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

AUG 03 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 June 1999.

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

Stephan Brocoum
Acting Assistant Manager, Office of
Licensing and Regulatory Compliance

OL&RC:BMT-1734

Enclosure:
Ltr 7/14/99, Craig to Kozai, w/encl

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Rec'd 8/3/99

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
Tony Cain, 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

July 14, 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, June 1999

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

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

Sincerely,

Raye R. 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

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
N. Biggar, M&O/Woodward & Clyde, 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

June 1999

COORDINATION and PLANNING

Processing of some 58 documents prepared by U.S. Geological Survey authors continued by the USGS-Yucca Mountain Project Branch. Of these listed items, 33 are USGS reports (split between 14 geological and 19 hydrologic topics), five are journal articles (four on hydrologic topics), 10 are Proceedings articles (seven with hydrologic topics and three geological in nature), and eight are abstracts (five on geological topics). The USGS reports mostly are water-resources investigation reports (WRIRs) and open-file reports (OFRs), with a few reports of mapping investigations (I-maps). In addition, two hydrologic milestone reports were being processed.

GEOLOGY

Geologic work focused on several issues. Development of lithostratigraphic workbooks continued, incorporating synthesis of stratigraphic, lithologic, and geophysical information. In other efforts, work on fault-zone studies produced an abstract (by R. Dickerson) for submittal to the Fall 1999 annual meetings of the Geological Society of America. The 1:50,000-scale geologic map of the Site SZ area (Level 3 milestone SPG258M3) has been delayed by document-development guidelines stipulated by AP-3.10Q. As of June 30, however, that map and accompanying text are in processing for publication. Preliminary digital versions of the map and cross sections have been sent to the SZ modelers (following completion of comment resolution and checking) so there is no impact on SZ modeling activities. Staff completed collection of data for the ECRB Cross-Drift small-scale fracture study and completed digital photography of all surveyed lines. The study consisted of six horizontal traverses and 18 vertical traverses in the Cross Drift. The data received technical review by C. Rautman (SNL) on June 28. Initial results indicated that fracture densities along the small-scale fracture traverses (13 to 26 fractures per meter) were very similar to those previously predicted by C. Rautman on the basis of original rock-quality (RQD) values calculated for the Cross Drift. Preliminary cluster analysis of the data has been conducted; fracture sets are distinguished at this early stage of analysis only by orientation. Future work will identify sets on the basis of additional characteristics. The preliminary analysis indicated several sets from the detailed line-survey (DLS) data from H4 (ECRB Cross-Drift Stations 17+35 to 17+41), H5 (Cross-Drift Stations 22+15 to 22+21), and H6 (Cross-Drift Stations 24+25 to 24+31) complexes (including vertical trace lines) as follows:

- SET 1 Subhorizontal discontinuities, striking 299 to 331° and dipping ENE at 6 to 15°
- SET 2 Moderate to high dip, striking 128 to 139° and dipping NE at 70 to 84°

SET 3 Moderate dip, striking 170 to 193° and dipping N at 68 to 77°. Staff completed final technical review of the report titled *Geology of the ECRB Cross Drift, Stations 0+00 to 27+81, Exploratory Studies Facility, Yucca Mountain Project, Yucca Mountain, Nevada*. Work began on comment resolution regarding the reviewers' comments. Completed DLS data from the Cross Drift were submitted to USGS QA-implementation specialists in Denver. Review and correction of full-periphery geologic maps from the Cross Drift continued. It was determined, after technical reviews, that the heat-dissipation-probe holes and some samples from the Cross Drift had been incorrectly plotted on the full-periphery maps. Those plotted locations were corrected.

In support of the Nye County drilling work, preliminary lithostratigraphic logs for deep Nye County boreholes were developed, based on analyses of cuttings samples. Unreviewed preliminary logs are expected to be submitted to Project participants in early July.

In unscheduled work, staff worked on completion of the Busted Butte as-built geologic data. Technical reviews were completed. A technical review of a paper by S. Levy and others (LANL) also was completed; that paper is titled *Flow path textures and mineralogy in tuffs of the unsaturated zone*. Technical reviews also were completed on two resolution analyses, "TBV-245 Resolution Analysis: Design-basis Block Size Assessment," and TBV-361/TBD-328 Resolution Analysis: Ground Control Loads."

HYDROLOGY

Unsaturated-Zone Hydrology

Several ongoing UZ efforts continued during June. Monitoring of temperature, relative humidity, and barometric pressure continued in the ESF Main Drift, niches, and in Alcove #7. Data were collected from 51 heat-dissipation (HD) probes in Alcove #7. Eight surface-based HD probes monitored soil moisture potential in and adjacent to the Ghost Dance fault. Twenty-one HD probes monitored the rock water potential in Niche #1. In the tracer/infiltration experiments at Alcove #1, water applications resumed on February 19. To date, 33,727 gallons of water have been applied at the surface above Alcove #1. Seepage into the alcove began on March 6, and to date, approximately 3161 gallons of water have been collected in the alcove. As of June 25, none of the LiBr tracer added to the infiltration water had been detected in the alcove. On June 26, a small spike of the tracer was detected in alcove samples, but samples collected after that date contain only the background concentration of Br. Tracer application was stopped on June 28, but water applications continued. Staff attended a meeting held in Sacramento, where plans were discussed for experiments planned for characterization of the Cross Drift. Since that characterization is a joint effort with LBNL, each group discussed their intentions. Future meetings will be held to ensure that both groups are making progress on the final plans. The Northern Ghost Dance fault (NGDF) data package has completed technical and QA review and has been submitted. The associated NGDF report has completed technical review and now is in AP-3.10Q review. In work on determination of hydraulic

