LOCKHEED MARTIN

Y/ER-299

**ENVIRONMENTAL
RESTORATION
PROGRAM**

**Data Management Implementation Plan
for the Bear Creek Valley
Treatability Study Phase II
Hydraulic Performance Testing,
Oak Ridge Y-12 Plant,
Oak Ridge, Tennessee**

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for release to the public. Date: 12/8/97

ENERGY SYSTEMS

MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

ENTECH, Inc.

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

**Data Management Implementation Plan
for the Bear Creek Valley
Treatability Study Phase II
Hydraulic Performance Testing,
Oak Ridge Y-12 Plant,
Oak Ridge, Tennessee**

Date Issued—December 1997

Prepared by
ENTECH, Inc.
Oak Ridge, Tennessee
under subcontract ICK-AEN02V

Prepared for the
U.S. Department of Energy
Office of Environmental Management
under budget and reporting code EW 20

Environmental Management Activities at the
OAK RIDGE Y-12 PLANT
Oak Ridge, Tennessee 37831
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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APPROVALS

**Data Management Implementation Plan
for the Bear Creek Valley
Treatability Study Phase II
Hydraulic Performance Testing,
Oak Ridge Y-12 Plant,
Oak Ridge, Tennessee**

Y/ER-299

December 1997

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LMES Project Manager

12/8/97
Date

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12/4/97
Date

PREFACE

This *Data Management Implementation Plan for the Bear Creek Valley Treatability Study Phase II Hydraulic Performance Testing, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Y/ER-299)* was prepared to discuss data management for Phase II, Hydraulic Performance Testing, of the Bear Creek Valley Treatability Study. Specific data collected will include monitoring/extraction well and trench construction details, hydraulic testing data, and water quality parameters to provide hydraulic and treatment performance data required to design a long-term treatment. This work was prepared under Work Breakdown Structure 01.20.01.01.10.34.20.30.35 (Cost Center Activity Data Sheet 2322, "Bear Creek Valley Watershed Record of Decision").

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ABBREVIATIONS

ESD	Environmental Sciences Division
LMES	Lockheed Martin Energy Systems, Inc.
MKF-OR	MK-Ferguson of Oak Ridge Company
OREIS	Oak Ridge Environmental Information System
PEMS	Project Environmental Measurements System
QA/QC	quality assurance/quality control

1. INTRODUCTION

1.1 OBJECTIVES

1.1.1 Project

The overall objective of the Bear Creek Valley Treatability Study is to provide site-specific data defining potential treatment technologies applicable to contaminated groundwater and surface water. The ultimate goal of this effort is to install a treatment system that will remove uranium, technetium, nitrate, and several metals from groundwater before it reaches Bear Creek. This project, the Bear Creek Valley Treatability Study Phase II Hydraulic Performance Testing, directly supports the Bear Creek Valley Feasibility Study. Specific project objectives include (1) installing monitoring and extraction wells, (2) installing a groundwater extraction trench, (3) performing pumping tests of the extraction wells and trench, (4) determining hydraulic gradients, and (5) collecting water quality parameters.

1.1.2 Data Management

The primary purpose of environmental data management is to provide a system for generating and maintaining technically defensible data. To meet current regulatory requirements for the Environmental Restoration Program, complete documentation of the information flow must be established. To do so, each step in the data management process (collection, management, storage, and analysis) must be adequately planned and documented. This document will serve to identify data management procedures, expected data types and flow, and roles and responsibilities for all data management activities associated with the Bear Creek Valley Treatability Study Phase II Hydraulic Performance Testing project.

Meeting this objective is critical to the overall success of this project because (1) the data are important in supporting Environmental Restoration Program management decisions about contaminant migration and remedial alternatives, (2) the data must be technically defensible, and (3) data collection and analysis costs are high. Records management practices, information management procedures, and database management systems will be used to track, document, and manage all field and analytical data collected by ENTECH, Inc., during this project. Additionally, some field data collected by the Environmental Sciences Division (ESD) at Oak Ridge National Laboratory as part of a separate, but related, project will be managed as part of this project. Procedures required for data management are listed in Table 1.

