U.S. DEPARTMENT OF ENERGY

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YUCCA MOUNTAIN

YUCCA MOUNTAIN
SITE CHARACTERIZATION
PROJECT

TECHNICAL DATA BASE QUARTERLY REPORT

APRIL - JUNE 1991

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

TECHNICAL DATA BASE QUARTERLY REPORT

APRIL-JUNE 199[illegible]

Prepared by

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INTRODUCTION

The acquisition and development of technical data are activities that provide the information base from which the Yucca Mountain Site will be characterized and may eventually be licensed as a high-level waste repository. Consequently, it is vital that technical data be controlled and managed to ensure that these data are available for subsequent Yucca Mountain Site Characterization Project (YMP) use. The Project Technical Data Base (TDB) is the repository for the regional and site-specific technical data required in intermediate and license application analyses and models. The TDB Quarterly Report provides the mechanism for identifying technical data currently available from the Project TDB.

Due to the variety of scientific information generated by YMP activities, the Project TDB consists of three components, each designed to store specific types of data. The Site and Engineering Properties Data Base (SEPDB) maintains technical data best stored in a tabular format. The Geographic Nodal Information Study and Evaluation System (GENISES), which is the Geographic Information System (GIS) component of the Project TDB, maintains spatial or map-like data. The Geologic and Engineering Materials Bibliography of Chemical Species (GEMBOCHS) data base maintains thermodynamic/geochemical data needed to support geochemical reaction models involving the waste package and repository geochemical environment. Each of these data bases are addressed independently within the TDB Quarterly Report.

The TDB Quarterly Report is divided into sections for each TDB component and includes appendices within each section, as appropriate. The structure of each section varies due to the differing needs of each TDB component. However, as a minimum, each section identifies technical data currently available within the respective TDB component. Other optional information included within each section has been determined by the appropriate TDB component staff to be pertinent for individuals requesting data.

The Technical Data Management System on the YMP is currently undergoing significant development and expansion that will enable it to evolve into a more efficient system to meet the needs of the Project. Future plans include a TDB Handbook, TDB Parameter Dictionary, and an Automated Technical Data Tracking (ATDT) System. The TDB Handbook will provide guidelines to assist participants in the submission of technical data to, retrieval of technical data from, and modification of previously submitted data in the TDB. The TDB Parameter Dictionary will define specific structures and formats of data to be submitted to the TDB to ensure consistency in the reporting of data, and it will identify attributes associated with the data to ensure entries in the data base are meaningful. Additionally, the TDB Parameter Dictionary will define the component of the TDB in which the data will reside. The ATDT system is an Information Management System designed to trace the development of all technical data acquired by the Project and to maintain the link between the information stored in the ATDT System and the actual records of technical data maintained by the records system.

A Project Data Catalog, identifying all technical data collected by the Project, will be prepared from the ATDT System. The TDB Quarterly Report will eventually be merged with the Project Data Catalog once all of the information about the existing technical data in the TDB has been included in the ATDT System.

Report
SNL

SEPDB QUARTERLY REPORT

APRIL - JUNE 1991

SANDIA NATIONAL LABORATORIES

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SEPDB QUARTERLY REPORT

1.0 INTRODUCTION

This Site and Engineering Properties Data Base (SEPDB) Quarterly Report summarizes the current status of the SEPDB and lists Sandia's major activities and accomplishments in the development and operation of the data base during April, May and June of 1991. The report presents the data that is currently available in the SEPDB and gives instructions for submitting and retrieving data. An example of how data should be compiled for submittal to the SEPDB, a sample data retrieval (SEPDB product), and a blank work request form are also included.

The SEPDB is being developed and operated by Sandia National Laboratories as a component of the Project Technical Data Base in support of a license application. The SEPDB provides the controlled storage and reporting of scientific and engineering data generated by site characterization, performance assessment and design activities. It primarily contains the geologic, hydrologic, and rock property data from core sample testing and field measurements, but is intended for essentially all technical data that is being acquired on the project and is best stored in tabular form.

2.0 SEPDB ACTIVITIES AND ACCOMPLISHMENTS FROM APRIL - JUNE 1991

A. The SEPDB staff started a major effort to complete data entry for all data which has been submitted but has not yet been entered. This effort resulted in a significant expansion of the data base during this quarter. The following data was entered and has been approved by the submitter, making it available for project use:

New Data Available for Project Use

- DA0001; DA0003C,D,E,G,J,L; DA004A,B,C,F,H,I,J; DA0030: Extensive data from the chemical analysis of water samples from fifteen drillholes (USGS submittals)

- DA0026: Hydraulic conductivity data from rock property analysis, UE-25a #1 core (USGS submittal)

- DA0028: X-ray analysis of selected samples and fracture fillings from USW G-4 (USGS submittal)

- DA0055: Air permeability data for tuff samples from Calico Hills and Prow Pass (SNL submittal, SAND89-2270)

B. The following data was also entered into the data base and is pending approval of the submitter:

Data Entered and Pending Approval:

- DA0010; DA0011; DA0012; DA0013; DA0014; DA0015; DA0016; DA0017; DA0019; DA0021; DA0022; DA0023; DA0025; DA0050; DA0054: Hole history data (Fenix & Scisson submittals)

- DA0018: Drill hole surface coordinates and elevations (Holmes & Narver submittal)

C. The use of SEPDB data by project participants is increasing. The following SEPDB products (data reports) were issued during this quarter:

SEPDB Products (Data Reports)

- Hard copy and tape (ASCII files) of all SEPDB tables for G. Bodvarsson (Lawrence Berkeley)

- Hydraulic conductivity and lithology data report for Paul Whitney (Battelle, PNL)

- Compressive strength data report for Steve Bauer (SNL)

- Pore saturation data report for Franz Lauffer (SNL)

D. The following data was submitted for entry into the SEPDB:

SEPDB Data Submittals

- DA0156: Manganese-oxide minerals in fractures of the Crater Flat tuff in drill core USW G-4 (LANL submittal)

- DA0059-0149: Various data from fifty three different USGS reports (USGS submittals)

E. The initial draft of the SEPDB Handbook was completed. The purpose of this handbook is to make the use of the SEPDB by all project participants as easy and straight forward as possible. It presents guidelines for determining the data that should be submitted to the SEPDB and how to submit it, how to request data, and how to modify previously submitted data if necessary. These guidelines will simplify all interactions with the SEPDB.

F. The initial version of the Internal Tracking System (ITS) application for the SEPDB was completed. The application automatically tracks recipients of SEPDB data and the exact data they received. This will allow fast notification if errors in the data are discovered at a later date.

G. The parameters stored in the SEPDB were identified and categorized. This information will be used as input to the Technical Data Base Parameter Dictionary currently being developed.

H. The development of an interface between the GENISES and SEPDB systems was started. Work is proceeding to establish the ability to transfer SEPDB ASCII files to the GENISES system where they can be integrated with the graphical data.

I. On May 16 and 17, Paula Adams participated in a working meeting with EG&G (GENISES system) to identify and resolve discrepancies in drill hole names and location data between the SEPDB and GENISES. A work plan was developed and is proceeding.

3.0 DATA CURRENTLY AVAILABLE FROM THE SEPDB

The data that is currently available from the SEPDB is detailed by nine different reports presented in Appendix A. These reports provide a comprehensive view of the current contents of the SEPDB. The information presented in each report and the corresponding page numbers are as follows:

A. Types of data currently stored in the SEPDB (pages A1-A2).

B. For each drill hole, the parameters for which data is available including the reference report (pages A3-A10).

C. For each parameter, the drill holes for which data is available including the reference report (pages A11-A17).

D. The data available that is not associated with a drill hole core sample (page A18).

E. The drill holes for which coordinates (Nevada State Plane, Central Zone) are available (pages A19-A20).

F. The drill holes for which bottom hole information (i.e. bottom hole coordinates, total depth, total vertical depth) is available (pages A21-A22).

G. The drill holes for which core information (i.e. length of cored interval, percent recovery) is available (page A23).

H. The hole history reports that have been submitted to the SEPDB from which the drill hole data has been taken (page A24).

I. A complete listing of the reference reports for the data contained in the SEPDB (pages A25-A28).

4.0 INSTRUCTIONS FOR SUBMITTING DATA TO THE SEPDB

The procedure for submitting data to the Technical Data Base is defined in project Administrative Procedure AP-5.20, "Technical Information Flow to and

from the Yucca Mountain Project Technical Data Base." Appendix A of this report and Appendix C of the Technical Data Management Plan should be used to determine whether or not data should be submitted for entry into the SEPDB. The SEPDB Administrator may also be contacted to discuss the format and scope of the data to be submitted.

5.0 INFORMATION TO INCLUDE WHEN SUBMITTING DATA

In addition to the data values for each parameter, the SEPDB tables have been structured to store important supporting information such as the location of core samples and field measurements, the test method and conditions used to generate the data, and the report in which the data is published. It is important to include this supporting information when submitting data to the SEPDB. The structures of the SEPDB tables are presented in Appendix B. These should be used as guides when compiling data for submittal to the SEPDB. The general structure is as follows:

Parameter Information: List all parameters and their associated data values. Specify the units for each parameter and report any known uncertainties in the data.

Location Information: Report all information that specifies the location of core samples or field measurements. This should include the drill hole name and coordinates, the drill hole depth, and the sample identification number.

Test Conditions: Describe the test method and list all important test conditions such as date, time, temperature, pressure, flow rate, sample size, and instrument type.

Tracking Information: If the data is published, give the reference information for the publication. Report the QA level under which the data was collected, the CRF accession number, the Local Records Center identification number, the SCP activity number, and the WBS number if known.

The SEPDB data compilation shown in Appendix C is an excellent example of how data is best compiled for submittal to the SEPDB.

6.0 INSTRUCTIONS FOR RETRIEVING DATA FROM THE SEPDB

Data is requested from the SEPDB by simply filling out a Work Request form and sending it to the SEPDB Administrator. Blank Work Request forms can be found in Appendix C of this report. Requests for data may also be made by making a telephone call to the SEPDB staff (see Section 7.0 for SEPDB contacts). In either case, the following information must be provided:

A. The requester's name, organization, address, and telephone number.

B. A description of the data that is being requested including a list of the specific parameters.

C. The desired format of the data report (a separate page showing the desired format including column headings is preferred).

No special approvals are required by Project participants to retrieve data from the SEPDB. However, non-participants must obtain approval from the Technical Data Manager at the Project Office who will then notify the SEPDB Administrator of the approved request. Note that data requesters do not have to fill out a TDIF to retrieve data from the SEPDB. The TDIF is completed by the SEPDB staff after the data request is met.

The data that is available from the SEPDB can be reported in a wide range of table structures as specified by the user. This is made possible by the flexibility of the INGRES software used by the SEPDB. In addition, the relational character of the data base enables many different types of data to be reported at specific depths for drill hole core samples and at specific surface coordinates for non-core samples. The SEPDB data report shown in Appendix C is an excellent example of the ability of the SEPDB to provide various types of data in a format that can easily be used in performance assessment and design.

7.0 SEPDB CONTACTS

The SEPDB is operated by Sandia's Technical Projects Division 6316. The primary contacts are:

Gary Tipton	SEPDB Administrator	FTS 844-3602
Rick Orzel	System Manager	FTS 844-2880
Paula Adams	Data Base Specialist	FTS 846-8178

Gary should be the first point of contact with questions on how to submit data and on whether or not data is appropriate for storage in the SEPDB. Rick should be the first contact with hardware and software questions including how to use the menu driven program currrrently being developed to interact with the SEPDB from a terminal and how other systems can be connected to the SEPDB. Paula should be contacted first when requesting data reports.

The SEPDB staff welcomes all questions, concerns, and suggestions for improvement. Feel free to contact us at any time by phone or in writing. Written correspondence should be sent to:

SEPDB Administrator
Sandia National Laboratories
Technical Projects Division 6316
P.O. Box 5800
Albuquerque, New Mexico 87185

APPENDIX A

DATA CURRENTLY STORED IN THE SEPDB

PARAMETER	DESCRIPTION
BOTTOM HOLE COORDINATES	Nevada Plane Coordinates for Bottom of Surveyed Drill Holes
BULK DENSITY	Bulk Density Values and Test Conditions
BULK MODULUS	Bulk Modulus Data and Test Conditions
COMPRESSIVE STRENGTH	Compressive Strength Data and Test Conditions
CORE INFORMATION	Core Information, Intervals and Percent Recovery
CURVE FIT	Saturation Curve-Fit Parameters and Test Conditions
DRILL HOLE COORDINATES	Drill Hole Locations, Surveys and Status
DRILL HOLE WATER CHEMISTRY	Water Chemical Constituent Values for Drill Holes
ELASTIC PROPERTIES	Elastic Properties (Poisson's Ratio & Young's Modulus)
FLOOD PREDICTIONS	Flood Predictions (100 yr, 500 yr & Regional Maximum) & Locations
GRAIN DENSITY	Grain Density Values and Test Conditions
HYDRAULIC CONDUCTIVITY	Hydraulic Conductivity Values and Test Conditions
LITHOLOGIC UNITS	Lithologic Unit Depths in Drill Hole
MATRIX POTENTIAL	Matrix Potential Data and Test Conditions
MEASURED FLOODS	Parameters for Measured Floods
MINERALOGY	Mineralogical Samples and Test Conditions
PALEOMAGNETIC	Paleomagnetic Data and Test Conditions
PERMEABILITY	Permeability and Test Conditions
PORE SATURATION	Pore Saturation and Test Conditions
PORE WATER CONTENT	Natural-state Porewater Content Percentages
POROSITY	Porosity Values and Test Conditions
PREDICTED FLOOD LOCATION	Cross Section Locations for Predicted Floods
RELATIVE HYDRAULIC CONDUCTIVITY	Relative Hydraulic Conductivity & Test Conditions
SAMPLE LOCATIONS	Location Coordinates for Surface Samples
SONIC VELOCITY	Laboratory Sonic Velocity Measurements
SPRING WATER CHEMISTRY	Water Chemical Values for Springs & Non-Drill Hole Wells
STORAGE COEFFICIENT	Storage Coefficient Values for Well Tests
STRATIGRAPHIC	Thermal/Mechanical Stratigraphic Units
THERMAL CONDUCTIVITY	Thermal Conductivity Data and Test Conditions
TRANSMISSIVITY	Transmissivity Data and Pumping Conditions

WATER LEVEL	Water Elevations and Depths, Dates of Measurements
WATER PRODUCTION	Percent Water Production in Drill Hole Intervals
WELL HYDRAULIC CONDUCTIVITY	Well Test Hydraulic Conductivity Measurements

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
J-11		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
J-12		
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
J-13		
	Bulk Density Values and Test Conditions	USGS WRIR 83-4171
	Grain Density Values and Test Conditions	USGS WRIR 83-4171
	Hydraulic Conductivity Values and Test Conditions	USGS WRIR 83-4171
	Lithologic Unit Depths in Drill Hole	USGS WRIR 83-4171
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Pore Saturation and Test Conditions	USGS WRIR 83-4171
	Natural-state Porewater Content Percentages	USGS WRIR 83-4171
	Porosity Values and Test Conditions	USGS WRIR 83-4171
	Laboratory Sonic Velocity Measurements	USGS WRIR 83-4171
	Transmissivity Data and Pumping Conditions	USGS WRIR 83-4171
	Well Test Hydraulic Conductivity Measurements	USGS WRIR 83-4171
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
		USGS WRIR 83-4171
UE- 6d		
	Water Elevations and Depths, Dates of Measurements	USGS 1543-3
	Water Chemical Constituent Values for Drill Holes	USGS 1543-3
UE-16f		
	Water Elevations and Depths, Dates of Measurements	USGS 1543-3
	Water Chemical Constituent Values for Drill Holes	USGS 1543-3
UE-17a		
	Water Chemical Constituent Values for Drill Holes	USGS 1543-4
UE-25 WT #12		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #13		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
UE-25 WT #14		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #15		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #16		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #17		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #3		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #4		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25 WT #6		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
UE-25a #1		
	Bulk Density Values and Test Conditions	SAND88-0811 USGS OFR 81-1338
	Grain Density Values and Test Conditions	SAND88-0811 USGS OFR 81-1338
	Mineralogical Samples and Test Conditions	LA-11497-MS SAND88-0882 USGS OFR 84-491
	Porosity Values and Test Conditions	SAND88-0811 USGS OFR 81-1338
	Laboratory Sonic Velocity Measurements	USGS OFR 81-1338
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
UE-25a #4		
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
UE-25a #5		
	Thermal/Mechanical Stratigraphic Units	SAND84-1076

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
UE-25a #6		
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
UE-25a #7		
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
UE-25b #1		
	Bulk Density Values and Test Conditions	USGS WRIR 84-4253
	Grain Density Values and Test Conditions	USGS WRIR 84-4253
	Hydraulic Conductivity Values and Test Conditions	USGS WRIR 84-4253
	Lithologic Unit Depths in Drill Hole	USGS WRIR 84-4253
	Mineralogical Samples and Test Conditions	LA-11497-MS
		USGS BULL-1777
	Pore Saturation and Test Conditions	USGS WRIR 84-4253
	Natural-state Porewater Content Percentages	USGS OFR 83-855
		USGS WRIR 84-4253
	Porosity Values and Test Conditions	USGS WRIR 84-4253
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Transmissivity Data and Pumping Conditions	USGS WRIR 84-4253
	Well Test Hydraulic Conductivity Measurements	USGS WRIR 84-4253
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
		USGS WRIR 84-4253
	Water Chemical Constituent Values for Drill Holes	USGS OFR 83-855
		USGS OFR 85-484
		USGS WRIR 84-4253
		USGS WRIR 84-4267
UE-25c #1		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
UE-25c #2		
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
UE-25c #3		
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
UE-25p #1		
	Lithologic Unit Depths in Drill Hole	USGS OFR 84-450
		USGS OFR 86-175
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Transmissivity Data and Pumping Conditions	USGS WRIR 84-4241
	Water Elevations and Depths, Dates of Measurements	USGS OFR 84-450
		USGS WRIR 84-4197

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
		USGS WRIR 84-4248
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
		USGS WRIR 84-4248
UE-29a #1		
	Water Elevations and Depths, Dates of Measurements	USGS OFR 84-142
	Water Chemical Constituent Values for Drill Holes	USGS OFR 84-142
UE-29a #2		
	Water Elevations and Depths, Dates of Measurements	USGS OFR 84-142
	Water Chemical Constituent Values for Drill Holes	USGS OFR 84-142
		USGS OFR 85-484
		USGS WRIR 84-4267
USW G-1		
	Bulk Density Values and Test Conditions	SAND87-2380
		SAND88-0811
		UCLR-53602
		UCLR-53645
	Saturation Curve-Fit Parameters and Test Conditions	SAND87-2380
	Grain Density Values and Test Conditions	SAND88-0811
		UCLR-53645
	Hydraulic Conductivity Values and Test Conditions	SAND87-2380
	Lithologic Unit Depths in Drill Hole	USGS OFR 81-1349
	Matrix Potential Data and Test Conditions	SAND87-2380
	Mineralogical Samples and Test Conditions	LA-11497-MS
		SAND88-0882
		USGS BULL-1777
		USGS OFR 81-1349
		USGS OFR 84-491
	Porosity Values and Test Conditions	SAND88-0811
		UCLR-53602
		UCLR-53645
	Thermal Conductivity Data and Test Conditions	SAND88-0624
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW G-2		
	Bulk Density Values and Test Conditions	SAND88-0811
	Compressive Strength Data and Test Conditions	SAND85-0703
	Elastic Properties (Poisson's Ratio & Young's Modulus)	SAND85-0703
	Grain Density Values and Test Conditions	SAND88-0811
	Lithologic Unit Depths in Drill Hole	USGS OFR 83-732
	Mineralogical Samples and Test Conditions	LA-11497-MS
		SAND88-0882
		USGS BULL-1777
		USGS OFR 83-732

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
		USGS OFR 84-491
	Porosity Values and Test Conditions	SAND88-0811
	Thermal Conductivity Data and Test Conditions	SAND88-0624
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW G-3		
	Bulk Density Values and Test Conditions	USGS OFR 84-552
	Grain Density Values and Test Conditions	USGS OFR 84-552
	Lithologic Unit Depths in Drill Hole	USGS OFR 84-491
	Mineralogical Samples and Test Conditions	USGS OFR 84-491
	Porosity Values and Test Conditions	USGS OFR 84-552
	Laboratory Sonic Velocity Measurements	USGS OFR 84-552
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW G-4		
	Bulk Density Values and Test Conditions	SAND87-2380
		SAND88-0811
		UCLR-53795
		USGS OFR 84-552
	Saturation Curve-Fit Parameters and Test Conditions	SAND87-2380
	Grain Density Values and Test Conditions	SAND88-0811
		UCLR-53795
		USGS OFR 84-552
	Hydraulic Conductivity Values and Test Conditions	SAND87-2380
	Lithologic Unit Depths in Drill Hole	USGS OFR 84-063
	Matrix Potential Data and Test Conditions	SAND87-2380
	Mineralogical Samples and Test Conditions	LA-10927-MS
		LA-11497-MS
		SAND88-0882
		USGS BULL-1777
		USGS OFR 84-789
	Porosity Values and Test Conditions	SAND88-0811
		UCLR-53795
		USGS OFR 84-552
	Laboratory Sonic Velocity Measurements	USGS OFR 84-552
	Thermal Conductivity Data and Test Conditions	SAND88-0624
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Transmissivity Data and Pumping Conditions	USGS WRIR 86-4015
	Well Test Hydraulic Conductivity Measurements	USGS WRIR 86-4015
	Water Elevations and Depths, Dates of Measurements	USGS OFR 84-063
		USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 84-063
		USGS OFR 85-484
USW GU-3		
	Bulk Density Values and Test Conditions	SAND87-2380
		SAND88-0811