properties of Busted Butte, a data package of hydrologic properties was prepared and reviewed. That package currently is undergoing evaluation by a checker.

Ongoing efforts in hydrochemistry included additional work on revision of the report describing correction of geochemical modeling of perched-water ^{14}C ages at Yucca Mountain, in which P. Glynn (USGS National Research Program, Reston) and J.-P. Nicot of the M&O worked on validation of the software program PHREEQC. Analytical work involved samples from several sources. Three USW SD-6 and five Nye County NC-EWDP bailed SZ water samples and two SD-6 UZ pore-water samples were analyzed for cation, anion, silica, and alkalinity concentrations. Two SD-6 and thirteen USW WT-24 pore-water samples underwent tritium analysis, and the counted data were reduced. Pore water was extracted by centrifugation from two SD-6 core samples. The extracted water will be analyzed for major-ion chemistry and $^{18}O/^{16}O$ and D/H isotopic ratios. Distillation methods were used to extract pore water from eight SD-6, seven WT-24, and one SZ water sample (from borehole MR-3) for tritium analysis. Two water samples collected using core compression were delivered for analysis of uranium and strontium isotopes. UZ Hydrochemistry personnel met with QA Implementation staff to resolve questions and to expedite processing of two data packages and scientific notebooks SN-31, -32, -74, -77, and -102. The close-out for Notebook SN-102 was completed, and the notebook was sent for management review. Staff compiled a list of DTNs related to UZ hydrochemistry and sent that to J. Fabryka-Martin (LANL) for inclusion in the AP-3.10Q planning document for geochemistry.

Routine work also continued. Water samples collected by centrifuge, compression, and distillation methods during June were recorded in the water-collection data base, and tritium measurements were recorded in that data base. Anion, cation, silica, and alkalinity results obtained during June were recorded in the major-ion data base. Staff performed a technical review of procedure HP-202, "Analysis of water samples for anion and cation concentrations by ion chromatography." The LKB liquid-scintillation counter was calibrated.

Saturated-Zone Hydrology

Demobilization at the C-hole complex continued during June with removal of transducers and downhole equipment from boreholes UE-25 c#1 and UE-25 c#3 between June 7 and June 24. The transducers were packaged to be sent in July to the manufacturer for closing calibrations. Transducers from UE-25 c#2 will be sent when they are removed from the borehole, the timing of which is now uncertain under an NTS-wide safety-related stop-work order imposed on June 24. Re-location of trailers and other equipment has been underway since May. As of June 24, the surface plumbing had been dismantled.

Modeling of the Death Valley regional flow system (DVRFS) continued as an active area of investigation. Highlights of that work included compilations and refinements of data sets for flow models, progress in construction of cross sections and geologic interpretations, and improvement of regional recharge estimates. Regional modeling data received continued attention. A table illustrating relations between field names and tables in NWIS (ver. 3.1) and the DVRFS data base was developed. New web-page links

to NWIS field definitions also were added to assist data-base users. Data-base queries have been constructed (in an on-going effort) to identify missing and inconsistent entries in GWSI. Resolution of problems will be prioritized based on importance for regional modeling. Work continued on ACCESS forms that facilitate pre-processing with MODFLOW2000 for easy compilation for input into the regional flow model. Six packages have been completed. Other work on model-input arrays included modifications to boundary conditions and discharge and recharge arrays for all model nodes. Model discretization was revised to adapt input of data to the HGU packages for MODFLOW2000. Compilation of hydrographs for sites within Yucca Flat and annotation of data with results of preliminary analyses began. In addition, preliminary compilation of water-level interval data for sites within the DVRFS model boundary was completed. Depth intervals contributing water to boreholes were defined so that hydraulic head can be assigned to the appropriate model layers. Analysis was completed of water-level hydrographs from areas within Pahrump Valley, Amargosa Valley, and sparse-data areas. Acceptable data will be used as head observations in the steady-state regional model. Minor bugs were fixed in the ARCVIEW project used to analyze DVRFS water levels. Compilation of metadata for existing ARCINFO coverages continued. Work continued on development of model-calibration processing routines. The three-layer YMP model was modified to new formats. The Hydrogeologic Unit package now supports vertical anisotropy for forward modeling and sensitivities and interacts with the Horizontal Flow Barrier package. The Horizontal Flow Barrier coding has been incorporated into MODFLOW2000. Linear confidence intervals on advective travel calculated using the MODFLOWP three-layer YMP model were evaluated. Staff assembled AP-3.10Q documents and two data packages for the site-scale framework model.

Geologic compilations continued with significant efforts. Bedrock/alluvium overlay maps were created for regional mapping of Tertiary and Quaternary units. Staff met in Las Vegas for placement of fault lines on the flow-system tectonic map, including faults based on gravity gradients under Quaternary/late Tertiary basins. The lines have been digitized, and a first draft of the tectonic map is nearly completed; that map information will be incorporated into the geologic map. Edge-matching and redefinition of units was performed on the northern and western parts of the map to create a uniform stratigraphy and to eliminate boundary problems. The entire data base was combined into a single set of coverages (with a place-holder where Rev. 4 of the NTS geologic map later will be added). Caldera boundaries were added where needed throughout the map area. New faults were added and structures extended based upon interpretation from Landsat images and geophysical data. A new preliminary interpretation of the maximum gradient in the gravity data was added. Those lines may represent significant basin faults with no surface exposure. Discussions were held concerning additional steps in refining the geologic data base and to coordinate additional steps for future work in development of DVRFS geologic maps. Staff completed cataloging NHAP photography for the Indian Springs, Las Vegas, Mesquite Lake, Pahranagat Range, and Quinn Canyon Range 1:100,000-scale sheets. An order was placed for a series of USGS high-altitude black and white prints (at similar 1:80,000 scale) for areas in the Nellis Air Force Range on the Beatty, Cactus Flat, Indian Springs, Pahranagat Range, Pahute Mesa, and Timpahute

Range sheets that are not covered by NHAP photography. This order, when combined with already procured NHAP photography, will provide full stereographic coverage of the entire DVRFS model area. Three days of fieldwork were conducted in areas shown in the central and eastern parts of the Death Valley Junction and the northern part of the Owlshead Mountains 1:100,000-scale sheets. Surficial units were mapped on topographic maps and NHAP aerial photographs. The satellite-image maps were used to identify areas needing field checking. A portable PLGR Global Positioning System unit was used for determining the positions and altitudes of stations tied to field notes that were recorded during field traverses mainly concentrated along major roads. Position and altitude data for an additional 52 field stations collected in May were added to the 1:100,000-scale sheets, providing accurate field control for mapping on the image maps. Staff classified units on the existing regional geologic map into three generalized units (Quaternary/Quaternary-Tertiary surficial deposits, Tertiary sediments, and Tertiary volcanic rocks/pre-Cenozoic bedrock). The contacts between these lumped units were printed and labeled on clear acetate at scale for five of the 1:100,000-scale base maps in the model area, with similar data to be printed for the remaining 1:100,000-scale maps in the regional tectonic map. Those overlays will be used to guide interpretation of boundaries during mapping of surficial units on the image maps. Compilation of surficial deposits, unit descriptions, and introductory materials for Rev. 4 of the NTS map was completed; that map should enter technical review in July. Interpretation of surficial units in the Saline Valley image-map area began. A Level 4 progress report on the status of surficial mapping for the regional geologic map **[milestone SPH747M4: Geological Interpretations Completed]** was completed on June 30. Work continued on facies analysis of the Lower Carbonate aquifer, and compilation of facies maps for Tertiary volcanic units also continued. Staff conducted field checks of welding variations in rocks of the Crater Flat and Paintbrush Groups. Stratigraphic data from the upper and lower confining units were compiled. Construction of regional cross sections for the DVRFS continued on schedule, but considerable work remains in tying sections together. Good progress was reported in compilation of the northern Amargosa Desert/Specter Range/Point of Rocks area where several sections converge. Similar work was carried out on cross sections of the Frenchman Flat/Yucca Flat areas. East-west sections through Death Valley were completed in draft form. Staff examined thrust faults exposed in ranges bounding the Amargosa Desert. Particular effort concerned overall structural style, thrust geometry, regional correlation of thrust sheets, and potential hydrologic implications of thrusts in the flow model. Several cross sections were created, as were narrative descriptions, and digitization of sections continued. Staff provided a technical review of Rev. 3 of the GP-01 technical procedure, "Geologic Mapping." Revisions to preliminary tables defining surficial map units for both regional and detailed mapping were made on the basis of field observations. Correlations of DVRFS map units to published and unpublished surficial map units within and adjacent to the model area have been expanded. Field mapping from the Daylight Pass quadrangle (in the Funeral Mountains bordering the northwestern corner of the Amargosa Desert) was compiled and submitted for digitization. That mapping of bedrock stratigraphy and structure will help constrain subsurface interpretations in the Amargosa Desert. Evaluation and correlation of subsurface data from boreholes in the Amargosa Desert continued, with particular emphasis on the 300+ wells in the Amargosa Farms area. Borehole data, on a continuing

basis, were entered into an ACCESS data base. Ready retrieval will be available for construction of subsurface correlations. Borehole data also were coordinated with geologic information for integration into cross sections.

Work continued on compilation of the progress report on improvement of regional recharge estimates. Efforts also continued on updating of the hydrologic framework model. