Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 30307
North Las Vegas, NV 89036-0307

QA: N/A

OCT 0 4 1999

OVERNIGHT MAIL

Newton K. Stablein
High Level Waste & Uranium Recovery
Division of Waste Management
Office of Nuclear Material Safety & Safeguards
U.S. Nuclear Regulatory Commission
Two White Flint North
Rockville, MD 20852

SUBMITTAL OF PARTICIPANTS' MONTHLY PROGRESS REPORT

As you have requested, the U.S. Nuclear Regulatory Commission is on distribution to receive a copy of the Yucca Mountain Site Characterization Project participants' monthly status report on a regular basis. Enclosed is the U.S. Geological Survey Progress Report for August 1999.

If you have any questions, please contact Bertha M. Terrell at (702) 794-1348.

Stephan Brocoum
Assistant Manager, Office of
Licensing and Regulatory Compliance

OL&RC:BMT-2103

Enclosure:
Ltr 9/16/99, Craig to Kozai, w/encl

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cc w/encl:
L. H. Barrett, DOE/HQ (RW-1) FORS
A. B. Brownstein, DOE/HQ (RW-52) FORS
C. E. Einberg, DOE/HQ (RW-52) FORS
S. H. Hanauer, DOE/HQ (RW-2) FORS
R. A. Milner, DOE/HQ (RW-2) FORS
N. H. Slater, DOE/HQ (RW-52) FORS
Richard Major, ACNW, Washington, DC
B. J. Garrick, ACNW, Washington, DC
J. K. Kessler, EPRI, Palo Alto, CA
Steve Kraft, NEI, Washington, DC
W. D. Barnard, NWTRB, Arlington, VA
R. R. Loux, State of Nevada, Carson City, NV
John Meder, State of Nevada, Carson City, NV
Alan Kalt, Churchill County, Fallon, NV
D. A. Bechtel, Clark County, Las Vegas, NV
Harriet Ealey, Esmeralda County, Goldfield, NV
Leonard Fiorenzi, Eureka County, Eureka, NV
Andrew Remus, Inyo County, Independence, CA
Michael King, Inyo County, Edmonds, WA
Tammy Manzini, Lander County, Austin, NV
Eve Culverwell, Lincoln County, Caliente, NV
Jackie Wallis, Mineral County, Hawthorne, NV
L. W. Bradshaw, Nye County, Pahrump, NV
Jerry McKnight, Nye County, Tonopah, NV
Debra Kolkman, White Pine County, Ely, NV
R. I. Holden, National Congress of American Indians, Washington, DC
Tom Burton, Nevada Indian Environmental Coalition, Reno, NV
K. L. Ashe, M&O, Las Vegas, NV
M. A. Lugo, M&O, Las Vegas, NV
E. F. O'Neill, M&O, Las Vegas, NV
J. H. Smyder, Naval Reactors, Las Vegas, NV
A. V. Gil, DOE/YMSCO, Las Vegas, NV
C. M. Newbury, DOE/YMSCO, Las Vegas, NV
B. M. Terrell, DOE/YMSCO, Las Vegas, NV
OL&RC Library
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United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Box 25046 M.S. 421
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

INFORMATION ONLY

September 16, 1999

Wayne Kozai
Yucca Mountain Site Characterization
Project Office
U. S. Department of Energy
P.O. Box 30307
Las Vegas, Nevada 89036-0307

SUBJECT: Yucca Mountain Project Branch - U.S. Geological Survey (YMPB-USGS) Progress Report, August 1999

Attached is the USGS progress report in the required format for the month of August, 1999.

If you have any questions or need further information, please call Raye Ritchey Arnold at (303)236-5050, ext 296.

Sincerely,

Raye Ritchey Arnold
for Robert W. Craig
Technical Project Officer
Yucca Mountain Project Branch
U.S. Geological Survey

Enclosure:
cc: J. Bresee, DOE/OCRWM-HQ/Forrestal
S. Hanauer, DOE/Forrestal
R. Dyer, DOE, Las Vegas
D. Barr, DOE, Las Vegas
C. Fox, DOE, Las Vegas
A. Gil, DOE, Las Vegas

ENCLOSURE

T. Gunter, DOE, Las Vegas
S. Morris, DOE, Las Vegas
R. Patterson, DOE, Las Vegas
R. Spence, DOE, Las Vegas
T. Sullivan, DOE, Las Vegas
M. Tynan, DOE, Las Vegas
D. Williams, DOE, Las Vegas
C. Glenn, NRC, Las Vegas (2 copies)
R. Wallace, USGS, Reston
K. Ashe, M&O/Duke, Las Vegas
P. Burke, M&O/TRW, Las Vegas
L. Hayes, M&O/TRW, Las Vegas
R. Wemheuer, M&O/Fluor Daniel
R. Craig, USGS, Las Vegas
M. Chornack, USGS, Denver
L. Ducret, USGS, Denver
W. Dudley, USGS, Denver
D. Edwards, USGS, Las Vegas
D. Gillies, USGS, Denver
D. Hoxie, USGS, Las Vegas
C. Hunter, USGS, Denver
R. Keefer, USGS, Denver
B. Parks, USGS, Denver
Z. Peterman, USGS, Denver
W. Scott, USGS, Las Vegas
R. Arnold, USGS, Denver
A. Whiteside, SAIC, Denver

U.S. GEOLOGICAL SURVEY
EXECUTIVE SUMMARY

August 1999

COORDINATION and PLANNING

Processing of some 66 documents prepared by U.S. Geological Survey authors continued during August by the USGS-Yucca Mountain Project Branch. Of these listed documents, 33 are USGS reports (18 with hydrologic topics and 15 with geologic topics), six are journal articles (mostly on geologic topics), nine are Proceedings articles (split between seven of hydrologic subject matter and two with geologic topics), and 16 are abstracts (split evenly between geologic and hydrologic topics). Most of the USGS reports are water-resources investigations reports (WRIRs) or open-file reports (OFRs), and several are reports of mapping investigations (I-maps). In addition, two hydrologic milestone reports were being processed.

During August, one publication package was prepared and sent to the Records Coordinator for transmittal to the RPC, and the related OSTI package was sent to DOE. That publication, the 1997 calendar-year Yucca Mountain regional water-level report, is referenced as follows:

> LaCamera, R.J., Locke, G.L., and Munson, R.H., 1999, Selected ground-water data for the Yucca Mountain region, southern Nevada and eastern California, through December 1997: U.S. Geological Survey Open-File Report 98-628, 84 p.

GEOLOGY

Geologic work continued in several areas. The geologic group continued support to 3-D geologic modeling with on-going work on stratigraphic workbooks (spreadsheets and macros) summarizing geophysical, stratigraphic, and lithologic information on boreholes at Yucca Mountain. Cross-Drift and borehole structural data obtained by the structural geology team will be submitted through close-out of scientific notebook SN-103 ("Structural Description of ESF Sampling Localities"). That notebook now has passed management review. Staff prepared an abstract titled *Characteristics of fault zones at Yucca Mountain, Nevada*, by R. Dickerson, D. Sweetkind, and C. Potter, for the annual Geological Society of America meetings. The abstract summarizes preliminary findings from fault-zone studies to date. Work continued on preparation for publication of the 1:50,000-scale geologic map of the SZ site area. In work related to underground mapping, construction of the cross-over alcove has been delayed until the end of August; no mapping was conducted. The report describing geology of the ECRB Cross Drift has been completed by field mapping staff, and the report manuscript is in the AP-3.10Q checking process. Work on the short-trace-length fracture study continued. On-going

activity included analysis of data from the small-scale fracture study and preparation of collected and reviewed data for submittal to the Project.

HYDROLOGY

Unsaturated-Zone Hydrology

In work to evaluate the percolation flux across the repository horizon, temperature, relative humidity, and wind-speed data were collected from monitoring stations at Cross Drift Stations 0+25, 2+37, 2+88, 3+38, 10+03, and 21+07. Temperature and relative humidity data were collected from the vent line at Cross Drift Station 0+00 and at Cross Drift Station 24+75. Water potential in the Cross Drift was monitored with 103 heat-dissipation (HD) probes installed in 2-m-deep drill holes at 25-m intervals from Cross Drift Station 0+50 to Station 26+00, as well as with the 20 HD probes installed at other locations in the Cross Drift. Those measured water potentials continued to indicate that the rock mass is wetter (the potentials are higher) and that the moisture is more uniformly distributed than expected. Preparation of a data package containing the Cross-Drift HD probe measurements continued, and also in support of moisture monitoring, preparation of a data package containing Cross-Drift temperature, wind-speed, and relative humidity data was initiated. Data-package preparation, review, and checking also are nearly complete on data collected on the hydraulic properties of Busted Butte.

Characterization of seepage into alcoves continued. Monitoring of temperature, relative humidity, and barometric pressure continued in the ESF Main Drift, niches, and in Alcove #7. Data were collected from 51 HD probes in Alcove #7. Eight surface-based HD probes monitored the soil moisture potential in and adjacent to the Ghost Dance fault. Twenty-one HD probes monitored the rock water potential in Niche #1. The first rounds of planning for the Cross-Drift seepage experiment have been completed. Additional meetings with other people involved with the test are being planned. In on-going tracer-infiltration experiments at Alcove #1, water applications (resumed on February 19) resulted to date in application of 52,345 gallons of water to the surface above Alcove #1. Seepage into the alcove began on March 6, and to date, approximately 4100 gallons of water have been collected in the alcove. After detection of an added LiBr tracer in the collection tanks and subsequent return of tracer concentration to background levels by July 15, continued monitoring of the tracer-marked infiltration water has detected no additional tracer. Work continued on compilation of the ESF moisture-monitoring and Alcove #1 infiltration-experiment data packages.

In air-permeability work, the North Ghost Dance fault (NGDF) report has completed AP-3.10Q checker review and has been submitted to the YMPB Reports Specialist for final review prior to submittal to USGS Headquarters and DOE reviews (expected in September). (The NGDF data package also was completed and submitted in July 1999.)

USGS staff continued to provide support to pilot-scale engineered-barrier (EBS) Phase II tests. Water-potential measurements continued with eight HD probes, and water content was measured with time-domain reflectometry (TDR) probes in EBS pilot-scale Canister

#1. Volumetric measurement of effluent from the two USGS suction lysimeters in Canister #1 also continued. Four tensiometers were installed to measure water potentials in that canister. (Tensiometers were split between the fine material [Overton Sand] and the coarse material [the 8-20 Sand], to provide more accurate measurements for the water potentials greater than –100 cm in Canister #1.) Measurement of water potential and water content in Canister #3 continued with 13 HD probes and nine TDR probes. Other work related to the pilot-scale testing included measurement of temperature, relative humidity, and barometric pressure at the EBS test facility in Building A1. Procurement began for instrumentation to be used in Canisters #3 and #4. Procedures for measuring thermal/hydraulic/chemical properties of candidate EBS materials were compiled, and compilation of data packages for measured properties from potential EBS materials also began.

Hydrochemical work continued. Staff wrote a draft section on Sr isotope pore-water analyses for inclusion in the geochemistry Analysis/Modeling Report (AMR). Geochemical modeling software (PHREEQC, v. 2.0) used to obtain ^{14}C residence times of perched water (in the report describing correction of perched-water ages) remained in review. Documentation and validation are underway on that software (configuration management identification LV-1999-002). Analytical efforts again involved samples from a variety of sources. Pore water was distilled, and dissolved CO_2 was extracted, from seven ESF core samples. That CO_2 will be analyzed for carbon isotopes, and the pore water will be analyzed for tritium as part of the ^{36}Cl validation study. The CO_2 may be analyzed for carbon isotopes. Pore water was extracted by centrifuge methods from three USW SD-9 core samples. Extracted water will be analyzed for major-ion chemistry and for $^{18}O/^{16}O$ and D/H isotopic ratios. In work on USW WT-24 cores, pH values of pore water collected by compression methods were checked and recalibrated where necessary. Specimen custody reports were identified for all core samples from which water was extracted and isotopic analyses were preformed between September 1997 and July 1999.

In hydrochemical data work, efforts continued on the data package and report titled *Carbon-14 activity of pore water obtained by vacuum distillation and one-dimensional compression methods on Yucca Mountain, Nevada, cores* (published in the Proceedings of the Third International Conference on Isotopes, Vancouver, Canada) to be held in early September. The data checklist also was completed for a package titled "Analysis of tritium concentration, during FY98 and FY99, in pore water extracted from boreholes UZ-7A, UZ-14, NRG-7A, WT-24, SD-6, SD-7, SD-9, and SD-12," and the package was sent for checker review. Data were entered into appropriate data bases. Water samples collected by centrifuge, compression, and distillation methods during August were recorded in the water-collection data bases. The liquid scintillation counter was calibrated. Documentation of cold-room storage conditions in Building 56 was prepared as part of sample-handling discussions.

Saturated-Zone Hydrology

Transducers removed from boreholes UE-25 c#1 and c#3 were repackaged and shipped to the manufacturer during the last week of August for closing calibrations. Those

calibrations are expected during September. Other demobilization efforts at the C-hole complex have been delayed by the NTS-wide stop-work order.

In water-level monitoring not previously reported for July 1999, water-level measurements included USW H-1 (tubes 1, 2, 3, and 4) and USW G-2 on July 19; UE-25 WT#6, UE-25 WT#16, and UE-25 J-12 on July 21; USW H-3 (upper and lower intervals), USW WT-1, UE-25 p#1, and UE-25 WT#14 on July 26; USW WT-7, USW WT-10, USW VH-1, and UE-25 WT#12 on July 27; UE-25 WT#4, UE-25 J-11, UE-25 WT#17, UE-25 WT#3, and UE-25 WT#15 on July 28; and UE-25 J-13, UE-25 WT#13, and USW WT-24 on July 29. Measurements made in August included UE-25 J-11 and USW H-4 (lower interval) on August 4; USW H-3 (lower interval) on August 9; UE-25 p#1 and USW H-1 (tubes 1, 2, 3, and 4), USW G-2, and UE-25 WT#4 on August 16; USW WT-7 and WT-10, USW VH-1, and USW H-6 (upper and lower intervals) on August 17; USW WT-1, USW H-3 (upper interval), and USW H-5 (upper and lower intervals) on August 18; UE-25 WT#13 and WT#15, and UE-25 J-12 on August 19; UE-25 WT#6 and WT#16 on August 23; UE-25 WT#12, USW H-4 (upper interval), and USW WT-2 on August 24; USW WT-24 on August 25; and UE-25 WT#3, WT#14, and WT#17, and J-13 on August 26. Review of electronic data files began. In related calibrations, a Mt. Sopris Multiconductor Cable Unit, serial number (s/n) 1532 was calibrated August 4 through August 9. The cable unit failed the calibration without the weight bar but did pass the calibration test with the weight bar attached. Considerable time then was spent documenting the failed calibration and qualifying related data. An operational check of a volumetric bucket (s/n B) was completed on July 21, and a similar check of another volumetric bucket (s/n C) was completed on August 4. Calibration checks of several Setra barometers (s/n 971431, 588128, 971434, 971433, and 433311) were completed on August 3. One Setra barometer (s/n 971432) failed calibration check on August 3. Setra barometers were returned to Setra for factory calibration. Two Paroscientific transducers (s/n 65024 and 65017) were returned to Paroscientific for factory calibration. Water-level data packages received attention during August. A data package was submitted on August 5 in completion of Level 4 **milestone SPH38RM4 [Water-Level Data 2nd quarter FY99 Data Package to RPC/TDB]**. Processing of the third-quarter FY1999 data package began; that package was reviewed by the PI on August 18. Water-level worksheets were still in preparation; when complete, the third-quarter package will be sent for technical review.