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
		USGS OFR 84-552
	Saturation Curve-Fit Parameters and Test Conditions	SAND87-2380
	Grain Density Values and Test Conditions	SAND88-0811
		USGS OFR 84-552
	Hydraulic Conductivity Values and Test Conditions	SAND87-2380
	Lithologic Unit Depths in Drill Hole	USGS OFR 84-491
	Matrix Potential Data and Test Conditions	SAND87-2380
	Mineralogical Samples and Test Conditions	LA-11497-MS
		SAND88-0882
		USGS OFR 84-491
	Paleomagnetic Data and Test Conditions	USGS OFR 85-48
	Porosity Values and Test Conditions	SAND88-0811
		USGS OFR 84-552
	Laboratory Sonic Velocity Measurements	USGS OFR 84-552
	Thermal Conductivity Data and Test Conditions	SAND88-0624
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
USW H-1		
	Bulk Density Values and Test Conditions	USGS WRIR 84-4032
		USGS WRIR 84-4193
	Grain Density Values and Test Conditions	USGS WRIR 84-4032
		USGS WRIR 84-4193
	Hydraulic Conductivity Values and Test Conditions	USGS WRIR 84-4032
	Lithologic Unit Depths in Drill Hole	USGS WRIR 84-4032
	Matrix Potential Data and Test Conditions	USGS WRIR 84-4193
	Pore Saturation and Test Conditions	USGS WRIR 84-4032
	Natural-state Porewater Content Percentages	USGS WRIR 84-4032
	Porosity Values and Test Conditions	USGS WRIR 84-4032
		USGS WRIR 84-4193
	Relative Hydraulic Conductivity & Test Conditions	USGS WRIR 84-4193
	Storage Coefficient Values for Well Tests	USGS WRIR 84-4032
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Transmissivity Data and Pumping Conditions	USGS WRIR 84-4032
	Well Test Hydraulic Conductivity Measurements	USGS WRIR 84-4032
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4032
		USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS WRIR 84-4032
		USGS WRIR 84-4267
USW H-3		
	Lithologic Unit Depths in Drill Hole	USGS WRIR 84-4272
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Storage Coefficient Values for Well Tests	USGS WRIR 84-4272
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Transmissivity Data and Pumping Conditions	USGS WRIR 84-4272
	Well Test Hydraulic Conductivity Measurements	USGS WRIR 84-4272
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
USW H-4		
	Lithologic Unit Depths in Drill Hole	USGS WRIR 85-4030
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Percent Water Production in Drill Hole Intervals	USGS WRIR 85-4030
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Transmissivity Data and Pumping Conditions	USGS WRIR 85-4030
	Well Test Hydraulic Conductivity Measurements	USGS WRIR 85-4030
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
		USGS WRIR 85-4030
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
		USGS WRIR 85-4030
USW H-5		
	Lithologic Unit Depths in Drill Hole	USGS OFR 83-853
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Water Elevations and Depths, Dates of Measurements	USGS OFR 83-853
		USGS WRIR 83-4171
		USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 83-853
		USGS OFR 85-484
USW H-6		
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Thermal/Mechanical Stratigraphic Units	SAND84-1076
	Water Elevations and Depths, Dates of Measurements	USGS OFR 83-856
		USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 83-856
		USGS OFR 85-484
USW VH-1		
	Lithologic Unit Depths in Drill Hole	USGS OFR 82-457
	Water Elevations and Depths Dates of Measurements	USGS WRIR 84-4197
	Water Chemical Constituent Values for Drill Holes	USGS OFR 85-484
		USGS WRIR 84-4267
		USGS WRIR 86-4359
USW VH-2		
	Lithologic Unit Depths in Drill Hole	USGS OFR 85-475
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW WT-1		
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197

DATA CURRENTLY AVAILABLE ORGANIZED BY DRILL HOLE

HOLE	TYPE OF DATA	REFERENCE CITATION
USW WT-10		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW WT-11		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW WT-2		
	Mineralogical Samples and Test Conditions	LA-11497-MS
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
USW WT-7		
	Water Elevations and Depths, Dates of Measurements	USGS WRIR 84-4197
	Bulk Density Values and Test Conditions	SAND88-0811
	Bulk Modulus Data and Test Conditions	SAND86-1131
	Compressive Strength Data and Test Conditions	SAND86-1131
	Elastic Properties (Poisson's Ratio & Young's Modulus)	SAND86-1131
	Parameters for Measured Floods	USGS WRIR 83-4001
	Cross Section Locations for Predicted Floods	USGS WRIR 83-4001
	Flood Predictions (100 yr, 500 yr & Regional Maximum)	USGS WRIR 83-4001
	Grain Density Values and Test Conditions	SAND88-0811
	Lithologic Unit Depths in Drill Hole	SAND89-2270
	Mineralogical Samples and Test Conditions	SAND86-1131
		SAND88-0882
		USGS OFR 84-491
	Permeability and Test Conditions	SAND89-2270
	Paleomagnetic Data and Test Conditions	USGS OFR 85-48
	Porosity Values and Test Conditions	SAND88-0811
		SAND89-2270
	Location Coordinates for Surface Samples	SAND86-1131
		SAND88-0811
		SAND89-2270
		USGS OFR 84-491
		USGS OFR 85-48
	Water Chemical Values for Springs & Non-Drill Hole Wells	USGS WRIR 84-4267

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

Bulk Density Values and Test Conditions:

J-13	USGS WRIR 83-4171
UE-25a #1	SAND88-0811
	USGS OFR 81-1338
E-25b #1	USGS WRIR 84-4253
USW G-1	SAND87-2380
	SAND88-0811
	UCLR-53602
	UCLR-53645
USW G-2	SAND88-0811
USW G-3	USGS OFR 84-552
USW G-4	SAND87-2380
	SAND88-0811
	UCLR-53795
	USGS OFR 84-552
USW GU-3	SAND87-2380
	SAND88-0811
	USGS OFR 84-552
USW H-1	USGS WRIR 84-4032
	USGS WRIR 84-4193
non-core samples	SAND88-0811

Bulk Modulus Data and Test Conditions:

non-core samples	SAND86-1131

Compressive Strength Data and Test Conditions:

USW G-2	SAND85-0703
non-core samples	SAND86-1131

Saturation Curve-Fit Parameters and Test Conditions:

USW G-1	SAND87-2380
USW G-4	SAND87-2380
USW GU-3	SAND87-2380

Elastic Properties (Poisson's Ratio & Young's Modulus):

USW G-2	SAND85-0703
non-core samples	SAND86-1131

Parameters for Measured Floods:

non-core samples	USGS WRIR 83-4001

Cross Section Locations for Predicted Floods.

non-core samples	USGS WRIR 83-4001

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

Flood Predictions (100 yr, 500 yr & Regional Maximum) & Locations:

non-core samples	USGS WRIR 83-4001

Grain Density Values and Test Conditions:

J-13	USGS WRIR 83-4171
UE-25a #1	SAND88-0811
	USGS OFR 81-1338
UE-25b #1	USGS WRIR 84-4253
USW G-1	SAND88-0811
	UCLR-53645
USW G-2	SAND88-0811
USW G-3	USGS OFR 84-552
USW G-4	SAND88-0811
	UCLR-53795
	USGS OFR 84-552
USW GU-3	SAND88-0811
	USGS OFR 84-552
USW H-1	USGS WRIR 84-4032
	USGS WRIR 84-4193
non-core samples	SAND88-0811

Hydraulic Conductivity Values and Test Conditions:

J-13	USGS WRIR 83-4171
UE-25b #1	USGS WRIR 84-4253
USW G-1	SAND87-2380
USW G-4	SAND87-2380
USW GU-3	SAND87-2380
USW H-1	USGS WRIR 84-4032

Lithologic Unit Depths in Drill Hole:

J-13	USGS WRIR 83-4171
UE-25b #1	USGS WRIR 84-4253
UE-25p #1	USGS OFR 84-450
	USGS OFR 86-175
USW G-1	USGS OFR 81-1349
USW G-2	USGS OFR 83-732
USW G-3	USGS OFR 84-491
USW G-4	USGS OFR 84-063
USW GU-3	USGS OFR 84-491
USW H-1	USGS WRIR 84-4032
USW H-3	USGS WRIR 84-4272
USW H-4	USGS WRIR 85-4030
USW H-5	USGS OFR 83-853
USW VH-1	USGS OFR 82-457
USW VH-2	USGS OFR 85-475
non-core samples	SAND89-2270

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

Matrix Potential Data and Test Conditions:

USW G-1	SAND87-2380
USW G-4	SAND87-2380
USW GU-3	SAND87-2380
USW H-1	USGS WRIR 84-4193

Mineralogical Samples and Test Conditions:

J-12	LA-11497-MS
J-13	LA-11497-MS
UE-25a #1	LA-11497-MS
	SAND88-0882
	USGS OFR 84-491
UE-25b #1	LA-11497-MS
	USGS BULL-1777
UE-25p #1	LA-11497-MS
USW G-1	LA-11497-MS
	SAND88-0882
	USGS BULL-1777
	USGS OFR 81-1349
	USGS OFR 84-491
USW G-2	LA-11497-MS
	SAND88-0882
	USGS BULL-1777
	USGS OFR 83-732
	USGS OFR 84-491
USW G-3	USGS OFR 84-491
USW G-4	LA-10927-MS
	LA-11497-MS
	SAND88-0882
	USGS BULL-1777
	USGS OFR 84-789
USW GU-3	LA-11497-MS
	SAND88-0882
	USGS OFR 84-491
USW H-3	LA-11497-MS
USW H-4	LA-11497-MS
USW H-5	LA-11497-MS
USW H-6	LA-11497-MS
USW WT-1	LA-11497-MS
USW WT-2	LA-11497-MS
non-core samples	SAND86-1131
	SAND88-0882
	USGS OFR 84-491

Permeability and Test Conditions:

non-core samples	SAND89-2270

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

Percent Water Production in Drill Hole Intervals:

USW H-4	USGS WRIR 85-4030

Paleomagnetic Data and Test Conditions:

USW GU-3	USGS OFR 85-48
non-core samples	USGS OFR 85-48

Pore Saturation and Test Conditions:

J-13	USGS WRIR 83-4171
UE-25b #1	USGS WRIR 84-4253
USW H-1	USGS WRIR 84-4032

Natural-state Porewater Content Percentages:

J-13	USGS WRIR 83-4171
UE-25b #1	USGS OFR 83-855
	USGS WRIR 84-4253
USW H-1	USGS WRIR 84-4032

Porosity Values and Test Conditions:

J-13	USGS WRIR 83-4171
UE-25a #1	SAND88-0811
	USGS OFR 81-1 38
UE-25b #1	USGS WRIR 84-4253
USW G-1	SAND88-0811
	UCLR-53602
	UCLR-53645
USW G-2	SAND88-0811
USW G-3	USGS OFR 84-552
USW G-4	SAND88-0811
	UCLR-53793
	USGS OFR 84-552
USW GU-3	SAND88-0811
	USGS OFR 84-552
USW H-1	USGS WRIR 84-4032
	USGS WRIR 84-4193
non-core samples	SAND88-0811
	SAND89-2270

Relative Hydraulic Conductivity & Test Conditions.

USW H-1	USGS WRIR 84-4193

Location Coordinates for Surface Samples:

non-core samples	SAND86-1131
	SAND88-0811
	SAND89-2270
	USGS OFR 84-491

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

	USGS OFR 85-48

Laboratory Sonic Velocity Measurements:

J-13	USGS WRIR 83-4171
UE-25a #1	USGS OFR 81-1338
USW G-3	USGS OFR 84-552
USW G-4	USGS OFR 84-552
USW GU-3	USGS OFR 84-552

Water Chemical Values for Springs & Non-Drill Hole Wells:

non-core samples	USGS WRIR 84-4267

Storage Coefficient Values for Well Tests:

USW H-1	USGS WRIR 84-4032
USW H-3	USGS WRIR 84-4272

Thermal Conductivity Data and Test Conditions:

USW G-1	SAND88-0624
USW G-2	SAND88-0624
USW G-4	SAND88-0624
USW GU-3	SAND88-0624

Thermal/Mechanical Stratigraphic Units:

UE-25a #1	SAND84-1076
UE-25a #4	SAND84-1076
UE-25a #5	SAND84-1076
UE-25a #6	SAND84-1076
UE-25a #7	SAND84-1076
UE-25b #1	SAND84-1076
USW G-1	SAND84-1076
USW G-2	SAND84-1076
USW G-4	SAND84-1076
USW GU-3	SAND84-1076
USW H-1	SAND84-1076
USW H-3	SAND84-1076
USW H-4	SAND84-1076
USW H-5	SAND84-1076
USW H-6	SAND84-1076

Transmissivity Data and Pumping Conditions:

J-13	USGS WRIR 83-4171
UE-25b #1	USGS WRIR 84-4253
UE-25p #1	USGS WRIR 84-4248
USW G-4	USGS WRIR 86-4015
USW H-1	USGS WRIR 84-4032
USW H-3	USGS WRIR 84-4272
USW H-4	USGS WRIR 85-4030

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

Well Test Hydraulic Conductivity Measurements:

J-1[illegible]	USGS WRIR 83-4171
UE-25b #1	USGS WRIR 84-4253
USW G-4	USGS WRIR 86-4015
USW H-1	USGS WRIR 84-4032
USW H-3	USGS WRIR 84-4272
USW H-4	USGS WRIR 85-4030

Water Elevations and Depths, Dates of Measurement :

J-11	USGS WRIR 84-4197
J-12	USGS WRIR 84-4197
J-13	USGS WRIR 84-4197
UE-16d	USGS 1543-3
UE-16f	USGS 1543-3
UE-25 WT #12	USGS WRIR 84-4197
UE-25 WT #13	USGS WRIR 84-4197
UE-25 WT #14	USGS WRIR 84 4197
UE-25 WT #15	USGS WRIR 84-4197
UE-25 WT #16	USG WRIR 84-4197
UE-25 WT #17	USG RIR 84-4197
UE-25 WT #3	USGS WRIR 84-4197
UE-25 WT #4	USGS WRIR 84-4197
UE-25 WT #o	USGS WRIR 84-4197
UE-25b #1	USGS WRIR 84-4197
	USGS WRIR 84-4253
UE-25c #1	USGS WRIR 84-4197
UE-25p #1	USGS OFR 84-450
	USGS WRIR 84-4197
	USGS WRIR 84-4248
UE-29a #1	USGS OFR -142
UE-29a #2	USGS OF -142
USW G-1	USGS WR 4-4197
USW G-2	USGS WR. 34-4197
USW G-3	USGS WRIR 84-4197
USW G-4	USGS OFR 84-063
	USGS WRIR 84-4197
USW H-1	USGS WRIR 84-4032
	USGS WRIR 84-4197
USW H-3	USGS WRIR 84-4197
USW H-4	USGS WRIR 84-4197
	USGS WRIR 85-4030
USW H-5	USGS OFR 83-853
	USGS WRIR 83-4171
	USGS WRIR 84-4197
USW H-6	USGS OFR 83-856
	USGS WRIR 84-4197
USW VH-1	USGS WRIR 84-4197
USW VH-2	USGS WRIR 84-4197
USW WT-1	USGS WRIR 84-4197
USW WT-10	USGS WRIR 84-4197
USW WT-11	USGS WRIR 84-4197

DATA CURRENTLY AVAILABLE SEPDB ORGANIZED BY PARAMETER

USW WT-2	USGS WRIR 84-4197
USW WT-7	USGS WRIR 84-4197

Water Chemical Constituent Values for Drill Holes:

J-12	USGS OFR 85-484
J-13	USGS OFR 85-484
	USGS WRIR 83-4171
UE-16d	USGS 1543-3
UE-16f	USGS 1543-3
UE-17a	USGS 1543-4
UE-25b #1	USGS OFR 83-855
	USGS OFR 85-484
	USGS WRIR 84-4253
	USGS WRIR 84-4267
UE-25c #1	USGS OFR 85-484
UE-25c #2	USGS OFR 85-484
UE-25c #3	USGS OFR 85-484
UE-25p #1	USGS OFR 85-484
	USGS WRIR 84-4248
UE-29a #1	USGS OFR 84-142
UE-29a #2	USGS OFR 84-142
	USGS OFR 85-484
	USGS WRIR 84-4267
USW G-4	USGS OFR 84-063
	USGS OFR 85-484
USW H-1	USGS WRIR 84-4032
	USGS WRIR 84-4267
USW H-3	USGS OFR 85-484
USW H-4	USGS OFR 85-484
	USGS WRIR 85-4030
USW H-5	USGS OFR 83-853
	USGS OFR 85-484
USW H-6	USGS OFR 83-856
	USGS OFR 85-484
USW VH-1	USGS OFR 85-484
	USGS WRIR 84-4267
	USGS WRIR 86-4359

TYPE OF DATA	REFERENCE CITATION
Bulk Densi Values and Test Conditions	SAND88-0811
Bulk Modul Data and Test Conditions	SAND86-1131
Compressive Strength Data and Test Conditions	SAND86-1131
Elastic Properties (Poisson's Ratio & Young's Modulus)	SAND86-1131
Parameters for Measured Floods	USGS WRIR 83-4001
Cross Section Locations for Predicted Floods	USGS WRIR 83-4001
Flood Predictions (100 yr, 500 yr & Regional Maximum) & Locations	USGS WRIR 83-4001
Grain Density Values and Test Conditions	SAND88-0811
Lithologic Unit Depths in Drill Hole	SAND89-2270
Mineralogical Samples and Test Conditions	SAND86-1131
	SAND88-0882
	USGS OFR 84-491
Permeability and Test Conditions	SAND89-2270
Paleomagnetic Data and Test Conditions	USGS OFR 85-48
Porosity Values and Test Conditions	SAND88-0811
	SAND89-2270
Location Coordinates for Surface Samples	SAND86-1131
	SAND88-0811
	SAND89-2270
	USGS OFR 84-491
	USGS OFR 85-48
Water Chemical Values for Springs & Non-Drill Hole Wells	USGS WRIR 84-4267

DRILL HOLES FOR WHICH COORDINATES ARE AVAILABLE

USW Holes	UE Holes	Seismic Holes	Other Holes
* USW ES-1	UE-16d	U-25 Seismic #1	J-11
* USW ES-2	UE-16f	U-25 Seismic #10	J-12
USW G-1	UE-17a	U-25 Seismic #11	J-13
USW G-2	* UE-25 G-5	U-25 Seismic #12	PS CAROLYN
USW G-3	UE-25 RF #1	U-25 Seismic #13	PS SANDY
USW G-4	UE-25 RF #10	U-25 Seismic #14	* Test Hole #1
USW GA-1	UE-25 RF #11	U-25 Seismic #15	* Test Hole #10
USW GU-3	UE-25 RF #2	U-25 Seismic #16	* Test Hole #11
* USW GX	UE-25 RF #3	U-25 Seismic #17	* Test Hole #12
* USW GY	UE-25 RF #3B	U-25 Seismic #18	* Test Hole #13
USW H-1	UE-25 RF #4	U-25 Seismic #19	* Test Hole #14
USW H-3	UE-25 RF #5	U-25 Seismic #2	* Test Hole #15
USW H-4	* UE-25 RF #6	U-25 Seismic #20	* Test Hole #2
USW H-5	UE-25 RF #7	U-25 Seismic #21	* Test Hole #3
USW H-6	UE-25 RF #7A	U-25 Seismic #22	* Test Hole #4
* USW H-WEST	UE-25 RF #8	U-25 Seismic #23	* Test Hole #5
USW SD 5A	UE-25 RF #9	U-25 Seismic #24	* Test Hole #6
USW SD 5B	UE-25 TC #1	U-25 Seismic #3	* Test Hole #7
USW UZ-1	UE-25 TC #2	U-25 Seismic #4	* Test Hole #8
USW UZ-13	UE-25 TC #3	U-25 Seismic #5	* Test Pit #1
* USW UZ-2	UE-25 TC #4	U-25 Seismic #6	* Test Pit #2
* USW UZ-3	UE-25 TC1 #1	U-25 Seismic #7	* Test Pit #3
* USW UZ-4	UE-25 TC1 #2	U-25 Seismic #8	* Test Pit #6
* USW UZ-5	UE-25 TC1 #3	U-25 Seismic #9	
USW UZ-6	UE-25 TC1 #4	U-26 Seismic #1	
* USW UZ-6a	UE-25 UZ #4	U-29 Seismic #1	
USW UZ-6s	UE-25 UZ #5	U-30 Seismic #1	
USW UZ-7	UE-25 UZN #1	U-30 Seismic #2	
USW UZ-8	UE-25 UZN #10	U-5 Seismic #1	
* USW UZ-N1	UE-25 UZN #12	U-5 Seismic #2	
USW UZ-N24	UE-25 UZN #13	US-25 Seismic #1	
USW UZ-N25	UE-25 UZN #14	US-25 Seismic #10	
USW UZ-N26	UE-25 UZN #18	US-25 Seismic #11	
* USW UZ-N3	UE-25 UZN #19	US-25 Seismic #12	
USW UZ-N40	UE-25 UZN #2	US-25 Seismic #13	
USW UZ-N41	UE-25 UZN #20	US-25 Seismic #14	
USW UZ-N42	UE-25 UZN #21	US-25 Seismic #15	
USW UZ-N43	UE-25 UZN #22	US-25 Seismic #16	
USW UZ-N44	UE-25 UZN #23	US-25 Seismic #17	
USW UZ-N45	UE-25 UZN #28	US-25 Seismic #18	
USW UZ-N46	UE-25 UZN #29	US-25 Seismic #19	
USW UZ-N47	UE-25 UZN #3	US-25 Seismic #2	
USW UZ-N48	UE-25 UZN #30	US-25 Seismic #20	
USW UZ-N49	UE-25 UZN #4	US-25 Seismic #21	
USW UZ-N50	UE-25 UZN #5	US-25 Seismic #3	
USW UZ-N51	UE-25 UZN #56	US-25 Seismic #4	
USW UZ-N52	UE-25 UZN #6	US-25 Seismic #5	
USW UZ-N65	UE-25 UZN #60	US-25 Seismic #6	
USW UZ-N66	UE-25 UZN #7	US-25 Seismic #7	

* Layout Drill-hole

DRILL HOLES FOR WHICH COORDINATES ARE AVAILABLE

USW Holes	UE Holes	Seismic Holes	Other Holes
USW UZ-N67	UE-25 UZN #8	US-25 Seismic #8	
USW UZ-N68	UE-25 UZN #85	US-25 Seismic #9	
USW UZ-N69	UE-25 UZN #9		
USW UZ-N70	UE-25 UZN #97		
USW UZ-N71	UE-25 UZNC #1		
USW UZ-N72	UE-25 UZNC #2		
USW UZ-N73	UE-25 WT #12		
USW UZ-N74	UE-25 WT #13		
USW UZ-N75	UE-25 WT #14		
USW UZ-N76	UE-25 WT #15		
USW UZ-N77	UE-25 WT #16		
USW UZ-N78	UE-25 WT #17		
USW UZ-N79	UE-25 WT #18		
USW UZ-N80	* UE-25 WT #19		
USW UZ-N81	* UE-25 WT #20		
USW UZ-N82	UE-25 WT #3		
USW UZ-N83	UE-25 WT #4		
USW UZ-N84	UE-25 WT #5		
USW UZ-N86	UE-25 WT #6		
USW UZ-N87	UE-25a #1		
USW UZ-N88	* UE-25a #2		
USW UZ-N89	UE-25a #3		
USW UZ-N90	UE-25a #4		
USW UZ-N93	UE-25a #5		
USW UZ-N94	UE-25a #6		
USW UZ-N95	UE-25a #7		
USW UZ-N96	UE-25b #1		
USW UZ-N98	* UE-25b #2		
* USW UZ4N-2	UE-25c #1		
* USW UZ4N-4	UE-25c #2		
* USW UZ4N-5	UE-25c #3		
USW VH-1	UE-25h #1		
USW VH-2	UE-25p #1		
* USW VH-3	* UE-25pa #1A		
USW WT-1	* UE-25pa #1B		
USW WT-10	UE-29 UZN #91		
USW WT-11	UE-29 UZN #92		
USW WT-2	UE-29a #1		
* USW WT-21	UE-29a #2		
* USW WT-22			
USW WT-7			
* USW WT-8			
* USW WT-9			

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* Layout drill-hole

DRILL HOLES FOR WHICH BOTTOM HOLE INFORMATION IS AVAILABLE
(Bottom Hole Coordinates, Depth)

USW Holes	UE Holes	Seismic Holes	Other Holes
USW G-1	UE-16d	U-25 Seismic #1	
USW G-2	UE-16f	U-25 Seismic #10	
USW G-3	UE-17a	U-25 Seismic #11	
USW G-4	UE-25 RF #1	U-25 Seismic #12	
USW GA-1	UE-25 RF #10	U-25 Seismic #13	
USW GU-3	UE-25 RF #11	U-25 Seismic #14	
USW H-1	UE-25 RF #2	U-25 Seismic #15	
USW H-3	UE-25 RF #3	U-25 Seismic #16	
USW H-4	UE-25 RF #3B	U-25 Seismic #17	
USW H-5	UE-25 RF #4	U-25 Seismic #18	
USW H-6	UE-25 RF #5	U-25 Seismic #19	
USW UZ-1	UE-25 RF #7	U-25 Seismic #2	
USW UZ-13	UE-25 RF #7A	U-25 Seismic #20	
USW UZ-6	UE-25 RF #8	U-25 Seismic #21	
USW UZ-6a	UE-25 RF #9	U-25 Seismic #22	
USW UZ-7	UE-25 UZ #4	U-25 Seismic #23	
USW UZ-8	UE-25 UZ #5	U-25 Seismic #24	
USW UZ-N24	UE-25 UZN #1	U-25 Seismic #3	
USW UZ-N25	UE-25 UZN #10	U-25 Seismic #4	
USW UZ-N26	UE-25 UZN #12	U-25 Seismic #5	
USW UZ-N40	UE-25 UZN #13	U-25 Seismic #6	
USW UZ-N41	UE-25 UZN #14	U-25 Seismic #7	
USW UZ-N42	UE-25 UZN #18	U-25 Seismic #8	
USW UZ-N43	UE-25 UZN #19	U-25 Seismic #9	
USW UZ-N44	UE-25 UZN #2	U-26 Seismic #1	
USW UZ-N45	UE-25 UZN #20	U-29 Seismic #1	
USW UZ-N46	UE-25 UZN #21	U-30 Seismic #1	
USW UZ-N47	UE-25 UZN #22	U-30 Seismic #2	
USW UZ-N48	UE-25 UZN #23	U-5 Seismic #1	
USW UZ-N49	UE-25 UZN #28	U-5 Seismic #2	
USW UZ-N50	UE-25 UZN #29	US-25 Seismic #1	
USW UZ-N51	UE-25 UZN #3	US-25 Seismic #10	
USW UZ-N52	UE-25 UZN #30	US-25 Seismic #11	
USW UZ-N65	UE-25 UZN #4	US-25 Seismic #12	
USW UZ-N66	UE-25 UZN #5	US-25 Seismic #13	
USW UZ-N67	UE-25 UZN #56	US-25 Seismic #14	
USW UZ-N68	UE-25 UZN #6	US-25 Seismic #15	
USW UZ-N69	UE-25 UZN #60	US-25 Seismic #16	
USW UZ-N70	UE-25 UZN #7	US-25 Seismic #17	
USW UZ-N71	UE-25 UZN #8	US-25 Seismic #18	
USW UZ-N72	UE-25 UZN #85	US-25 Seismic #19	
USW UZ-N73	UE-25 UZN #9	US-25 Seismic #2	
USW UZ-N74	UE-25 UZN #97	US-25 Seismic #20	
USW UZ-N75	UE-25 UZNC #1	US-25 Seismic #21	
USW UZ-N76	UE-25 UZNC #2	US-25 Seismic #3	
USW UZ-N77	UE-25 WT #12	US-25 Seismic #4	
USW UZ-N78	UE-25 WT #13	US-25 Seismic #5	
USW UZ-N79	UE-25 WT #14	US-25 Seismic #6	
USW UZ-N80	UE-25 WT #15	US-25 Seismic #7	
USW UZ-N81	UE-25 WT #16	US-25 Seismic #8	

(Bottom Hole Coordinates, Depth)

USW Holes	UE Holes	Seismic Holes	Other Holes
USW UZ-N[illegible]	UE-25 WT #17	US-25 Seismic #9	
USW UZ-N8[illegible]	UE-25 WT #18		
USW UZ-N84	[illegible] #3		
USW UZ-N86	[illegible] #4		
USW UZ-N87	UE [illegible] #5		
USW UZ-N88	UE-25 WT #6		
USW UZ-N89	UE-25a #1		
USW UZ-N90	UE-25a #3		
USW UZ-N9[illegible]	UE-25a #4		
USW UZ-N94	UE-25a #5		
USW UZ-N95	UE-25a #6		
USW UZ-N96	UE-25a #7		
USW UZ-N98	UE-25b #1		
USW VH-1	UE-25c #1		
USW VH-2	UE-25c #2		
USW WT-1	UE-25c #3		
USW WT-10	UE-25h #1		
USW WT-11	UE-25p #1		
USW WT-2	UE-29 UZN #91		
USW WT-7	UE-29 UZN #92		
	UE-29a #1		
	UE-29a #2		

DRILL HOLES FOR WHICH CORE INFORMATION IS AVAILABLE

(CORE INTERVALS, PERCENT AND RECOVERY DATA)

USW Holes	UE Holes	Seismic Holes	Other Holes
USW G-1	UE-25 RF #1		
USW G-2	UE-25 RF #10		
USW G-3	UE-25 RF #11		
USW G-4	UE-25 RF #2		
USW GA-1	UE-25 RF #3		
USW GU-3	UE-25 RF #3B		
USW H-1	UE-25 RF #4		
USW H-3	UE-25 RF #5		
USW H-4	UE-25 RF #7		
USW H-5	UE-25 RF #7A		
USW H-6	UE-25 RF #8		
USW UZ-1	UE-25 RF #9		
USW UZ-13	UE-25 UZ #4		
USW UZ-6	UE-25 UZ #5		
USW UZ-6s	UE-25 UZN #1		
USW UZ-7	UE-25 UZN #10		
USW UZ-8	UE-25 UZN #19		
USW UZ-N24	UE-25 UZN #21		
USW UZ-N25	UE-25 UZN #22		
USW UZ-N26	UE-25 UZN #23		
USW UZ-N40	UE-25 UZN #28		
USW UZ-N41	UE-25 UZN #29		
USW UZ-N42	UE-25 UZN #30		
USW UZ-N43	UE-25 UZN #85		
USW UZ-N44	UE-25 UZN #97		
USW UZ-N45	UE-25 WT #12		
USW UZ-N46	UE-25 WT #13		
USW UZ-N47	UE-25 WT #14		
USW UZ-N48	UE-25 WT #15		
USW UZ-N49	UE-25 WT #16		
USW UZ-N70	UE-25 WT #18		
USW UZ-N74	UE-25 WT #3		
USW UZ-N75	UE-25 WT #4		
USW UZ-N90	UE-25 WT #6		
USW UZ-N98	UE-25a #4		
USW VH-1	UE-25a #5		
USW VH-2	UE-25a #6		
USW WT-1	UE-25a #7		
USW WT-10	UE-25b #1		
USW WT-11	UE-25c #1		
USW WT-2	UE-25c #2		
USW WT-7	UE-25c #3		
	UE-25h #1		
	UE-25p #1		
	UE-29 UZN #91		
	UE-29 UZN #92		
	UE-29a #1		
	UE-29a #2		

HOLE HISTORIES SUBMITTED TO THE SEPDB

NNWSI Hole Histories UE-25 WT #3, UE-25 WT #4, UE-25 WT #5, UE-25 WT #6, UE-25 WT #12, UE-25 WT #13, UE-25 WT #14, UE-25 WT #15, UE-25 WT #16, UE 25 WT #17, UE-25 WT #18, USW WT-1, USW WT-2, USW WT-7, USW WT-10, USW WT-11, DOE/NV/10322-10

NNWSI Hole Histories UE-25 RF #1, UE-25 RF #2, UE-25 RF #3, UE-25 RF #3B, UE-25 RF #4, UE-25 RF #5, UE-25 RF #7, UE-25 RF #7A, UE-25 RF #8, UE-25 RF #9, UE-25 RF #10, UE-25 RF #11, DOE/NV/10322-11

NNWSI Hole Histories UE-29a #1, UE-29a #2, DOE/NV/10322-12

NNWSI Hole History UE-25b #1, DOE/NV/10322-13

NNWSI Hole Histories UE-25c #1, UE-25c #2, UE-25c #3, DOE/NV/10322-14

NNWSI Hole History UE-25h #1, DOE/NV/10322-15

NNWSI Hole History UE-25p #1, DOE/NV/10322-16

NNWSI Hole Histories USW VH-1, USW VH-2, DOE/NV/10322-17

NNWSI Hole Histories USW H-1, USW H-3, USW H-4, USW H-5, USW H 6, DOE/NV/10322-18

NNWSI Hole Histories USW G-1, USW G-2, USW G-3, USW G-4, USW GA-1, USW GU-3, DOE/NV/10322-19

NNWSI Hole Histories USW UZ-1, UE-25 UZ#4, UE-25 UZ #5, USW UZ-6, USW US-6s, USW UZ-7, USW UZ-8, USW UZ-13, DOE/NV/10322-20

NNWSI Hole Histories, Unsaturated Zone - Neutron Holes, 76 Boreholes drilled between May 1984 and February 1986, DOE/NV/10322-21

NNWSI 51 Seismic Hole Histories, DOE/NV/10322-25

NNWSI Hole Histories UE-25a #1, UE-25a #3, UE-25a #4, UE-25a #5, UE-25a #6, UE-25a#7, DOE/NV/10322-9

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APPENDIX F

BULK DENSITY

TABLE DESCRIPTION: Bulk Density Values and Test Conditions

PARAMETERS
- Bulk density value for the sample
- Unit of measure for bulk density data (g/cm**3)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Sample mass and units of measure of sample tested
- Saturation state of sample during test

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

BULK MODULUS

TABLE DESCRIPTION: Bulk Modulus Data and Test Conditions

PARAMETERS
- Numerical value for bulk modulus
- Unit of measure for bulk modulus data (GPa, ...)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample length and units of measure of sample tested
- Confining pressure of sample during test
- Sample diameter and units of measure of sample tested
- Drainage condition of sample during test
- Pore pressure conditions of sample during test
- Saturation state of sample during test
- Strain rate during test (per sec,...)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

BOTTOM HOLE COORDINATES

TABLE DESCRIPTION: Nevada Plane Coordinates for Bottom of Surveyed Drill Holes

PARAMETERS

- Total depth of hole in feet
- Total vertical depth of hole in feet (will be <= total depth)

LOCATION INFORMATION

- Nevada state-plane coordinates for bottom of hole or sample (measured in feet)
- Nevada state-plane coordinates for bottom of hole or sample (measured in feet)

TEST CONDITIONS

- Date of survey
- Bottom hole survey type

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document

COMPRESSIVE STRENGTH

TABLE DESCRIPTION: Compressive Strength Data and Test Conditions

PARAMETERS
- Numerical value for compressive strength
- Unit of measure for compressive strength data (MPa,)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Confining pressure of sample during test
- Pore pressure conditions of sample during test
- Drainage condition of sample during test
- Axial strain at which sample failed
- Unit of measure for axial strain data (milli, ...)
- Strain rate during test (per sec,...)
- Saturation state of sample during test

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

CORE INFORMATION

TABLE DESCRIPTION: Core Information, Intervals and Percent Recovery

PARAMETERS
- Length of cored interval
- Units for cored, recovered, and interval fields
- Percent of recovered core to cored length (%)
- Length of actual recovery of core in interval

LOCATION INFORMATION
- Drill hole name for the data
- Location of top of cored interval (measured in feet)
- Location of bottom of core interval (measured in feet)

TEST CONDITIONS
- Identification number for section of core

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

CURVE FIT

TABLE DESCRIPTION: Saturation Curve-Fit Parameters and Test Conditions

PARAMETERS
- van Genuchten curve-fit parameter, alpha
- Unit of measure for alpha data (per meter, ...)
- Standard error for alpha
- van Genuchten curve-fit parameter, beta
- Standard error for beta
- Residual saturation of sample
- Standard error for residual saturation

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Number of points in sample
- Analysis method used to determine parameter value

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

ELASTIC PROPERTIES

TABLE DESCRIPTION: Elastic Properties (Poisson's Ratio & Young's Modulus)

PARAMETERS
- Poisson's ratio for the sample (no units)
- Numerical value for Young's modulus
- Unit of measure for Youngs Modulus data (GPa, lb/sq ft, ..)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Confining pressure of sample during test
- Pore pressure conditions of sample during test
- Drainage condition of sample during test
- Axial strain at which sample failed
- Unit of measure for axial strain data (/sec)
- Strain rate during test (per sec,...)
- Saturation state of sample during test

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

MEASURED FLOODS

TABLE DESCRIPTION: Parameters for Measured Floods

PARAMETERS
- Maximum discharge of water
- Unit of measure for maximum discharge data (ex. cfs for cubic feet per second)

LOCATION INFORMATION
- Location of flood event measurement
- Latitude of x_section (ex. 36 deg 3 min)
- Longitude of x_section (ex. 116 deg 24 min)

TEST CONDITIONS
- Date of actual flood event
- Range in altitude of drainage basin, usually the feet above sea level (ex. 3000 - 6080 ft)
- Drainage basin area above location
- Unit of measure for drainarea (ex. mi**2 for square miles)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

FLOOD PREDICTIONS

TABLE DESCRIPTION: Flood Predictions (100 yr, 500 yr & Regional Maximum) & Locations

PARAMETERS
- Estimated peak discharge
- Unit of measure for estimated peak discharge data (ex. cfs for cubic feet per second)
- Mean velocity of flood event (ex. 7.2 ft/sec

LOCATION INFORMATION
- Unique name for each cross-section location
- Name of river bed or wash
- Latitude of x_section (ex. 36 deg 3 min)
- Longitude of x_section (ex. 116 deg 24 min)
- Mean elevation of contributing drainage basin

TEST CONDITIONS
- Type of flood (100 yr, 500 yr, regional max, ...)
- Cross-sectional area below water surface (ex. 11,000 sq. ft)
- Cross-sectional distance between channel banks at water surface (ex. 1,530 ft)
- Vertical distance from water surface to deepest point in cross-section (ex. 4.1 ft)
- Contributing drainage basin area above cross-section (ex. 256 mi**2 for square miles)
- Analysis method for calculating predictions (ex. fortymile wash study, statewide relations, SCS method, 482 x (drainarea**0.565), 2200 x (drainarea**0.571), Crippen & Bue boundary curve, ...)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
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GRAIN DENSITY

TABLE DESCRIPTION: Grain Density Values and Test Conditions

PARAMETERS
- Grain Density value for the sample
- Unit of measure for grain density data (g/cm**3)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Sample mass and units of measure of sample tested

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

DRILL HOLE COORDINATES

TABLE DESCRIPTION: Drill Hole Locations, Surveys and Status

LOCATION INFORMATION
- Drill hole name for the data
- Nevada state-plane coordinates for top of hole (measured in feet)
- Nevada state-plane coordinates for top of hole (measured in feet)
- Elevation above sea level of drill-hole
- Elevation at top of casing (measured in feet)

TEST CONDITIONS
- Date of survey
- Status of drillhole's construction

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document

HYDRAULIC CONDUCTIVITY

TABLE DESCRIPTION: Hydraulic Conductivity Values and Test Conditions

PARAMETERS
- Hydraulic Conductivity for the sample
- Unit of measure for hydraulic conductivity data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test id if multiple tests on the same interval or sample were taken
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Direction of measurement (horizontal, vertical)
- Sample pressure and units of measure during test
- Confining pressure of sample during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

LITHOLOGIC UNITS

TABLE DESCRIPTION: Lithologic Unit Depths in Drill Hole

PARAMETERS

- Stratigraphic unit name or rock type with the name of the stratigraphic unit above it for the interval described (ex. Bedded Tuff below Prow Pass Member)
- Depth in hole to top of lithologic-unit interval
- Depth in hole to bottom of lithologic-unit interval
- Unit of measure for the interval (ft or m)

LOCATION INFORMATION

- Drill hole name for the data
- Sample identification number

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

MATRIX POTENTIAL

TABLE DESCRIPTION: Matrix Potential Data and Test Conditions

PARAMETERS
- Matric Potential Value for the sample
- Unit of measure for matric potential data
- Range of the amount, such as >, <, trace or interval top, if amount is given as a range of values, for the matricpot value

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Sample temperature and units of measure during test
- Test number of multiple tests on the same interval or sample
- Sample pressure and units of measure during test
- Testing method used to determine parameter value
- Quantity of water present in the voids
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Unit of measure for quantity of water present in voids - (d for dimensionless)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Mineralogical Samples and Test Conditions

PARAMETERS
- Name of the mineral, oxide or constituent reported
- Numerical amount of the constituent
- Unit that constituent is reported in (%)
- Uncertainty in reported data value

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole to top of mineralogy unit interval
- Depth in hole to bottom of mineralogy unit interval
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Type of analysis
- Cross-reference to the comments in the mineralsmp table
- Testing method used to determine parameter value
- Type of material tested (mineral, whole rock, ...)
- Comments on material or various tests

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

PERMEABILITY

TABLE DESCRIPTION: Permeability and Test Conditions

PARAMETERS
- Permeability of the sample
- Unit of measure for permeability data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test id if multiple tests on the same interval or sample were taken
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Direction of measurement (horizontal, vertical)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
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- Specifies location of reference in participant's data archive (PDA)

WATER PRODUCTION

TABLE DESCRIPTION: Percent Water Production in Drill Hole Intervals

PARAMETERS
- Percent water production value for the interval
- Unit of measure for percent water production data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Top of depth interval which measurement represents
- Bottom of depth interval which measurement represents
- Unit of measure for the interval (ft or m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Date measurement was performed
- Amount of deviation from best fit of test analysis
- Amount of water pumped for the test
- Rate at which water was pumped from the test well

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

PALEOMAGNETIC

TABLE DESCRIPTION: Paleomagnetic Data and Test Conditions

PARAMETERS

- Average declination of remanence (water reference mark)
- Numerical value for intensity of remanence
- Average inclination of remanence (water reference mark)
- Inclination of remanence relative to reference mark
- Unit of measure for the average declination and inclination data (degrees, ...)
- Unit of measure for the intensity data (Amp/m, ...)
- Declination of remanence relative to reference mark
- Unit of measure for the declination and inclination data (degrees, ...)

LOCATION INFORMATION

- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS

- Declination of the reference mark
- Test number of multiple tests on the same interval or sample
- Alternating field demagnetization prior to test
- Paleomagnetic orientation of the reference mark
- Half angle of the cone of 95% confidence
- Alternating field demagnetization levels used
- Fisher precision parameter
- Testing method used to determine parameter value

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

PORE SATURATION

TABLE DESCRIPTION: Pore Saturation and Test Conditions

PARAMETERS
- Value for the natural state pore saturation of the sample
- Unit of measure for the pore saturation data (%)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

PORE WATER CONTENT

TABLE DESCRIPTION: Natural-state Porewater Content Percentages

PARAMETERS
- Natural-state water content for total sample
- Unit of measure for the natural state water content data (cc/cc, vol %, wt %)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Porosity Values and Test Conditions

PARAMETERS
- Porosity value for the sample
- Unit of measure for porosity data (%,)

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Sample mass and units of measure of sample tested

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Relative Hydraulic Conductivity & Test Conditions

PARAMETERS
- Relative Hydraulic Conductivity Value for the sample
- Unit of measure for relative hydraulic conductivity data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Direction of measurement (horizontal, vertical)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

SAMPLE LOCATIONS

TABLE DESCRIPTION: Location Coordinates for Surface Samples

LOCATION INFORMATION
- Sample identification number
- Location of sample
- Nevada State Plane Coordinates (easting) (measured in feet)
- Nevada State Plane Coordinates (northing) (measured in feet)
- Altitude above sea level of the sample
- Unit of measure for the altitude (ft, m or gl for ground level)

TEST CONDITIONS
- Date sample was taken
- Method of obtaining the sample's location

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal in which the sample was first reported.

TABLE DESCRIPTION: Laboratory Sonic Velocity Measurements

PARAMETERS
- Sonic Velocity Value for the sample
- Unit of measure for sonic velocity data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample pressure and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Direction of measurement (horizontal, vertical)

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

THERMAL CONDUCTIVITY

TABLE DESCRIPTION: Thermal Conductivity Data and Test Conditions

PARAMETERS

- Numerical value for thermal conductivity
- Unit of measure for thermal conductivity data (W/mK, ..)

LOCATION INFORMATION

- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS

- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Pore pressure conditions of sample during test
- Pore fluid used for sample saturation
- Confining pressure of sample during test
- Saturation state of sample during test

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Thermal Conductivity Data and Test Conditions

PARAMETERS

- Numerical value for thermal conductivity
- Unit of measure for thermal conductivity data (W/mK, ..)

LOCATION INFORMATION

- Drill hole name for the data
- Sample identification number
- Depth in hole from which sample originates
- Unit of measure for depth (ft, m)

TEST CONDITIONS

- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Sample temperature and units of measure during test
- Sample length and units of measure of sample tested
- Sample diameter and units of measure of sample tested
- Pore pressure conditions of sample during test
- Pore fluid used for sample saturation
- Confining pressure of sample during test
- Saturation state of sample during test

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Thermal/Mechanical Stratigraphic Units

PARAMETERS

- Stratigraphic unit name or rock type with the name of the stratigraphic unit above it for the interval described (ex. UO, TCw, PTn)
- Depth in hole to top of thermal/mechanical stratigraphic-unit interval
- Depth in hole to bottom of thermal/mechanical stratigraphic-unit interval
- Unit of measure for the interval (ft or m)

LOCATION INFORMATION

- Drill hole name for the data

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Transmissivity Data and Pumping Conditions

PARAMETERS
- Transmissivity value for the interval
- Unit of measure for transmissivity data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Top of depth interval which measurement represents
- Bottom of depth interval which measurement represents
- Unit of measure for the interval (ft or m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Method of analysis for transmissivity value
- Test episode if several tests are grouped into episodes
- Date water sample was collected
- Rate at which water was pumped from the test well
- Amount of water pumped for the test
- Amount of deviation from best fit of test analysis

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Well Test Hydraulic Conductivity Measurements

PARAMETERS
- Well test hydraulic conductivity value for the interval
- Unit of measure for the well hydraulic conductivity data

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Top of depth interval which measurement represents
- Bottom of depth interval which measurement represents
- Unit of measure for the interval (ft or m)

TEST CONDITIONS
- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Method of analysis for conductivity value
- Test episode if several tests are grouped into episodes
- Date water sample was collected
- Rate at which water was pumped from the test well
- Amount of water pumped for the test

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

TABLE DESCRIPTION: Water Elevations and Depths, Dates of Measurements

PARAMETERS

- Date of water level measurement
- Value used to correct down-hole run to true run
- Depth to water, true vertical if depth correction is specified. If surface altitude is given depth is depth of water below land surface.
- Altitude of water surface above sea level
- Depth of drill hole from which samples orginated
- Altitude of land surface at the well
- Unit of measure for sample

LOCATION INFORMATION

- Drill hole name for the data
- Sample identification number
- Top of interval that the level represents
- Bottom of interval that the level represents
- Source of the land-surface altitude

TEST CONDITIONS

- Test number of multiple tests on the same interval or sample
- Testing method used to determine parameter value
- Measurement access for reported value (i.e., composite, tube 1, upper, lower)

SEPDB TRACKING INFORMATION

- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

DRILL HOLE WATER CHEMISTRY

TABLE DESCRIPTION: Water Chemical Constituent Values for Drill Holes

PARAMETERS
- Name of the chemical constituent or physical property
- Numerical amount or value of the constituent or physical property
- Unit of measure for the constituents (mg/l, pCu/l)
- Uncertainty in reported data value

LOCATION INFORMATION
- Drill hole name for the data
- Sample identification number
- Top of depth interval which sample represents
- Bottom of depth interval which sample represents
- Depth in hole from which sample originates
- Unit of measure for the interval (ft or m)

TEST CONDITIONS
- Cross-reference to the comments in the wtrsumm table
- Date water sample was collected
- Testing method used to determine parameter value
- Type of analysis
- Sample temperature and units of measure during test
- Quantity of water pumped before sample was taken
- Well interval temperature when sample was collected
- Length of pre-sample pumping in units of time
- Discharge rate of pre-sample pumping

SEPDB TRACKING INFORMATION
- QA level of the data-gathering activity under approved YMP/QAPP (QA or NQ). TBD indicates no QAPP was in place.
- Data authorization number assigned each TPO data submittal
- Page number where summary information appears in reference document
- Page number where value appears in reference document
- Specifies location of reference in participant's data archive (PDA)

EXAMPLE OF SEPDB DATA COMPILATION

THERMAL EXPANSION EXPERIMENTAL DATA COMPILATION FORM FOR THE YUCCA MTN

PART 1. SAMPLE LOCATION AND IDENTIFICATION

SAMPLE ID Perp. A SAMPLE ORIGIN UE-25n#1

SAMPLE DEPTH (ft) 108.8 TEST NO 1

PART 2. PARAMETERS

HEATING CURVE DATA

TEMPERATURE RANGE DURING HEATING	°C	25-50	50-100	100-150	150-200	200-250	250-300
	°F	77-122	122-212	212-302	302-392	392-482	482-572
LINEAR THERMAL EXPANSION COEFFICIENT DURING HEATING (10^{-6}·°C^{-1})[a]		8.3	9.6	13.6	18.6	20.6	N/C
ESTIMATED EXPERIMENTAL UNCERTAINTY (10^{-6}·°C^{-1})[a]		N/D	N/D	N/D	N/D	N/D	N/A
PORE PRESSURE (MPa)		0.1	0.1	0.1	0.1	0.1	N/A

COOLING CURVE DATA

TEMPERATURE RANGE DURING COOLING	°C	300-250	250-200	200-150	150-100	100-50	50-25
	°F	572-482	482-392	392-302	302-212	212-122	122-77
LINEAR THERMAL EXPANSION COEFFICIENT DURING COOLING (10^{-6}·°C^{-1})[a]		N/C	N/C	N/C	N/C	N/C	N/C
ESTIMATED EXPERIMENTAL UNCERTAINTY (10^{-6}·°C^{-1})[a]		N/A	N/A	N/A	N/A	N/A	N/A
PORE PRESSURE (MPa)		N/A	N/A	N/A	N/A	N/A	N/A

PART 3. EXPERIMENT CONDITIONS

EXPERIMENT TECHNIQUE Dual Push Rod Dilatometer

SAMPLE LENGTH (cm)	SAMPLE DIA (cm)	SAMPLE WIDTH (cm)	SAMPLE THICKNESS (cm)	PRETEST SAMPLE MASS (g)	POSTTEST SAMPLE MASS (g)
2.55	N/A	0.3	0.3	N/D	N/D

HEATING RATE (°C/min)	COOLING RATE (°C/min)	TYPE OF ATMOSPHERE	DRAINED OR UNDRAINED	CONFINING PRESSURE (MPa)	INITIAL SAMPLE SATURATION	TYPE OF PORE FLUID
1	N/D	Air	Undrained	0.1	Natural-state	N/A

PART 4. REFERENCE AND SUPPORTING INFORMATION

QA LEVEL OF DATA-GATHERING ACTIVITY TBD

SNL YMP DATA-SET ID 31/1018-2/1/78

SNL DATA REPORT NUMBER SAND88-1581

THIS DCF COMPLETED BY Barry Schwartz (Name) 6313 (SNL Div) 1/25/88 (Date)

a. To obtain thermal expansion coefficients in units of 10^{-6}·°F^{-1}, multiply by 5/9.

COMMENTS

N/A = not applicable, N/C = not compiled, N/D = no data available, TBD = to be determined.

Rev 6113

EXAMPLE OF SEPDB PRODUCT (DATA REPORT)

WORK REQUEST

TMP SITE & ENGINEERING PROPERTIES DATA BASE (SEPDB)

Send to:
SEPDB Data Base Administrator
Sandia National Laboratories
Technical Projects Division, 6316
P. O. Box 5800
Albuquerque, NM 87185
Telephone: (505 or FTS) 846-0304 or 846-8178

Request Number: [illegible]
Date Received: [illegible]
Product QA Level: [illegible]
Data QA Level: [illegible]

TO BE COMPLETED BY REQUESTOR:

Name: Stephen J Bauer Signature: [illegible]

Organization: SNL - 6313 Date: 5/24/91

Address: SNL Telephone: 846 3645

Work Requested - Attach additional explanations, sketches, and example listing, if appropriate:

Requested Data QA Level: N/A

Uniaxial and triaxial strength test with strain properties

for all units at Yucca Mtn

Please provide test conditions, sample description - depth, hole ID etc

also any other information such as porosity.

TO BE COMPLETED BY DATA BASE PERSONNEL

Type: Data Entry ___ Product Request ✓ Other ___

Accepted By: [illegible] Date: 5/24/91
Assigned To: [illegible] Date: 5/24/91
Verified By: [illegible] Date: 6/7/91
Approved By: [illegible] Date: 6/7/91

Product Numbers, or Accession Numbers:

SEP009?

File - 6310 41/12131/1.4/NO

Number of attachments: 0

WORK:1/90

EXAMPLE OF SEPDB PRODUCT (DATA REPORT)

DEPTH (ft)	CR SAMPLE ID	COMPRESSIVE STRENGTH (MPa)	(C) AXIAL STRENGTH (mil/in)	POISSONS RATIO	YOUNG'S MODULUS (GPa)	(E) AXIAL STRENGTH (mil/in)	PRD SAMPLE ID	POROSITY (%)	DRY BULK DENSITY (g/cm**3)	SATURATED BULK DENSITY (g/cm**3)	NATURAL BULK DENSITY (g/cm**3)	GRAIN DENSITY (g/cm**3)	GEOLOGIC STRATIGRAPHY	THERMAL-MECHANICAL UNIT
797.00	02-797.0-1	143.0	2.7	0.20	57.1	2.7	1	2.00	2.350	2.370	-	2.400	TSW	Tbw1
797.00	02-797.0-2	125.0	2.2	0.31	59.9	2.2	2	4.00	2.330	2.370	-	2.430	TSW	Tbw1
797.00	02-797.0-A	162.0	3.0	0.23	43.3	3.0	A	4.00	2.340	2.380	-	2.440	TSW	Tbw1
797.00	02-797.0-B	130.0	3.6	0.26	39.6	3.6	B	3.00	2.360	2.390	-	2.430	TSW	Tbw1
810.00	02-810.4-A	160.0	3.3	0.24	37.0	3.3	A	3.00	2.360	2.390	-	2.430	TSW	Tbw1
940.60	02-940.4-C	157.0	3.3	0.26	49.0	3.3		-	-	-	-	-	TSW	Tbw1
940.60	02-940.4-A	167.0	4.6	0.30	42.0	4.6	A	8.00	2.310	2.390	-	2.510	TSW	Tbw1
940.60	02-940.4-B	115.0	3.0	0.26	41.9	3.0	B	10.00	2.200	2.300	-	2.530	TSW	Tbw1
940.60	02-940.4-D	117.0	3.2	0.26	42.1	3.2	D	8.00	2.290	2.370	-	2.490	TSW	Tbw1
949.60	02-949.0-C	220.0	6.2	0.19	36.6	6.2	C	7.00	2.300	2.370	-	2.470	TSW	Tbw1
949.00	02-949.0-A	190.0	2.6	-	68.3	2.6	A	7.00	2.330	2.400	-	2.510	TSW	Tbw1
949.00	02-949.0-B	210.0	4.0	0.21	46.3	4.0	B	8.00	2.310	2.390	-	2.510	TSW	Tbw1
949.00	02-949.0-D	157.0	3.1	0.24	34.7	3.1	D	8.00	2.300	2.380	-	2.500	TSW	Tbw1
1297.60	02-1297.6-A	3.0	1.4	-	-	-	A	22.00	1.940	2.160	-	2.490	TSW	Tbw1
1297.60	02-1297.6-B	7.0	2.4	-	-	-	B	24.00	1.900	2.140	-	2.500	TSW	Tbw1
1326.30		-	-	-	-	-		11.46	2.240	-	2.350	2.530	TSW	Tbw2
1339.00		-	-	-	-	-		14.21	2.120	-	2.280	2.530	TSW	Tbw2
1341.30	02-1341.3-A	83.0	4.7	0.11	22.1	4.7	A	10.00	2.240	2.340	-	2.490	TSW	Tbw2
1341.30	02-1341.3-C	73.0	4.1	0.17	22.0	4.1	C	10.00	2.240	2.340	-	2.510	TSW	Tbw2
1341.30	02-1341.3-D	86.0	4.1	-	22.7	4.1	D	10.00	2.240	2.340	-	2.510	TSW	Tbw2
1341.30	02-1341.3-E	61.0	3.7	-	23.6	3.7	E	12.00	2.210	2.330	-	2.250	TSW	Tbw2
1379.10	02-1379.1-A	170.0	5.6	0.17	33.9	5.6	A	9.00	2.300	2.390	-	2.530	TSW	Tbw2
1379.10	02-1379.1-C	97.0	6.3	0.10	10.0	6.2	C	14.00	2.150	2.270	-	2.500	TSW	Tbw2
1379.10	02-1379.1-D	173.0	6.1	0.17	31.0	6.1	D	9.00	2.200	2.370	-	2.510	TSW	Tbw2
1379.10	02-1379.1-E	96.0	5.0	0.19	20.5	5.0	E	12.00	2.230	2.350	-	2.530	TSW	Tbw2
1500.60		-	-	-	-	-	24	19.10	2.104	2.204	-	2.602	TSW	Tbw2
1502.60		-	-	-	-	-	25	11.60	2.274	2.390	-	2.574	TSW	Tbw2
1507.00	02-1507.0-B	165.0	6.1	0.20	35.9	6.1	B	9.00	2.300	2.390	-	2.530	TSW	Tbw2
1507.00	02-1507.0-D	155.0	5.5	0.16	33.5	5.5	D	7.00	2.330	2.400	-	2.510	TSW	Tbw2
1600.00		-	-	-	-	-	26	16.70	2.197	2.270	-	2.520	TSW	Tbw2
1600.70		-	-	-	-	-	27B	15.20	2.154	2.304	-	2.542	TSW	Tbw2
1600.70		-	-	-	-	-	27A	14.20	2.191	2.324	-	2.553	TSW	Tbw2
1613.90		-	-	-	-	-	28	11.10	2.301	2.402	-	2.547	TSW	Tbw2
1624.10		-	-	-	-	-	29	11.10	2.234	2.319	-	2.515	TSW	Tbw2
1628.50		-	-	-	-	-	30	16.00	2.204	2.353	-	2.627	TSW	Tbw2
1646.00	02-1646.0-B	32.0	3.0	-	-	-		-	-	-	-	-	TSW	Tbw2
1646.00	02-1646.0-C	27.0	5.0	-	-	-		-	-	-	-	-	TSW	Tbw2
1659.20	02-1659.2-B	53.0	4.4	-	-	-		-	-	-	-	-	TSW	Tbw2
1659.20	02-1659.2-A	60.0	5.2	-	-	-	A	4.00	2.270	2.310	-	2.360	TSW	Tbw2
1725.05	02-1725.05-A	22.0	3.9	0.26	6.3	3.9		-	-	-	-	-	Bedded Tuff below TSW	Chnlc
1725.05	02-1725.05-C	29.0	4.0	0.10	8.5	4.0		-	-	-	-	-	Bedded Tuff below TSW	Chnlc
1740.00	02-1740.0-A	30.0	3.5	0.10	14.2	3.5		-	-	-	-	-	Bedded Tuff below TSW	Chnlc
1740.00	02-1740.0-B	37.0	3.2	-	11.3	3.2		-	-	-	-	-	Bedded Tuff below TSW	Chnlc
1740.00	02-1740.0-C	23.0	3.4	0.22	11.0	3.4		-	-	-	-	-	Bedded Tuff below TSW	Chnlc
1740.00	02-1740.0-E	35.0	3.3	0.23	11.3	3.3		-	-	-	-	-	Bedded Tuff below TSW	Chnlc
1740.00	02-1740.0-F	20.0	4.3	0.11	11.1	4.3		-	-	-	-	-	Bedded Tuff below TSW	Chnlc

NOTES: CR SAMPLE ID are the sample identifications associated with the compressive strength, poissons ratio and young's modulus fields.
PRD SAMPLE ID are the sample identifications associated with the porosity, bulk density and grain density fields.
(C) AXIAL STRENGTH is the axial strength for compressive strength. (E) AXIAL STRENGTH is the axial strength for poissons ratio and young's modulus.
- indicates no data was submitted. TSW is Geologic Stratigraphy field stands for Topopah Spring Member.

June 6, 1991

SEPDB PRODUCT NUMBER: SEP0093

SUPPORTING COMPRESSIVE STRENGTH DATA FOR DRILL HOLE USW G-2

DATA AUTHORIZATION NUMBER: DA0060
SUBMITTAL CITATION NUMBER: SAND93-0703
SUBMITTAL TITLE: Uniaxial and Triaxial Compression Test Series on the Topopah Spring Member from USW G-2, Yucca Mountain, Nevada
DATA QA LEVEL: SQ

DEPTH (ft)	SAMPLE ID	COMPRESSIVE STRENGTH (MPa)	AXIAL STRENGTH (mill)	CONFINING PRESSURE	STRAIN RATE DURING TEST	SAMPLE LENGTH	SAMPLE DIAMETER	PAGE NO	LOCAL RECORD CENTER NUMBER
797.00	G2-797.0-1	143.0	2.7	0	1e-05 /sec	101.7 mm	50.8 mm	9,17	51/L02-3/30/84
797.00	G2-797.0-2	125.0	2.2	0	1e-05 /sec	101.7 mm	50.9 mm	9,17	51/L02-3/30/84
797.00	G2-797.0-A	142.0	3.0	0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
797.00	G2-797.0-B	130.0	3.6	0	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
818.40	G2-818.4-A	160.0	5.3	0	1e-05 /sec	50.9 mm	25.2 mm	9,17	51/L02-3/30/84
948.40	G2-948.4-A	147.0	4.6	0	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
948.40	G2-948.4-B	115.0	3.0	0	1e-07 /sec	50.8 mm	25.2 mm	9,17	51/L02-3/30/84
948.40	G2-948.4-C	157.0	3.3	0	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
948.40	G2-948.4-D	117.0	3.2	0	1e-07 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
949.00	G2-949.0-C	220.0	6.2	0	1e-05 /sec	50.7 mm	25.3 mm	9,17	51/L02-3/30/84
949.00	G2-949.0-A	150.0	3.6	0	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
949.00	G2-949.0-B	210.0	4.0	0	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
949.00	G2-949.0-D	157.0	3.1	0	1e-05 /sec	101.7 mm	50.9 mm	9,17	51/L02-3/30/84
1297.60	G2-1297.6-A	3.0	1.4	0	1e 05 /sec	50.8 mm	25.2 mm	9,17	51/L02-3/30/84
1297.60	G2-1297.6-B	7.0	2.4	0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-A	85.0	4.7	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-C	73.0	4.1	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-D	84.0	4.1	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-E	61.0	3.7	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-A	170.0	5.6	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-C	97.0	6.3	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-D	175.0	6.1	0	1e-05 /sec	50.9 mm	25.2 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-E	94.0	5.0	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1587.00	G2-1587.0-B	165.0	6.1	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1587.00	G2-1587.0-D	155.0	5.5	0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1646.00	G2-1646.0-B	32.0	3.0	10	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1646.00	G2-1646.0-C	27.0	5.0	10	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1659.20	G2-1659.2-A	60.0	5.3	10	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1659.20	G2-1659.2-B	53.0	4.6	10	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1725.05	G2-1725.05-A	22.0	2.9	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1725.05	G2-1725.05-C	29.0	4.0	0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-A	20.0	2.3	0	1e-07 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-C	23.0	3.4	0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-D	27.0	3.2	0	1e-07 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-E	35.0	3.5	0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-F	20.0	4.3	0	1e-07 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84

NOTE: The following are global values for the entire report:

TEST TYPE: constant strain rate
TEST TEMPERATURE: ambient
PORE PRESSURE: ambient
DRAINAGE CONDITION: drained
SATURATION STATE: saturated

SUPPORTING ELASTIC PROPERTIES DATA FOR DRILL HOLE USW G-2

DATA AUTHORIZATION NUMBER: DA0008
SUBMITTAL CITATION NUMBER: SAND85-0703
SUBMITTAL TITLE: Uniaxial and Triaxial Compression Test Series on the Topopah Spring Member from USW G-2, Yucca Mountain, Nevada
DATA QA LEVEL: SQ

DEPTH (ft)	SAMPLE ID	YOUNG'S MODULUS (GPa)	POISSONS RATIO	AXIAL STRENGTH (mPa)	STRAIN RATE DURING TEST	SAMPLE LENGTH	SAMPLE DIAMETER	PAGE NO	LOCAL RECORD CENTER NUMBER
797.00	G2-797.0-1	37.1	0.28	2.7	1e-05 /sec	101.7 mm	50.8 mm	9,17	51/L02-3/30/84
797.00	G2-797.0-2	39.9	0.31	2.2	1e-05 /sec	101.7 mm	50.9 mm	9,17	51/L02-3/30/84
797.00	G2-797.0-A	43.3	0.25	3.0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
797.00	G2-797.0-B	39.6	0.26	3.6	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
810.40	G2-810.4-A	37.0	0.24	5.3	1e-05 /sec	50.9 mm	25.2 mm	9,17	51/L02-3/30/84
940.40	G2-940.4-A	42.0	0.30	4.6	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
940.40	G2-940.4-B	41.9	0.26	3.0	1e-07 /sec	50.8 mm	25.2 mm	9,17	51/L02-3/30/84
940.40	G2-940.4-C	49.0	0.26	3.3	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
940.40	G2-940.4-D	42.1	0.26	3.2	1e-07 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
949.60	G2-949.6-C	30.6	0.19	6.2	1e-05 /sec	50.7 mm	25.3 mm	9,17	51/L02-3/30/84
969.00	G2-969.0-A	60.3	-	2.6	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
969.00	G2-969.0-B	46.3	0.21	4.8	1e-05 /sec	50.8 mm	25.3 mm	9,17	51/L02-3/30/84
969.00	G2-969.0-D	54.7	0.34	3.1	1e-05 /sec	101.7 mm	50.9 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-A	22.1	0.11	4.7	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-C	22.0	0.17	4.1	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-D	22.7	-	4.1	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1541.30	G2-1541.3-E	23.6	-	3.7	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-A	33.9	0.17	5.6	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-C	30.0	0.10	6.3	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-D	31.0	0.17	6.1	1e-05 /sec	50.9 mm	25.2 mm	9,17	51/L02-3/30/84
1579.10	G2-1579.1-E	20.5	0.19	5.0	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1587.00	G2-1587.0-B	33.9	0.20	6.1	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1587.00	G2-1587.0-D	33.5	0.16	5.5	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1723.05	G2-1723.05-A	6.3	0.24	3.9	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1723.05	G2-1723.05-C	8.5	0.10	4.0	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-A	14.2	0.10	2.5	1e-07 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-C	11.8	0.22	3.4	1e-05 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-D	11.2	-	3.2	1e-07 /sec	50.9 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-E	11.2	0.23	3.5	1e-05 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84
1740.00	G2-1740.0-F	11.1	0.11	4.3	1e-07 /sec	50.0 mm	25.3 mm	9,17	51/L02-3/30/84

NOTE: The following are global values for the entire report:
TEST TYPE: constant strain rate
TEST TEMPERATURE: ambient
CONFINING PRESSURE: 0
PORE PRESSURE: ambient
DRAINAGE CONDITION: drained
SATURATION STATE: saturated

EXAMPLE OF SEPDB PRODUCT (DATA REPORT)

June 6, 1991

SEPDB PRODUCT NUMBER: SEP0093

SUPPORTING POROSITY DATA FOR DRILL HOLE USW G-2

DATA AUTHORIZATION NUMBER: DA0042
SUBMITTAL CITATION NUMBER: SAND90-0011
SUBMITTAL TITLE: Density and Porosity Data for Tuffs from the Unsaturated Zone at Yucca Mountain, Nevada
DATA QA LEVEL: TBD

DEPTH (ft)	SAMPLE ID	POROSITY (%)	TEST TYPE	TEST TEMPERATURE	TEST PRESSURE	PAGE NO	LOCAL RECORD CENTER NUMBER
797.0	1	2.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-4	51/L02-3/30/84
797.0	2	4.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-4	51/L02-3/30/84
797.0	A	4.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-3	51/L02-3/30/84
797.0	B	3.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-3	51/L02-3/30/84
810.4	A	9.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-5	51/L02-3/30/84
948.4	A	8.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-5	51/L02-3/30/84
948.4	B	10.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-6	51/L02-3/30/84
948.4	D	8.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-6	51/L02-3/30/84
949.6	C	7.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-7	51/L02-3/30/84
949.0	A	7.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-7	51/L02-3/30/84
949.0	B	8.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-8	51/L02-3/30/84
949.0	D	8.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-8	51/L02-3/30/84
1297.6	A	22.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-9	51/L02-3/30/84
1297.6	B	24.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-9	51/L02-3/30/84
1524.3		11.46	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-10	51/L03-9/7/82
1559.0		14.21	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-10	51/L03-9/7/82
1561.3	A	10.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-11	51/L02-3/30/84
1561.3	C	10.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-11	51/L02-3/30/84
1561.3	D	10.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-12	51/L02-3/30/84
1561.3	E	12.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-12	51/L02-3/30/84
1579.1	A	9.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-13	51/L02-3/30/84
1579.1	C	14.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-13	51/L02-3/30/84
1579.1	D	9.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-14	51/L02-3/30/84
1579.1	E	12.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-14	51/L02-3/30/84
1580.4	24	19.10	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-15	51/L03-1/10/85
1582.6	25	11.68	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-15	51/L03-1/10/85
1587.0	B	9.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-16	51/L02-3/30/84
1587.0	D	7.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-16	51/L02-3/30/84
1600.0	26	16.70	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-17	51/L03-1/10/85
1600.7	27A	14.20	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-17	51/L03-1/10/85
1600.7	27B	15.20	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-18	51/L03-1/10/85
1613.9	28	11.10	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-18	51/L03-1/10/85
1624.1	29	11.10	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-19	51/L03-1/10/85
1628.5	30	16.00	matrix, 100[1-(DSD/GD)]	ambient	ambient	C-19	51/L03-1/10/85
1659.2	A	4.00	matrix, 100(SSD-DSD)/MD	ambient	ambient	C-20	51/L02-3/30/84

NOTE: Sample Length, Sample Mass and Sample Diameter not given for USW G-2.