1.2 PLANNED DATA COLLECTION ACTIVITIES

Project data will be collected from August through December 1997. The work will consist of the following specific activities: installation of five monitoring wells at the trench site, installation of an inclined extraction well at the NT-1 site, installation of two monitoring wells at the NT-1 site, construction of a trench filled with high-conductivity backfill and reactive media at the trench site, installation of eight piezometers within the trench backfill, installation of an extraction well in the trench backfill, performance of background monitoring of groundwater levels and meteorological conditions at both sites, intensive monitoring of groundwater levels at the trench site under

nonpumping conditions, performance of stepped drawdown and constant-rate pumping tests at the NT-1 site, performance of stepped drawdown and constant-rate pumping tests at the trench site, and collection of water quality parameters during background monitoring and pump testing at both sites. Groundwater monitoring will be performed manually and with electronic data loggers from both new (total of 13) and existing (total of 7) monitoring wells and piezometers.

Concurrently with this project, ESD will be performing an in situ geochemical evaluation of the trench reactive media by installing and sampling a series of piezometers in and adjacent to the trench. Additionally, ESD will install approximately nine piezometers at the trench site for hydrologic monitoring. Data collection activities performed by Lockheed Martin Energy Systems, Inc. (LMES), and its contractors (e.g., ENTECH, Inc.) will be conducted in accordance with this data management plan. It is anticipated that geological, piezometer construction, and hydrologic (manual and electronic water levels) data collected by ESD will be included with the data managed as part of this project. ESD data will be collected following established procedures and practices, and copies of relevant field logbooks, notes, and forms will be submitted to ENTECH for inclusion in the project records, reports, and electronic submittals.

Table 1. Data management procedures

Procedure	Subject activity	Issue date	Revision
ERWM/ER-P2205	Development, Completion, and Control of Data Forms and Logbooks	03/23/95	0
ERWM/ER-P2207	Backup and Restoration Processes for Environmental Data Management Systems within the Environmental Restoration Program	08/02/95	0
EM&EF/ER-P2214	Environmental Data Entry, Transfer, and Transformation Verification	09/06/96	0
ERWM/ER-P2701	Transmitting Data to the Oak Ridge Environmental Information System	1996	3
EM&EF/ER-P2215	Archival of Environmental Data within the Environmental Restoration Program	09/20/96	0
ERWM/ER-P2213	Data Validation Plans for Environmental Restoration Project		
AP-17.1	Records Management	11/01/94	0
AP-19.0	Software Quality Assurance	09/15/94	0

2. DATA NEEDS AND SOURCES

2.1 HISTORICAL DATA

No historical data have been identified for use in this project.

2.2 PROJECT-GENERATED DATA

2.2.1 Data Types

Several types of data will be required to achieve the project objectives. Geological data, such as soil and rock descriptions and elevation of bedrock, will be obtained during monitoring/extraction well installation and trench construction. Additional well and trench construction physical information, such as screen length and as-built dimensions and location (survey data), will be captured during and following construction. Hydrologic data collected will include groundwater levels, collected both manually and by using electronic data loggers, and precipitation and barometric pressure data from a data logger located near GW-101. Water quality parameters, specifically temperature, conductivity, pH, and dissolved oxygen, will be collected from selected monitoring wells and surface water locations. No other field measurements are anticipated.

2.2.2 Identification Scheme

All new monitoring and extraction wells will be assigned a descriptive code plus a sequential number. At the NT-1 site, monitoring wells will be designated "PTMW-nn," and the extraction well will be designated "PTW-01." At the trench site, monitoring wells will be designated "TMW-nn," and the extraction well will be designated "EW-01." In each case, "nn" represents a sequential number that will be unique within each designated station type. Existing wells and piezometers, as well as new piezometers installed by ESD, will be identified consistently by using the established nomenclature provided by LMES or ESD.

All field data collected during the project will be assigned a six character source designator. This source designator will be included in the database, and, where applicable, marked on hard copy submittals to ENTECH by other organizations. Source designators will include ENTECH and MK-Ferguson of Oak Ridge Company (MKF-OR).

3. ROLES AND RESPONSIBILITIES

Data management roles and responsibilities for the project are defined herein. Table 2 lists the assigned project personnel.

3.1 RESPONSIBLE PARTIES

Several different organizations will collect and/or manage data for this project. As a result, coordination among organizations will be an important component of the project.

- ENTECH will initialize a project database that uses a data structure compatible with the Project Environmental Measurements System (PEMS) and Oak Ridge Environmental Information System (OREIS) structures and will provide inspection and documentation support to the field activities. After data collection begins, ENTECH will upload all project data to the database.
- The construction phase of the field effort, including drilling, well installation, and trench construction, will be accomplished by MKF-OR and its subcontractors for LMES.

- The hydraulic testing phase of the field effort, including water level measurement, climatological monitoring, and pump testing, will be accomplished by ENTECH and its subcontractors for LMES.
- ESD will perform periodic monitoring of water levels in piezometers installed in and around the trench site. Hard copy submittal of these data will be made to ENTECH for inclusion in the project database. Geochemical data collected by ESD will not be included as part of this projects' data set.
- Project data described in Section 2.2.1 will be transferred to OREIS following completion of data collection activities and quality assurance review of the data set.
- Project records, such as logbooks and field forms, will be generated by ENTECH. These records will be consolidated and transferred to the LMES Document Management Center at the end of the project along with complete electronic data logger files, which will be clearly labeled.

3.2 PROJECT ROLES

Project Manager, LMES. Responsible for the overall management, activity coordination, and technical direction of the project. Specific responsibilities include allocation and control of project budget, review and approval of field change order requests, and review of draft project submittals.

Project Manager, ENTECH. Responsible for the management, activity coordination, and technical implementation of the project. Specific responsibilities include allocation and control of the ENTECH project budget, preparation and submittal of field change order requests, and preparation and review of draft and final project submittals.

Data Manager, LMES. Oversees all data management activities. Interfaces with other organizations as necessary to facilitate communication and timely and efficient data transfer. Identifies and acquires relevant data, as appropriate. Reviews data submittals and verifies data completeness and consistency.

Data Coordinator/Manager, ENTECH. Coordinates data support for the technical team. Prepares work agreements as necessary and receives and processes field data. Participates in quality assurance/quality control (QA/QC) activities, including nonconformance investigations and reporting and QA reviews. Oversees all data management activities and verifies data entry activities. Serves as primary point-of-contact between ENTECH and other organizations as necessary to facilitate communication and timely and efficient data transfer. Identifies and acquires all relevant data, as appropriate. Verifies data completeness and consistency and resolves problems associated with the data.

Project QA Specialist, ENTECH. Reviews project plans and reports to ensure QA practices are in place and project data meets technical objectives for completeness, adequacy, and defensibility. Provides periodic oversight of data collection and data management activities.

Data Entry Clerk, ENTECH. Enters new or existing data generated by field activities when provided on hard copy.

Title III Oversight, ENTECH. Oversees implementation of the *Hydraulic Testing Plan for the Bear Creek Valley Treatability Study, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (LMES 1997). Prepares for and coordinates pump testing field activities. Oversees field data collection, recording, and documentation activities, including any electronic data capture implemented in the field.

Records Manager, ENTECH. Controls the recorded information about project activities that is generated and/or received by project organizations. Provides all necessary information to the client at project closeout.

ESD Interface, Lockheed Martin Energy Research Corporation. Serves as point-of-contact between ENTECH and ESD for identification and coordination of ESD data collection activities. Ensures copies of relevant field records are provided to ENTECH for inclusion in the project data set.

Construction Engineer, MKF-OR. Responsible for the supervision and technical conformance of trench and monitoring well installation activities. Ensures required material certification submittals and civil surveying data are provided to ENTECH.

Table 2. Data management contacts

Role	Organization	Name	Phone
LMES Project Manager	LMES	John Vanderlan	423/576-2745
ENTECH Project Manager	ENTECH	Rick Adkisson	423/481-3231
Data Manager	LMES	Virginia Forsberg	423/574-7000
Data Coordinator/Manager	ENTECH	Dean McCartney	423/481-3231
Project QA Specialist	ENTECH	Dean McCartney	423/481-3231
Data Entry Clerk	ENTECH	Chris Daniel	423/481-3231
Title III Oversight	ENTECH	David Keefer	423/483-2030
Records Manager	ENTECH	Geanis Farr	423/481-3231
ESD Interface	Lockheed Martin Energy Research Corp.	David Watson	423/241-4749
Construction Engineer	MKF-OR	John Stiner	423/574-8103

4. DATA MANAGEMENT ACTIVITIES

4.1 PROJECT DATABASE

A database structure compatible with PEMS and OREIS will be used for project data collection activities, as applicable. The sampling database will be created by the Data Manager and initially populated with limited Hydraulic Test Plan information only. The project database will be updated on a regular basis as field activities progress.

4.2 FIELD LOGBOOKS AND FORMS

Field forms or logbooks will be used to record field measurement data that is not collected with an electronic data logger (copies of field forms are included in the Appendix). Data to be recorded includes well construction and installation measurements, field water quality measurements, equipment calibration information, equipment decontamination activities, and a chronological narrative of field activities. Each logbook will contain, at a minimum, a title page, table of contents, and sampling team activity log sheets. The Title III Oversight representative or designee will review each field logbook and form, verifying that it is complete and accurate. General requirements for each logbook and form are as follows:

- all logbook and form entries will be written clearly and legibly;
- dates will be recorded using the format “dd/mm/yy” and time recorded in the 24-h clock format;
- zeros in sample ID numbers will be written with a slash (Ø) to distinguish them from “O”s;
- text will be written using permanent, black ink;
- corrections to logbooks or forms will be made by lining through the error with a single line, such as not to obliterate the correction, and initialing and dating the correction;
- any bound but unused logbook pages will be identified with a diagonal line marked across the page, and the line will be dated and initialed;
- blanks on field collection forms will be completed; if any section of the forms are not used, it will be indicated by drawing a line through the unused area and dating and initialing or marking as “NA”;
- security of logbooks and forms will be maintained at all times and, when not in use, they will be stored under lock and key;
- logbooks and forms will be reviewed and signed (not initialed) as soon as practical by a qualified project team member other than the person completing the record; and
- backup copies of logbooks and forms will be maintained and stored in an area separate from the originals.

4.2.1 Logbook Title Page

Each logbook will contain an appropriate title page providing the following information:

- project title;
- logbook title;
- work site;
- contract number;
- task order;
- project manager name and telephone number;

- start date; and
- end date.

4.2.2 Table of Contents

Each logbook will contain a table of contents. The table of contents will be updated as pages of the logbook are filled.

4.2.3 Site Logbook

The site logbook is the primary documentation of field activities performed during the project. It is a bound book with a hard cover and sequentially numbered pages. Its primary purpose is to document each day's field activities; the personnel on-site and tasks performed; and any administrative occurrences, conditions, or activities that may have affected the field work or data quality for any given day. The site logbook will be kept by the Title III Oversight representative. The front of the logbook will be used to list the location, the names of the companies performing the field sampling, the client name, and the contract number of the work being performed. The site logbook will be updated daily. Following review, the Title III Oversight representative will sign the bottom of the last page of the day.

The site logbook will, at a minimum, contain the following information:

- names, titles, and organizations of any visitors who entered the site during the day; and
- specific comments relative to any problem areas that occurred during the day's activities, the final resolution, and the anticipated affect on the outcome of the field investigation or on data quality.

4.2.4 Field Team Activity Logbooks

Each field team member will be responsible for recording information about the day's activities in an individual field activity logbook. The information that should be recorded will include the following:

- name of the sample team member;
- time of arrival and departure from drilling or monitoring locations throughout the day;
- any unusual occurrences encountered during sampling;
- notes describing problems with any of the equipment or instruments, items that are broken, and their serial number(s);
- field change order requests and verbal approval/disapproval notation; and
- any other information necessary to document their activity.

4.3 CAPTURE OF FIELD INFORMATION

ERWM/ER-P2213 has been reviewed relative to the need for producing a data validation plan. For the field data being collected under this project, a data validation plan is not needed.

4.3.1 Hydrologic Data and Field Water Quality Parameters

During the background monitoring period and pump testing, water levels and climatological data will be recorded by using electronic data loggers or, for manual measurements, on water level measurement forms. Continuous water level measurements collected by electronic data logger will be converted to daily averages for submittal to OREIS. Complete electronic data logger files will be clearly labeled and transferred to the LMES Document Management Center at the end of the project. Field water quality parameter measurements will be recorded by using electronic data loggers or, for manual measurements, on field measurement forms. The completed forms will be returned to the ENTECH Data Coordinator after completion of each measurement event. The measurements will be entered and the electronic information verified against the field data for accuracy and completeness. Note that all groundwater levels are expected to be measured as feet below the top of casing. Any deviations must be clearly noted and accompanied by a description of the measuring point and its offset, in feet, from the top of casing. Any discrepancies noted during review of the field measurements will be forwarded to the ENTECH Data Coordinator for resolution.

4.3.2 Geological Data and Well and Trench Construction Data

Geological data will be collected during well and trench construction activities by the Title III Oversight representative and documented on the appropriate forms. Physical data recorded during drilling and installation of monitoring and extraction wells and during excavation and construction of the groundwater extraction trench shall be reviewed for accuracy by the Title III Oversight representative after each activity is complete. This review shall include as-built documentation from the wells and trench. Reviewed forms and construction data shall then be provided to the ENTECH Data Coordinator at least weekly for data entry. All data entry will be performed by following established procedures.

4.3.3 Survey Data

All monitoring and extraction wells and critical trench dimensions will be surveyed by MKF-OR or its subcontractor personnel. These data shall be compiled and checked by the project Construction Engineer and provided to the ENTECH Project Manager within 1 week after completion of the task. Coordinates will be provided in the Oak Ridge Y-12 Plant grid system and/or the administrative grid coordinate system and will be documented as to accuracy. A copy in both electronic and hard-copy format will be provided to the ENTECH Data Coordinator.

4.3.4 Records

Project records related to field data collection will be generated by ENTECH, MKF-OR, and ESD. Records produced by these organizations will follow established records management practices and provide for safe, controlled storage of project records. Records produced by ENTECH will be managed in accordance with ENTECH procedure AP-17.1. This procedure is consistent with applicable LMES procedures. Upon completion of the field effort, the ENTECH Records Coordinator will ensure copies of all field-related documentation generated by these organizations

and managed as part of this project are included in the project file. The project file will be maintained by ENTECH pending transmittal to LMES at contract closeout.

4.4 DATA CONSOLIDATION AND STORAGE

Strict adherence to procedure-based routines (i.e., ENTECH procedure AP-19.0; this procedure is consistent with applicable LMES procedures) established for data security, backup, and archival and the maintenance of proper database change practices will ensure database integrity. The database, once loaded, will be safe from physical corruption (i.e., hardware or software failure) or from unauthorized access and illegal updating. Any changes to the database will be documented by the Data Manager/Coordinator. Supervisory access to the project database will be restricted to the Data Manager/Coordinator and the Project Manager.

5. DATA CONTROL, ARCHIVAL, AND TRANSMITTALS

5.1 DATA CONTROL

As described earlier, PEMS- and OREIS-compatible data management structure will be employed for data storage and control. The ENTECH Data Manager will create and initialize the project database. All project data management personnel with data loading responsibilities will be provided accounts with read and write access into the project database area. These accounts will be used for all data loading and updating activities. Other project personnel may be provided with uncontrolled copies of the database to view data or generate reports. Changes to the database after it has been populated will be documented. The need for project-specific software or data analysis programs is not anticipated.

5.2 OREIS DATA TRANSMITTALS

OREIS ready-to-load files of field measurements, well construction data, and locations will be submitted as OREIS deliverables. These files will be submitted to OREIS following the current revision of LMES procedure ERWM/ER-P2701. Although the project team may use PEMS for reporting purposes during the course of the project, OREIS will serve as the official repository for these data and will ensure their availability for use by future projects. Table 3 provides the anticipated schedule for OREIS submittals.

Table 3. Expected RTL delivery schedule

Ready-to-load type	Time frame
Well construction data	30 days after final data report
Field measurements and survey coordinates	30 days after final data report

5.3 DATA AND DOCUMENT ARCHIVAL

Upon completion of the project, any project data provided to and residing in PEMS will be archived as a function of PEMS. Sufficient documentation will accompany the archived data to fully describe the source, contents, and structure of the data to ensure future data usability. Computer programs used to manipulate or report the archived data will be included in the data archive information package to further enhance the data's future usability.

Hard copies of all original field and analytical results, data verification programs, data packages, and associated QA/QC forms will be clearly labeled, filed, and stored as part of the project files. The ENTECH Records Coordinator will ensure that all required Administrative Record File documents are acquired and indexed.

Upon completion of data management activities for the project, all associated project records will be included in the ENTECH project file. The ENTECH Records Manager will subsequently deliver all project records to LMES at contract closeout.

6. REFERENCE

LMES (Lockheed Martin Energy Systems, Inc.) 1997. *Hydraulic Testing Plan for the Bear Creek Valley Treatability Study, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee*, Y/ER-292, Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

APPENDIX
FIELD FORMS

[illegible]

WELL NO. _____

PAGE 2 of

[illegible]

9:-099M(A);0192

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. _____

WELL INSTALLATION DIAGRAM

LOGGED BY: _____

DRILLING DATES

DRILLING COMPANY: _____

STARTED: _____

DRILLER: _____ HELPER: _____

FINISHED: _____

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. _____

WELL INSTALLATION DIAGRAM

LOGGED BY: _____

DRILLING DATES

DRILLING COMPANY: _____

STARTED: _____

DRILLER: _____ HELPER: _____

FINISHED: _____

NOT TO SCALE

NOTE:
ALL DEPTHS ARE MEASURED FROM
GROUND SURFACE UNLESS
OTHERWISE NOTED

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. _____

WELL INSTALLATION DIAGRAM

LOGGED BY: _____

DRILLING DATES

DRILLING COMPANY: _____

STARTED: _____

DRILLER: _____ HELPER: _____

FINISHED: _____

NOT TO SCALE

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL NO. _____

WELL INSTALLATION DIAGRAM

LOGGED BY: _____

DRILLING DATES

DRILLING COMPANY: _____

STARTED: _____

DRILLER: _____ HELPER: _____

FINISHED: _____

NOT TO SCALE

[illegible]

Y-12 PLANT GROUNDWATER PROTECTION PROGRAM		WELL NO. _____	
EQUIPMENT DECONTAMINATION INSPECTION SUMMARY		INSTALLATION ☐ P&A ☐	
LOCATION: _____		DATE: START: _____	
DECONTAMINATION CREW: _____		FINISH: _____	

EQUIPMENT	DECON DATE	INSPECTION DATE	INSPECTION (PASS/FAIL)	INSPECTOR'S INITIALS
DRILL RIG _____ (Mast, Chassis, Cables, Carousel, Hoses, Etc.)				
DRILLING TOOLS (Pipe Wrenches, Hand Tools, Lifting Belts, Clevis, Chains, Etc.)				
DOWN HOLE TOOLS (Drilling Rods, Stabilizers, Washover Pipe, Bits, Etc.)				
WELL CONSTRUCTION MATERIALS (Casing, Screen, Centralizers, Etc.)				
WORKOVER RIG _____ (Mast, Chassis, Cables, Hoses, Etc.)				
DEVELOPMENT TOOLS (Tubing, Bailers, Pumps, Etc.)				
OTHER EQUIPMENT OR RE-INSPECTIONS (SPECIFY)				

COMMENTS:

ENTECH, INC.
ARCHITECTURE, ENGINEERING
ENVIRONMENTAL, CONSTRUCTION
OAK RIDGE, TENNESSEE

ENTECH FIELD CHANGE FORM

Site Name: _____ ENTECH Charge Number: _____ Field Change Number: _____

Description:

Reason For Change:

Recommended Disposition:

Field Oversight Manager (Signature)

Date

Disposition:

Project Manager (Signature)

Date

Distribution: LMES Project Manager

Others as required: _____

LMES Contracting Officer

ENTECH Project Manager

Field Oversight Manager

Field Activities Coordinator

Project File

Sheet #: _____

DATALOGGER INSTALLATION FIELD DATA SHEET

Y-12 BCVTS Hydraulic Test (Phase II) Project

Project ID: ENT-S3P.02 Date / / Time : :

Personnel: _____

Logger S/N: _____ Site ID: _____

Paired Well(s): _____ Paired Well(s) Sheet #(s): _____

Station ID	Channel	XD S/N	XD Depth	XD psi	Equation or slope/offset/linearity	MP Description

Datalogger Reading Interval: _____ minutes / hours

DSP#: _____ DSP Status: _____ %full _____ Errors

Station ID	Ft of Water Above Transducer (datalogger)	Measured Depth To Water (ft BMP)	XD Depth (ft BMP) (calculated)	XD Depth (ft BMP) (measured, if available)	Calibration Check (ft XD raised / logger response)
					/
					/
					/
					/
					/
					/

Battery: _____ V. Log started? Y / N Start Time: _____ : _____ : _____

DSP Status (after log started): _____ %full _____ Errors

Installed/Reset by: _____

ft BMP = feet below measuring point

XD = Transducer

DSP = Data Storage Pack

Suite 2
560 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830
(423) 481-3231

Water Level Measurements

Measurement Team: _____

Project Number and Location: _____

Measuring Device Serial No.: _____

Measuring Point: _____

Well I.D. No.: _____

Date: _____

Well Location: _____

Time: _____

Casing Size _____

Depth to Water _____
(From Top of Casing)

Height of Casing _____
(From Ground Surface)

Depth to Water _____
(From Ground Surface)

Total Well Depth _____
(If Known)

Comments/Conditions: _____

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC);
Top of Protective Steel Casing (TOSC); Ground Surface (GS), etc.

Depth to Water: Measurement should be recorded to the nearest 0.01 ft.
(e.g., 10.06 feet below TOC)

Y-12 BCVTS Hydraulic Test (Phase II) Project**Installation Field Data Sheet**

Date _____ Time _____ Well _____
 Personnel _____ Paired Well _____
 _____ Paired Well Sheet Number _____
 _____ Karst Well: Y / N

Required Equipment

☐ Pressure Transducer	☐ Packer Assembly
☐ 1 Channel Logger	☐ Temp. & Cond. Probes
☐ 2 Channel Logger	☐ Barometric Transducer
☐ 4 Channel Logger	☐ Rain Gage

Equipment Information Summary

Equipment	Manufacturer	Model	Serial No.	Range	Last Calib. Ck.
Data Logger					
Transducer					
Water Level Indicator					
Packer					
Cond. Probe					
Temp. Probe					
Rain Gage					

Well Data

Measuring Point: _____ (MSL); TOC / Other _____
 Static Water Level (S W L) (measured): _____ (ft BMP) _____ (MSL)
 Total Well Depth (measured) : _____ (ft BMP) _____ (MSL)
 Well Diameter : 2 / 4 inches; Screen Length _____ (ft)
 Depth to Top of Screen : _____ (ft BMP) _____ (MSL)
 Maximum Depth to Water (DTW): _____ (ft BMP) _____ (MSL)
 Minimum DTW: _____ (ft BMP) _____ (MSL)

Calculations

	Ft BMP		Ft BMP		Ft BMP
Total Well Depth		Depth to Top of Screen		SWL (measured)	
Less SWL		Less Packer Spacing		Plus Transducer Required Depth	
Water Column Height		Depth of Packer		Depth of Transducer	
Depth to Top of Screen		Comments:			
Plus 1/2 Screen Length					
Temp & Cond Probe Depth					

Data Recorded by	Date	Data Verified by	Date

Y-12 BCVTS Hydraulic Test (Phase II) Project**Installation Field Data Sheet**

Date _____ Time _____ Personnel _____ Well _____

Lift Equipment Safety Check (Satisfactory/Unsatisfactory)

	Sat.	Unsat.		Sat.	Unsat.
Tripod:			Chain Lift		
Eye bolt			Chain		
Legs			Hooks		
Feet			Brakes		
Pipe Elevator			Housing		
Pipe Clamp			Holding Fork		
Pipe & Coupling			Well Head Assem.		

Equipment Installation

☐ Transducer Installed
 Depth : _____ (ft BMP) _____ (MSL)
 Cable Length : _____ ft

☐ Rain Gage Installed

☐ Packer Installed
 Depth _____ (ft BMP) _____ (MSL)
 Packer Inflation Pressure _____ (PSI)
 Number of Pipe Sections
 _____ 5 ft., _____ 2 ft., Total Length _____ ft.

☐ Temperature and Conductivity Probe Installed
 Depth _____ (ft BMP) _____ (MSL)
 Cable Lengths _____ ft

☐ 1 / 2 / 4 Channel Logger Installed

Data Logger Records

File Structure	Type	Units	Comments:		
Column A	Time	minutes			
Column B					
Column C					
Column D					
Column E					
Test Number	ID	Interval	Date (MM/DD/YY)	Time (HH:MM:SS)	Comments

Comments

Data Recorded by	Date	Data Verified by	Date

Y-12 BCVTS Hydraulic Test (Phase II) Project**Installation Field Data Sheet**

Date _____ Time _____ Personnel _____ Well _____

Calibration Check

SWL _____; Data Logger _____

Height Transducer Moved _____

SWL _____; Data Logger _____

System Operation Check

Data Collection System Operating Y / N

Comments**Site Departure**☐

Equipment Secured

☐

Equipment Protected from Weather

☐

Decontamination Completed

Data Recorded by

Date

Data Verified by

Date

DATALOGGER INSTALLATION FIELD DATA SHEET

Y-12 BCVTS Hydraulic Test (Phase II) Project

Project ID: ENT-S3P.02 Date / / Time :

Personnel: _____

Logger S/N: _____ Site ID: _____

Paired Well(s): _____ Paired Well(s) Sheet #(s): _____

Station ID	Channel	XD S/N	XD Depth	XD psi	Equation or slope/offset/linearity	MP Description

Datalogger Reading Interval: _____ minutes / hours

DSP#: _____ DSP Status: _____ %full _____ Errors

Station ID	Ft of Water Above Transducer (datalogger)	Measured Depth To Water (ft BMP)	XD Depth (ft BMP) (calculated)	XD Depth (ft BMP) (measured, if available)	Calibration Check (ft XD raised / logger response)
					/
					/
					/
					/
					/
					/

Battery: _____ V. Log started? Y / N Start Time: _____:_____ _____

DSP Status (after log started): _____ %full _____ Errors

Installed/Reset by: _____

ft BMP = feet below measuring point

XD = Transducer

DSP = Data Storage Pack

Y-12 BCVTS Hydraulic Test (Phase II) Project**Service Field Data Sheet**

Date _____ Time _____ Well _____
 Personnel _____ IFDS Sheet Number _____
 _____ Paired Well _____
 _____ Paired Well Sheet Number _____

