requested, turnaround time required, samplers' signatures and a section for tracking sample possession.

When the samples are shipped to the lab for analysis the individuals relinquishing and receiving the samples sign, date, and note the time and reason for transfer on the COC. The completed original form is then placed inside the shipping container. The laboratory documents receipt of the samples on the COC and notify the shipper and the WSSRAP in the event that samples are damaged, tampered with, or missing.

Corrections necessary in completing COC forms are made by a single strike-mark through the error. The person making the correction initials and dates each correction.

2.4 REQUEST FOR ANALYSIS

Samples collected in the field commonly require analysis by an off-site laboratory subcontracted by the WSSRAP. In order to authorize testing on the samples, PMC personnel complete a Laboratory Services Authorization Form. These forms are specific to each sample matrix (i.e., water, soil, etc.). They include such information as laboratory name, sample identification numbers, number of containers, analytical

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A MORRISON KNUDSEN COMPANY

WELDON SPRING SITE REMEDIAL ACTION PROJECT (WSSRAP)
7295 HIGHWAY 94 SOUTH
ST. CHARLES, MO 63303

TELEPHONE (314) 441-8086 TELEX (314) 447-0803

ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY FORM

WSSRAP CONTRACT: _____ REQUEST NO: _____

PHONE EXT.: _____ DATE SAMPLED: _____ LABORATORY RECEIVING SAMPLES: _____

SAMPLE NUMBER	NO. OF CONT.	MATRIX	PARAMETERS	PRESERVATIVES

SAMPLERS' SIGNATURE: _____

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR TRANSFER	SEAL INTACT (YES/NO)	COOLER TEMP.

ENVIRONMENTAL CHAIN OF CUSTODY FORM

FIGURE 2-2

REPORT NO.: DOE/OR/21548-118	DRAWING NO.: A/PI/027/0590	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 5/90

parameters, turnaround time requested and required number. The Laboratory Services Authorization Forms authorize analytical service and provide a mechanism for tracking analytical laboratory budgets and performance. An example form is presented in Figure 2-3.

2.5 SAMPLE SHIPMENT

Samples are packaged and shipped to analytical laboratories in accordance with WSSRAP standard operating procedures. These procedures detail the requirements of packaging and shipping for common types of samples in order to protect the samples during shipment. All samples shipped off-site are accompanied by a Shipping Order Form (Figure 2-4). This form is completed by the Subcontract Administrator when the Chain-of-Custody and Laboratory Services Authorization Forms are reviewed and approved. These three forms are combined, placed in a plastic bag, and accompany the sample being shipped.

2.6 SAMPLE TRACKING

Sample shipments to analytical laboratories are inventoried and controlled by the use of a laboratory contract request number. When a sample shipment is made, sample information from the documentation is entered into a computerized database, the Environmental Sample Tracking (EST) system.

EST allows timely inventory of the status of analytical samples from collection through receipt of data results. The EST system also serves an accounting function by calculating analytical costs, assists in invoice payment authorization and provides budget reporting.

WATER ANALYSIS

MK-FERGUSON
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WSSPAP
7295 HWY 94 South
St. Charles, MO 63303
(314) 481-9086

Page 1 of 1

LABORATORY SERVICES AUTHORIZATION FORM

Lab: ABC — Request No: 32

Requisitioner: JOHN DOE — Dept: ES&H

Cost Code: EMP — P.O. No: 3589-1002-00001

Need Date: 6/1/90 — C.O.C. No: ___

___ Emergency ___ Urgent
___ Priority X Standard

Sample Id.	Containers	Matrix
GW-2010-Q290	2	GROUNDWATER
GW-2110-Q290	2	"

Authorization:

William Williams — 5/4/90
ME-F Procurement — Date

John W. Doe — 5/4/90
E & H — Date

Shipping: Initial _____ Date: _____

Receiving: Initial _____ Date: _____

PRIMARY ANALYSES

___ [1010] Charge Mass Balance
___ [1102] Chromium, Hexavalent
___ [1103] Chromium, Trivalent
___ [1104] Dioxins, Class Specific
___ [1105] TCL Metals + Lithium +Sn
___ [1106] Nitrogen., NO/NO
___ [1107] Nitrogen., Kjeld., Unfiltered
X [1108] Nitrogen., Unfiltered
___ [1109] SO3,Cl,BOD,P
___ [1110] Oxygen Demand, Chemical
___ [1111] PCB's
___ [1112] pH
___ [1113] TCL Semi Volatile Orgs
___ [1114] TCL Volatile Organics
___ [1115] Total OVA
___ [1116] Total Organic Carbon
___ [1119] Total Suspended Solids

RADIOCHEMICAL

___ [3001] Gross Alpha
___ [3002] Gross Beta
___ [3003] Isotopic Actinium
___ [3004] Isotopic Radium
___ [3005] Isotopic Thorium
___ [3006] Isotopic Uranium
___ [3007] Lead - 210
___ [3008] Polonium - 210
___ [3009] Radium - 226
___ [3010] Radium - 228
___ [3011] Thorium - 230, 232
X [3013] Uranium-Natural

___ [1201] Extraction, EP Toxicity
___ [1202] Extraction, TCLP
___ [1110] Sample Filtration
___ [1114] Sample Preservation
___ [1200] RFDFS Quarterly Analysis
___ [1201] RFDFS Annual Analysis
___ Metals Analysis Attachment

SECONDARY ANALYSES

___ [3001] 2378 TCDD
___ [3002] Acidity, Total
___ [3003] Alkalinity, Total
___ [3004] Arsenic
___ [3005] Ash Content
___ [3006] Bacteria, Fecal Coli
___ [3007] Bacteria, Fecal Strep
___ [3008] Bacteria, Total Coli
___ [3011] Bromide
___ [3012] BTU Value
___ [3013] Chlorine
___ [3014] Corrosivity
___ [3017] Cyanide
___ [3018] Cyanide Reactive
___ [3019] Cyanide Total
___ [3020] Hardness
___ [3021] Nitrate
___ [3022] Nitrite
___ [3141] Nitrogen, Ammonia
___ [3151] Nitrogen, Kjeldahl
___ [3301] Nitrogen, Organic
___ [3377] Oil & Grease (HEM)
___ [3100] Organic Halide, (TOX)
___ [3130] Oxygen Demand, Biochem
___ [3160] Phenols
___ [3161] Phosphorus, Ortho
___ [3431] Phosphorus, Total
___ [3440] Solids, Volatile
___ [3441] Specific Gravity
___ [3460] Sulfide Reactive
___ [3471] Sulfide Total
___ [3481] Sulfite
___ [3491] Sulfur Content
___ [7501] TCL Pesticides/PCB
___ [7511] TOC
___ [3512] Turbidity (J.T.U.)
___ [3513] Viscosity
___ [3764] Zirconium

LABORATORY AUTHORIZATION FORM

FIGURE 2-3

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/003/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

NO. 5000

SHIPPING ORDER

SHIPPED FROM

CONTRACT NO C0001

LOCATION W.S.P.

DATE SHIPPED 5/4/90

PURPOSE OF SHIPMENT

SALE ___ C TRANSFER X

RETURN FOR CREDIT ___

FOR REPAIR ___

OTHER ___

00001-00001
P. O. NO. ASSIGNED

SHIPPED TO
ABC LABS INC.
1234 INDUSTRIAL DR.
WELDON SPRING, MO 63303
ATTN: JOE DUPONT
1-919-323-4001

SHIPPED VIA FEDERAL EXP.

B. L. NO. ___ DATE 5/4/90 PREPAID X COLLECT ___

QUANTITY	UNIT	DESCRIPTION	SERIAL NO. OR SPECIAL MARK
		REQUEST # 32	
1	COOLER	CONTAINING FOUR(4) SAMPLES FROM TWO(2) IDENTIFICATION NUMBERS	
		★ STANDARD TURNAROUND	

CLAIMS FOR SHORTAGES MUST BE MADE WITHIN 10 DAYS

SHIPMENT OF ITEMS LISTED ABOVE WERE MADE IN THE MANNER NOTED.
William Williams

SHIPMENT OF ABOVE ITEMS FOR PURPOSE DESIGNATED IS HEREBY APPROVED
Bill Thompson

FORM WH115 Rev. 5-87

SHIPPING ORDER FORM

FIGURE 2-4

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/004/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90

3 DATA QUALITY

All data and documentation from sampling activities are reviewed under Environmental Data Administration Plan (EDAP) data quality programs. Data received from analytical laboratories are also reviewed for completeness and quality. The data quality programs, data verification and data validation examine documents and data prior to its use at WSSRAP.

3.1 DATA VERIFICATION PROGRAM

The verification program is primarily designed to ensure that documentation and data are reported in compliance with established Data Quality Objectives (DQOs) and Standard Operating Procedures (SOPs) and to evaluate the completeness of data. The Data Verification Program consists of six verification tests Two tests are associated with data delivery and analytical costing. Four tests compare actual procedures to Weldon Spring Site Remedial Action Project (WSSRAP) DQOs, analytical protocol and SOPs. Elements reviewed are sample preservation and identification, Chain-of-Custody (COC) completion, analytical hold times, and data review. The results of the verification tests are documented with a verification checklist (Figure 3-1).

3.1.1 Data Delivery

Delivery of analytical data is tracked to ensure that the requested laboratory services are performed in an accurate and timely manner.

Analytical results are delivered in two formats: a formal report with QA/QC paperwork and an electronic copy. Current contracts with two analytical laboratories require delivery only

WELDON SPRING SITE REMEDIAL ACTION PROJECT (WSSRAP)
VERIFICATION CHECKLIST
FORM 4.9.1.2

Request Number:_____
Date Sampled:_____
Date Shipped:_____
Date laboratory received samples:_____
Date WSSRAP received analytical results:_____
Turnaround time requested: ___S(28 days) ___P(14 days)
___U(5 days) ___E(48 hrs.)
Were turnaround times met? ___yes ___no If not, specify/explain:
_____
Laboratory name:_____
Sample ID numbers:_____
_____
_____
Parameters requested:_____
_____
_____
_____
_____
Samples preserved and labelled at WSSRAP according to applicable procedure:
___yes ___no
Chain of custody completed according to established procedure:
___yes ___no
Extraction holding times met? ___yes ___no
Comments:_____
_____
Analytical holding times met? ___yes ___no
Comments:_____
_____
Data reviewed by:_____

Verification Checklist completed by:

_____ _____
Signature Date

DATA VERIFICATION CHECKLIST

FIGURE 3-1

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/005/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90

of formal analytical reports. Future laboratory service contracts will require delivery of data in both formats.

Analytical results from subcontract laboratories are received at WSSRAP and are logged and dated by the Project Management Contractor (PMC) Subcontract Administrator. All analytical results are forwarded to the PMC Data Administration Section. The receipt of data is recorded in a manual sample tracking log.

The data formats are reviewed to determine if all formats have been received according to contract requirements. In addition, data are reviewed to confirm that all parameters are received for the analytical tests. If additional data are required to complete the laboratory request, a discrepancy form (Figure 3-2) is completed and sent to the Subcontract Administrator for handling.

As discussed in Section 2.4, when samples are shipped, a lab authorization form is completed. The laboratory authorization form indicates a turnaround time for delivery of analytical results. The standard turnaround time is 28 calendar days.

Analytical services are also available within premium turnaround times ranging from 48 hours to 2 weeks. These services are usually reserved for special sampling events or National Pollutant Discharge Elimination System (NPDES) monthly reports.

When the data are received by the PMC, the date is recorded on the laboratory report. This date is compared with the shipping date for the sample to determine a total turnaround time. If a turnaround time is greater than the requested time, a verification discrepancy form is completed to record the

VERIFICATION DISCREPANCY DOCUMENTATION
FORM 4.9.1.4

Date:_____

WSSRAP Sample ID:_____

Laboratory performing analysis:_____

Laboratory ID:_____

Describe discrepancy:_____

_____

_____

_____

_____

Corrective Action Taken:_____

_____

_____

_____

_____

Signature:_____ Date:_____

VERIFICATION DISCREPANCY FORM

FIGURE 3-2

REPORT NO.: DOE/OR/21548-119		DRAWING NO.: A/PI/006/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90	

turnaround time. The potential effects of negligence in meeting turnaround times may include failure to comply with analytical hold times on analyses.

3.1.2 Sample Preservation and Identification

Documents prepared during sample collection are reviewed to verify compliance in identification and preservation of samples. According to procedures, consistent numbering of sample location is necessary for sample identification. Sample IDs are checked for proper use of sample type identifiers, location number/coordinates, date codes and QA/QC coding.

Preservation of samples is required under certain analytical methods. Sample preservation required prior to shipment is documented on field data forms. The forms are reviewed for completeness and accuracy in preservation during the verification tests.

3.1.3 Chain-of-Custody

Copies of COC records are returned to the PMC with the analytical results. The COC records are reviewed for compliance with procedures as described in EDAP Section 2.3 and WSSRAP SOPs. The COC is reviewed for possession and signatures status of the samples, for any samples that may have been damaged, and for clarity of information provided on the COC form.

3.1.4 Analytical Holding Times

WSSRAP DQOs incorporate analytical methods under U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) protocol. These methods designate maximum analytical holding times, the period between sample collection

and analysis. Some methods also specify extraction procedures and extraction holding times.

When analytical results are received, the date of extraction and date of analysis for each analyte is reported. The extraction and analysis dates are compared with the sample collection date to determine total holding time for the sample. The sample's holding time is compared to the holding time for the analytical method as defined by the WSSRAP DQOs. Holding times are recorded for each analysis. A discrepancy form is completed for sample holding times that exceed DQO protocol.

3.1.5 Data Review

All analytical data are reviewed as a final verification test. The data review process evaluates comparability of sample data with other previously reported concentrations for the sample location. Sample data is also compared to the QA/QC samples, field blanks, and laboratory duplicate samples collected on the same sample date. The data review reports inconsistencies in concentrations, sampling procedure, sample identification, etc.

The data review form (Figure 3-3) is completed by the PMC personnel. The data reviewer will designate the data as "acceptable" or "unacceptable" and include qualifying comments on the data review sheet for all data designated as unacceptable. Unacceptable data will be considered for data validation activities as presented in Section 3.2.

3.1.6 Verification Documentation

The verification checklist is completed by the Data Administration Section based on results of each verification

WELDON SPRING REMEDIAL ACTION PROJECT (WSSRAP)

DATA VERIFICATION DATA REVIEW SHEET
FORM 4.9.1.1

Laboratory:_____

Request Number(s):_____

_____

Date Received:_____

Reviewer(s):_____

Review Date:_____

_____

Data is: Acceptable:____ Unacceptable:____

Comments:_____

_____

_____

_____

_____

Signature:_____

Date Returned:_____

REVIEWER: THIS SHEET SHOULD BE RETURNED TO THE VERIFICATION DEPARTMENT WITHIN 2 WORKING DAYS OF DATE RECEIVED.

DATA REVIEW FORM

FIGURE 3-3

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/007/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90

test. Overall integrity of the data is measured and documented with the verification checklist.

All data will be assigned a verification status code of A (approved) or S (significant). If no discrepancies exist from the verification review, a status of A, approved will be assigned to the data. If significant discrepancies exist, such as samples that exceed holding times, a status code of S will be assigned to the data. Data with a status code of S will be considered for validation review as part of the non-random data validation program that is further detailed in Section 3.2.

All data regardless of status code will be considered available for use by WSSRAP. The verification status does not disqualify data from use. The verification tests are used to determine compliance with WSSRAP DQOs and SOPs and prequalify sample data for data validation review.

3.2 DATA VALIDATION

Data validation is the process of reviewing the analytical data, using laboratory records, to assess laboratory performance as compared to quality control (QC) criteria, data quality objectives, and procedural requirements. The purpose of validation is to document the quality and usefulness of the data and documentation developed during sample analysis.

The validation of data is divided into the following three tasks: (1) identification of data to be validated, (2) actual validation, and (3) documentation. These tasks are discussed in the following sections.

3.2.1 Identification

The identification of data to be validated is accomplished in two ways. The first consists of routine validation. Approximately 5% of the samples collected will be validated as soon as the analytical data is received from the lab. These data points are identified in the sampling plans that detail their collection. An additional 5% of the data will be selected following completion of the data review portion of the verification process. Additional data points may be identified for validation based on the criticality and sensitivity of the data. For example, data that contribute to risk assessments or final remedial action decisions may be identified for validation. Requests for validation are made on data validation request and tracking log forms (Figure 3-4).

3.2.2 Validation

The actual data validation process is detailed in an Engineering SOP (ENG-9). This process consists of reviewing and evaluating the data resulting from laboratory analyses. The review consists of two phases. The first deals with the analytical process itself. Laboratory analytical records are reviewed and evaluated to assure compliance with the procedures governing the analysis. These records may include but are not limited to: sample custody records, sample preparation logs, instrument printouts, calibration checks, initial calibration data, etc.

The second phase of the data validation process consists of evaluating the data for precision, accuracy, and completeness. Precision, accuracy and completeness are evaluated by comparing the data to data quality objectives in sampling plans.

CONTROL NO: _____

DATA VALIDATION REQUEST FORM

REQUESTOR: _____

WBS CODE: _____

DEPARTMENT: _____

DATE: _____

USE ONE FORM PER LABORATORY.. LAB NAME: _____

REQUEST NO: _____

SAMPLES RECOMMENDED FOR VALIDATION:

WESRAP ID	LAB ID	SAMPLE DATE	PARAMETER	FOR REVIEW USE

FOR REVIEW USE:

DATE REC'D: _____

SUBMITTED TO VALIDATION: _____

DATE OF REQUEST TO LAB: _____

DATE COMPLETED: _____

VALIDATION REQUEST FORM

FIGURE 3-4

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/026/0590	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 5/90

The primary end result of the validation process is a qualifier which denotes the quality of the data point. These qualifiers range from "acceptable with no limitations" to not acceptable. This qualifier enables data evaluation personnel to incorporate data quality into interpretations. A list of data qualifiers is shown in Figure 3-5.

3.2.3 Documentation

Data validation activities will be recorded in several documents. These documents include a detailed validation checklists specific to analysis. An example of validation documentation for a semi-volatiles analysis is shown in Appendix B. Data validation summary reports will be generated for each validation request and will provide information substantiating the assignment of qualifiers.

As a result of validation activities, at least 10% of the WSSRAP data will be directly validated (validation that results out of a specific request from data users). However, for some analyses, a portion of the database will also be validated indirectly (or "by association") as a consequence of the "sample batching" nature of most analytical procedures. Such indirect validation is possible for most metals analyses, most miscellaneous inorganic analyses, some anions, and some radiological procedures since the data documentation for these analyses is typically presented for the entire analytical batch or lot (which may include WSSRAP samples that were not specifically requested for validation).

DATA VALIDATION QUALIFIER LIST

QUALIFIER	PURPOSE
Primary	
N	Sample not scheduled for data validation
P	Data validation in Progress (Pending)
A+	Data useable; no further qualifiers
A[*]	Data useable; with qualifiers
R[*]	Data Rejected; with explanation
O[**]	Data validation ON-HOLD (additional info requested from lab)
Secondary *	
>	high bias
<	low bias
L	Lab Control Sample (LCS) outside acceptance range (accuracy)
B	Blank contamination (integrity)
M	MS/MSD outside acceptance range (accuracy/precision)
D	Dup. Relative % Difference outside acceptance range (precision)
S	Surrogates outside acceptance range (accuracy)
I	Internal Standards (GC/MS) outside acceptance range (quantification)
H(#/#)	Holding times exceeded (integrity)
C	Calibration criteria not met (quantification)
T	GC/MS Tune criteria not met (qualification)
F	Interferences present (matrix related)
?	Other (see data validation notes)
J	Estimated value
Y	Shipping delay to lab (greater than 1 day)
G	Typographical error (significant)

Tertiary **

c	calibration	i	instrument printouts
s	sample preparation	l	control charts
t	tune	d	data summary sheets
q	QC samples/information	n	notebook entries
u	custody transfer record	e	corr. action/exception reports
p	standards preparation	?	other (see data validation notes)
m	mass spectra		

EXAMPLES:

A[L>,H(5)] - means the data point is useable, but the value may be slightly high (per the LCS); and the holding time was exceeded by 5 days.

A[F,J] - means the data point appears useable, but there are sample-related interferences present that resulted in an estimated value.

R[S<] - means the data are not useable because the surrogate recoveries were too low to rely on the value.

P - means this sample/analyte is scheduled for data validation, but the validation tasks are not yet complete.

DATA VALIDATION QUALIFIERS

FIGURE 3-5

REPORT NO.: DOE/OR/21548-119		DRAWING NO.: A/PI/028/0590	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 5/90	

4 DATA ADMINISTRATION

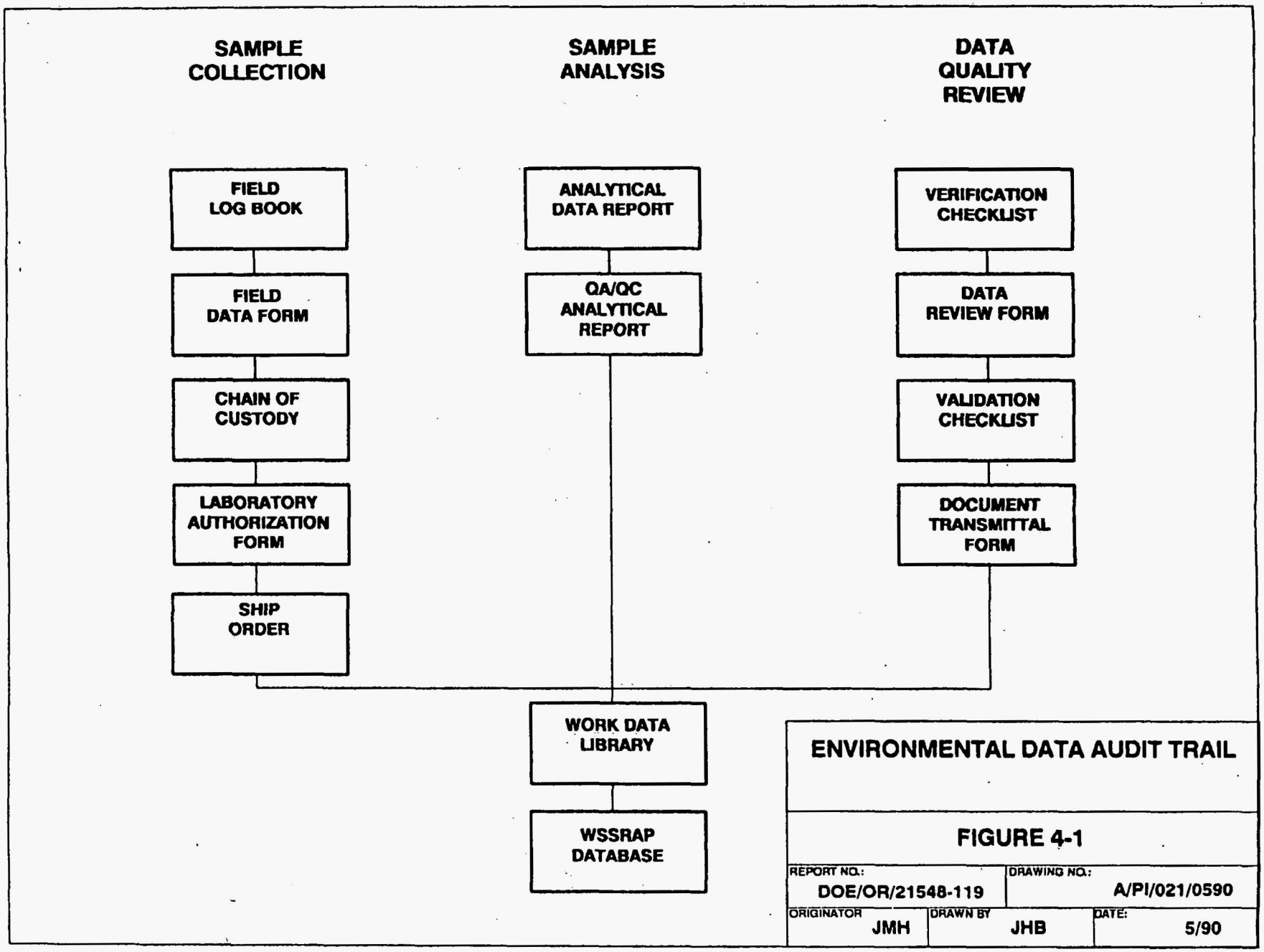
All documentation and data generated through the environmental monitoring activities are managed and maintained by the data administration plan of the Environmental Data Administration Plan (EDAP). Each document created from sampling to data quality review provides information and support for environmental decisions at Weldon Spring Site Remedial Action Project (WSSRAP). The standardization of forms and documents as directed by Standard Operating Procedures (SOPs) provides a source of information that is complete yet unique for each sample. The full set of data and documents is termed the data audit trail. Figure 4-1 summarizes the data and documentation in the audit trail. The administration of data includes the maintenance of all documents and data in the audit trail, providing the information to WSSRAP in an organized, flexible manner and incorporating a system to archive data.

In this discussion of data administration plans, all environmental data and documentation from sampling, analysis and quality review programs are collectively referred to as records.

4.1 RECORD MAINTENANCE

Environmental records are maintained in two formats: hard copy records and electronic records. Hard copy records include all documents and data preserved in written, typed or instrument-printed form. All environmental records originate in hard copy format.

Electronic records are defined as computerized records of environmental data. Currently, only analytical data are maintained in electronic format. Approximately 60% of the subcontract laboratories transcribe analytical reports into electronic format. Analytical results not reported in



ENVIRONMENTAL DATA AUDIT TRAIL

FIGURE 4-1

REPORT NO.:	DRAWING NO.:	
DOE/OR/21548-119	A/PI/021/0590	
ORIGINATOR: JMH	DRAWN BY: JHB	DATE: 5/90

electronic format are transcribed to electronic records by the Project Management Contractor (PMC).

4.1.1 Hard Copy Records

All original records are received by the PMC. When the original is received, a copy of the document is made. A copy of the record is filed in the Work Data Library.

The Work Data Library is a centralized library system that contains all documents and data from environmental monitoring activities. The library is primarily organized by record type: data or documentation. Each record type is then classified and filed according to sample type. Sample types were mentioned in Section 2.1 as a manner in which to assign sample identification numbers. Functionally, sample types also form the basis for data interpretation and, therefore, sample types are used in record management. Table 4-1 lists the sample type categories in use.

When a record is submitted to the library files, it is assigned an index number based on record and sample type number. An example of the index record number is ES-19-01-02. The first four characters (ES-19) identify the document as an environmental record. The fifth and sixth digits (01) designate the record as analytical data. The seventh and eighth digits (02) designate the sample type as surface water. A current Work Data Library index is presented in Table 4-2. The index is updated periodically to incorporate new records.

When record copies are made for the Work Data Library, the originals are forwarded to Quality Assurance for secured storage. An internal document transmittal form is completed to accompany the document transfer (Figure 4-2). All original

TABLE 4-1 WSSRAP Environmental Data Sample Type Categories

AA	Ambient Air
AP	Air Particulate
BA	Bulk Asbestos
BG	Biological
BZ	Breathing Zone
IN	Insulation
LY	Lysimeter
MW	Monitoring Well
NP	NPDES
OT	Industrial Hygiene
PZ	Piezometer
RD	Radon Cup
RS	Radiation Safety
SD	Sediment/Sludge
SO	Soils Phase I
S2	Soils Phase II
SW	Surface Water

TABLE 4-2 Work Data Library Index

ES-19-01	TECHNICAL DATA
ES-19-01-01	Groundwater Data
ES-19-01-02	Surface Water Data
ES-19-01-03	Spring/Seep Data
ES-19-01-04	Radon Data
ES-19-01-05	TLD Data
ES-19-01-06	NPDES Data
ES-19-01-07	Industrial Hygiene Data
ES-19-01-08	Radiation Lab Data
ES-19-01-09	Air Particulate Data
ES-19-01-10	Sludge Data
ES-19-01-11	Sediment Data
ES-19-01-12	Soils Data
ES-19-01-13	Biological Data
ES-19-02	QUALITY ASSURANCE
ES-19-02-01	metaTRACE QA Reports
ES-19-02-02	Acculab QA Reports
ES-19-02-03	JTC QA Reports
ES-19-02-04	Inhouse Calibration Records
ES-19-02-05	AEHA QA Reports
ES-19-02-06	IT QA Reports
ES-19-02-07	Other Labs QA Reports
ES-19-02-08	Training Records
ES-19-02-09	Document Transmittal
ES-19-02-10	Audits/Reviews/Performance
ES-19-03	DOCUMENTATION
ES-19-03-01	Field Sheets
ES-19-03-02	Log Books
ES-19-03-03	Chain of Custody Records
ES-19-04	CORRESPONDENCE - REPORTS & LETTERS
ES-19-04-01	DOE/PMC Correspondence
ES-19-04-02	Laboratory Correspondence
ES-19-04-03	EPA Correspondence
ES-19-04-04	USGS
ES-19-04-05	MoDNR
ES-19-04-06	SCCAHW
ES-19-04-07	DOE/PMC Reports
ES-19-05	DATA VERIFICATION RECORDS
ES-19-05-01	Data Review Sheets
ES-19-05-02	Verification Checklists
ES-19-05-03	Verification Summaries
ES-19-05-04	Discrepancy Forms

MK-FERGUSON CO.
A MORRISON KNUDSEN COMPANY

INTERNAL DOCUMENT TRANSMITTAL

TRANSMITTAL NO.

WORK PKG NO	CONTRACT NO. 3589	DATE.
TO.		FROM
ATTENTION		SIGNATURE.

ACTION REQUESTED:	STATUS	
	APPROVED - FOR CONSTRUCTION	A
	DISAPPROVED - REVISE AND RESUBMIT	D
	APPROVED WITH COMMENTS - FOR CONSTRUCTION	E

PROCEDURE, SPECIFICATION, DRAWING OR ITEM NUMBER	REV NO.	NO. COPIES	TITLE OR DESCRIPTION	STATUS

ADDRESSEE:

RECEIPT ACKNOWLEDGEMENT REQUIRED ☐
PLEASE RETURN ONE COPY OF THIS TRANSMITTAL TO DOCUMENT CONTROL WITHIN ___ WORKING DAYS

RECEIPT ACKNOWLEDGEMENT NOT REQUIRED ☐

THE ABOVE LISTED DOCUMENTS HAVE BEEN RECEIVED BY:

SIGNATURE

DATE RECEIVED

INTERNAL DOCUMENT TRANSMITTAL FORM

FIGURE 4-2

REPORT NO.: DOE/OR/21548-119	DRAWING NO.: A/PI/009/0490	
ORIGINATOR: JMH	DRAWN BY: GLN	DATE: 4/90

documents are inventoried by Quality Assurance and stored in fireproof safes at the WSS.

4.1.2 Electronic Records

Electronic records are maintained in a computerized database system termed the WSSRAP database. The WSSRAP database is a microcomputer based system utilizing dBASE III Plus software. Analytical records are organized into database files by sample type such as groundwater. The database files contain in database fields specific information on the sample. The fields maintained in the WSSRAP database include sample identification number, sample date, analytical date, parameter, etc. The list of all database fields and a description of field information is presented in Table 4-3.

Analytical results reported by the subcontract laboratory in electronic format are submitted on a 5 1/4" floppy diskette. Each diskette contains a dBASE III Plus file recording specific sampling information. The diskette is received by the PMC and copied to the WSSRAP database during verification tests. After the disk transfer is completed, a control number is assigned to each diskette and recorded on a disk record log maintained by the PMC. All diskettes are filed in a fireproof safe located at the WSS.

4.2 RECORD USE

The Work Data Library and the WSSRAP database provide an centralized source for information to be used in preparing environmental reports and remedial action alternatives. The environmental records are organized to provide data that are readily retrievable and convenient for use. Environmental records are required for use by on-site and off-site personnel.

TABLE 4-3 WSSRAP Environmental Database Fields

Field	Description of Information
WSSRAP ID	Sample identification number
Lab ID	Analytical laboratory identification number
Sample Date	Date of sample collection
Matrix	Sample type
Category	Compound or group of parameters analyzed
Parameter	Compound analyzed - chemical or radiological
Concentration	Identified amount of parameter
Units	Standard of measurement of parameter analyzed
Error	Range of error in measurement of concentration. Used mainly in radiological analyses.
Analysis Date	Date of analysis of sample
Extraction Date	Date of sample extraction if applicable under analytical method
Method	Analytical method used by laboratory in analysis of sample
Detection Limit	Minimum reportable concentration of compound defined by data quality objectives
Verification	Verification code assigned reflecting analytical status of sample
Qualifier	Validation code assigned to sample reflecting usability of data

4.2.1 Use of Work Data Library

The Work Data Library is located at the WSS. All personnel have full access to records in the library for use and/or copying. Personnel requiring use of records must sign the documents out on a library log maintained by the PMC to record such use of records. A maximum check-out period of one day is allowed and only on-site use of records is permitted. The Data Administration Section manages the use of the Work Data Library.

4.2.2 Use of WSSRAP Database

The electronic record database is more widely used for review of analytical data by WSSRAP personnel. Database use is managed by a customized software program called the Generic Universal Report Utility (GURU). The GURU program was developed by the PMC for use in accessing the WSSRAP database. GURU is a compiled dBASE program written for the IBM PC network system.

The GURU program provides a tool for easy and flexible access to data records. The GURU is also defined as a data extraction program since data can be selected and sorted based on sample identification number, parameter or any other field definition. Selected data can be extracted or copied to other computerized formats or as a printed report.

The GURU program also provides a method to secure data contained in the WSSRAP database. Data are made available to the user without risking the integrity of the data. Users are allowed to view or copy records, but records cannot be modified or deleted within the GURU system.

On-site use of the WSSRAP database is provided by accessing the WSSRAP local area network system. Users requiring access to the database must complete a user registration form with the PMC

Management Information System (MIS) Coordinator. A user name and password is assigned to each user and specifies access to the WSSRAP database and GURU system.

Off-site use of the WSSRAP database and the GURU system is available for WSSRAP participants. Access to the database will be provided by a modem connection. The modem capability allows off-site users to dial in on standard phone lines and connect to a computer at the WSS. The modem connection allows the same convenience and security features of on-site use. Off-site users requiring access to the database must complete a users' registration form with the PMC MIS Coordinator. A user name and password is assigned to each user and off-site access may be specified.

4.3 DATA ARCHIVING

A system of archiving environmental data is necessary due to the volume of data and duration of WSSRAP. Formats of data documentation -- hard copy, originals, and electronic -- will be archived. Archiving of data will be allowed only after all EDAP data quality activities have been completed on the data to be archived. Specifically the data must be verified and validated under the EDAP program.

All original documents are transferred to Quality Assurance and are archived under DOE contract requirements. The original documents are stored in the WSSRAP Quality Control area in a fireproof safe. The original documents will be maintained by Quality Control for the duration of the project. Work Data Library and Electronic data records are maintained by the Data Administration sections. These records will be archived. Archival of records is performed annually.

Work Data Library documents will be inventoried and will be boxed and stored at WSSRAP for a one-year period in archive status. After one year in archive, the Work Data Library documents will be destroyed.

Electronic data records will also be archived after five years. All archive data will be transferred to new historic data record files. The archive files will be backed up with magnetic tapes and stored in the fireproof safe in Quality Assurance. The archive data files will be available for use by the WSSRAP GURU program but not in conjunction with active data files. Original electronic data reporting disks from the laboratory will be destroyed after five years.

5 REFERENCES

MK-Ferguson Company and Jacobs Engineering Group, 1990a. Environmental Monitoring Plan, Weldon Spring Site. Revision 1. DOE/OR/21548-103. February.

MK-Ferguson Company and Jacobs Engineering Group, 1990b. WSSRAP Quality Assurance Program Plan, Revision 2. St. Charles, Missouri.

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MK-Ferguson Company and Jacobs Engineering Group, 1989. WSSRAP Procedures Manual, Environmental, Safety and Health. St. Charles, MO. May.

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U.S. Environmental Protection Agency, 1987. Data Quality Objectives for Remedial Response Activities - Development Process. EPA 540/6-87/003. March.

APPENDIX A
Data Quality Objectives

Specific Data Quality Objectives (DQOs) for the Weldon Spring Site Remedial Action Project (WSSRAP) have been developed according to the U.S. Environmental Protection Agency (EPA) Guidance Document. These site-specific DQOs include Precision, Accuracy, Representativeness, Completeness and Comparability (PARCC) goals for future data collection activities. Each of these goals is discussed in the following paragraphs.

PRECISION AND ACCURACY

Precision and accuracy goals for analytical data are presented in the following table. Analytical methods, detection limits and precision and accuracy goals are presented by analytical parameter and media for both soil and water. Generic precision and accuracy goals are also presented.

REPRESENTATIVENESS

The representativeness of data collected will be ensured by proper selection of sampling locations and by ensuring that Standard Operating Procedures are followed during sample collection.

COMPLETENESS

Completeness is the percentage of measurements that are valid. The goal for completeness at the WSSRAP is 85%.

COMPARABILITY

By establishing precision and accuracy goals and monitoring analytical performance, comparability evaluations can be made with previous data for which precision and accuracy data are available.

EDAP/TXTJOANN

The DQOs presented herein are to be used for future monitoring and characterization activities. As future characterization activities are identified, these DQOs will be reviewed. If the existing DQOs are acceptable and appropriate, they will be applied. If not, new DQOs will be developed. The DQOs presented in this summary will be reviewed annually and updated as appropriate.

DATA QUALITY OBJECTIVES FOR THE WSSRAP
PRECISION AND ACCURACY GUIDLINES
FOR ROUTINE MONITORING AND CHARACTERIZATION

CATEGORY	ANALYTICAL PARAMETER	ANALYTICAL LEVEL	ANALYTICAL METHOD b	MDC b UG/G	PRECISION (soil)	ACCURACY (soil)	MDL b UG/L	PRECISION (water)	ACCURACY (water)	COMMENTS
RADIATION SCREENING	GROSS ALPHA	I	2.6.4 •	NA	NA	NA	NA	NA	NA	ES&H SOP
	GROSS BETA/GAMMA	I	2.6.3 •	NA	NA	NA	NA	NA	NA	ES&H SOP
FIELD MEASUREMENTS	pH	I	4.5.1 •	NA	NA	NA	NA	20	NA	ES&H SOP
	TEMPERATURE	I	4.5.1 *	NA	NA	NA	NA	20	NA	ES&H SOP
	CONDUCTIVITY	I	4.5.2 •	NA	NA	NA	NA	20	NA	ES&H SOP
	SPECIFIC IONS	I	4.5.5 •	NA	NA	NA	NA	20	NA	ES&H SOP
	ORGANIC VAPORS	I	3.1.1 *	NA	NA	NA	NA	20	NA	ES&H SOP
	SETTLEABLE SOLIDS	I	4.5.7 •	NA	NA	NA	0.1	20	NA	ES&H SOP
	TH-230, TH-232	II	UNC	2 pCi/g	50	50	NA	NA	NA	
ONSITE RADIOLOGICAL MEASUREMENTS	U-238, U-235,	III	901.1	1 pCi/g	50	30	NA	NA	NA	
	RA-226, RA-228	III	901.1	1 pCi/g	50	20	NA	NA	NA	
	TH-230, TH-232	II	UNC	2 pCi/g	50	20	NA	NA	NA	
	GROSS ALPHA	III	2.4.3*	NA	NA	NA	NA	NA	NA	ES&H SOP
OFFSITE RADIOLOGICAL MEASUREMENTS	NAT. URANIUM	III	EPA 908.0	1 pCi/g	50	30	1 pCi/l	20	20	
	RADIUM-226, -228	III	EPA 903.1	1 pCi/g	50	30	1 pCi/l	20	20	
	THORIUM-230, -232	III	EERF 00/07	1 pCi/g	50	30	1 pCi/l	20	20	
	GROSS ALPHA	III	EPA 900.0	3 pCi/g	50	30	3 pCi/l	40	40	
	GROSS BETA	III	EPA 900.0	3 pCi/g	50	30	8 pCi/l	40	40	
NITROAROMATIC COMPOUNDS	TNT	III	USATHAMA	1.2	e	e	0.03 d	f	f	
	2,4-DNT	III	USATHAMA	0.75	e	e	0.03 d	f	f	
	2,6-DNT	III	USATHAMA	1.41	e	e	0.01 d	f	f	
	1,3,5-TNB	III	USATHAMA	0.57	e	e	0.03 d	f	f	
	1,3-DNB	III	USATHAMA	0.9	e	e	0.09 d	f	f	
	NITROBENZENE	III	USATHAMA	1.44	e	e	0.03 d	f	f	
MISC.	TSS	III	EPA 160.2	NA	NA	NA	2	20	20	
	TDS	III	EPA 160.2	NA	NA	NA		20	20	
	TOC	III	EPA 415.1				0.1	20	20	
	LITHIUM	III	EPA 200.7	5	50	50	50	20	20	
	MO	III	EPA 200.7	4	50	50	4	20	20	
	ZR	III	EPA 200.7	20	50	50	20	20	20	
	CR+3	III	EPA 200.7		50	50	10	20	20	
	CR+6	III	COLORIMETRIC		50	50	5	20	20	
	TOX	III	EPA 450.0	5	50	50		20	20	
	NO3	III	300.0/353.2c	0.5	50	50	0.25/0.1c*	20	20	MG/L
	SO4	III	300.0/375.4c	5	50	50	1.0/1.0c*	20	20	MG/L
	CL	III	300.0/325.1c	1.5	50	50	0.25/0.2c*	20	20	MG/L
	FL	III	300.0/340.2c	1.25	50	50	0.25/0.6c*	20	20	MG/L
	NO2	III	300.0	0.5	50	50		20	20	MG/L
	% MOISTURE	II	ASTM	NA	50	NA	NA	NA	NA	
	pH (SOIL)	III	EPA 160.2	NA	50	NA	NA	NA	NA	
	ASBESTOS-PCM/TEM	III	3.1.4	NA	NA	NA	NA	NA	NA	ES&H SOP
CLP-VOA		IV	CLP	CRDL	AS REQUIRED BY CLP		CRDL	AS REQUIRED BY CLP		

DATA QUALITY OBJECTIVES FOR THE WSSRAP
PRECISION AND ACCURACY GUIDLINES
FOR ROUTINE MONITORING AND CHARACTERIZATION

CATEGORY	ANALYTICAL PARAMETER	ANALYTICAL LEVEL	ANALYTICAL METHOD b	MDC b UG/G	PRECISION (soil)	ACCURACY (soil)	MDL b UG/L	PRECISION (water)	ACCURACY (water)	COMMENTS
CLP-SEMIVOA -	BNA	IV	CLP	CRDL	AS REQUIRED BY CLP		CRDL	AS REQUIRED BY CLP		
CLP-PEST/PCB		IV	CLP	CRDL	AS REQUIRED BY CLP		CRDL	AS REQUIRED BY CLP		
CLP-METALS	AL	IV	CLP-ICP	20	AS REQUIRED BY CLP		200	AS REQUIRED BY CLP		
	AS	IV	CLP-ICP	1	AS REQUIRED BY CLP		10	AS REQUIRED BY CLP		
	BE	IV	CLP-ICP	0.5	AS REQUIRED BY CLP		5	AS REQUIRED BY CLP		
	CD	IV	CLP-ICP	0.5	AS REQUIRED BY CLP		5	AS REQUIRED BY CLP		
	CR	IV	CLP-ICP	1	AS REQUIRED BY CLP		10	AS REQUIRED BY CLP		
	CU	IV	CLP-ICP	2.5	AS REQUIRED BY CLP		25	AS REQUIRED BY CLP		
	PB	IV	CLP-AA	0.5	AS REQUIRED BY CLP		5	AS REQUIRED BY CLP		
	HG	IV	CLP-CV	0.1	AS REQUIRED BY CLP		0.2	AS REQUIRED BY CLP		
	NI	IV	CLP-ICP	4	AS REQUIRED BY CLP		40	AS REQUIRED BY CLP		
	NA	IV	CLP-ICP	500	AS REQUIRED BY CLP		5000	AS REQUIRED BY CLP		
	ZN	IV	CLP-ICP	2	AS REQUIRED BY CLP		20	AS REQUIRED BY CLP		
	BA	IV	CLP-ICP	20	AS REQUIRED BY CLP		200	AS REQUIRED BY CLP		
	AG	IV	CLP-ICP	1	AS REQUIRED BY CLP		10	AS REQUIRED BY CLP		
	FE	IV	CLP-ICP	10	AS REQUIRED BY CLP		10	AS REQUIRED BY CLP		
	K	IV	CLP-ICP	500	AS REQUIRED BY CLP		5000	AS REQUIRED BY CLP		
	MN	IV	CLP-ICP	1.5	AS REQUIRED BY CLP		15	AS REQUIRED BY CLP		
	MG	IV	CLP-ICP	500	AS REQUIRED BY CLP		5000	AS REQUIRED BY CLP		
	SE	IV	CLP-AA	0.5	AS REQUIRED BY CLP		5	AS REQUIRED BY CLP		
	VA	IV	CLP-ICP	5	AS REQUIRED BY CLP		50	AS REQUIRED BY CLP		
	TL	IV	CLP-AA	1	AS REQUIRED BY CLP		10	AS REQUIRED BY CLP		
	SB	IV	CLP-ICP	6	AS REQUIRED BY CLP		60	AS REQUIRED BY CLP		
	CA	IV	CLP-ICP	500	AS REQUIRED BY CLP		5000	AS REQUIRED BY CLP		
	CO	IV	CLP-ICP	5	AS REQUIRED BY CLP		50	AS REQUIRED BY CLP		
OTHER PARAMETERS NOT LISTED		II,III,IV	TBD	TBD	50	50	TBD	20	20	SEE NOTE

* - SEE COMMENT SECTION
TBD - TO BE DETERMINED
NA - NOT APPLICABLE
ACCURACY = PERCENT BIAS = PERCENT RECOVERY - 100
a - ACCURACY AND PRECISION DATA PRESENTED FROM EPA DQO GUIDANCE DOCUMENT - SPECIFIC PRECISION AND ACCURACY TO BE NEGOTIATED WITH THE LABORATORY
b - DETECTION LIMITS AND METHODS FROM EXISTING CONTRACT WITH metaTRACE - NEW DETECTION LIMITS AND/OR METHODS TO BE ESTABLISHED WITH NEW LABORATORY
c - JTC METHODS AND DETECTION LIMITS
d - ARMY ENVIRONMENTAL HYGIENE AGENCY (AEHA) DETECTION LIMITS
e - TO BE NEGOTIATED WITH THE LABORATORY
f - TO BE PROVIDED BY AEHA
NOTE: GENERIC DQOS APPLY TO MEDIA AND/OR ANALYTICAL METHODS NOT LISTED IN THIS TABLE. SPECIFIC DQOS MAY BE DEVELOPED AS A PART OF FUTURE SAMPLING AND ANALYSIS PLANS

APPENDIX B
Data Validation Documentation

SEMI-VOLATILES BY GC/MS - CHECKLIST PAGE 1 OF [ ]

Data Set #:	Related Datasets:	Analysis Date:

SAMPLES IN ANALYSIS SET:

WSSRAP ID	Lab ID	Lab File No.	Date Sampled	Date Rec'd	Date Extracted	HT OK?	Qualifiers
a.							
b.							
c.							
d.							
e.							
f.							
g.							
h.							
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j.							
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s.							
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ANALYSIS SEQUENCE: (sample/FRN/time)

Dates: to

1.	16.
2.	17.
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15.	30.

Date _____ Reviewer (printed) _____ Signature _____

DFTPP TUNE		Dataset #:
Tune File #:	Seq. #:	Instr. ID:
DFTPP Inj. Date:	DFTPP Inj. Time:	

m/e	Ion Abundance Criteria	% Rel. Abundance
51	30.0 - 60.0% of mass 198	
68	Less than 2.0% of mass 69	( )1
69	Mass 69 relative abundance	
70	Less than 2.0% of mass 69	( )1
127	40.0 - 60.0% of mass 198	
197	Less than 1.0% of mass 198	
198	Base Peak, 100% relative abundance	
199	5.0 - 9.0% of mass 198	
275	10.0 - 30.0% of mass 198	
365	Greater than 1.00% of mass 198	
441	Present, but less than mass 443	
442	Greater than 40.0% of mass 198	
443	17.0 - 23.0% of mass 442	( )2

1 - value is % mass 69 2 - value is % mass 442

MATRIX SPIKE/ MSD		Sample ID:				Matrix:	
COMPOUND	SEQ. NO.	SPIKE ADDED	SAMP CONC	MS CONC	MS % REC	REC limits Water	REC limits Soil
Phenol						12-89	26-90
2-Chlorophenol						27-123	25-102
1,4-Dichlorobenzene						36-97	28-104
N-Nitroso-di-n-prop.						41-116	41-126
1,2,4-Trichlorobenzene						39-98	38-107
4-Chloro-3-methylphenol						23-97	26-103
Acenaphthene						46-118	31-137
4-Nitrophenol						10-80	11-114
2,4-Dinitrotoluene						24-96	28-89
Pentachlorophenol						9-103	17-109
Pyrene						26-127	35-142

COMPOUND	SEQ. NO.	SPIKE ADDED	MSD CONC	MSD % REC	% RPD	RPD limits Water	RPD limits Soil
Phenol						42	35
2-Chlorophenol						40	50
1,4-Dichlorobenzene						28	27
N-Nitroso-di-n-prop.						38	38
1,2,4-Trichlorobenzene						28	23
4-Chloro-3-methylphenol						42	33
Acenaphthene						31	19
4-Nitrophenol						50	50
2,4-Dinitrotoluene						38	47
Pentachlorophenol						50	47
Pyrene						31	36

RPD: _____out of _____ outside limits.

Spike recovery: _____out of _____outside limits.

COMMENTS:

INITIAL CALIBRATION					Date(s) performed:				
Instrument ID:					Calib.#:				
Data Set #:	Calc. Chk	MEAN RRF	% RSD	RT Chk		Calc. Chk	MEAN RRF	% RSD	RT Chk
2-Fluorophenol					3-Nitroaniline				
Phenol-d6					Acenaphthene		#	*	
Phenol			*		2,4-Dinitrophenol		#		
bis(2-Chloroethyl)ether					4-Nitrophenol		#		
2-Chlorophenol					Dibenzofuran				
1,3-Dichlorobenzene					2,4-Dinitrotoluene				
1,4-Dichlorobenzene			*		2,6-Dinitrotoluene				
Benzyl Alcohol					Diethylphthalate				
1,2-Dichlorobenzene					4-Chlorophenyl-phenylether				
2-Methylphenol					Fluorene				
bis(2-Chloroisopropyl)ether					4-Nitroaniline				
4-Methylphenol					*2,4,6-Tribromophenol*				
N-Nitroso-di-n-propylamine		#			4,6-Dinitro-2-methylphenol				
Hexachloroethane					N-Nitrosodiphenylamine			*	
Nitrobenzene-d5					4-Bromophenyl-phenylether				
Nitrobenzene					Hexachlorobenzene				
Isophorone					Pentachlorophenol			*	
2-Nitrophenol			*		Phenanthrene				
2,4-Dimethylphenol					Anthracene				
Benzoic Acid					Di-n-butylphthalate				
bis(2-Chloroethoxy)methane					Fluoranthene			*	
2,4-Dichlorophenol			*		Pyrene				
1,2,4-Trichlorobenzene					*Terphenyl-d14*				
Naphthalene					Butylbenzylphthalate				
4-Chloroaniline					3,3'-Dichlorobenzidine				
Hexachlorobutidiene			*		Benzo(a)anthracene				
4-Chloro-3-methylphenol			*		bis(2-Ethylhexyl)phthalate				
2-Methylnaphthalene					Chrysene				
Hexachlorocyclopentadiene		#			Di-n-octylphthalate			*	
2,4,6-Trichlorophenol			*		Benzo(b)fluoranthene				
2,4,5-Trichlorophenol					Benzo(k)fluoranthene				
2-Fluorobiphenyl					Benzo(a)pyrene			*	
2-Chloronaphthalene					Indeno(1,2,3-cd)pyrene				
2-Nitroaniline					Dibenzo(a,h)anthracene				
Dimethylphthalate					Benzo(g,h,i)perylene				
Acenaphthylene									

Min. RRF for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

CONTINUING CALIBRATION					Date performed:				
Date of initial Calib.:					Init Calib #:				
Instrument ID:									
Data Set #:	Calc. Chk'	RT Chk'	RRF50	% Diff		Calc. Chk'	RT Chk'	RRF50	% Diff
2-Fluorophenol					3-Nitroaniline				
Phenol-d6					Acenaphthene			#	*
Phenol				*	2,4-Dinitrophenol			#	
bis(2-Chloroethyl)ether					4-Nitrophenol			#	
2-Chlorophenol					Dibenzofuran				
1,3-Dichlorobenzene					2,4-Dinitrotoluene				
1,4-Dichlorobenzene				*	2,6-Dinitrotoluene				
Benzyl Alcohol					Diethylphthalate				
1,2-Dichlorobenzene					4-Chlorophenyl-phenylether				
2-Methylphenol					Fluorene				
bis(2-Chloroisopropyl)ether					4-Nitroaniline				
4-Methylphenol					*2,4,6-Tribromophenol*				
N-Nitroso-di-n-propylamine			#		4,6-Dinitro-2-methylphenol				
Hexachloroethane					*N-Nitrosodiphenylamine*				*
Nitrobenzene-d5					4-Bromophenyl-phenylether				
Nitrobenzene					Hexachlorobenzene				
Isophorone					Pentachlorophenol				*
2-Nitrophenol				*	Phenanthrene				
2,4-Dimethylphenol					Anthracene				
Benzoic Acid					Di-n-butylphthalate				
bis(2-Chloroethoxy)methane					Fluoranthene				*
2,4-Dichlorophenol				*	Pyrene				
1,2,4-Trichlorobenzene					*Terphenyl-d14*				
Naphthalene					Butylbenzylphthalate				
4-Chloroaniline					3,3'-Dichlorobenzidine				
Hexachlorobutidiene				*	Benzo(a)anthracene				
4-Chloro-3-methylphenol				*	bis(2-Ethylhexyl)phthalate				
2-Methylnaphthalene					Chrysene				
Hexachlorocyclopentadiene			#		Di-n-octylphthalate				*
2,4,6-Trichlorophenol				*	Benzo(b)fluoranthene				
2,4,5-Trichlorophenol					Benzo(k)fluoranthene				
2-Fluorobiphenyl					Benzo(a)pyrene				*
2-Chloronaphthalene					Indeno(1,2,3-cd)pyrene				
2-Nitroaniline					Dibenzo(a,h)anthracene				
Dimethylphthalate					Benzo(g,h,i)perylene				
Acenaphthylene									

Min. RRF50 for SPCC(#) = 0.050 Max %Diff for CCC(*) = 25.0%

SURROGATE RECOVERIES

Dataset #: Sample matrix:

SEQ. #	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	Tot Out
1.							
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	CLP QC Limits Water	Soil
S1 (NBZ) = Nitrobenzene-d5	(35-114)	(23-120)
S2 (FBP) = 2-Fluorobiphenyl	(43-116)	(30-115)
S3 (TPH) = Terphenyl-d14	(33-141)	(18-137)
S4 (PHL) = Phenol-d6	(10-94)	(24-113)
S5 (2FP) = 2-Fluorophenol	(21-100)	(25-121)
S6 (TBP) = 2,4,6-Tribromophenol	(10-123)	(19-122)

COMMENTS:

INTERNAL STANDARD AREA SUMMARY

Data Set #	IS1 (DCB)	RT	IS2 (NPT)	RT	IS3 (ANT)	RT	IS4 (PHN)	RT	IS5 (CRY)	RT	IS6 (PRY)	RT
12 Hour Std												
Upper lmt.												
Lower lmt.												
SEQ #.												
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IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10
Upper lmt. = +100% of IS area

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12
Lower lmt. = - 50% of IS area

METHOD BLANK SUMMARY

		Seq. #:
Data Set #:	Analysis Date:	FRN:
	Extraction Date:	Lab Lot #:

Compound	Conc. (ugl or ugkg)	Compound	Conc. (ugl or ugkg)
2-Fluorophenol		3-Nitroaniline	
Phenol-d6		Acenaphthene	
Phenol		2,4-Dinitrophenol	
bis(2-Chloroethyl)ether		4-Nitrophenol	
2-Chlorophenol		Dibenzofuran	
1,3-Dichlorobenzene		2,4-Dinitrotoluene	
1,4-Dichlorobenzene		2,6-Dinitrotoluene	
Benzyl Alcohol		Diethylphthalate	
1,2-Dichlorobenzene		4-Chlorophenyl-phenylether	
2-Methylphenol		Fluorene	
bis(2-Chloroisopropyl)ether		4-Nitroaniline	
4-Methylphenol		*2,4,6-Tribromophenol*	
N-Nitroso-di-n-propylamine		4,6_Dinitro-2-methylphenol	
Hexachloroethane		N-Nitrosodiphenylamine	
Nitrobenzene-d5		4-Bromophenyl-phenylether	
Nitrobenzene		Hexachlorobenzene	
Isophorone		Pentachlorophenol	
2-Nitrophenol		Phenanthrene	
2,4-Dimethylphenol		Anthracene	
Benzoic Acid		Di-n-butylphthalate	
bis(2-Chloroethoxy)methane		Fluoranthene	
2,4-Dichlorophenol		Pyrene	
1,2,4-Trichlorobenzene		*Terphenyl-d14*	
Naphthalene		Butylbenzylphthalate	
4-Chloroaniline		3,3'-Dichlorobenzidine	
Hexachlorobutidiene		Benzo(a)anthracene	
4-Chloro-3-methylphenol		bis(2-Ethylhexyl)phthalate	
2-Methylnaphthalene		Chrysene	
Hexachlorocyclopentadiene		Di-n-octylphthalate	
2,4,6-Trichlorophenol		Benzo(b)fluoranthene	
2,4,5-Trichlorophenol		Benzo(k)fluoranthene	
2-Fluorobiphenyl		Benzo(a)pyrene	
2-Chloronaphthalene		Indeno(1,2,3-cd)pyrene	
2-Nitroaniline		Dibenzo(a,h)anthracene	
Dimethylphthalate		Benzo(g,h,i)perylene	
Acenaphthylene		# of TIC's (list below)	

TIC	RT	Conc.	TIC	RT	Conc.
1.			11.		
2.			12.		
3.			13.		
4.			14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		

SEMI-VOLATILES BY GCMS - CHECKLIST PAGE [ ] OF [ ]

WSSRAP ID:	Dataset #:	Seq. No.:
Lab No.:	Lab File No.:	
Level: L/M	GPC'd?: Y/N	% Moisture:
Dilution Factor:		Sample Volume (g or ml):

	Primary Ion	Secondary Ion(s)	Ion Chk	Calc Chk	Ret. Time	Conc. ugl or ugkg	Conc. in DB
2-Fluorophenol	112	64					
Phenol-d6	99	42,71					
Phenol	94	65,66					
bis(2-Chloroethyl)ether	93	63,95					
2-Chlorophenol	128	64,130					
1,3-Dichlorobenzene	146	148,113					
1,4-Dichlorobenzene	146	148.113					
Benzyl Alcohol	108	79,77					
1,2-Dichlorobenzene	146	148,113					
2-Methylphenol	108	107					
bis(2-Chloroisopropyl)ether	45	77,79					
4-Methylphenol	108	107					
N-Nitroso-di-n-propylamine	70	42,101,130					
Hexachloroethane	117	201,199					
Nitrobenzene-d5	82	128,54					
Nitrobenzene	77	123,65					
Isophorone	82	95,138					
2-Nitrophenol	139	65,109					
2,4-Dimethylphenol	107	121,122					
Benzoic Acid	122	105,77					
bis(2-Chloroethoxy)methane	93	95,123					
2,4-Dichlorophenol	162	164,98					
1,2,4-Trichlorobenzene	180	182,145					
Naphthalene	128	129,127					
4-Chloroaniline	127	129					
Hexachlorobutidiene	225	223,227					
4-Chloro-3-methylphenol	107	144,142					
2-Methylnaphthalene	142	141					
Hexachlorocyclopentadiene	237	235,272					
2,4,6-Trichlorophenol	196	198,200					
2,4,5-Trichlorophenol	196	198,200					
2-Fluorobiphenyl	172	171					
2-Chloronaphthalene	162	164,127					
2-Nitroaniline	65	92,138					
Dimethylphthalate	163	194,164					
Acenaphthylene	152	151,153					

SEMI-VOLATILES BY GCMS - CHECKLIST PAGE [ ] OF [ ]

WSSRAP ID:	Dataset #:	Seq. No.:
Lab No.:	Lab File No.:	
Level: L/M	GPC'd?: Y/N	% Moisture:
Dilution Factor:		Sample Volume (g or ml):

	Primary Ion	Secondary Ion(s)	Ion Chk	Calc Chk	Ret. Time	Conc. ugl or ugkg	Conc. in DB
3-Nitroaniline	138	108,92					
Acenaphthene	153	152,154					
2,4-Dinitrophenol	184	63,154					
4-Nitrophenol	109	139,65					
Dibenzofuran	168	139					
2,4-Dinitrotoluene	165	63,182					
2,6-Dinitrotoluene	165	89,121					
Diethylphthalate	149	177,150					
4-Chlorophenyl-phenylether	204	206,141					
Fluorene	166	165,167					
4-Nitroaniline	138	92,108					
2,4,6-Tribromophenol	330	332,141					
4,6-Dinitro-2-methylphenol	198	182,77					
N-Nitrosodiphenylamine	169	168,167					
4-Bromophenyl-phenylether	248	250,141					
Hexachlorobenzene	284	142,249					
Pentachlorophenol	266	264,268					
Phenanthrene	178	179,176					
Anthracene	178	179,176					
Di-n-butylphthalate	149	150,104					
Fluoranthene	202	101,100					
Pyrene	202	101,100					
Terphenyl-d14	244	122,212					
Butylbenzylphthalate	149	91,206					
3,3'-Dichlorobenzidine	252	254,126					
Benzo(a)anthracene	228	229,226					
bis(2-Ethylhexyl)phthalate	149	167,279					
Chrysene	228	226,229					
Di-n-octylphthalate	149	-					
Benzo(b)fluoranthene	252	253,125					
Benzo(k)fluoranthene	252	253,125					
Benzo(a)pyrene	252	253,125					
Indeno(1,2,3-cd)pyrene	276	138,227					
Dibenzo(a,h)anthracene	278	139,279					
Benzo(g,h,i)perylene	276	138,277					

SEMI-VOLATILES BY GCMS - CHECKLIST PAGE [ ] OF [ ]

WSSRAP ID:	Dataset #:	Seq. No.:
Lab No.:	Lab File No.:	
Level: L/M	GPC'd?: Y/N	% Moisture:
Dilution Factor:		Sample Volume (g or ml):

# of TICs: Compound name	Ret. Time	Quant. ion	Conc. ugl or ugkg	Conc. in DB
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