SUPPORTING BULK DENSITY DATA FOR DRILL HOLE USW G-2

DATA AUTHORIZATION NUMBER: DA0042
SUBMITTAL CITATION NUMBER: SAND00-0011
SUBMITTAL TITLE: Density and Porosity Data for Tuffs from the Unsaturated Zone at Yucca Mountain, Nevada
DATA QA LEVEL: TBD

DEPTH (ft)	SAMPLE ID	BULK DENSITY (g/cm**3)	SATURATION STATE	TEST TYPE	TEST TEMPERATURE	TEST PRESSURE	SAMPLE MASS	PAGE NO	LOCAL RECORD CENTER NUMBER
797.0	1	2.350	dry	caliper	ambient	ambient	483.69 g	C-4	31/L02-3/30/84
797.0	1	2.370	saturated	caliper	ambient	ambient	489.21 g	C-4	31/L02-3/30/84
797.0	2	2.330	dry	caliper	ambient	ambient	481.50 g	C-4	31/L02-3/30/84
797.0	2	2.370	saturated	caliper	ambient	ambient	489.05 g	C-4	31/L02-3/30/84
797.0	A	2.340	dry	caliper	ambient	ambient	59.67 g	C-3	31/L02-3/30/84
797.0	A	2.300	saturated	caliper	ambient	ambient	60.71 g	C-3	31/L02-3/30/84
797.0	B	2.340	dry	caliper	ambient	ambient	60.12 g	C-3	31/L02-3/30/84
797.0	B	2.390	saturated	caliper	ambient	ambient	60.87 g	C-3	31/L02-3/30/84
818.4	A	2.340	dry	caliper	ambient	ambient	59.89 g	C-5	31/L02-3/30/84
818.4	A	2.390	saturated	caliper	ambient	ambient	60.80 g	C-5	31/L02-3/30/84
948.4	A	2.310	dry	caliper	ambient	ambient	58.89 g	C-5	31/L02-3/30/84
948.4	A	2.390	saturated	caliper	ambient	ambient	60.84 g	C-5	31/L02-3/30/84
948.4	B	2.280	dry	caliper	ambient	ambient	57.90 g	C-6	31/L02-3/30/84
948.4	B	2.300	saturated	caliper	ambient	ambient	60.30 g	C-6	31/L02-3/30/84
948.4	D	2.290	dry	caliper	ambient	ambient	58.40 g	C-6	31/L02-3/30/84
948.4	D	2.370	saturated	caliper	ambient	ambient	60.41 g	C-6	31/L02-3/30/84
949.6	C	2.300	dry	caliper	ambient	ambient	58.33 g	C-7	31/L02-3/30/84
949.6	C	2.370	saturated	caliper	ambient	ambient	60.36 g	C-7	31/L02-3/30/84
949.8	A	2.330	dry	caliper	ambient	ambient	59.33 g	C-7	31/L02-3/30/84
949.8	A	2.400	saturated	caliper	ambient	ambient	61.10 g	C-7	31/L02-3/30/84
949.8	B	2.310	dry	caliper	ambient	ambient	58.84 g	C-8	31/L02-3/30/84
949.8	B	2.390	saturated	caliper	ambient	ambient	60.85 g	C-8	31/L02-3/30/84
949.8	D	2.300	dry	caliper	ambient	ambient	475.41 g	C-8	31/L02-3/30/84
949.8	D	2.390	saturated	caliper	ambient	ambient	492.02 g	C-8	31/L02-3/30/84
1297.6	A	1.940	dry	caliper	ambient	ambient	49.20 g	C-9	31/L02-3/30/84
1297.6	A	2.160	saturated	caliper	ambient	ambient	54.85 g	C-9	31/L02-3/30/84
1297.6	B	1.900	dry	caliper	ambient	ambient	48.66 g	C-9	31/L02-3/30/84
1297.6	B	2.140	saturated	caliper	ambient	ambient	54.76 g	C-9	31/L02-3/30/84
1526.3		2.240	dry	immersion	ambient	ambient	73.996 g	C-10	31/L03-9/7/82
1526.3		2.350	natural	immersion	ambient	ambient	77.620 g	C-10	31/L03-9/7/82
1559.0		2.120	dry	immersion	ambient	ambient	49.016 g	C-10	31/L03-9/7/82
1559.0		2.200	natural	immersion	ambient	ambient	46.268 g	C-10	31/L03-9/7/82
1561.3	A	2.240	dry	caliper	ambient	ambient	57.01 g	C-11	31/L02-3/30/84
1561.3	A	2.340	saturated	caliper	ambient	ambient	59.72 g	C-11	31/L02-3/30/84
1561.3	C	2.260	dry	caliper	ambient	ambient	57.59 g	C-11	31/L02-3/30/84
1561.3	C	2.360	saturated	caliper	ambient	ambient	60.12 g	C-11	31/L02-3/30/84
1561.3	D	2.260	dry	caliper	ambient	ambient	57.67 g	C-12	31/L02-3/30/84
1561.3	D	2.360	saturated	caliper	ambient	ambient	60.11 g	C-12	31/L02-3/30/84
1561.3	E	2.210	dry	caliper	ambient	ambient	56.70 g	C-12	31/L02-3/30/84
1561.3	E	2.330	saturated	caliper	ambient	ambient	59.63 g	C-12	31/L02-3/30/84
1579.1	A	2.300	dry	caliper	ambient	ambient	58.59 g	C-13	31/L02-3/30/84
1579.1	A	2.390	saturated	caliper	ambient	ambient	60.01 g	C-13	31/L02-3/30/84
1579.1	C	2.150	dry	caliper	ambient	ambient	55.15 g	C-13	31/L02-3/30/84

NOTE: Sample Length and Sample Diameter not given for USW G-2.

EXAMPLE OF SEPDB PRODUCT (DATA REPORT)

SUPPORTING BULK DENSITY DATA FOR DRILL HOLE USW G-2

REPORTS

DEPTH (ft)	SAMPLE ID	BULK DENSITY (g/cm^3)	SATURATION STATE	TEST TYPE	TEST TEMPERATURE	TEST PRESSURE	SAMPLE MASS	PAGE NO	LOCAL RECORD CENTER NUMBER
1379.1	C	2.290	saturated	caliper	ambient	ambient	56.00 g	C-13	51/L02-3/30/84
1379.1	D	2.280	dry	caliper	ambient	ambient	57.00 g	C-14	51/L02-3/30/84
1379.1	D	2.370	saturated	caliper	ambient	ambient	69.19 g	C-14	51/L02-3/30/84
1379.1	E	2.230	dry	caliper	ambient	ambient	56.92 g	C-14	51/L02-3/30/84
1379.1	E	2.350	saturated	caliper	ambient	ambient	59.03 g	C-14	51/L02-3/30/84
1500.4	24	2.106	dry	immersion	ambient	ambient	47.082 g	C-15	51/L03-1/18/85
1500.4	24	2.284	saturated	immersion	ambient	ambient	51.047 g	C-15	51/L03-1/18/85
1502.6	25	2.294	dry	immersion	ambient	ambient	152.967 g	C-15	51/L03-1/18/85
1502.6	25	2.390	saturated	immersion	ambient	ambient	159.424 g	C-15	51/L03-1/18/85
1507.8	B	2.300	dry	caliper	ambient	ambient	50.70 g	C-16	51/L02-3/30/84
1507.8	B	2.390	saturated	caliper	ambient	ambient	60.00 g	C-16	51/L02-3/30/84
1507.8	D	2.330	dry	caliper	ambient	ambient	59.35 g	C-16	51/L02-3/30/84
1507.8	D	2.400	saturated	caliper	ambient	ambient	61.23 g	C-16	51/L02-3/30/84
1600.0	26	2.107	dry	immersion	ambient	ambient	161.117 g	C-17	51/L03-1/18/85
1600.0	26	2.270	saturated	immersion	ambient	ambient	173.573 g	C-17	51/L03-1/18/85
1600.7	27A	2.191	dry	immersion	ambient	ambient	70.009 g	C-17	51/L03-1/18/85
1600.7	27A	2.324	saturated	immersion	ambient	ambient	73.123 g	C-17	51/L03-1/18/85
1600.7	27B	2.156	dry	immersion	ambient	ambient	66.377 g	C-18	51/L03-1/18/85
1600.7	27B	2.304	saturated	immersion	ambient	ambient	70.914 g	C-18	51/L03-1/18/85
1619.9	28	2.301	dry	immersion	ambient	ambient	74.029 g	C-18	51/L03-1/18/85
1619.9	28	2.402	saturated	immersion	ambient	ambient	82.404 g	C-18	51/L03-1/18/85
1624.1	29	2.236	dry	immersion	ambient	ambient	109.724 g	C-19	51/L03-1/18/85
1624.1	29	2.319	saturated	immersion	ambient	ambient	113.799 g	C-19	51/L03-1/18/85
1628.5	30	2.296	dry	immersion	ambient	ambient	131.315 g	C-19	51/L03-1/18/85
1628.5	30	2.353	saturated	immersion	ambient	ambient	140.170 g	C-19	51/L03-1/18/85
1639.2	A	2.270	dry	caliper	ambient	ambient	57.76 g	C-20	51/L02-3/30/84
1639.2	A	2.310	saturated	caliper	ambient	ambient	58.63 g	C-20	51/L02-3/30/84

NOTE: Sample Length and Sample Diameter not given for USW G-2.

SUPPORTING GRAIN DENSITY DATA FOR DRILL HOLE USW G-2

DATA AUTHORIZATION NUMBER: DA0042
SUBMITTAL CITATION NUMBER: SAND88-0011
SUBMITTAL TITLE: Density and Porosity Data for Tuffs from the Unsaturated Zone at Yucca Mountain, Nevada
DATA QA LEVEL: TBD

DEPTH (ft)	SAMPLE ID	GRAIN DENSITY (g/cm**3)	TEST TYPE	TEST TEMPERATURE	TEST PRESSURE	SAMPLE MASS	PAGE NO	LOCAL RECORD CENTER NUMBER
797.0	1	2.400	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-4	31/L02-3/30/84
797.0	2	2.430	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-4	31/L02-3/30/84
797.0	A	2.440	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-3	31/L02-3/30/84
797.0	B	2.430	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-3	31/L02-3/30/84
818.4	A	2.430	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-5	31/L02-3/30/84
940.4	A	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-5	31/L02-3/30/84
940.4	B	2.530	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-6	31/L02-3/30/84
940.4	D	2.490	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-6	31/L02-3/30/84
949.6	C	2.470	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-7	31/L02-3/30/84
969.0	A	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-7	31/L02-3/30/84
969.0	B	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-8	31/L02-3/30/84
969.0	D	2.500	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-8	31/L02-3/30/84
1297.6	A	2.490	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-9	31/L02-3/30/84
1297.6	B	2.500	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-9	31/L02-3/30/84
1526.3		2.530	water pycnometer	ambient	ambient	44.672 g	C-10	31/L03-9/7/82
1559.0		2.530	water pycnometer	ambient	ambient	44.813 g	C-10	31/L03-9/7/82
1561.3	A	2.490	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-11	31/L02-3/30/84
1561.3	C	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-11	31/L02-3/30/84
1561.3	D	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-12	31/L02-3/30/84
1561.3	E	2.250	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-12	31/L02-3/30/84
1579.1	A	2.530	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-13	31/L02-3/30/84
1579.1	C	2.500	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-13	31/L02-3/30/84
1579.1	D	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-14	31/L02-3/30/84
1579.1	E	2.530	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-14	31/L02-3/30/84
1500.4	24	2.602	water pycnometer	ambient	ambient	26.598 g	C-15	31/L03-1/10/85
1502.4	25	2.594	water pycnometer	ambient	ambient	29.897 g	C-15	31/L03-1/10/85
1507.0	B	2.530	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-16	31/L02-3/30/84
1507.0	D	2.510	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-16	31/L02-3/30/84
1600.0	26	2.528	water pycnometer	ambient	ambient	29.131 g	C-17	31/L03-1/10/85
1600.7	27A	2.559	water pycnometer	ambient	ambient	26.009 g	C-17	31/L03-1/10/85
1600.7	27B	2.542	water pycnometer	ambient	ambient	27.154 g	C-18	31/L03-1/10/85
1613.9	28	2.507	water pycnometer	ambient	ambient	27.204 g	C-18	31/L03-1/10/85
1624.1	29	2.515	water pycnometer	ambient	ambient	28.031 g	C-19	31/L03-1/10/85
1628.5	30	2.627	water pycnometer	ambient	ambient	28.514 g	C-19	31/L03-1/10/85
1639.2	A	2.560	GD = DBD/(1 + DBD - SBD)	ambient	ambient		C-20	31/L02-3/30/84

NOTE: Sample Length and Sample Diameter not given for USW G-2.

BLANK WORK REQUEST FORM

WORK REQUEST

TMP SITE & ENGINEERING PROPERTIES DATA BASE (SEPDB)

Send to:
SEPDB Data Base Administrator
Sandia National Laboratories
Technical Projects Division, 6316
P. O. Box 5800
Albuquerque, NM 87185
Telephone: (505 or FTS) 846-0304 or 846-8178

Request Number: _____
Date Received: _____
Product QA Level: _____
Data QA Level: _____

TO BE COMPLETED BY REQUESTOR:

Name: _____ Signature: _____

Organization: _____ Date: _____

Address: _____ Telephone: _____

Work Requested - Attach additional explanations, sketches, and example listing, if appropriate:

Requested Data QA Level: _____

TO BE COMPLETED BY DATA BASE PERSONNEL

Type: Data Entry ____ Product Request ____ Other _____

Accepted By: _____ Date: _____
Assigned To: _____ Date: _____
Verified By: _____ Date: _____
Approved By: _____ Date: _____

Product Numbers, or Accession Numbers:

File - 6310 41/12131/1.4/

Number of attachments: ____

WORK:1/90

THE GEOGRAPHIC INFORMATION SYSTEM COMPONENT OF THE YMP TECHNICAL DATA BASE

(GENISES)

THE GEOGRAPHIC NODAL INFORMATION STUDY AND EVALUATION SYSTEM

QUARTERLY REPORT

BY
GENISES STAFF

Geographic Info.
System Component
YMP Tech. Data Base

GENISES Staff
Remote Sensing Laboratory YMP Support Office
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YMP GENISES Work Request Form GENISES-A1

1.0 INTRODUCTION

The Geographic Information System (GIS) component of the Technical Data Base is under development by the Remote Sensing Laboratory (RSL) operated by EG&G Energy Measurements, Inc. (EG&G/EM). The purpose of the Geographic Nodal Information Study and Evaluation System (GENISES) is to provide a repository for technical data that are best characterized by spatial or geographic (map-oriented) features.

Chapter 2 describes the primary types of data currently held by EG&G/EM RSL and provides reference information on the sources of GENISES data. This information is presented in the form of two tables.

Chapter 3 discusses the significant activities during the previous quarter, including data added to the database, requested and delivered products, and the status of the EG&G/EM RSL YMP Support Office.

Chapter 4 describes major activities scheduled for the upcoming quarter, including plans for equipping the YMP Support Office, the development plan for the GENISES database, and design plans for the revised Site Atlas Map Portfolio.

The YMP GENISES Work Request form is provided in Appendix GENISES-A. This form is to be used when requesting information products from the GENISES database.

2.0 DATABASE CONTENTS

2.1 Types of Data Currently Held

As mentioned previously, GENISES contains spatial and geographic data associated with the Yucca Mountain site. These data are summarized in Table 2-1. This table has been organized to present data layer types or themes, listings of the types of attribute or descriptive data associated with each data layer, and an index number that indicates the reference or data source from which associated GENISES information was taken. This listing is not comprehensive; rather, it is intended to provide GENISES users with an understanding of the primary thematic data layers contained in the database.

TABLE 2-1 TYPES OF DATA CURRENTLY IN THE GENISES DATABASE

ADMINISTRATIVE DATA

01 LAND OWNERSHIP (1:100,000 scale source data)

Land Status

02 POLITICAL AND ADMINISTRATIVE BOUNDARIES (1:2,000,000 scale source data; entire US digital database)

Political (national, state and country boundaries); Administrative (national parks, forests, wilderness areas, Indian and Military reservations).

03 POLITICAL AND ADMINISTRATIVE B ARIES (1:100,000 scale source data; entire US digital database)

Political (national, state and county boundaries); Administrative (national parks, forests, wilderness areas, Indian and Military reservations).

04 POLITICAL AND ADMINISTRATIVE BOUNDARIES (1:24,000 scale source data)

Political (national, state and county boundaries); Administrative (national parks, forests, wilderness areas, Indian and Military reservations).

05 PUBLIC LAND SURVEY SYSTEM (PLSS)

Township, Range, Section

06 PUBLIC LAND SURVEY SYSTEM (PLSS) (1:24,000 scale source data)

Township, Range, Section

07 7.5' USGS TOPOGRAPHIC QUADRANGLE DLG AVAILABILITY INDEX

Name, USGS reference no., Year published, Year revised, contour interval, availability of: PLSS, boundaries, hydrography, hypsography, transportation, and DEM.

08 ORTHOPHOTO SHEETS INDEX MAP (1:6,000 scale source data)

Sheet number, scale, date of photography.

09 ORTHOPHOTO SHEETS INDEX MAP (1:12,000 scale source data)

Sheet number, scale, date of photography.

10 BLM LAND WITHDRAWAL BOUNDARY

Boundary, area, perimeter

TABLE 2-1 TYPES OF DATA CURRENTLY IN THE GENISES DATABASE

11 GEOGRAPHIC NAMES INFORMATION SYSTEM (Entire US digital database)

Names found on USGS maps.

12 LODE MINING CLAIM (1:6,000 scale source data)

Boundary, area, perimeter, claim, ID.

13 DEMOGRAPHIC DATA (1:100,000 scale source data; entire US digital database)

Populated places, census tract, census block

INFRASTRUCTURE DATA

14 TRANSPORTATION FEATURES (1:2,000,000 scale source data; entire US digital database)

Roads and trails, railroads and airfields.

15 TRANSPORTATION FEATURES (1:100,000 scale source data; entire US digital database)

Roads and trails, railroads and airfields.

16 TRANSPORTATION FEATURES (1:24,000 scale source data)

Roads, trails, railroads, pipelines, transmission lines.

SITE CHARACTERIZATION ACTIVITIES

17 EXISTING ACTIVITIES

Activity ID, source, elevation, activity type, depth, core requirement, drainage

18 PROPOSED ACTIVITIES

Activity ID, source, elevation, activity type, depth, core requirement, year.

19 CONCEPTUAL CONTROLLED AREA BOUNDARY

Boundary, area, perimeter, name

20 CONCEPTUAL PERIMETER DRIFT

Boundary, area, perimeter, name

TABLE 2-1 TYPES OF DATA CURRENTLY IN THE GENISES DATABASE

21 SUBSURFACE ACCESS DRIFTS AND RAMPS

Length

22 EXPLORATORY STUDIES FACILITIES (1:2,400 scale source map)

Facility Names

23 CORE AREA BOUNDARY

Boundary, area, perimeter, name

24 DISTURBANCE FEATURES

Roads, Pads, Other

PHYSIOGRAPHIC DATA

25 GEOFEATURES (1:250,000 scale source data)

Name

26 ELEVATION CONTOURS (1:2,400 scale source data; 2 foot interval)

isoline value

27 ELEVATION CONTOURS (1:6,000 scale source data; 10 foot interval)

isoline value

28 ELEVATION CONTOURS (1:24,000 scale source data; 20 foot interval)

isoline value

29 ELEVATION CONTOURS (1:40,000 scale source data; 40 foot interval)

isoline value

30 ELEVATION CONTOURS (1:5,000 scale source data; 2 meter interval)

isoline value

31 ELEVATION CONTOURS (1:100,000 scale source data; 50 meter interval)

isoline value

32 DIGITAL ELEVATION MODEL (DEM) (1:250,000 scale source data)

Surface elevation

TABLE 2-1 TYPES OF DATA CURRENTLY IN THE GENISES DATABASE

33 DIGITAL ELEVATION MODEL (DEM) (1:24,000 scale source data)

Surface elevation

34 DIGITAL ELEVATION MODEL (DEM) (1:12,000 scale source data)

Surface elevation

35 DIGITAL ELEVATION MODEL (DEM) (1:6,000 scale source data)

Surface elevation

36 SEISMIC REFRACTION STUDIES

Length, ID, shot point locations,

37 SEISMIC REFLECTION STUDIES

Length, ID

38 GEOELECTRIC SURVEY AREAS

Area, type of survey

39 GEOELECTRIC TRAVERSES

Type of traverse, length, sounding locations

40 RESISTIVITY SOUNDINGS

Location

GEOLOGIC DATA

41 FAULTS (1:12,000 and 1:24,000 scale source data)

Locational certainty, fault movement

42 FRACTURES (1:12,000 and 1:24,000 scale source data)

Strike

43 FRACTURE SETS (1:12,000 and 1:24,000 scale source data)

Strike

44 TECTONIC BRECCIA (1:12,000 and 1:24,000 scale source data) Location

TABLE 2-1 TYPES OF DATA CURRENTLY IN THE GENISES DATABASE

45 BEDROCK ALLUVIUM CONTACT (1:12,000 and 1:24,000 scale source data)

Bedrock/alluvium, area, perimeter

HYDROGRAPHIC DATA

46 HYDROGRAPHY (1:2,000,000 scale source data; entire US digital database)

Streams, water bodies

47 HYDROGRAPHY (1:100,000 scale source data; entire US digital database)

Streams, water bodies

48 HYDROGRAPHY (1:24,000 scale source data)

Streams, water bodies

49 FLOOD PRONE AREAS (1:24,000 scale source data)

Limits of Inundation

50 FLOODPLAIN CROSS-SECTION (1:24,000 scale source data)

USGS Cross-section

51 DRAINAGE BASINS (1:24,000 scale source data)

Drainage Basin Divide

52 HYDROGRAPHIC REGIONS AND BASINS (1:750,000 scale source data)

Basins, subbasins

53 MONITORING SITES/STATIONS

Site identification, monitoring type, site ID, buffers

54 POTENTIOMETRIC CONTOURS

Isoline value

BIOLOGIC DATA

55 BIOLOGICAL STUDY AREAS

Area ID

TABLE 2-1 TYPES OF DATA CURRENTLY IN THE GENISES DATABASE

56 DESERT TORTOISE TRANSECTS

Biology ID, study area, year, length, presence of sign

57 SMALL MAMMAL TRAPLINES

Trapline ID

58 PROPOSED LAGOMORPH TRANSECTS

Transect, length, ID

59 PROPOSED SCENT STATION ROUTES

Transect, length, ID

2.2 Database References

GENISES information is available to YMP participating organizations and, on approval by the YMP Project Office, to outside parties. Access to or development of specific information products may be obtained by completing a YMP GENISES Work Request (see Appendix GENISES-A). Table 2-2 is a listing of GENISES reference citations. These citations identify GENISES information sources.

TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

REF	(*)	REFERENCE
01		U.S. Bureau of Land Management, 1978. "Surface Management Status Map", Beatty Quadrangle, Nevada-California, 1:100,000 Scale Series (Planimetric).
02		U.S. Geological Survey, National Mapping Program, 1970. "National Atlas of the United States of America", Digital Line Graphs at 1:2,000,000 scale.
03		U.S. Department of Commerce, Bureau of the Census, 1990. "Topologically Integrated Geographic Encoding and Referencing System - TIGER database. Digital database for the entire US containing political and administrative boundaries at a 1:100,000 scale.
04		U.S. Geological Survey, National Mapping Program. "Digital Line Graphs from 1:24,000 Scale Maps", Boundaries. [illegible]tty Mountain, Nevada, 1987, Provisional. East of Beatty Mountain, [illegible]evada, 1987, Provisional. Topopah Spring NW, Nevada, 1961. Topopah Spring, Nevada, 1961. Carrara Canyon, Nevada, 1981, Provisional. Crater Flat, Nevada, 1986, Provisional. Busted Butte, Nevada, 1961, Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Amargosa Valley, Nevada, 1961, photo-revised 1983. Striped Hills, Nevada, 1961, photo-revised 1983.
05		Rautman, C., 1987. Sandia National Laboratories, IGIS product number CAL0194.
06		U.S. Geological Survey, National Mapping Program. "Digital Line Graphs from 1:24,000 Scale Maps", U.S. Public Land Survey System. Beatty Mountain, Nevada, 1987, Provisional. East of Beatty Mountain, Nevada, 1987, Provisional. Topopah Spring NW, Nevada, 1961. Topopah Spring, Nevada, 1961. Carrara Canyon, Nevada, 1981, Provisional. Crater Flat, Nevada, 1986, Provisional. Busted Butte, Nevada, 1961, Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Amargosa Valley, Nevada, 1961, photo-revised 1983. Striped Hills, Nevada, 1961, photo-revised 1983.
07		A 1:24,000 scale 7.5' topographic quadrangle index map has been prepared for an area covering the Nevada Test Site and Yucca Mountain Site Characterization Project. The index map also shows the availability of digital line graph data (DLG), which is updated quarterly with information provided by the USGS National Mapping Division. 1:24,000 scale DLG layers include: transportation, hydrography, boundaries, hypsography, and public land survey system. Digital Elevation Model (DEM) files are also available.

(*) Reference Number correlates with Reference Number cited in Table 2.1 Types of Data Currently Being Stored in the GENISES.

TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

REF (*)	REFERENCE
01	U.S. Bureau of Land Management, 1978. "Surface Management Status Map", Beatty Quadrangle, Nevada-California, 1:100,000 Scale Series (Planimetric).
02	U.S. Geological Survey, National Mapping Program, 1970. "National Atlas of the United States of America", Digital Line Graphs at 1:2,000,000 scale.
03	U.S. Department of Commerce, Bureau of the Census, 1990. "Topologically Integrated Geographic Encoding and Referencing System - TIGER database. Digital database for the entire US containing political and administrative boundaries at a 1:100,000 scale.
04	U.S. Geological Survey, National Mapping Program. "Digital Line Graphs from 1:24,000 Scale Maps", Boundaries. Beatty Mountain, Nevada, 1987, Provisional. East of Beatty Mountain, Nevada, 1987, Provisional. Topopah Spring NW, Nevada, 1961. Topopah Spring, Nevada, 1961. Carrara Canyon, Nevada, 1981, Provisional. Crater Flat, Nevada, 1986, Provisional. Busted Butte, Nevada, 1961, Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Amargosa Valley, Nevada, 1961, photo-revised 1983. Striped Hills, Nevada, 1961, photo-revised 1983.
05	Rautman, C., 1987. Sandia National Laboratories, IGIS product number CAL0194.
06	U.S. Geological Survey, National Mapping Program. "Digital Line Graphs from 1:24,000 Scale Maps", U.S. Public Land Survey System. Beatty Mountain, Nevada, 1987, Provisional. East of Beatty Mountain, Nevada, 1987, Provisional. Topopah Spring NW, Nevada, 1961. Topopah Spring, Nevada, 1961. Carrara Canyon, Nevada, 1981, Provisional. Crater Flat, Nevada, 1986, Provisional. Busted Butte, Nevada, 1961, Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Amargosa Valley, Nevada, 1961, photo-revised 1983. Striped Hills, Nevada, 1961, photo-revised 1983.
07	A 1:24,000 scale 7.5' topographic quadrangle index map has been prepared for an area covering the Nevada Test Site and Yucca Mountain Site Characterization Project. The index map also shows the availability of digital line graph data (DLG), which is updated quarterly with information provided by the USGS National Mapping Division. 1:24,000 scale DLG layers include: transportation, hydrography, boundaries, hypsography, and public land survey system. Digital Elevation Model (DEM) files are also available.

(*) Reference Number correlates with Reference Number cited in Table 2.1 Types of Data Currently Being Stored in the GENISES.

TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

08 1:6,000 scale orthophotographs were generated in 1991 for an area covering the Repository Block Area. An index map has been prepared as a GIS coverage to show the areal extent and sheet boundaries for these orthophotographs. This index can also be used to identify the ten foot elevation contour maps and digital elevation models.

09 1:12,000 scale orthophotographs were generated in 1991 for an area covering the near-field study area. An index map has been prepared as a GIS coverage to show the areal extent and sheet boundaries for these orthophotographs. This index can also be used to identify the twenty foot elevation contour maps and digital elevation models.

10 Proposed Bureau of Land Management withdrawal boundary provided by Phil Ralphs (9-9-88). Boundaries delineated on a copy of a Public Land Survey System map with portions of sections identified.

11 U.S. Geological Survey. "Geographic Names Information System". This database contains digital files on more than 2 million place names and features in the US - from towns, schools, reservoirs, and parks to streams, valleys, springs and ridges. Each State file contains the names found on USGS topographic maps. For each geographic name listed, there are 15 descriptive elements, such as the descriptive name, type of feature, geographic coordinates and the name of the topographic map containing the feature.

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13 U.S. Department of Commerce, Bureau of the Census, 1990. "Topologically Integrated Geographic Encoding and Referencing System - TIGER database. Digital database for the entire US containing demographic features at a 1:100,000 scale.

14 U.S. Geological Survey, 1970. "National Atlas of the United States of America", Digital Line Graphs at 1:2,000,000 scale.

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TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

17 U.S. Department of Energy, 1986. "NNWSI Drill Hole Map", prepared by Holmes and Narver, Inc.; Drawing Number JS-025-001-C2, Rev. 2; 1:12,000 scale. (Used as a location/identifier cross-check source).

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Fenix and Scission, 1986. "NNWSI Hole Histories UE-25 WT #3, UE-25 WT #4, UE-25 WT #5, UE-25 WT #6, UE-25 WT #12, UE-25 WT #13, UE-25 WT #14, UE-25 WT #15, UE-25 WT #16, UE-25 WT #17, UE-25 WT #18, USW WT-1, USW WT-2, USW WT-7, USW WT-10, USW WT-11", DOE/NV/10322-10.

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Fenix and Scisson, 1986. "NNWSI Hole Histories UE-29a #1 and UE-29a #2", DOE/NV/10322-12.

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TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

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18 U.S. Department of Energy, 1985. "Regional NNWSI Map", prepared by Holmes and Narver, Inc.; Drawing Number JS-025-002-C1; 1:48,000 scale. (Used as a location/identifier cross-check source).

U.S. Department of Energy, 1988. "Yucca Mountain Project Surface-based Investigations Plan", Volumes 1-4, YMP/88-25.

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21 U.S. Department of Energy, 1991. "Subsurface Access Drifts" prepared by Raytheon Services of Nevada; Drawing Number YMP-025-1-MING-MI01.

22 U.S. Department of Energy, 1987. "ESF Overall Site Plan -Layout No. 8", prepared by Holmes and Narver, Inc.; Drawing Number SK-025-002-C14, 1:2,400 scale drawing. Manually digitized. 23 Rautman, C., 1987. Sandia National Laboratories, IGIS product number CAL0194.

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Bare Mountain, NE Bare Mountain, SE Big Dune, NE Topopah Spring, NW Topopah Spring, SW Lathrop Wells,

EG&G Energy Measurements, Inc. aerial photography flown at a scale of 1:24,000 in July 1986 and September 1987.

25 Boundaries of geofeatures and their names were interpreted from U.S. Geological Survey 1:250,000 scale maps. Caliente, NV;UT, 1954, Revised 1970 Death Valley, CA;NV, 1954, Revised 1970 Goldfield, NV;CA, 1954, Revised 1970 Kingman, AZ;NV;CA, 1954, Revised 1969 Las Vegas, NV;AZ;CA, 1954, Revised 1969 Trona, CA, 1954, Revised 1970

26 U.S. Geological Survey, 1986. "Greater Exploratory Shaft Area, Yucca Mountain, NV", 1:2,400 scale (2 foot elevation contour interval); produced by USGS Branch of Astrogeology, Flagstaff, Arizona for the U.S. Department of Energy.

TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

27 Digital elevation contours (10 foot intervals) were generated in 1991 for an area covering the Repository Block Area. An index map has been prepared to show the areal extent and sheet boundaries for these contour maps.

28 U.S. Geological Survey, National Mapping Program. "Digital Line Graphs from 1:24,000 Scale Maps", Hypsography (20 foot elevation contours). Topopah Spring NW, Nevada, 1961. Topopah Spring, Nevada, 1961. Crater Flat, Nevada, 1986, Provisional. Busted Butte, Nevada, 1961, Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Amargosa Valley, Nevada, 1961, photo-revised 1983. Striped Hills, Nevada, 1961, photo-revised 1983.

Digital elevation contours at twenty foot intervals were generated in 1991 for an area covering the near-field study area. An index map has been prepared to show the areal extent and sheet boundaries for these contour maps.

29 U.S. Geological Survey, National Mapping Program. "Digital Line Graphs from 1:24,000 Scale Maps", Hypsography (40 foot elevation contours). Beatty Mountain, Nevada, 1987, Provisional. East of Beatty Mountain, Nevada, 1987, Provisional. Carrara Canyon, Nevada, 1981, Provisional.

30 U.S. Geological Survey, 1985. "Topographic Maps of Yucca Mountain Area, Nye County, Nevada", 1:5,000 scale (two meter elevation contours); produced by USGS Branch of Astrogeology for the U.S. Department of Energy.

31 U.S. Geological Survey 30 x 60 Minute Series Topographic Quadrangle Map, 1986, 1:100,000 Scale Metric, Beatty, Nevada-California; Contour interval 50 meters (manually digitized).

32 U.S. Geological Survey, "1:250,000 Scale Digital Elevation Model (DEM) Data", produced by the Defense Mapping Agency, 1o x 1o blocks:

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33 U.S. Geological Survey, "1:24,000 Scale 7.5-minute Digital Elevation Model Data", 30 meter UTM spacing. Beatty Mountain, Nevada, 1987, Provisional. East of Beatty Mountain, Nevada, 1987, Provisional. Topopah Spring NW, Nevada, 1961. Topopah Spring, Nevada, 1961. Carrara Canyon, Nevada, 1981, Provisional. Crater Flat, Nevada, 1986, Provisional. Busted Butte, Nevada, 1961, Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Striped Hills, Nevada, 1961, photo-revised 1983.

34 Digital elevation models were generated for the near-field study area (1:12,000 scale) from the 1991 orthophotograph process. The DEM has approximately a 250 foot grid.

35 Digital elevation models were generated for the Repository Block area (1:6,000 scale) from the 1991 orthophotograph process. The DEM has approximately a 160 foot grid.

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Pankratz, L. W., 1982. "Reconnaissance Seismic Refraction Studies at Calico Hills, Wahmonie, and Yucca Mountain: Southwest Nevada Test Site, Nye County, Nevada". USGS-OFR-82-478, Figure 8.

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Hoover, D.B., M.P. Chornack, K.H. Nervick, and M.M. Broker, 1982. "Electrical Studies at the Proposed Wahmonie and Calico Hills Nuclear Waste Sites, Nevada Test Site, Nye County, Nevada", U.S. Geological Survey Open File Report 82-446.

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TABLE 2-2 REFERENCE AND SOURCE CITATIONS FOR GENISES DATA

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43 Scott, R.B., and J. Bonk, 1984. "Preliminary Geologic Map of Yucca Mountain, Nye County, Nevada With Geologic Cross Sections". USGS-OFR-84-494, 1:12,000 scale.

44 Scott, R.B., and J. Bonk, 1984. "Preliminary Geologic Map of Yucca Mountain, Nye County, Nevada With Geologic Cross Sections". USGS-OFR-84-494, 1:12,000 scale.

45 Scott, R.B., and J. Bonk, 1984. "Preliminary Geologic Map of Yucca Mountain, Nye County, Nevada With Geologic Cross Sections". USGS-OFR-84-494, 1:12,000 scale.

46 U.S. Geological Survey, 1970. "National Atlas of the United States of America", Digital Line Graphs at 1:2,000,000 scale. 47 U.S. Department of Commerce, Bureau of the Census, 1990. "Topologically Integrated Geographic Encoding and Referencing System - TIGER database. Digital database for the entire US containing hydrographic features at a 1:100,000 scale.

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Photo-revised 1983. Jackass Flats, Nevada, 1961, Photo-revised 1983. Ashton, Nevada, 1987, Provisional. Big Dune, Nevada, 1986, Provisional. Amargosa Valley, Nevada, 1961, photo-revised 1983. Striped Hills, Nevada, 1961, photo-revised 1983.

49 United States Geological Survey, 1983. "Map Showing Approximate Flood Prone Areas, Fortymile Wash And Its Principal Southwestern Tributaries, Nevada Test Site, Southern Nevada". From Water Resources Investigation Report 83-4001 (Plate 1); Hydrology mapped by R.R. Squires and R.L. Young, 1982.

50 United States Geological Survey, 1983. "Map Showing Approximate Flood Prone Areas, Fortymile Wash And Its Principal Southwestern Tributaries, Nevada Test Site, Southern Nevada". From Water Resources Investigation Report 83-4001 (Plate 1); Hydrology mapped by R.R. Squires and R.L. Young, 1982.

51 United States Geological Survey, 1983. "Map Showing Approximate Flood Prone Areas, Fortymile Wash And Its Principal Southwestern Tributaries, Nevada Test Site, Southern Nevada". From Water Resources Investigation Report 83-4001 (Plate 1); Hydrology mapped by R.R. Squires and R.L. Young, 1982.

52 Division of Water Resources, State Engineers Office, 1971. Compiled by F.E. Rush, B.R. Scott, A.S. Van Denburgh and B.J. Vasey. "State of Nevada Water Resources and Inter-Basin Flows". An area covering from 117o 00' 000" 36o 00' 00" to 115o 00' 00" 38o 00' 00" was manually digitized.

53 Proposed water-level monitoring and spring-discharge monitoring site locations were derived from coordinate data as reported by Walker and Eakin, 1963; Thordarson, 1967; Johnston, 1968; and Dudley and Larson, 1976.

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57 Science Applications International Corporation, 1988. Small mammal trapline sampling locations were provided by J.K Prince. Locations were drafted onto a full scale (1:12,000 scale) copy of the Scott and Bonk, 1984 preliminary geologic map of Yucca Mountain.

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EG&G Energy Measurements, Inc., Environmental Studies Department, 1989. "Proposed Scent-Station Route C and Locations for Yucca Mountain Project", drafted onto USGS 1:24,000 scale 7.5' topographic quadrangle, Crater Flat, Nev.

3.0 SIGNIFICANT ACTIVITIES THIS QUARTER

3.1 Data Added During This Quarter:

GENISES PRODUCT #	PARTICIPANT	CITATION #	TITLE
YMP-91-025.1	RSN	21	Subsurface Access Drifts

3.2 Requested and Delivered Products (4/19 - 6/91)

PRODUCT NUMBER	TITLE	REQUESTOR
YMP-90-057.3	Regional Water-level and Spring Discharge Monitoring Sites	Fasano/SAIC
YMP-89-036.1	Mining Claims	Lorenz/REECo
YMP-89-036.2	Mining Claims	Lorenz/REECo
YMP-90-041.2	Proposed Land Withdrawal	Lorenz/REECo
NTS-87-002.1	Proposed Activities	Pysto/SAIC
YMP-91-008.2	Orthophoto Sheet Index	McKeown/BR
YMP-91-020.1	Existing Drillholes	Sullivan/DOE
YMP-91-021.1	Proposed Drillholes	Sullivan/DOE
YMP-91-008.2	Orthophoto Sheet Index	Prince/SAIC
YMP-91-022.1	Existing Drillholes	Sullivan/DOE
YMP-91-023.1	Proposed Drillholes	Sullivan/DOE
YMP-90-014.1	Orthophoto and Soil Mapping Index	Dussman/SAIC
YMP-91-008.2	Orthophoto Sheet Index	Dussman/SAIC
YMP-91-024.1	Selected Drillholes	Long/DOE
NNWSI-87-004.3	Proposed Conditions	Pysto/SAIC
YMP-91-001.3	Flood Prone Areas	Wittwer/LBL
YMP-91-008.2	1:6,000 Scale Orthophoto Index	Wittwer/LBL
YMP-91-011.2	Faults and Alluvial Contacts	Wittwer/LBL
YMP-91-022.1	Existing Drillholes	Wittwer/LBL

YMP-91-023.1	Proposed Drillholes	Wittwer/LBL
YMP-91-025.1	Existing Drillholes and Subsurface Access Drifts	Stanley/RSN
YMP-91-026.1	Proposed Drillholes and Subsurface Access Drifts	Stanley/RSN
NTS-91-020.2	USGS Digital Data Products For the NTS	Gibson/SNL
NTS-91-001.1	TLD Monitoring Network at the NTS	Gibson/SNL
YMP-91-057.4	Southern Regional Water-level and Spring Discharge Monitoring Sites	Fasano/SAIC
YMP-91-025.1	Existing Drillholes and Subsurface Access Drifts	Stanley/RSN
YMP-91-026.1	Proposed Drillholes and Subsurface Access Drifts	Stanley/RSN
NNWSI-87-004.1	Proposed Activities	Fysto/SAIC
NTS-90-027.1	Desert Tortoise Maps	Rautenstrauch/EGG
YMP-91-057.4	Southern Regional Water-level and Spring Discharge Monitoring Sites	Fasano/SAIC
YMP-91-025.1	Existing Drillholes and	Sinks/SAIC
YMP-90-061.1/ 069.1	Meteorology Study Plan Figures	Flint/USGS
YMP-91-025.1	Existing Drillholes and Subsurface Access Drifts	Gertz/DOE
YMP-91-026.1	Proposed Drillholes and Subsurface Access Drifts	Gertz/DOE
NTS-90-019.1	Tortoise Transect Maps	Rautenstrauch/EGG
NTS-90-021.1	Tortoise Transect Maps	Rautenstrauch/EGG
NTS-90-022.1	Tortoise Transect Maps	Rautenstrauch/EGG
NTS-90-026.1	Tortoise Transect Maps	Rautenstrauch/EGG
YMP-91-029.1	GSA Tour for NTS and Vicinity	Chornak/USGS
YMP-91-027.1	GSA Tour Map for YMP Area	Chornak/USGS

YMP-91-026.1	Proposed Drillholes and Subsurface Access Drifts	Sinks/SAIC
YMP-91-030.1	Basemap	White/DOE
YMP-91-030.2	Trenches (Overlay to basemap)	White/DOE
YMP-91-030.3	Existing Drillholes (overlay to basemap)	White/DOE

3.3 EG&G/EM RSL YMP Support Office

During this quarter the EG&G/EM RSL YMP Support Office was established at the Valley Bank Center, 101 Convention Center Drive. The YMP Support Office staff includes: Elaine Ezra (Office Manager), Jim Beckett (TDB Administrator), Dave Brickey (Geoscience Task Leader), Barbara Kistler (Site Atlas Task Leader) and Steve Kowalkowski (Analyst). Susan Rohde (Map Coordinator) coordinates the YMP map production activities conducted at the RSL Nellis Facility.

The YMP Support Office will allow easy access to the GENISES database by Project participants. Analysts trained in spatial analysis will be available to facilitate interactive sessions for Participants not well versed in GIS technology.

4.0 UPCOMING MAJOR ACTIVITIES

4.1 EG&G/EM RSL YMP Support Office

The YMP Support Office staff will be developing the hardware and software requirements for the Support Office. Initial planning includes the purchase of two UNIX workstations with ARC/INFO and INGRES software implementations; one large format digitizing tablet, one large format B&W plotting device and one small format color thermal printer.

4.2 The Geographic Nodal Information Study and Evaluation System (GENISES) Database.

A Development Plan for the GENISES database will be drafted during the next quarter. The Development Plan will address the approach and schedule for the following database design phases: Needs Assessment; Conceptual Design; Physical Design; Pilot Study; Implementation; and Operational.

4.3 Site Atlas Map Portfolio

A revised version of the YMP Site Atlas is currently underway. During the next quarter a design for the Site Atlas Map Portfolio will be completed, and

will include a description of the following: user needs, physical size, map layouts, and data collection requirements.

APPENDIX GENYSES-A

YMP GENYSES WORK REQUEST
FORM

BLANK WORK REQUEST FORM

EG&G ENERGY MEASUREMENTS

YMP GENISES WORK REQUEST

SEND TO:
GENISES Technical Database Administrator
RSL YMP Support Office
EG&G Energy Measurements, Inc.
P.O. Box 1912, M/S V-02
Las Vegas, Nevada 89125
Telephone: FTS 544-7448 FAX: FTS 544-7469

To be completed by GENISES Database Personnel:
Request No: _____
Job No: _____
Date requested: _____

TO BE COMPLETED BY THE REQUESTOR:

DATE _____

NAME _____ SIGNATURE _____

ORGANIZATION _____ TELEPHONE _____

ADDRESS _____

PURPOSE OF REQUESTED DATA _____

IS THE PRODUCT QUALITY AFFECTING? _____ DATE DUE _____

COMMENTS: If the request is for copies of existing maps or records, the requestor should provide the EG&G EM map reference number located in the lower right corner of all map products. If this is a request for a new product or modification of an existing product, please describe desired product or modification and include any CA requirements or drawings, maps or sketches as appropriate.

PRODUCT FORMAT

HARDCOPY: _____ NUMBER OF COPIES _____ MAP SIZE OR SCALE _____

DIGITAL _____ OS _____ FILE FORMAT _____ MEDIA _____

To be completed by GENISES Database Personnel

RECEIVED BY: _____ DATE: _____
ASSIGNED TO: _____ DATE: _____
VERIFIED BY: _____ DATE: _____
APPROVED BY: _____ DATE: _____

PRODUCT OR ACCESSION NUMBERS _____

YMSO-001 WHITE Original YELLOW MRSD Copy PINK Analyst Copy GOLDENROD Originator Record Copy

THE GEMBOCHS DATABASE AND SOFTWARE LIBRARY:

YMP-TDB QUARTERLY REPORT: 3rd QUARTER 1991

JAMES W. JOHNSON AND SUZANNE R. LUNDEEN

EARTH SCIENCES DEPARTMENT, L-219
LAWRENCE LIVERMORE NATIONAL LABORATORY
LIVERMORE, CA 94550

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Overview of the GEMBOCHS Database and Software Library

The GEMBOCHS (Geologic and Engineering Materials: Bibliography Of Chemical Species) database contains compositional and thermodynamic data for over 2000 chemical species, including virtually all endemic and potential contaminant species relevant to Yucca Mountain. These data, retrieved from an extensive literature search during the past decade (Appendix A), represent a fundamental component of our ability to quantitatively predict the chemical consequences of irreversible fluid-rock reactions that may occur within the post-emplacement repository environment at Yucca Mountain. Other fundamental components of this predictive capability include the various theoretical models used to represent (1) the thermodynamic behavior of chemical species as a function of temperature (T) and pressure (P), (2) the equilibrium distribution of elemental mass among coexisting species as a function of T, P, and bulk composition, and (3) the redistribution of this mass among these species as a function of imposed chemical and/or thermal disequilibrium. Each of these successive models is inherently dependent upon each of its predecessors: e.g., the calculations involved in model (3) require as input the results of models (1)-(2), which in turn are dependent on GEMBOCHS data. The Database Development Task at LLNL maintains and develops GEMBOCHS as well as an extensive software library, which includes a suite of routines that implement model (1) above. The EQ3/6 Code Development Task, also at LLNL, maintains and develops the EQ3/6 software package, which facilitates practical application of models (2) and (3) to address geochemical problems.

GEMBOCHS is a relational database that resides in the Database Development Task's local installation of the Ingres relational database management system. Formal requests for changes or additions to GEMBOCHS can be submitted by contacting the GEMBOCHS database administrator via the standard electronic mail system (see below); such requests require concomitant submittal of a TDIF and Data Transmittal Package in accordance with YMPO AP-5.2Q. These change requests are processed locally using CNGBOCHS, an interactive code that can be viewed as an automated tracking and filing system for the requests as they are reviewed and resolved. Modifications and additions to GEMBOCHS are incorporated locally using DBAPP, an interactive program that interfaces the user with GEMBOCHS tables, permits selected users having password-restricted access to update the tabulated data, and automatically reports these updates to a dedicated audit table.

The software interface between GEMBOCHS and the EQ3/6 modeling package consists of two programs: DOOUT and EQPT. DOOUT accesses data for the user-specified subset of GEMBOCHS species, calculates aqueous dissociation constants for these species as a function of T and P using the theoretical models noted in (1) above, and generates the DATAO file - a formatted ASCII file that contains all data explicitly required by the EQ3/6 package as well as many other data of interest to EQ3/6 users. EQPT reads the DATAO file, fits the aqueous dissociation-constant grids to interpolating polynomials, and writes the calculated polynomial coefficients together with all other required data to the DATA1 file - an unformatted file that is read directly by EQ3 and EQ6.

It is important to emphasize the fact that GEMBOCHS itself cannot be interfaced directly with EQ3/6 or any other alternate geochemical modeling package; a software pipe, DOOUT-EQPT or one of their derivative analogs, is always required. Of course, this requirement is actually advantageous: it ensures the continued versatility and integrity of GEMBOCHS data because (1) GEMBOCHS is not structurally tied to any one geochemical modeling code, (2) DOOUT-EQPT clones that interface GEMBOCHS with new modeling software are readily developed, and (3) GEMBOCHS itself is not modified when generating such clones.

The following report provides a summary of GEMBOCHS database contents, describes the major programs contained in the GEMBOCHS software library, discusses the use of GEMBOCHS by YMP participants, outlines the procedure by which these participants may request modifications to GEMBOCHS, and tabulates all such modifications incorporated during the 3rd quarter, 1991. First, however, a few words summarizing the association between GEMBOCHS (i.e., the LLNL Database Development Task) and YMP participants that use this database.

The GEMBOCHS-YMP Association

The LLNL Database Development Task has been funded, at various levels of support, by the YMP and its predecessors (NNWSI, etc.) from FY82 to the present. This continuous funding has reflected the critical, ongoing dependence of other project participants on maintaining and developing GEMBOCHS (which in the past has been referred to as the LLNL Thermochemical Database, MDAIN, etc.). This dependence on GEMBOCHS is primarily through its use with the EQ3/6 modeling package, which has also been funded by these projects. Current YMP-sponsored research activities that depend heavily on the continued availability of GEMBOCHS and EQ3/6 include modeling of ion-exchange processes associated with fluid-zeolite interactions (B. Viani, C. Bruton, LLNL), experimental studies of glass wasteform dissolution (W. Bourcier, LLNL), and numerical simulation of groundwater chemistry at Yucca Mountain within the pre- and potential post-emplacement environment (W. Steinkampf, USGS; M. Ebinger, LANL). Other DOE-sponsored activities that use GEMBOCHS and EQ3/6 extensively include ongoing environmental remediation projects at Fernald, OH (contact: J. Carr, DOE) and Rocky Flats, CO (contact: D. Simonson, DOE) and studies of brine chemistry associated with the WIPP project (contact: L. Brush, DOE).

The GEMBOCHS Database: Summary of Contents

The particular collection of thermodynamic data and associated regression coefficients (equation-of-state parameters, heat capacity coefficients, etc.) required by a specific geochemical modeling code varies somewhat as a function of the processes being modeled and the theory and equations being used to represent these processes. Nevertheless, there is considerable overlap in the thermodynamic data required to calculate the standard molal thermodynamic properties of species as a function of T and P,

the equilibrium distribution of elemental mass among coexisting phases as a function of T, P, and bulk composition, and the evolution of this distribution as a consequence of chemical and/or thermal perturbation. The GEMBOCHS database contains all of the thermodynamic data and regression parameters required to perform each of these modeling activities using most of the geochemical software packages currently available.

The compositional and thermodynamic data contained in each of the 23 GEMBOCHS tables are listed and briefly defined in the GEMBOCHS Data Dictionary, which is given in Appendix B. For the convenience of those interested in what data are used for each type of chemical species, the following skeletal outline is also provided.

Compositional Data for Minerals, Gases, or Aqueous Species

Elemental Composition
Common Name

Reaction Data for Aqueous Dissociation of Minerals, Gases, or Aqueous Species

Reaction Stoichiometry
Equilibrium Constants
Pressure, Temperature Conditions
Standard Molal Gibbs Free Energies of Reaction
Standard Molal Enthalpies of Reaction
Standard Molal Entropies of Reaction
Standard Molal Volumes of Reaction
Standard Molal Heat Capacities of Reaction
Parameter Units
Literature References

Thermodynamic Data for Minerals

Standard Molal Gibbs Free Energy of Formation
Standard Molal Enthalpy of Formation
Standard Molal Entropy at Reference Pressure (Pr) and Temperature (Tr)
Standard Molal Volume at Pr, Tr
Standard Molal Heat Capacity at Pr, Tr
Molecular Weight
Heat Capacity Coefficients
Temperature Limits on Heat Capacity Coefficients
Standard Molal Enthalpy of Transition
Standard Molal Entropy of Transition
Standard Molal Volume of Transition
Clapeyron Slope
Parameter Units
Literature References

Thermodynamic Data for Gases

Standard Molal Gibbs Free Energy of Formation
Standard Molal Enthalpy of Formation
Standard Molal Entropy at Pr, Tr
Standard Molal Volume at Pr, Tr
Standard Molal Heat Capacity at Pr, Tr
Molecular Weight
Heat Capacity Coefficients
Temperature Limits on Heat Capacity Coefficients
Parameter Units
Literature References

Thermodynamic Data for Aqueous Species

Standard Molal Gibbs Free Energy of Formation
Standard Molal Enthalpy of Formation
Standard Molal Entropy at Pr, Tr
Standard Molal Volume at Pr, Tr
Standard Molal Heat Capacity at Pr, Tr
Molecular Weight
Equation-of-State Coefficients
Debye-Huckel Parameters
Ionic Charge
Electronic Entropy
Parameter Units
Literature References

The GEMBOCHS Software Library: Selections of Relevance to YMP

The database software library facilitates maintenance and development of the GEMBOCHS database and its practical use to address relevant environmental problems via geochemical modeling packages such as EQ3/6. Only those four programs that are directly relevant to the YMP's current use of GEMBOCHS are summarized below.

CNGBOCHS

CNGBOCHS is an interactive program that permits on- or off-site GEMBOCHS users having access to the gov electronic mailing domain to submit formal change requests using the standard electronic mail (Email) utility; note that such requests must be accompanied by concomitant submittal of a TDIF and Data Transmittal Package in accordance with AP-5.2Q. CNGBOCHS, which interfaces Email, a dedicated Ingres database (CNGREQ), and the Interleaf desktop publishing package, also provides the local Database Development staff with a convenient tracking and filing system for the process of reviewing, resolving, and verifying resolution of these change requests.

A given Email change request is first filed in CNGREQ; subsequently, its status evolves from "review" to "assigned" to "verification" and finally to "completion". At each stage of this evolution, the responsible party submits their comments or a report of their actions to CNGREQ via an electronic form that interfaces the party with this database. The status of the request then changes, and an Email message indicating this change is sent to all those affected. At any point during this process, the electronic form which summarizes the current disposition of the change request can be printed using the built-in interface to Interleaf.

DBAPP

DBAPP is an interactive FORTRAN77-Equel code that facilitates review of GEMBOCHS data by all local users and modification of these data by selected members of the Database Development staff. DBAPP interfaces the user with GEMBOCHS via an extensive suite of electronic forms. These forms permit any user to browse through GEMBOCHS data, and a smaller set of password-restricted users to modify, augment, or delete these data. The operative status of new species is either "active" or "notused". "Active" species appear in release versions of the DATAO suite for use with EQ3/6 whereas "notused" species are restricted to use within the trial DATAO files used locally. In addition, DBAPP automatically reports all GEMBOCHS updates to a dedicated audit table, which contains the complete modification history of GEMBOCHS.

DOOUT

DOOUT is a FORTRAN77-Equel code that serves as a software pipe between GEMBOCHS and EQPT. DOOUT performs the following functions: (1) retrieves data from GEMBOCHS for the user-specified subset of chemical species (currently, there are five such subsets; these are described below), (2) calculates aqueous dissociation constants for these species from 0 to 100 C at 1.0132 bars and from 100 to 300 C along the $H2^0$ vaporization boundary using the SUPCRT91 equation of state, CrissCobble extrapolation, or DQUANT method for aqueous species and Cp integration for solids, gases, and liquids, and (3) generates the DATAO file, a formatted ASCII file that contains the dissociation constants, all other data explicitly required for EQ3/6 calculations, and various other species data of interest to EQ3/6 users.

EQPT

EQPT is a FORTRAN77 code that serves as a software interface between the DATAO file produced by DOOUT and the EQ3/6 geochemical modeling package. EQPT performs the following functions: (1) reads the DATA0 file, (2) fits species dissociation constants to interpolating polynomials, and (3) generates the DATA1 file, an unformatted equivalent of DATA0 where species dissociation constants are replaced with their associated polynomial

regression coefficients, and all data not explicitly required for EQ3/6 calculations has been filtered.

Note that although DOOUT and EQPT could be readily consolidated into a single code, there are significant advantages associated with maintaining their independence. Specifically, the present arrangement (1) provides users with a wealth of additional, relevant data not explicitly required by EQ3/6, (2) provides this data in a formatted ASCII file which can be viewed, printed, and edited, (3) provides users with the option of customizing DATA0 files by adding new species or modifying data for existing species, and (4) minimizes EQ3/6 run-time costs associated with reading these large thermodynamic databases by providing these data on an unformatted file that contains only those data explicitly required for the calculations.

Use of GEMBOCHS by YMP Participants

In general, YMP participants use the GEMBOCHS database strictly through its association with the EQ3/6 software package. Hence, the typical YMP user's only contact with GEMBOCHS is in the form of the various DATA0 files produced by DOOUT (see above). Five distinct DATA0 files are presently available for use with the current release version (3245.1090) of EQ3/6. This suite of files is listed below:

DATA0 filename	Description	# of species
DATA0.com.R10	Composite database	1834
DATA0.sup.R10	SUPCRT91 database	462
DATA0.nea.R10	NEA/CODATA database	424
DATA0.pit.R10	Pitzer database	488
DATA0.hmw.R10	Harvey-Moller-Weare database	71

Each of these five files is designed to meet specific geochemical modeling needs; for a given EQ3/6 modeling problem, the appropriate DATA0 file is determined on the basis of compositional complexity, required level of internal consistency, and desired formalism for calculating activity coefficients.

The "R10" suffix of a given DATA0 filename refers to the release number of the file. A new suite of DATA0 files having incremented suffixes is generated and released as often as required by modifications and additions to GEMBOCHS.

Access to EQ3/6 and the complete suite of DATA0 files may be obtained by contacting Tom Wolery of LLNL (FTS-532-5789).

Procedure for Requesting Modifications or Additions to GEMBOCHS

Anyone having access to the government (gov) domain of the standard

electronic mail network (Email) can request modifications or additions to GEMBOCHS by sending an Email message describing the request to cngbochs@s33.es.llnl.gov; the requestor must also submit concomitantly a TDIF and Data Transmittal Package in accordance with AP-5.2Q. To facilitate timely resolution, the subject field of these Email change requests must be assigned the string "GEMBOCHS request", and the following text must contain all information required to resolve the request. Typically, this information will include (1) the requestor's full name and phone number, (2) a complete description of the request (i.e., the error report or request to add data), (3) a summary of all references supporting the request, and if (2) defines an error report, also (4) the specific DATA0 file(s) (including version number) where the error occurs.

Change requestors are notified by CNGBOCHS (via Email) as their requests move from "review" to "assigned" to "verification" to "completion" status.

Thos who do not have Email access may request changes by contacting Jim Johnson of LLNL (FTS-543-7352).

Modifications and Additions to GEMBOCHS: 3rd Qtr., 1991

The subset of the GEMBOCHS audit table that covers the 3rd Qtr. (1 April 30 June), 1991, is given in Appendix C. This table summarizes all GEMBOCHS modifications that were incorporated during this time. In mid-April, 1991, the R10 suite of DATA0 files was released; Appendix D provides a summary of all modifications and additions that were incorporated between the release of DATA0 suites R9 (mid-January, 1991) and R10.

Concluding Remarks

The GEMBOCHS thermodynamic database and its associated software library together represent a comprehensive and versatile package that can be used to quantitatively address a myriad of geochemical modeling problems. Included among these are several ongoing YMP-sponsored studies that specifically address potential environmental concerns associated with the proposed repository at Yucca Mountain.

Appendix A

GEMBOCHS REFERENCES

APPENDIX A: GEMBOCHS References

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Appendix B

GEMBOCHS DATA DICTIONARY

APPENDIX B: GEMBOCHS Data Dictionary

The data dictionary defines each column variable and its valid range of values for each data table in the GEMBOCHS thermodynamic database. Column variables that must be assigned a non-null value are underlined.

Table: AQUEOUS

Aqueous species data.

1 row per species.

Aqueous.NAME

Description	primary key
Range	Species.NAME where Species.TYPE= aqueous

Aqueous.TYPE

Description	type of aqueous species
Range	Enumerated:
	basis — strict basis species
	aux — alternate basis species
	aqueous — non-basis species

Aqueous.CHG

Description	ionic charge
Range	integer

Aqueous.ITYPE

Description	Criss-Cobble ion type values, only entered for those species listed by Criss and Cobble (1964a,b)
Range	Enumerated:
	1 simple cations
	2 simple anions and oh-
	3 oxy-anions
	4 acid oxy-anions

Aqueous.ACT_FLAG

Description	flag for O_2(aq), H_2(aq), SiO_2(aq) for EQ3/6 activity coefficient formalism
Range	negative integer

Aqueous.SE

Description	internal electronic entropy (cal) used in Criss-Cobble extrapolations for rare earth and lanthanide species
Range	positive real number

Aqueous.AZERO
Description ion size parameter used for EQ3/6 BDOT activity coefficient formalism data values are entered as listed for species in Nordstron and Munoz (1986,p. 200) after Kielland (1937)
Otherwise:
if Aqueous.CHG <1 then = 4.0
+1 then = 4.0
+2 then = 4.5
+3 then = 5.0
+4 then = 5.5
>4 then = 6.0

Aqueous.BDOT
Description bdot parameter
Range real number

Aqueous.CP
Description partial molal heat capacity (cal/mol)
Range real number

Aqueous.SOURCE
Description data citation
Range 10 character field

Table: AUDIT

Documentation for all GEMBOCHS data changes.

0-n rows per species

Audit.SPECIES
Description name of changed species
Range Species.NAME

Audit.TAB
Description GEMBOCHS table
Range 24 character field

Audit.COL
Description GEMBOCHS column
Range 24 character field

Audit.OLD_VAL
Description previous data value
Range 24 character field

Audit.NEW_VAL
Description new data value
Range 4 character field

Audit.UPDATE_BY
Description DBAPP user name
Range 24 character field

Audit.DATE CNG
Description date update made
Range 24 character field

Audit.REQUEST BY
Description name of person requesting data change
Range 24 character field

Audit.COMMENTS
Description additional comments
Range 64 character field

Table: **AUTHORITY**

Contains a list of users authorized to change GEMBOCHS data, and their passwords

1 row per user

Authority.PERSON
Description user name
Range 24 character field

Authority.PASSWORD
Description user's password
Range 24 character hidden field

Table: **COMMENTS**

User comments about selected species

0-n rows per species

Comments.NAME
Description species name
Range 24 character field

Comments.DESCRIPTION
Description user comments
Range 160 character field

Table: **COMPOSITION**

The stoichiometery for each species.

1 - n rows per species.

Composition.NAME
Description primary key
Range Species.NAME

Composition.COEFF
Description toichiometric coefficient
Range positive real number

Composition.SPECIES
Description refstate element
Range if Species.TYPE = ss then
Mineral.NAME where Mineral.TYPE = solid
else
Mineral.NAME where Mineral.STATE = refstate

Table: CP

Coefficients for the heat capacity polynomial

0-n rows per solid/liquid/gas

Cp.NAME
Description primary key
Range Species.NAME where
Species.TYPE= mineral

Cp.SOURCE
Description primary cited reference
Range References.SQUIBB

Cp.UNITS
Description cited units
Range Enumerated:
cal
jou

Cp.LIMIT
Description temperature limit for polynomial (°K)
Range positive real number

Cp.T0
Description constant, T^{**0} term
Range real number

Cp.T1
Description coefficient, T^{**1} term
Range real number

Cp.T_1
Description coefficient, T^{**-1} term
Range real number

Cp.T2
  Description coefficient, T^{**2} term
  Range real number
Cp.T_2
  Description coefficient, T^{**-2} term
  Range real number
Cp.T3
  Description coefficient, T^{**3} term
  Range real number
Cp.T_3
  Description coefficient, T^{**-3} term
  Range real number
Cp.THALF
  Description coefficient, $T^{**0.5}$ term
  Range real number
Cp.T_HALF
  Description coefficient, $T^{**-0.5}$ term
  Range real number
Cp.ERROR
  Description estimated polynomial error
  Range 10 character field

Table: CPTRAN

Contains heat capacity transition data

Cp.NAME
  Description primary key
  Range Species.NAME where
   Species.TYPE= mineral
Cptran.SOURCE
  Description primary cited reference
  Range References.SQUIBB
Cptran.DELHTR
  Description standard molal enthalpy of transition
  Range real number
Cptran.DELSTR
  Description standard molal entropy of transition
  Range real number
Cptran.SLOPE
  Description Clapeyron slope
  Range real number
Cptran.VTR
  Description standard molal volume of transition
  Range real number

GHS.DELG0
Description apparent standard molal Gibbs free energy of formation
Range real number
GHS.DELH0
Description apparent standard molal enthalpy of formation
Range real number
GHS.S0
Description conventional or absolute entropy
Range real number
GHS.V0
Description partial molal/molar volume (cm/mol)

Table: LABELS

User defined species subsets.

0-n rows per species.

Labels.NAME
Description primary key
Range Species.NAME

Labels.TYPE
Description code to distinguish type of subset
Range Enumerated:
est subset identifying estimated data
sub user defined subset

Labels.CLASS
Description estimated variable or subset name
Range If Labels.TYPE= est
then GEMBOCHS column
else 16 character field

Table: LOGK

Logk data as a function of temperature.

0-n rows per species

LOGK.NAME
Description primary key
Range Species.NAME
LOGKSOURCE
Description reference citation for LOGK
Range References.SQUIBB

LOGK.TEMP

Description	measured temperature for LOGK (°C) Note: if Basic.GFLAG = 3 and Basic.KSOURCE= tpgrid a Tpgrid.TEMP at 25°C must be entered
Range	positive real number

LOGK.PRES

Description	pressure corresponding with temperature in Tpgrid.TEMP
Range	positive real number

LOGK.LOGK

Description	LOGK value
Range	real number

Table: Mineral

Additional data for solid, liquid, gas and solid solutions

1 row per mineral species

Mineral.NAME

Description	primary key
Range	Species.NAME where Species.TYPE=mineral

Mineral.TYPE

Description	EQ3/6 species type.
Range	Enumerated: liquid liquid species solid solid/mineral species gas gaseous species ss solid solution

Mineral.COMPOSITION

Description	chemical composition of mineral name.
Range	55 character field

Mineral.ALTNAME

Description	alternate species name
Range	24 character field

Mineral.VARIETY

Description	crystalline form of polymorphs
Range	Enumerated: alpha, beta, gamma, etc.

Mineral.STATE

Description	crystalline state of species, identifies hypothetical endmembers of solid solutions, reference state elements, forms of solid solutions, or polymorphs.

Range	Enumerated: ideal regular refstate hypothetical polymorph

---

Table: PARAMETERS

Miscellaneous parameter grids needed for data0 header listing. Parameters include: temperature, pressure, Criss-Cobble parameters, Debye-Huckel constants, solution solution mixing parameters.

Parameters.NAME	
Description	type of parameter
Range	30 character field
Parameters.ONE	
Description	parameter value
Range	real number
Parameters.TWO	
Description	parameter value
Range	real number
Parameters.THREE	
Description	parameter value
Range	real number
Parameters.FOUR	
Description	parameter value
Range	real number
Parameters.FIVE	
Description	parameter value
Range	real number
Parameters.SIX	
Description	parameter value
Range	real number
Parameters.SEVEN	
Description	parameter value
Range	real number
Parameters.EIGHT	
Description	parameter value
Range	real number
Parameters.NINE	
Description	parameter value
Range	real number
Parameters.TEN	
Description	parameter value
Range	real number

Parameters.ELEVEN
- Description: parameter value
- Range: real number

Parameters.TWELVE
- Description: parameter value
- Range: real number

Parameters.PITNUM
- Description: order to print in Pitzer output file
- Range: integer

Parameters.BDOTNUM
- Description: order to print in Bdot output file
- Range: integer

Parameters.HMWNUM
- Description: order to print in HMW output file
- Range: integer

Table: REACTION

Species and coefficients for Data0 RXN and REF RXN.

0-n rows per species.

Reaction.NAME
- Description: primary key
- Range: Species.NAME

Reaction.SOURCE
- Description: citation of reference reaction (required when Reaction.TYPE=ref)
- Range: 10 character field

Reaction.TYPE
- Description: code to distinguish kind of reaction
- Range: Enumerated:
  d0 Data0 RXN
  ref REF RXN

Reaction.COEFF
- Description: coefficient associated with Reaction.SPECIES
- Range: real number

Reaction.SPECIES
- Description: component species in the reaction
- Range: if Reaction.TYPE= d0 then
  Aqueous.NAME
  where Aqueous.TYPE= basis or Aqueous.TYPE= aux
  else
  Species.NAME

Table: REFERENCES

Complete reference citations for all data sources.

References.SQUIBB

Description	reference citation in SQUIBB format: year,author and secondary author: yypri/sec
Range	10 character field

References.AUTHOR

Description	author(s), by last name, first initials
Range	160 character field

References.YR

Description	year published
Range	positive integer > 1850

References.YR_ALT

Description	designator for multi-year citations
Range	1 character field, ascending order

References.TITLE

Description	complete reference title
Range	300 character field

References.PUBLISHER

Description	publisher or journal
Range	80 character field

References.VOL

Description	volume number
Range	5 character field

References.PAGES

Description	page numbers
Range	1-2 character field

References.XCOPY

Description	reference copy information
Range	Enumerated:

yes	copy in GEMBOCHS reference library
no	copy not in reference library
abs	abstract in reference library
ord	copy requested

References.FILE

Description	defined as follows:
Range	Enumerated:

aux	reference not used in data0
pending	possible future reference
primary	current data0 reference

Table: REFSTATE

Properties of reference-state elements.

1 row per element

Refstate.NAME
- Description: element name in most common form
- Range: Mineral.NAME where Mineral.STATE=refstate

Refstate.SYMBOL
- Description: chemical symbol
- Range: 2 character field

Refstate.ATNUM
- Description: atomic number
- Range: positive integer

Refstate.SOA
- Description: Standard Order of Arrangement (Wagman et al., 1983)
- Range: positive integer

Refstate.MWT
- Description: molecular weight
- Range: positive real number

Refstate.BASIS
- Description: designated basis species for element
- Range: Aqueous.NAME where Aqueous.TYPE=basis

Table: SPECIES

Descriptive information about each chemical species

1 row per species.