Saturated-zone hydrologic testing on borehole USW SD-6ST1 included compilation of electronic data files for the report/memo on hydraulic properties in SD-6ST1. A McCrometer flow meter was removed from SD-6ST1 and shipped for closing calibration during the week of August 23.

In work on SZ hydrology, hydrochemistry and isotopic studies, the data package containing results of dissolved ion and isotopic analyses of SZ water was completed and submitted to the TDB. That submittal (on August 31) represented completion of Level 4 **milestone SPH471M4 [Dissolved Ion and Isotopic Analysis Data Package to RPC/TDB]**. Staff completed technical and checker reviews of an AMR for water-level

analysis and of a potentiometric surface map that will be used in support of site-scale SZ modeling efforts.

Death Valley regional flow system (DVRFS) modeling efforts continued on many fronts, again with emphasis on geologic compilations, model evaluation, and refinement of input data sets. Work on regional data bases continued, with completion of review of water-level interval data for sites within the DVRFS model boundary. The depth interval contributing water to boreholes was defined so the hydraulic head can be assigned to appropriate model layers. Maps of Pahrump Valley and Amargosa Valley were compiled to show the earliest water-level data posted at each site. Such data will be used for detailed analysis of water levels in those heavily developed valleys, with the intent of verification that hydrologic conditions (steady-state or transient) of the early water levels have been properly determined. Staff completed Level 4 **milestone SPH705M4 [Year-End Update on Evaluation of Transient Data]** with a memorandum to the TPO on August 31.

Synthesis of regional geologic maps continued, with addition of geophysical constraints, labeling of major features, unit descriptions (added to the map text), symbols to depict motions of major faults, and editing of some volcanic units based on author discussion and literature sources. A revised (Rev. 4) NTS geologic map was submitted for technical review. Editing of the tectonic map continued, and strategies for incorporation of bedrock and Quaternary geology were developed. Interpretation and compilation of surficial geology for the majority (85%) of the portion of the Saline Valley 1:100,000-scale sheet within the DVRFS model area was completed.. Staff discussed digitization procedures of the mapping and conducted a trial digitization of selected areas to test procedures and to determine a sustainable level of detail at the 1:2,500,000 scale of the final map. Map interpretation of that sheet is nearly complete, but mapping and digitization of the parts of the DVRFS model on the Darwin Hills and Last Chance Range 1:100,000-scale sheets continued. Fieldwork was conducted in areas depicted on the Goldfield and Cactus Flat 1:100,000-scale sheets, focusing on Stonewall Flat, northern Cactus Flat, Stone Cabin Valley, and southern Reveille Valley. Position-altitude data were uploaded from the PLGR in an ASCII file containing data for 51 new field stations. At each station, observations were recorded, and units were annotated on 7.5' topographic quadrangle maps and on black-and-white high-altitude aerial photographs. Revision of the map portrayal and unit descriptions of surficial geology on Rev. 4 of the NTS geologic map, which includes all of the Beatty and Pahute Mesa and the western-most parts of the Pahranagat Range and Indian Springs 1:100,000-scale sheets, was completed. The surficial unit mapping on Rev. 4 will be adapted and compiled for direct incorporation into the regional geologic map. Development of geologic cross sections continued. Extraction of new gravity profiles from recent gravity modeling was initiated, for incorporation into all FY1999 cross sections. Additional work was carried out on geologic cross sections and accompanying narrative descriptions. A part of the cross section extending from Pahute Mesa southwestward through the Oasis Valley discharge area was revised. Comparisons of current sections were made with existing USGS/Grose and UGTA/IT sections. Compilation of drill-hole data from about 800 drill holes in the Amargosa Farms area in the northern Amargosa Desert was completed. Some 117

boreholes were selected from the larger set to reconstruct subsurface geology in the Amargosa Desert area. The reconstructions will be developed with surfaces showing correlated contacts rather than the originally envisioned cross sections. Original field records from the Nye County early-warning drill holes were compared to recently completed stratigraphic descriptions of cuttings. Preliminary cross sections intersecting the early-warning drill holes were developed, depicting generalized stratigraphy developed from the original field records and the stratigraphic descriptions. The data also were plotted in comparison to depth to Paleozoic basement interpreted from recent gravity surveys in the area.

Work continued on flow-model calibration and on preparation of the report on regional recharge estimates, with the text currently about 75% complete. The report will document extension of the 1996 Yucca Mountain net-infiltration model to the Death Valley region and will present the initial recharge-estimation results based on simulated net infiltration. Work also continued on redefinition of soil properties and soil depth using Californian and Nevadan STATSGO coverages. Soil properties (including porosity, field capacity, residual water content, and saturated permeability) are being estimated using data provided by the STATSGO data base. Estimates are being verified using available data from field sampling sites at Yucca Mountain, the NTS, and the Valjean Valley area. That ongoing work requires more intensive GIS application and verification efforts than originally anticipated. Development of the regional daily climate model continued and used available precipitation and air-temperature data from sites within and adjacent to the DVRFS. The regional climate data base has been updated to include all precipitation and air-temperature records from about January 1900 through December 1997. Results from initial efforts at model calibration indicated a critical need to improve input regarding regional daily climate. Continued work on recalibration of the recharge model used the updated multi-layered root-zone model and updated estimates of bedrock permeability. Improvements in the evapotranspiration model increased the estimated daily amounts and should decrease estimates of recharge relative to existing recharge estimates (which are approximately 3 to 4 times greater than the Maxey-Eakin estimates). Regional SZ flow-model calibration and evaluation continued during the period with modification of inputs to the general head-boundary package. Flow observation-file construction was completed. A GIS map and associated model array was completed for use in constraining flow observations in the flow model. Discretization of the framework model for input of data to the Hydrogeologic Unit packages for MODFLOW2000 also was completed. In related work, staff developed macros and reformatted data from the hydrogeologic framework model and the potentiometric surface into ARC/INFO coverages and MODFLOW arrays. Model evaluation continued with preparation of a model-verification documentation package.

CLIMATE and PALEOHYDROLOGY

Senior climate staff continued work on the AMR for future-climate analyses following requirements of AP-3.10Q, with priority over all other tasks. Other staff continued work on compilation of data packages.

SPECIAL STUDIES

USGS and DOE staff participated in the public Open House held at the Denver Federal Center August 27 and 28 to commemorate the 120th anniversary of the USGS and presented several exhibits detailing work on characterization of Yucca Mountain. A large DOE booth provided an overview of investigations at Yucca Mountain, and additional USGS displays documented work on the unsaturated zone, on geologic mapping, on evaluation of seismotectonic hazards and of the unlikely probability of large changes in the water table, and on detailed investigation of growth of calcite and silica minerals. The Underground Mapping Team also illustrated that work, and consideration of analogs was illustrated by evidence from prehistoric sites. Public attendance was substantial, and participating staff provided valuable outreach to the public.

Guidance for preparation of input to Site Characterization Progress Report Number 21 was received from the M&O. Draft input on progress on site characterization from April 1 through September 30, 1999, is due to NEPO by September 24. Guidance also was distributed for revision of the Documentation of Program Change (formerly Appendix A) with input due to NEPO by October 11, 1999.

In other work, several sections of the UZ hydrology part of the Yucca Mountain Site Description (Revision 1) were transmitted to the NEPO coordinator one week ahead of schedule. Those sections included:

- 8.1 Introduction
- 8.2 Site Infiltration (incomplete pending receipt of draft AMR)
- 8.3 Properties of Hydrogeologic Units (Matrix Properties and Air-Injection Testing)
- 8.4 Pneumatic Pressure and Gaseous-Phase Flow in the Deep Unsaturated Zone
- 8.5 Distribution of *in situ* Water Potential and Temperature and Occurrences of Perched Water in the Deep Unsaturated Zone
- 8.6 Hydrochemical and Isotopic Indications of Fluid Flow (Summary)
- 8.7 Estimation of Percolation Flux in the Deep Unsaturated Zone
- 8.11 Evidence of Past Percolation Through the Unsaturated Zone

Section 8.8.4 (Fluid-flow Properties of the Ghost Dance Fault) is complete but needs to be integrated with Sections 8.8.2 (Effects of Ventilation on Moisture Conditions in the Exploratory Studies Facility) and 8.8.3 (Distribution and Movement of Fluids Used in ESF Construction), which are being prepared by staff at LBNL. Sections 8.9 and 8.10 on the UZ flow model are not yet complete because staff at LBNL still are preparing those sections in parallel with several AMRs and the UZ PMR. Section 8.12 (Summary of Unsaturated-Zone Hydrology) will be prepared as soon as all other sections are completed.

WATER-RESOURCES MONITORING

Routine water-monitoring efforts continued. All data were downloaded from the 17 tipping-bucket rain-gage network during the first week of July. All stations were in good operating condition. Those data are being reviewed and assembled into electronic data records. The assembled data package has been submitted for technical review and is expected to be finished by September 30.

USGS Level 3 Milestone Report

October 1, 1998 - August 31, 1999

Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comments
Letter Report: 4th Qtr FY98 Milestone Number: SSH14HM3	10/30/98	10/29/98	10/29/98	
Letter Report: 1st Qtr FY99 Milestone Number: SSH14IM3	1/29/99	1/28/99	1/28/99	
Preliminary Geologic Map for SZ Site Area Milestone Number: SPG258M3	3/5/99	9/30/99		
Submit UZ-7a & UZ-14 Rpt for Director's Approval Milestone Number: SPG630M3	3/15/99	9/30/99		
Ghost Dance Fault Data Pkg and Testing Report Milestone Number: SP3515M3	3/30/99	9/27/99		
Geology of ECRB X-Drift Milestone Number: SPG42GM3	3/31/99	9/30/99		
Letter Report: 2nd Qtr FY99 Milestone Number: SSH14JM3	4/30/99	4/29/99	4/29/99	
Letter Report: 3rd Qtr FY99 Milestone Number: SSH14KM3	7/30/99	7/30/99	7/30/99	

USGS Level 4 Milestone Report

October 1, 1998 - August 31, 1999

Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comments
Cross-Drift Q Stratigraphic Picks to TDB **Milestone Number:** SPG470M4	10/15/98	12/1/98	12/1/98	
Geologic Investigation Strategy Developed **Milestone Number:** SPH741M4	11/30/98	11/30/98	11/30/98	
Early Progress Model Calibration **Milestone Number:** SPH751M4	11/30/98	11/30/98	11/30/98	
UZ-7a & UZ-14 Draft Rpt to Tech Review **Milestone Number:** SPG626M4	12/2/98	12/9/98	12/9/98	
Index Map-Poten Areas Detail Geol Invest **Milestone Number:** SPH776M4	12/15/98	12/15/98	12/15/98	
1st Qtr Status of Data Package Development **Milestone Number:** SP37A1M4	12/30/98	1/8/99	1/8/99	
1st Qtr Status Supp Line Org Doc Issues/Backlog **Milestone Number:** SE9601M4	12/31/98	12/31/98	12/31/98	
Water-Level Data 4th Qtr FY98 DP to RPC/TDB **Milestone Number:** SPH38PM4	12/31/98	12/31/98	12/31/98	
Well Data Compiled/Analyzed Detail Geol Invest **Milestone Number:** SPH772M4	12/31/98	12/23/98	12/23/98	
Preliminary Maps to Hydrologists **Milestone Number:** SPH742M4	1/15/99	1/15/99	1/15/99	
HFM-Progress Report I **Milestone Number:** SPH730M4	1/29/99	1/29/99	1/29/99	
Climate Tables for TSPA-LA **Milestone Number:** SPC316M4	2/1/99	2/19/99	2/19/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Status of Prow Pass Involvement Milestone Number: SPH401M4	2/12/99	2/12/99	2/12/99	
Sr Isotopic System in Pore Wtr to RPC/TDB Milestone Number: SPH514M4	2/12/99	9/30/99		
ESF Monitoring Data Pkg to RPC/TDB Milestone Number: SPH336M4	2/19/99	9/30/99		
Alcove 1 Infil Expmt DP to RPC/TDB Milestone Number: SPH36M4	2/19/99	9/30/99		
Interp Rpt: Synthesis Frac Min Dating/Cl-36 Milestone Number: SPH28M4	2/26/99	9/15/99		
Mid-Yr Update on Evaluation of Transient Data Milestone Number: SPH703M4	2/26/99	2/26/99	2/26/99	
Progress on Regional Recharge Estimates Milestone Number: SPH729M4	2/26/99	2/26/99	2/26/99	
Dissolved Ion & Isotopic Analysis DP to RPC/TDB Milestone Number: SPH471M4	3/26/99	8/31/99	8/31/99	
2nd Qtr Status Supp Line Org Doc Issues/Backlog Milestone Number: SE9602M4	3/31/99	3/29/99	3/29/99	
2nd Qtr Status of Data Package Development Milestone Number: SP37A2M4	3/31/99	3/24/99	3/24/99	
Mid-Year Status EST Closeout Activities Milestone Number: SPC71AM4	3/31/99	3/31/99	3/31/99	
Mid Year Status-Tectonic Closeout Milestone Number: SPG221M4	3/31/99	8/5/99	8/5/99	
Mid-Year Status Topical Reports Milestone Number: SPG41AM4	3/31/99	3/30/99	3/30/99	
Mid-Year Status Peer Reviews Milestone Number: SPG51AM4	3/31/99	3/30/99	3/30/99	

Deliverable	Due Date	Expected Date	Completed Date	Comments
Mid-Year Status KTIs Milestone Number: SPG61AM4	3/31/99	3/30/99	3/30/99	
Interp Rpt: Corrctn Pched Wtr C-14 Ages Milestone Number: SPH517M4	3/31/99	9/30/99		
Mid-Yr Update on Regional SZ Mdlg Data Merge Milestone Number: SPH701M4	3/31/99	3/31/99	3/31/99	
Mid-Yr Update on Regional Spatial Data Merge Milestone Number: SPH707M4	3/31/99	3/31/99	3/31/99	
Geologic Sections Completed Milestone Number: SPH753M4	3/31/99	3/31/99	3/31/99	
Update Regional SZ Hydrochem Data I Milestone Number: SPH755M4	3/31/99	3/31/99	3/31/99	
Work Plan-Detail Geol Invest Milestone Number: SPH777M4	3/31/99	9/30/99		
Water-Level Data 1st Qtr FY99 DP to RPC/TDB Milestone Number: SPH38QM4	4/30/99	4/30/99	4/30/99	
Model Results to RPC Milestone Number: SPH442M4	4/30/99	9/27/99		
Letter Rpt: Rslts PA Wkshps & Sensit Analyses Milestone Number: SPH608M4	4/30/99	4/13/99	4/13/99	
Mid-Year Progress Model Calibration Milestone Number: SPH719M4	4/30/99	4/30/99	4/30/99	
Geol Interps-Progress Report I Milestone Number: SPH743M4	4/30/99	4/30/99	4/30/99	
HFM-Progress Report II Milestone Number: SPH731M4	5/28/99	5/28/99	5/28/99	
Drift & BHs Struc Data Obs to Date to RPC/TDB Milestone Number: SPG291M4	6/1/99	9/30/99		

Deliverable	Due Date	Expected Date	Completed Date	Comments
Hydro Prop Busted Butte to RPC/TDB Milestone Number: SPH913M4	6/15/99	9/20/99		
3rd Qtr Status of Data Package Development Milestone Number: SP37A3M4	6/30/99	6/30/99	6/30/99	
Draft Interp Report to Review Milestone Number: SPH446M4	6/30/99	9/27/99		
Geol Interps-Progress Report II Milestone Number: SPH744M4	6/30/99	6/30/99	6/30/99	
Preliminary Geologic Map to Hydrologists Milestone Number: SPH745M4	6/30/99	6/30/99	6/30/99	
Geol Interps Completed Milestone Number: SPH747M4	6/30/99	6/30/99	6/30/99	
TDMS/RPC: Submit USW SD-6 Strat Data Milestone Number: SP6B34M4	7/30/99	9/30/99		
Implications of New Data Impacting PSHA Milestone Number: SPG751M4	7/30/99	9/30/99		
Water-Level Data 2nd Qtr FY99 DP to RPC/TDB Milestone Number: SPH38RM4	7/30/99	8/9/99	8/9/99	
UZ Monit Data to RPC/TDB 10/98-3/99 Milestone Number: SPH111M4	8/2/99	9/30/99		
Yr-End Update on Evaluation of Transient Data Milestone Number: SPH705M4	8/31/99	8/30/99	8/30/99	

YMP PLANNING AND CONTROL SYSTEM (PACS)

MONTHLY COST/FTE REPORT

Participant U.S. Geological Surve
Date Prepared 9/12/99 02:48 PM

Fiscal Month/Year August 31, 1999

	CURRENT MONTH END						FISCAL YEAR		
WBS ELEMENT	ACTUAL COSTS	PARTICIPANT HOURS	SUBCONTRACT HOURS	PURCHASE COMMITMENTS	SUBCONTRACT COMMITMENTS	ACCRUED COSTS	APPROVED BUDGET	APPROVED FUNDS	CUMMULATIVE COSTS
1.2.1	56	1123	235	0	2	0	669	0	528
1.2.3	961	11086	4455	0	351	0	11261	0	8809
1.2.4	68	110	90	0	0	0	158	0	129
1.2.5	53	448	655	0	97	0	639	0	474
1.2.8	83	630	165	0	16	0	665	0	526
1.2.9	54	661	251	0	13	0	600	0	549
1.2.12	4	176	0	0	0	0	100	0	61
1.2.15	164	1284	773	0	30	0	1831	0	1679
	1443	15518	6624	0	509	0	15923	0	12755

U.S. GEOLOGICAL SURVEY
ESTIMATED COSTS FOR October 1, 1998 August 31, 1999
9/8/99 9:50:14 AM

	OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
0G535HB1 Provide Technical Data Coordination	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	39.3	39.7	0.0	418.86
81912470U1 Technical Data Management FY99	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	39.3	39.7	0.0	418.86
81912470	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	39.3	39.7	0.0	418.86
0GC522HB1 Conduct Satellite Records Operations	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	4.2	4.3	0.0	61.46
81919197U1 USGS Satelite Records Operations	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	4.2	4.3	0.0	61.46
81919197	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	4.2	4.3	0.0	61.46
AMJX	49.1	39.9	53.3	29.6	39.2	45.8	44.4	45.9	45.8	43.4	44.1	0.0	480.32
0G4XXHB1 EBS Testing for LADS - Backfill (Before	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	0.0	56.41
81912382U1 EBS Testing for LADS	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	0.0	56.41
81912382	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	0.0	56.41
AMMQ	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	3.5	0.0	56.41
0G32212HB5 Evaluate Short Trace Length Fract. Distr	0.0	0.0	0.0	0.0	0.0	0.0	4.3	24.1	26.5	13.0	10.1	0.0	77.95
0G32212HB7 Conduct Geologic Mapping of the ECRB	0.0	16.3	78.0	77.4	71.7	58.0	48.8	18.0	-0.2	49.8	34.4	0.0	452.06
81912050U2 Geologic Testing in the ECRB FY99	0.0	16.3	78.0	77.4	71.7	58.0	53.1	42.0	26.3	62.8	44.5	0.0	530.01
0G33124HB8 Eval Percolation Flux Across Repository	3.6	12.6	16.8	21.9	24.9	-2.9	16.5	49.7	43.9	26.8	19.7	0.0	233.42
0G33124HBD Conduct Moisture Monitoring in the ESF	17.1	27.8	20.5	21.6	13.9	20.2	0.1	-111.9	0.0	-9.3	14.0	0.0	14.00
0G36221HB4 Cond E-W X-Drift Frac Min Dtng & Isoto	21.2	-14.1	4.9	2.7	-0.5	3.9	9.0	31.8	16.0	20.7	51.5	0.0	146.98
81912050U3 Moisture Monitoring & Infiltration St	41.9	26.3	42.3	46.2	38.2	21.2	25.6	-30.4	59.9	38.2	85.1	0.0	394.39
0[illegible]212FB5 Conduct Geologic Mapping of the ECRB	75.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130.00
[illegible]12050UX Geologic Mapping of the ECRB (Def	75.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130.00
81912050	116.9	97.6	120.3	123.6	109.9	79.1	78.7	11.6	86.1	101.0	129.6	0.0	1,054.41
AMNE	116.9	97.6	120.3	123.6	109.9	79.1	78.7	11.6	86.1	101.0	129.6	0.0	1,054.41
0G4XXHB1 EBS Testing for LADS - Backfill (After 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	0.0	72.74
81912383U1 EBS Testing for LADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	0.0	72.74
81912383	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	0.0	72.74

U.S. GEOLOGICAL SURVEY
ESTIMATED COSTS FOR October 1, 1998 August 31, 1999
9/8/99 9:50:14 AM

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	AMNT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	5.8	64.3	0.0	72.74
0G33124HBB	Conduct Air-K & Hydrochemistry Testing	62.0	11.7	23.1	11.6	4.0	11.9	2.5	0.0	2.1	-2.2	3.1	0.0	129.80
0G33124HBF	Characterize Seepage into Alcoves I	14.1	18.6	18.7	8.8	13.8	0.8	2.7	0.0	2.3	22.2	3.6	0.0	105.67
0G33124HBG	Characterize Seepage into Alcoves II	1.7	4.1	7.7	21.1	23.7	12.6	0.0	40.6	0.0	4.1	0.0	0.0	115.66
0G33127HB2	Conduct Isotopic & Hydrochemical Analy	16.2	20.8	26.3	6.4	9.3	11.6	12.3	12.4	3.5	0.4	0.3	0.0	119.45
0G36221HB1	Conduct Fluid Inclusion Studies	4.4	20.9	12.0	10.0	11.7	8.3	14.6	-7.6	9.9	0.4	7.8	0.0	92.43
0G36221HB3	Cond Frac Mineral Dtg & Iso Analy - ES	32.2	21.3	16.2	19.9	23.0	15.0	9.0	0.9	7.6	-16.5	4.2	0.0	132.83
81912025U1	Moisture Monitoring & Fault Fractur	130.7	97.4	104.0	77.8	85.5	60.3	41.1	46.4	25.4	8.4	19.1	0.0	695.84
0G36221HB5	Water Flux Thru Repository Block	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.9	0.0	0.0	0.0	0.0	3.98
81912025UX	Geochronology of Fracture Minerals	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.9	0.0	0.0	0.0	0.0	3.98
81912025		130.7	97.4	104.0	77.8	85.6	60.3	41.1	50.2	25.4	8.4	19.1	0.0	699.82
0G33131HB2	Cond. Hydraulic & Tracer Testing of Pro	39.9	34.4	57.9	-1.5	15.2	0.8	3.1	1.3	3.6	-2.4	0.7	0.0	153.00
0G33132HB1	Cond Isotopic & Hydrochemical Studies	8.6	29.9	26.8	3.4	16.4	25.5	14.8	30.9	38.7	-4.5	2.8	0.0	193.32
0G36221HB8	Paleodischarge at Nye County Sites	0.0	0.0	0.0	0.0	0.0	0.0	2.8	8.0	0.0	14.3	0.0	0.0	25.15
0G3XXXXHB1	Oversee Nye County Drilling Program	8.3	-5.2	4.8	1.9	11.8	7.2	19.0	11.0	-1.3	0.7	0.0	0.0	58.45
0G3XXXXHB3	Provide SMF Well-Site Support	0.0	3.9	30.9	36.5	27.0	22.9	6.5	-1.4	3.4	0.5	0.0	0.0	130.18
81912029U1	SZ Data Analysis for SR FY99	56.8	62.9	120.5	40.3	70.5	56.5	46.2	49.9	44.4	8.6	3.5	0.0	560.10
81912029		56.8	62.9	120.5	40.3	70.5	56.5	46.2	49.9	44.4	8.6	3.5	0.0	560.10
0G33133HB?	Comp. Geo. Interpretations - Geologic M	7.4	16.0	12.3	9.9	12.7	12.8	11.9	5.0	10.3	6.6	-4.6	0.0	100.36
0G33133HB2	Conduct LA SZ Flow Model Sensitivity A	0.0	3.0	5.6	2.1	8.5	9.0	14.6	-6.8	0.3	5.1	3.9	0.0	45.30
0G33133HB3	Refine Geologic Framework Model	0.0	0.4	8.4	3.1	3.5	6.7	7.3	9.8	18.9	18.7	7.2	0.0	84.10
0G33133HBB	Develop Regional SZ Model	0.0	6.3	15.6	23.0	39.9	25.1	32.2	18.2	21.6	32.0	10.4	0.0	224.27
0G33133HBD	Comp. Geo. Interpretations - Hydrostruc	2.4	13.6	-0.7	6.2	4.2	5.2	9.9	4.5	11.9	3.2	1.9	0.0	62.37
0G33133HBE	Comp. Geo. Interpretations - Cross Sect	2.1	6.5	17.5	9.7	13.7	13.8	16.8	11.7	20.1	11.7	10.9	0.0	134.41
0G33133HBF	Comp. Geo. Interpretations - Amargosa	2.5	10.7	7.2	8.9	10.1	10.4	7.5	15.4	9.2	17.5	12.0	0.0	111.54
0G33133HBG	Hydrogeologic Framework Model	8.1	2.5	-6.0	0.9	9.6	6.6	3.5	9.1	9.7	8.6	16.7	0.0	69.29
0G33133HBH	Reduce Uncertainty - Recharge Work	0.0	0.0	2.2	0.8	1.9	3.0	3.7	3.0	2.8	-2.5	7.5	0.0	22.47
0G33133HBI	Reduce Uncertainty - Hydrochemical Flo	0.0	0.0	3.5	6.0	12.3	6.5	10.4	2.0	5.6	29.6	39.3	0.0	115.25
0G33133HBJ	Ground Water Flow Modeling	0.4	12.7	20.7	9.0	6.4	15.2	6.7	9.5	17.4	40.1	9.0	0.0	147.15
81912031U1	Regional and Site Scale Saturated Z	22.9	71.8	86.4	79.6	123.1	114.1	124.6	81.5	127.9	170.6	114.0	0.0	1,116.51

U.S. GEOLOGICAL SURVEY

ESTIMATED COSTS FOR October 1, 1998 August 31, 1999

9/8/99 9:50:14 AM

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0G33132HB2	Iso & Hhdrochem Studies SZ Water (WT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.0	39.04
0G33133HB7	Refine Regional Hydrogeologic Framew	0.0	0.0	85.3	-85.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G33133HBA	Reduce Uncertain Flux Values to Calibra	0.0	0.0	0.8	7.2	16.4	13.3	18.7	21.3	8.6	39.8	93.5	0.0	219.77
81912031UX	SZ Modeling & Hydrochem Studies (	0.0	0.0	86.1	-78.1	16.4	13.3	18.7	21.3	8.6	78.9	93.5	0.0	258.82
81912031		22.9	71.8	172.6	1.5	139.5	127.4	143.3	102.8	136.5	249.4	207.5	0.0	1,375.33
[illegible]211HB3	Complete Stratigraphic Descriptions UZ-	0.6	8.3	11.8	4.0	7.8	4.1	1.5	2.2	1.0	0.1	2.8	0.0	44.17
0G32211HB5	Correlate Lithostratigraphy & Geophysic	0.0	0.0	0.2	0.8	0.0	0.0	0.2	31.7	14.4	8.1	18.2	0.0	73.54
0G32212HB1	Provide Structural Support to Isotopic Ag	4.0	0.2	6.8	2.9	2.0	2.7	0.6	0.6	2.6	1.9	3.6	0.0	27.93
0G32212HB2	Conduct Fracture Syn in Sup of Reposit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G32212HB3	Conduct Spatial Analysis of Fracture Int	0.4	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G32212HB4	Provide Geo Sup to LBNL Geophys Inve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G32212HB6	Char. Structure of Alcove - X-Drift Infil. E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G32212HB8	Conduct Fault Zone Studies	0.9	5.8	3.5	10.8	2.7	3.0	4.3	9.9	-1.0	9.8	6.5	0.0	56.20
0G32212HB9	Provide Structural Support to TSPA/VA	29.8	18.9	9.8	13.5	13.1	13.0	24.1	2.5	3.4	5.9	8.1	0.0	142.07
0G395HB1	Provide USGS Support to 3-D Model: G	17.4	0.0	-9.3	-3.9	14.2	8.9	15.4	10.4	43.9	13.3	9.6	0.0	119.92
0G395HB2	Provide USGS Support to 3-D Model: St	0.0	0.0	0.0	11.4	0.4	0.0	0.0	0.0	3.4	9.2	8.6	0.0	32.97
81912210U1	Geologic Studies FY99	53.1	32.8	22.8	39.4	40.1	31.6	46.2	57.4	67.6	48.3	57.4	0.0	496.79
0G32211HB2	Conduct Stratigraphic Descriptions	8.9	14.0	-0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.12
81912210UX	Stratigraphic Description of SD6WT2	8.9	14.0	-0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.12
81912210		62.0	46.8	22.6	39.8	40.1	31.6	46.2	57.4	67.6	48.3	57.4	0.0	519.91
0G33[illegible]3HB2	Hydraulic properties - Busted Butte Core	0.0	4.6	-0.7	0.8	1.2	21.6	28.6	49.1	28.7	19.5	7.4	0.0	160.80
[illegible]124HBF	Characterize Seepage into Alcoves I	0.0	13.7	13.0	0.5	-10.3	1.4	7.5	3.1	15.4	8.8	10.5	0.0	63.61
0G33124[illegible]	Characterize Seepage into Alcoves II	0.0	4.3	0.0	0.0	2.3	8.3	52.3	-5.7	13.0	10.6	2.0	0.0	87.17
0G33127[illegible]	Cond Iso/Hydrochem Studies of UZ & P	0.0	0.0	0.0	0.0	1.4	0.0	9.3	4.3	15.4	17.7	21.9	0.0	69.94
0G33127HB[illegible]	[illegible]lorine 36 Validation Studies	0.0	0.0	0.0	0.0	9.5	8.8	12.5	6.9	19.7	6.8	5.0	0.0	69.17
0G36221HB[illegible]	[illegible]ntinue Fluid Inclusion Sutdies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G3[illegible]	[illegible]ontinue Fluid Inclusion Studies	0.0	0.0	0.0	0.0	0.0	0.0	20.8	33.1	29.1	30.6	12.2	0.0	125.77
0G36221HB9	Continue Frac Min Dtg & Isotopic Anlys	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.34
81912215U1	Moisture Monitoring & Fault Fractur	0.0	22.6	12.4	1.3	4.0	40.1	131.0	90.8	121.3	107.4	59.0	0.0	589.79
[illegible]36221HB7	Paleodischarge/Paleoclimate - Deferred	0.0	0.0	15.2	8.4	0.1	7.3	4.7	4.3	-1.7	0.4	0.8	0.0	39.51
[illegible]912215UX	Paleodischarge/Paleoclimate (Deferr	0.0	0.0	15.2	8.4	0.1	7.3	4.7	4.3	-1.7	0.4	0.8	0.0	39.51

U.S. GEOLOGICAL SURVEY

ESTIM. D COSTS FOR October 1, 1998 August 31, 1999

9/8/99 9:50:14 AM

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81912215		0.0	22.6	27.6	9.7	4.1	47.5	135.7	95.0	119.6	107.8	59.8	0.0	629.30
0G54XX	Provide Support to Performance Assess	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	-23.3	13.2	0.0	55.52
81912220U1	USGS Support to Performance Asse	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	-23.3	13.2	0.0	55.52
81912220		0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	-23.3	13.2	0.0	55.52
131HB3	C-Well Demobilization	0.0	0.0	0.0	0.0	0.0	0.7	1.8	4.9	12.7	11.8	14.8	0.0	46.83
132HB1	Cond Isotopic & Hydrochemical Studies	0.0	0.0	0.0	0.0	0.7	0.4	3.6	-2.6	7.3	23.5	1.4	0.0	34.20
0G36221HB9	Paleodischarge at Nye County Sites	0.0	0.0	0.0	0.0	2.8	0.0	0.0	7.3	6.9	18.9	30.0	0.0	65.94
0G3XXXXHB2	Oversee Nye County Drilling Program	0.0	0.0	0.0	0.0	0.0	0.9	8.4	8.7	4.9	4.6	4.2	0.0	31.78
81912245U1	SZ Data Analysis for SR/LA FY99	0.0	0.0	0.0	0.0	3.5	2.0	13.8	18.3	31.8	58.8	50.5	0.0	178.77
0G33127HB3	Iso & Hydrochem Studies of UZ Water a	0.0	3.9	7.9	12.1	8.2	9.4	6.9	10.6	9.0	9.0	4.1	0.0	81.14
0G33131HBG	SZ Hydrologic Testing	9.0	7.2	2.8	4.9	9.2	6.1	13.0	22.7	44.7	20.5	27.3	0.0	167.40
81912245UX	SZ Testing & UZ Hydrochemistry (De	9.0	11.2	10.6	17.0	17.3	15.5	20.0	33.3	53.7	29.5	31.4	0.0	248.55
81912245		9.0	11.2	10.6	17.0	20.9	17.6	33.8	51.7	85.5	88.3	81.9	0.0	427.31
0G39BHB9	Support Preparation of the WDLA	26.3	23.1	54.1	24.5	40.0	45.1	40.7	33.4	46.5	75.5	49.6	0.0	458.79
81916105U1	Support for Preparation of the WDL	26.3	23.1	54.1	24.5	40.0	45.1	40.7	33.4	46.5	75.5	49.6	0.0	458.79
0G32836HB1	Rvw Impacts of New Data on Volcanic &	15.7	-11.4	22.6	5.6	5.2	6.9	2.2	5.1	13.0	-0.9	0.0	0.0	63.94
0G32XXXHB1	LADS Support - Expansion Area	0.0	0.0	1.3	0.0	0.0	0.0	0.4	0.0	6.0	0.0	0.0	0.0	7.70
0G33129HB1	Provide Updated UZ Model Abstractions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G331XXHB1	Provide Support to Flow & Transport Mo	3.9	7.9	5.0	8.8	-0.4	1.0	9.2	-1.9	0.0	-15.4	0.0	0.0	18.14
0G33XXXHB1	LADS Support	0.0	5.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.77
16105U2	Review of Literature and Special Stu	19.7	1.6	28.6	14.4	4.8	7.8	11.8	3.2	19.0	-16.3	0.0	0.0	94.55
836HB2	Tectonic Closeout Activities	0.0	1.5	0.9	1.8	7.7	5.0	43.2	21.3	8.7	38.1	35.3	0.0	163.60
0G33121HB1	Coupled Infiltration Surface Water Flow	0.0	1.8	4.7	4.4	15.7	28.9	13.9	44.2	16.4	50.1	55.6	0.0	235.60
0G33123HB1	Surface Based Testing Closeout Activitie	0.0	9.1	46.7	44.5	34.2	31.1	27.6	41.1	27.4	44.8	34.6	0.0	341.06
0G36221HB6	Climate Closeout Activities	0.0	12.1	49.1	19.4	21.6	53.2	8.7	19.9	43.5	10.7	28.3	0.0	266.54
0G39BHA1	Supports KTIs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
0G39BHA1	Support Topical Rpts; NWTRB, ACNW,	5.8	-5.1	0.5	1.9	3.2	18.2	8.1	3.5	-0.4	1.3	0.7	0.0	37.77
0G39BHA1	Support Semiannual Progress Reports	0.0	5.0	2.3	0.4	0.0	2.7	5.0	-1.1	0.2	0.0	0.0	0.0	14.52
0G39BHA1	Support Peer Reviews	4.9	-2.0	-0.5	0.0	0.0	2.1	0.0	2.1	0.0	0.0	0.0	0.0	6.63
0G39HB1	Support Closeout Activities	0.0	0.0	0.0	4.9	5.9	36.9	15.7	36.6	33.1	19.3	27.2	0.0	179.63

U.S. GEOLOGICAL SURVEY

ESTIMATED COSTS FOR October 1, 1998 August 31, 1999

9/8/99 9:50:15 AM

		OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
0G39HB2	Support Hydrologic Modeling Team Clos	0.0	0.0	0.0	0.0	4.4	20.5	11.1	10.9	18.9	9.4	4.0	0.0	79.10
81916105U3	Technical Interactions and Special P	10.7	22.3	103.7	77.5	92.7	198.7	133.3	178.5	147.7	173.6	185.7	0.0	1,324.44
81916105		56.7	47.0	186.4	116.4	137.5	251.6	185.8	215.0	213.2	232.9	235.3	0.0	1,877.78
0G33127HB1	Conduct Chem. & Isotopic Analyses Drift	9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	2.3	3.6	0.0	86.00
81916107U1	Isotope Support for Thermal Testing	9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	2.3	3.6	0.0	86.00
81916107		9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	2.3	3.6	0.0	86.00
	AMNW	348.2	383.8	655.1	330.2	513.6	603.7	642.5	632.9	717.2	722.7	681.2	0.0	6,231.08
0G1CHB1	Conduct Engineering Assurance Activitie	38.0	36.6	38.7	35.1	40.4	44.4	38.6	40.8	39.1	44.3	46.9	0.0	442.98
81912019U1	Engineering Assurance FY99	38.0	36.6	38.7	35.1	40.4	44.4	38.6	40.8	39.1	44.3	46.9	0.0	442.98
0G1CHB2	Personnel Qualifications - Deferred	3.0	3.9	4.3	3.5	3.9	2.2	0.3	-0.7	3.2	3.0	5.6	0.0	32.30
0G1CHB2	Support Line Org. Doc. Issues/Backlog	2.8	3.0	1.7	2.9	7.8	9.7	8.6	6.3	3.7	2.8	3.7	0.0	53.20
81912019UX	Support Line Organization, Docume	5.9	6.9	6.0	6.5	11.7	11.9	8.9	5.6	6.9	5.8	9.3	0.0	85.50
81912019		43.9	43.6	44.7	41.6	52.2	56.3	47.5	46.4	46.0	50.1	56.2	0.0	528.48
	Core Library -- NV District	0.0	3.4	2.5	2.4	4.3	1.0	4.6	2.2	0.5	1.3	2.2	0.0	24.28
	Unfunded Work	91.7	97.0	-23.4	-11.6	-1.7	-50.5	-86.4	0.4	5.6	10.1	-20.5	0.0	10.70
0G31HB1	Support Scientific Programs Mgmt & Int	9.8	24.6	16.0	21.8	17.2	22.3	22.4	19.1	18.4	18.6	17.6	0.0	207.95
0G31HB2	Manage Nevada Operations/Earth Scien	40.4	57.7	45.8	37.6	29.2	39.8	48.2	25.6	13.7	39.1	37.1	0.0	414.29
81919090U1	USGS SP&I FY99	141.9	182.7	40.9	50.2	49.1	12.5	-11.3	47.3	38.2	69.1	36.5	0.0	657.22
0G39BHA1C	Provide Site Investigations Technical Su	27.1	38.5	34.1	55.6	40.0	46.3	65.6	85.7	104.1	108.0	99.0	0.0	704.06
[illegible]9BHA1D	Provide Quality Checks for Documents	0.0	0.0	0.0	1.3	8.0	8.0	3.1	11.7	6.6	12.3	4.7	0.0	55.63
[illegible]19090U3	USGS Site Investigations Technical	27.1	38.5	34.1	56.9	48.1	54.2	68.6	97.5	110.7	120.3	103.7	0.0	759.69
0G39BH[illegible]	Support QA Compliance, Implementatio	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
[illegible]19090U4	QA Compliance, Implementation, an	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
[illegible]31919090		169.0	221.2	75.0	107.2	97.1	66.8	57.4	144.8	148.9	189.4	140.2	0.0	1,416.91
0G825HB1	Implement Federal Safety & Occupation	6.8	7.6	7.9	7.9	6.7	8.8	7.8	8.7	9.0	8.0	8.1	0.0	87.27
[illegible]19121U1	Federal Occupational Safety & Healt	6.8	7.6	7.9	7.9	6.7	8.8	7.8	8.7	9.0	8.0	8.1	0.0	87.27
0G847HB1	Conduct Water Resources Studies	15.8	34.0	25.0	23.2	27.4	31.9	53.7	39.8	19.0	29.8	57.7	0.0	357.31
81919121U2	Water Resources FY99	15.8	34.0	25.0	23.2	27.4	31.9	53.7	39.8	19.0	29.8	57.7	0.0	357.31
0G847HB2	Water Appropriation Hearings	0.0	0.7	0.6	0.0	0.0	0.0	7.3	7.8	15.8	7.4	7.1	0.0	46.70

U.S. GEOLOGICAL SURVEY
ESTIMATED COSTS FOR October 1, 1998 August 31, 1999
9/8/99 9:50:15 AM

		OCT EST	NOV EST	DEC EST	JAN EST	FEB EST	MAR EST	APR EST	MAY EST	JUN EST	JUL EST	AUG EST	SEP EST	TOTAL
81919121U3	Water Appropriation Hearings	0.0	0.7	0.6	0.0	0.0	0.0	7.3	7.8	15.8	7.4	7.1	0.0	46.70
0G84XHB3	Tipping Bucket Rain Gage Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.9	0.0	9.7	9.7	0.0	34.33
81919121U4	Precipitation Gage Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.9	0.0	9.7	9.7	0.0	34.33
81919121		22.6	42.3	33.5	31.1	34.1	40.7	77.8	62.2	43.8	54.9	82.6	0.0	525.62
	AMPP	235.5	307.1	153.1	179.9	183.5	163.8	182.7	253.4	238.6	294.4	279.0	0.0	2,471.01
0GF23HB1	Provide Support/Personnel Services	18.8	22.6	23.1	26.2	22.7	22.0	21.8	17.5	-4.6	21.3	13.1	0.0	204.50
0GF23HB5	Provide Procurement & Property Manag	0.0	0.0	0.0	0.0	5.7	6.7	10.0	13.8	37.0	14.0	15.8	0.0	103.04
0GF23HB6	Provide Computer Support	13.6	25.2	16.1	18.3	39.8	33.0	33.8	28.1	49.6	32.6	40.7	0.0	330.98
81919110U1	Personnel, Procurement, Property S	32.4	47.8	39.2	44.5	68.2	61.8	65.6	59.4	82.0	67.9	69.6	0.0	638.52
0GF23HB2	Provide Facilities Management (space)	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	63.7	65.2	0.0	716.83
0GF23HB3	Provide Facilities Management (comput	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	92.8	21.6	0.0	237.42
0GF23HB4	Provide Facilities Management (other)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	9.2	3.2	0.0	34.83
81919110U2	Facilities Management (USGS)	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	165.7	89.9	0.0	989.08
0G[illegible]R1	Provide USGS Training Support	6.1	1.7	4.1	4.8	3.7	6.8	4.6	4.5	5.2	4.7	4.8	0.0	51.02
81919111U1	USGS Training Support	6.1	1.7	4.1	4.8	3.7	6.8	4.6	4.5	5.2	4.7	4.8	0.0	51.02
81919110		120.0	131.0	124.8	130.8	153.4	150.1	151.7	145.4	168.7	238.3	164.3	0.0	1,678.62
0G912HB1	Provide TPO Office Support	14.3	26.9	25.2	27.2	23.6	31.0	38.8	32.3	33.6	30.9	25.9	0.0	309.81
81919135U1	USGS Project Management FY99	14.3	26.9	25.2	27.2	23.6	31.0	38.8	32.3	33.6	30.9	25.9	0.0	309.81
0G922HB1	Conduct Project Control Activities	27.7	22.4	19.7	20.6	18.2	22.0	21.2	19.3	15.8	24.1	28.2	0.0	239.18
81919135U2	USGS Project Control FY99	27.7	22.4	19.7	20.6	18.2	22.0	21.2	19.3	15.8	24.1	28.2	0.0	239.18
81919135		42.0	49.3	44.9	47.8	41.8	53.1	60.0	51.7	49.4	55.0	54.0	0.0	548.99
	AMPW	162.1	180.3	169.8	178.6	195.2	203.2	211.7	197.1	218.0	293.3	218.4	0.0	2,227.61
[illegible]33131HB1	Conduct Water-Level Monitoring	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	0.0	161.68
81917027U1	Long-Term PC Monitoring FY99	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	0.0	161.68
81917027		7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	0.0	161.68
	AMRF	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	14.7	23.4	0.0	161.68

U.S. GEOLOGICAL SURVEY

ESTIMATED COSTS FOR October 1, 1998 August 31, 1999

9/8/99 9:50:15 AM

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1.2 OPERATING	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,192.6	1,177.2	1,322.2	1,475.3	1,443.3	0.0	12,755.26
CAPITAL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRAND TOTAL	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,192.6	1,177.2	1,322.2	1,475.3	1,443.3	0.0	12,755.26
FTEs													
FEDERAL	86.0	96.4	99.5	88.5	78.9	92.4	110.1	107.2	107.0	116.2	89.8	0.0	
CONTRACT	29.2	27.4	32.8	26.9	27.5	33.2	36.4	34.7	49.2	40.8	42.5	0.0	
TOTAL	115.2	123.7	132.4	115.4	106.4	125.6	146.4	141.9	156.1	157.0	132.2	0.0	

U.S. GEOLOGICAL SURVEY
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1.2 OPERATING	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,192.6	1,177.2	1,322.2	1,475.3	1,443.3	0.0	12,755.26
CAPITAL EQUIPMENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GRAND TOTAL	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,192.6	1,177.2	1,322.2	1,475.3	1,443.3	0.0	12,755.26
FTEs													
FEDERAL	86.0	96.4	99.5	88.5	78.9	92.4	110.1	107.2	107.0	116.2	89.8	0.0	
CONTRACT	29.2	27.4	32.8	26.9	27.5	33.2	36.4	34.7	49.2	40.8	42.5	0.0	
TOTAL	115.2	123.7	132.4	115.4	106.4	125.6	146.4	141.9	156.1	157.0	132.2	0.0	