Reference Data

	Manufacturer	Model	Serial Number
Water Level Indicator			

Measuring Point _____ (MSL) ; TOC / Other _____
 Packer Inflation Pressure: Old _____ psi; New _____ psi; Time _____

Transducer Operating
 Range: DTWs
 Measured Total Depth
 Current SWL
 Instantaneous Logger Reading
 Data Recorded as (circle one)

Max.
 Min.

ft BMP	MSL
ft BMP	MSL

Data Logger Records

Test Stopped? Y / N ; Time Stopped _____

Test #	ID	Start Date	Start Time	End Date	End Time	Interval	Comments
		MM/DD/YY	HH:MM	MM/DD/YY	HH:MM	(minutes)	

Download PC File Name _____; Copy to Floppy Disk : Y / N
 Analysis PC File Name _____; Copy to Floppy Disk : Y / N
 Data Format (circle one): Unchanged (see IFDS); / Changed (complete table below)

File Structure	Data Type	Units	Comments:
Column A			
Column B			
Column C			
Column D			
Column E			

Calibration Check

SWL _____; Data Logger _____
 Height Transducer Moved _____
 SWL _____; Data Logger _____

Data Recorded by	Date	Data Verified by	Date
------------------	------	------------------	------

DATALOGGER SERVICE FIELD DATA SHEET

Y-12 BCVTS Hydraulic Test (Phase II) Project

Project ID: _____ Date ____/____/____ Time ____:____:____

Personnel: _____

Logger S/N: _____ Site ID: _____ IFDS#: _____

Paired Well(s): _____ Paired Well(s) Sheet #(s): _____

DSP Status: _____ %full _____ Errors

Show Data, Last Line ____/____:____

Stop Test? Y/N Time ____:____ Change Desiccant? Y/NChange DSP? Y/N Old #: _____ New #: _____Change Battery? Y/N ____/____ V. (old / new)

Station ID	Water Level (ft BMP / MSL / ft above XD) (datalogger)	Measured DTW (ft BMP)	Water Level (ft BMP / MSL / ft above XD) (calc. w/ DTW)	XD Offset Change (if needed) (old/new)	New Water Level (ft BMP / MSL / ft above XD) (datalogger)	Calibration Check (ft XD raised / logger response)
				/		/
				/		/
				/		/
				/		/
				/		/
				/		/

Datalogger Reading/Report Interval Change? Y/N ____/____ (old / new) minutes / hoursDelayed Log Set? Y/N Start Time: ____:____:____

DSP Status (after log started): _____ %full _____ Errors

Show Data, First Line ____/____:____

Installed/Reset by: _____

ft BMP = feet below measuring point

XD = Transducer

DSP = Data Storage Pack

DTW = Depth To Water

Notes:

ENTECH, INC.
ARCHITECTURE, ENGINEERING
ENVIRONMENTAL, CONSTRUCTION
OAK RIDGE, TENNESSEE

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name: _____ Project No. _____
Well No. _____ Gauge Date: _____ Time: _____
Weather: _____
Well Condition: _____

Well Diameter (inches): _____

Odor (describe): _____

Sounding Method: _____ Measurement Reference: _____

Stick up/down (feet): _____

(1) Well Depth (feet): _____ Purge Date: _____ Time: _____

(2) Depth to Liquid (feet): _____ Purge Method: _____

(3) Depth to Water (feet): _____ Purge Rate (gpm): _____

(4) Liquid Column Height (feet) [(1) - (2)]: _____ Purge Time (min): _____

(5) Liquid Volume (gal) [(4) x F]: _____ Purge Volume (gal): _____

Did well pump dry? Describe: _____

Samplers: _____

Sampling Date: _____ Time: _____

Sample Type: _____ Split? _____ With Whom? _____

Comments and Observations: _____

Conversion: Liquid Column Height to Volume		Conversion: Inches to Feet					
Well Diameter	Gallons/foot (F)	inches	feet	inches	feet	inches	feet
2"	0.163	1	0.08	5	0.42	9	0.75
4"	0.653	1.5	0.12	5.5	0.46	9.5	0.79
6"	1.469	2	0.16	6	0.50	10	0.83
8"	2.611	2.5	0.21	6.5	0.54	10.5	0.87
12"	5.875	3	0.25	7	0.58	11	0.91
		3.5	0.29	7.5	0.62	11.5	0.95
		4	0.33	8	0.66		
		4.5	0.37	8.5	0.70		

DISTRIBUTION

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