Species-NAME
- Description: unique species name.
- Range: 24 character field

Species-TYPE
- Description: species type.
- Range: Enumerated:
  aqueous basis, auxiliary or non-basis aqueous species
  mineral solid, liquid, gas or solid solution species

Species.DATE
- Description: date of entry/last data change
- Range: dd-mmm-yyyy

Table: THERMO

Shows what data exists for each species

Thermo.NAME
Description primary key
Range Species.NAME

Thermo.STATUS
Description output status
Range Enumerated:
active
notused

Thermo.SOURCE
Description data source
Range References.SQUIBB

Thermo.GFLAG
Description data selection flag for DOOUT LOGK calculations
Range Enumerated:
0 incomplete data
1 use GHS.DELG0
2 use GHS.DELH0 and GHS.SZER0
3 use LOGK data
4 use urt data
..5 use CP data

Table: URT

Contains URT data

URT.NAME
Description species name
Range 24 character field

URT.SOURCE
Description data source
Range 10 character field

URT.URT
Description chemical potential (u/RT)
Range real number

Appendix C

GEMBOCHS AUDIT TABLE

3rd Quarter, 1991

Appendix C: GEMBOCHS Audit Table: 3rd Qtr., 1991

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER

****

Species: al(oh)4-

species	status	notused	active	4/11/91	Johnson
Comments:	replace deactivated supcrt species				

****

Species: clinoptilolite-hy-ca

species	name		clinoptilolite	4/8/91	
Comments:	added to test new clino				
basic	delg0	-4547.780	-4601.627	5/1/91	Viani
Comments:	recalculated for hy				

****

Species: clinoptilolite-hy-cs

species	name		clinoptilolite	4/8/91	
Comments:	added as test set for Viani				
basic	delg0	-4568.686	-4315.573	5/1/91	Viani
Comments:	recalculated for hy				

****

Species: clinoptilolite-hy-k

species	name		clinoptilolite	4/8/91	
Comments:	added as test case for Viani				
basic	delg0	-4558.181	-4376.834	5/1/91	Viani
Comments:	recalculated for hy				

****

Species: clinoptilolite-hy-na

species	name		clinoptilolite	4/12/91	
Comments:	added for Viani to test				
basic	delg0	-4535.926	-4546.476	5/1/91	Viani
Comments:	recalculated for hy				

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER

****

Species: clinoptilolite-hy-sr

species	name		clinoptilolite	4/12/91	
Comments:	added as new test set for Viani				
basic	delg0	-4552.547	-4731.276	5/1/91	Viani
Comments:	recalculated for hy				

****

Species: clinoptilolite-ss#1

species	name	clinoptilolite	clinoptilolite	12/91	Viani
Comments:	new test case				

****

Species: fe(oh)2(aq)

species	status	notused	active	4/11/91	Johnson
Comments:	replace deactivated supcrt species				

****

Species: fe(oh)3-

species	status	notused	active	4/11/91	Johnson
Comments:	replace deactivated supcrt species				

****

Species: koh(aq)

tpgrid	logk	0.000 0.000	25.000 14.460	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	delg0	-104423.000	-104.500	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	igflg	4	3	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	delh0	-113197.000	500.000	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	szer0	26.180	500.000	4/11/91	Johnson

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
Comments: replaces deactivated supcrt species					
species	status	notused	active	4/11/91	Johnson
Comments: replaces deactivated supcrt species					

****

Species: koh(aq)#1

tpgrid	logk	25.000 14.460	25.000 500.000	4/11/91	Johnson
Comments: new data0 species					
basic	delg0	-104.500	-104423.000	4/11/91	Johnson
Comments: new output species					
basic	delh0	500.000	-113197.000	4/11/91	Johnson
Comments: new output species					
basic	szer0	500.000	26.180	4/11/91	Johnson
Comments: new output species					
basic	igflg	3	4	4/11/91	Johnson
Comments: new output species					

****

Species: ni(oh)2(aq)

species	status	notused	active	4/11/91	Johnson
Comments: replace deactivated supcrt species					

****

Species: ni(oh)3-

species	status	notused	active	4/11/91	Johnson
Comments: replace deactivated supcrt species					

****

Species: znoh+

tpgrid	logk	150.000 -6.060	150.000 -6.060	4/11/91	Johnson
Comments: exchanged with deactivated supcrt species					
tpgrid	logk	0.000 0.000	25.000 -8.960	4/11/91	Johnson
Comments: exchanged with deactivated supcrt species					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	igflg	4	3	4/11/91	Johnson
Comments:	replace deactivated supcrt species				
basic	delg0	-79726.000	500.000	4/11/91	Johnson
Comments:	replace deactivated supcrt species				
basic	delh0	-82539.000	500.000	4/11/91	Johnson
Comments:	replace deactivated supcrt species				
basic	szer0	25.000	500.000	4/11/91	Johnson
Comments:	replace deactivated supcrt species				
species	status	notused	active	4/11/91	Johnson
Comments:	replace deactivated supcrt species				

****

Species: znoh+#1

basic	delg0	500.000	-79726.000	4/11/91	Johnson
Comments:	deactivated, made into test species				
basic	delh0	500.000	-82539.000	4/11/91	Johnson
Comments:	deactivated, made into test species				
basic	szer0	500.000	25.000	4/11/91	Johnson
Comments:	deactivated, made into test species				
basic	iqflg	3	4	4/11/91	Johnson
Comments:	deactivated, made into test species				
tpgrid	logk	100.000 -6.990	100.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	150.000 -6.060	150.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	200.000 -5.330	200.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	25.000 -8.960	25.000 500.000	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	250.000 -4.740	250.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	300.000 -4.250	300.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
tpgrid	logk	350.000 -3.840	350.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	60.000 -7.930	60.000 500.000	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				

Appendix D

GEMBOCHS AUDIT TABLE

DOOUT Suite R9 to R10

Appendix D: GEMBOCHS Audit Table: DOOUT Suite R9 to R10

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER

****

Species: ag(co3)2---

basic	delg0	-236889.000	-236890.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-304197.000	-304200.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: agcl(aq)

basic	delg0	-17454.000	-17450.000	2/15/91	
Comments:					
basic	delh0	-18269.000	-18270.000	2/15/91	
Comments:					

****

Species: agcl2-

basic	delg0	-51562.000	-51560.000	2/15/91	Johnson
Comments: new supcrt data					
basic	delh0	-61126.000	-61130.000	2/15/91	Johnson
Comment: new supcrt data					

****

Species: agcl3-

basic	delh0	-105943.000	-105940.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delg0	-82709.000	-82710,000	2/20/91	Johnson
Comments: new supcrt data					

****

Species: agcl4-

basic	delg0	-112277.000	-112280.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-142218.000	-142220.000	2/20/91	Johnson

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
Comments: new supcrt data					

****

Species: agco3-

basic	delg0	-111434.000	-111430.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-141596.000	-141600.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: agno3(aq)

basic	delh0	-23854.000	-23090.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delg0	-7806.000	-7810.000	2/20/91	Johnson
Comments: new supcrt data					
basic	szer0	52.750	50.000	2/20/91	Johnson
Comments: new supcrt data					

****

Species: al(oh)4-

species	status	not [illegible]d	active	4/11/91	Johnson
Comments: replace deact[illegible]ated supcrt species					

****

Species: alo2-

species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

****

Species: bacl+

basic	delg0	-164727.000	-164730.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-165774.000	-165770.000	2/20/91	Johnson
Comments: new supcrt data					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER

****

Species: baco3(aq)

basic	delh0	-285848.000	-285850.000	2/19/91	Johnson

Comments: new supcrt data

****

Species: baf+

basic	delg0	-201124.000	-201120.000	2/19/91	Johnson

Comments: new supcrt data

basic	delh0	-206511.000	-206510.000	2/19/91	Johnson

Comments: new supcrt data

****

Species: bahco3+

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

****

Species: cacl+

basic	delg0	-162548.000	-162550.000	2/20/91	Johnson

Comments: new supcrt data

basic	delh0	-169248.000	-169250.000	2/20/91	Johnson

Comments: new supcrt data

****

Species: cacl2(aq)

basic	delh0	-211062.000	-211060.000	2/20/91	Johnson

Comments: new supcrt data

****

Species: caco3(aq)

basic	delg0	-262848.000	-262850.000	2/19/91	Johnson

Comments: new supcrt data

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delh0	-287391.000	-287390.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: caf+

basic	delg0	-200388.000	-200390.000	2/15/91	Johnson
Comments: new supcrt data					
basic	delh0	-208597.000	-208600.000	2/15/91	Johnson
Comments: new supcrt data					

****

Species: cahco3+

basic	delg0	-273834.000	-273830.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: caso4(aq)

basic	delg0	-312925.000	-312930.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-345905.000	-345900.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: clinoptilolite-hy-ca

species name		clinoptilolite	4/8/91
Comments: added to test new clino			

****

Species: clinoptilolite-hy-cs

species name		clinoptilolite	4/8/91
Comments: added as test set for Viani			

****

Species: clinoptilolite-hy-k

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
species	name		clinoptilolite	4/8/91	
Comments:	added as test case for Viani				

****

Species: clinoptilolite-hy-na

species	name		clinoptilolite	4/12/91	
Comments:	added for Viani to test				

****

Species: clinoptilolite-hy-sr

species	name		clinoptilolite	4/12/91	
Comments:	added as new test set for Vaini				

****

Species: clinoptilolite-ss#1

species	name	clinoptilolite	clinoptilolite	4/12/91	Viani
Comments:	new test case				

****

Species: cooh+

species	status	active	notused	2/19/91	Johnson
Comments:	not in 1991 supcrt database				

****

Species: csbr(aq)

basic	delh0	-87792.000	-88090.000	2/19/91	Johnson
Comments:	new supcrt data				
basic	delgo	-93912.000	-94210.000	2/19/91	Johnson
Comments:	new supcrt data				
basic	szero	59.300	58.800	2/19/91	Johnson
Comments:	new supcrt data				

****

Species: cscl(aq)

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delg0	-99943.000	-100900.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-98344.000	-100950.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: csi(aq)

basic	delh0	-73329.000	-76840.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delg0	-81982.000	-82480.000	2/19/91	Johnson
Comments: new supcrt data					
basic	szero	63.300	61.300	2/19/91	Johnson
Comments: new supcrt data					

****

Species: fe(ch3coo)2(aq)

basic	delg0	-201792.000	-201800.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-259123.000	-259100.000	2/19/91	Johnson
Comments: new supcrt data					

Species: fe(oh)2(aq)

species	status	notused	active	4/11/91	Johnson
Comments: replace deactivated supcrt species					

****

Species: fe(oh)3-

species	status	notused	active	4/11/91	Johnson
Comments: replace deactivated supcrt species					

****

Species: fech3coo+

basic	delg0	-111892.000	-111900.000	2/19/91	Johnson

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
Comments: new supcrt data					
basic	delh0	-139042.000	-139060.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: fecl+

basic	delg0	-53031.000	-53030.000	2/15/91	Johnson
Comments: new supcrt data					
basic	delh0	-61264.000	-61260.000	2/15/91	Johnson
Comments: new supcrt data					

****

Species: fecl2(aq)

basic	delh0	-100233.000	-100370.000	2/20/91	Johnson
Comments: new supcrt data					
basic	szer0	-4.730	-4.220	2/20/91	Johnson
Comments: new supcrt data					
basic	delg0	-81156.000	-81280.000	2/20/91	Johnson
Comments: new supcrt data					

****

Species: feo(aq)

species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

****

Species: feoh+

species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 database					

****

Species: h3sio4-

species	status	active	notused	2/15/91	Johnson
Comments: doppleganger species					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER

****

Species: hfeo2-

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

****

Species: hnio2-

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

****

Species: hpbo2-

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

****

Species: hsio3-

basic	delh0	-271879.0001	-271880.000	2/19/91	Johnson

Comments: new supcrt clata

****

Species: hzno2-

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

****

Species: kbr(aq)

basic	delh0	-86317.000	-86320-000	2/19/91	Johnson

Comments: new supcrt data

basic	delg0	-90006.000	-90010.000	2/19/91	Johnson

Comments: new supcrt data

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATA	REQUESTER

****

Species: kcl(aq)

basic	deh0	-96012.000	-96810.000	2/19/91	Johnson
Comments:	new supcrt data				
basic	delg0	-96051.000	-96850.000	2/19/91	Johnson
Comments:	new supcrt data				

****

Species: khso4(aq)

basic	delg0	-245800.000	-246550.000	2/19/91	Johnson
Comments:	new supcrt data				
basic	delho	-269870.000	-270540.000	2/19/91	Johnson
Comments:	new supcrt data				
basic	szer0	56.030	56.310	2/19/91	Johnson
Comments:	new supcrt data				

****

Species: ki(aq)

basic	delh0	-71676.000	-71680.000	2/19/91	Johnson
Comments:	new supcrt data				

****

Species: koh(aq)

species	status	active	notused	2/19/91	Johnson
Comments:	not in supcrt 1991 manuscript				
tpgrid	logk	0.000 0.000	25.000 14.460	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	delg0	-104423.000	-104.500	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	igflg	4	3	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				
basic	delh0	-113197.000	500.000	4/11/91	Johnson
Comments:	replaces deactivated supcrt species				

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	szer0	26.180	500.000	4/11/91	Johnson
Comments: replaces deactivated supcrt species					
species	status	notused	active	4/11/91	Johnson
Comments: replaces deactivated supcrt species					

****

Species: koh(aq)#1

tpgrid	logk	25.000	14.460	25.000	500.000	4/11/91	Johnson
Comments: new data0 species							
basic	delg0	-104.500		-104423.000		4/11/91	Johnson
Comments: new output species							
basic	delh0	500.000		-113197.000		4/11/91	Johnson
Comments: new output species							
basic	szer0	500.000		26.180		4/11/91	Johnson
Comments: new output species							
basic	igflg	3		4		4/11/91	Johnson
Comments: new output species							

****

Species: kso4-

basic	delh0	-276978.000	-276980.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: licl(aq)

basic	delh0	-105675.000	-105680.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delg0	-99252.000	-99250.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: mgcl+

basic	delg0	-139707.000	-139700.000	2/15/91	Johnson
Comments: new supcrt data					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delh0	-150992.000	-151440.000	2/15/91	Johnson
Comments: new supcrt data					

****

Species: mgco3(aq)

basic	delg0	-238759.000	-238760.000	2/9/91	Johnson
Comments: new supcrt data					
basic	delh0	-270571.000	-270570.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: mgf+

basic	delg0	-177687.000	-177690.000	2/15/91	Johnson
Comments: new supcrt data					
basic	delh0	-189975.000	-190950.000	2/15/91	Johnson
Comments: new supcrt data					
basic	szer0	-24.800	-28.070	2/15/91	Johnson
Comments: new supcrt data					

****

Species: mghco3+

basic	delg0	-250202.000	-250200.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-275752.000	-275750.000	2/19/91	Johnson
Comments: new supcrt data					

****

Species: mgoh+

species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

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Species: mncl+

basic	delg0	-86288.000	-86290.000	2/20/91	Johnson

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTOR
Comments: new supcrt data					
basic	delh0	-88284.000	-88280.000	2/20/91	Johnson
Comments: new supcrt data					

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Species: mnso4(aq)

basic	delg0	-235637.000	-235640.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-266748.000	-266750.000	2/20/91	Johnson
Comments: new supcrt data					

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Species: nabr(aq)

basic	delh0	-84828.000	-84830.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delg0	-85606.000	-85610.000	2/19/91	Johnson
Comments: new supcrt data					

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Species: naf(aq)

basic	delg0	-128567.000	-128570.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-135862.000	-135860.000	2/19/91	Johnson
Comments: new supcrt data					

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Species: nahsio3(aq)

basic	delg0	-307142.000	-307140.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-332745.000	-332740.000	2/19/91	Johnson
Comments: new supcrt data					

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Species: nai(aq)

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delh0	-69282.000	-69280.000	2/[illegible]/91	Johnson

Comments: new supcrt data

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Species: ni(oh)2(aq)

species	status	notused	active	4/11/91	Johnson

Comments: replace deactivated supcrt data

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Species: ni(oh)3-

species	status	notused	active	4/11/91	Johnson

Comments: replace deactivated supcrt species

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Species: nicl+

basic	delg0	-40915.000	-40920.000	2/15/91	Johnson

Comments: new supcrt data

basic	delh0	-51397.000	-51400.000	2/15/91	Johnson

Comments: new supcrt data

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Species: nio(aq)

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

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Species: nioh+

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

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Species: pb(ch3coo)2(aq)

basic	delg0	-187024.000	-187020.000	2/20/91	Johnson

Comments: new supcrt data

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delh0	-187024.000	-187020.000	2/10/91	Johnson
Comments:	new supcrt data				

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Species: pbch3coo+

basic	delh0	-115209.000	-115210.000	2/20/91	Johnson
Comments:	new supcrt data				
basic	delg0	-97314.000	-97320.000	2/20/91	Johnson
Comments:	new supcrt data				

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Species: pbcl+

basic	delh0	-38626.000	-38630.000	2/15/91	Johnson
Comments:	new supcrt data				
basic	delg0	-39054.000	-39050.000	2/15/91	Johnson
Comments:	new supcrt data				

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Species: pbcl2(aq)

basic	delg0	-71197.000	-71200.000	2/15/91	Johnson
Comments:	new supcrt data				
basic	delh0	-77702.000	-77700.000	2/15/91	Johnson
Comments:	new supcrt data				

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Species: pbcl3-

basic	delg0	-102153.000	-102150.000	2/15/91	Johnson
Comments:	new supcrt data				
basic	delh0	-118274.000	-117700.000	2/15/91	Johnson
Comments:	new supcrt data				
basic	szer0	57.000	59.000	2/15/91	Johnson
Comments:	new supcrt data				

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TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
Species: pbcl4—					
basic	delg0	-133259.000	-133260.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-161231.000	-161230.000	2/20/91	Johnson
Comments: new supcrt data					

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Species: pbo(aq)					
species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

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Species: pboh+					
species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

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Species: rbbr(aq)					
basic	delh0	-85727.000	-85730.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delg0	-91006.000	-91010.000	2/19/91	Johnson
Comments: new supcrt data					

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Species: rbcl(aq)					
basic	delh0	-96751,000	-96800.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delg0	-97815.000	-97870.000	2/19/91	Johnson
Comments: new supcrt data					

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Species: rbf(aq)					
basic	delg0	-135454.000	-136450.000	2/19/91	Johnson
Comments: new supcrt data					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delh0	-138577.000	-139710.000	2/19/91	Johnson
Comments: new supcrt data					
basic	szero	32.000	31.600	2/19/91	Johnson
Comments: new supcrt data					

****

Species: rbi(aq)

basic	delh0	-71716.000	-71920.000	2/29/91	Johnson
Comments: new supcrt data					
basic	delg0	-79200.000	-79100.000	2/19/91	Johnson
Comments: new supcrt data					
basic	szer0	57.300	56.300	2/19/91	Johnson
Comments: new supcrt data					

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Species: srcl+

basic	delg0	-165798.000	-165800.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-169785.000	-169790.000	2/20/91	Johnson
Comments: new supcrt data					

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Species: srco3(aq)

basic	delg0	-264858.000	-264860.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-288617.000	-288620.000	2/19/91	Johnson
Comments: new supcrt data					

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Species: srf+

basic	delg0	-202291.000	-202290.000	2/19/91	Johnson
Comments: new supcrt data					
basic	delh0	-210669.000	-210670.000	2/19/91	Johnson
Comments: new supcrt data					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER

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Species: srhco3+

species	status	active	notused	2/19/91	Johnson

Comments: not in supcrt 1991 manuscript

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Species: zn(ch3coo)2(aq)

species	name		zn(ch3coo)2(aq)	2/21/91

Comments:

****

species: zn(ch3coo)3-

species	name		zn(ch3coo)3-	2/21/91

Comments:

****

Species: znch3coo+

species	name		znch3coo+	2/21/91

Comments:

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Species: zncl+

basic	delh0	-66539.000	-66240.000	2/15/91	Johnson

Comments: new supcrt data

basic	delg0	-66852.000	-66850.000	2/15/91	Johnson

Comments: new supcrt data

basic	szer0	2.000	23.000	2/15/91	Johnson

Comments: new supcrt data

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Species: zncl2(aq)

basic	delh0	-109084.000	-109080.000	2/15/91	Johnson

Comments: new supcrt data

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
basic	delg0	-98299.000	-98300.000	2/15/91	Johnson
Comments: new supcrt data					

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Species: zncl3-

basic	delg0	-129037.000	-129310.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-151061.000	-151060.000	2/20/91	Johnson
Comments: new supcrt data					
basic	szer0	31.590	25.000	2/20/91	Johnson
Comments: new supcrt data					

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Species: zncl4--

basic	delg0	-162170.000	-161890.000	2/20/91	Johnson
Comments: new supcrt data					
basic	delh0	-198456.000	-195200.000	2/20/91	Johnson
Comments: new supcrt data					
basic	szer0	26.000	36.000	2/20/91	Johnson
Comments: new supcrt data					

****

Species: zno(aq)

species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

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Species: zno2--

species	status	active	notused	2/19/91	Johnson
Comments: not in supcrt 1991 manuscript					

****

Species: znoh+

species	status	acvtive	notused	2/19/91	Johnson

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
Comments: not in supcrt 1991 manuscript					
tpgrid	logk	150.000 -6.060	150.000 -6.060	4/11/91	Johnson
Comments: exchanged with deactivated supcrt species					
tpgrid	logk	0.000 0.000	25.000 -8.960	4/11/91	Johnson
Comments: exchanged with deactivated supcrt species					
basic	igflg	4	3	4/11/91	Johnson
Comments: replace deactivated supcrt species					
basic	delg0	-79726.000	500.000	4/11/91	Johnson
Comments: replace deactivated supcrt species					
basic	delh0	-82539.000	500.000	4/11/91	Johnson
Comments: replace deactivated supcrt species					
basic	szer0	25.000	500.000	4/11/91	Johnson
Comments: replace deactivated supcrt species					
species	status	notused	active	4/11/91	Johnson
Comments: replace deactivated supcrt species					

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Species: znoh+#1

basic	delg0	500.000	-79726.000	4/11/91	Johnson
Comments: deactivated, made into test species					
basic	delh0	500.000	-82539.000	4/11/91	Johnson
Comments: deadctivated, made into test species					
basic	szer0	500.000	25.000	4/11/91	Johnson
Comments: deactivated, made into test species					
basic	igflg	3	4	4/11/91	Johnson
Comments: deactivated, made into test species					
tpgrid	logk	100.000 -6.990	100.000 500.00	4/11/91	Johnson
Comments: exchange with supcrt data0 species					
tpgrid	logk	150.000 -6.060	150.000 500.00	4/11/91	Johnson
Comments: exchange with supcrt data0 species					
tpgrid	logk	200.000 -5.330	200.000 500.00	4/11/91	Johnson
Comments: exchange with supcrt data0 species					
tpgrid	logk	25.000 -8.960	25.000 500.000	4/11/91	Johnson
Comments: exchange with supcrt data0 species					

TABLE	COLUMN	OLD VALUE	NEW VALUE	DATE	REQUESTER
tpgrid	logk	250.000 -4.740	250.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	300.000 -4.250	300.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	350.000 -3.840	350.000 500.00	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				
tpgrid	logk	60.000 -7.930	60.000 500.000	4/11/91	Johnson
Comments:	exchange with supcrt data0 species				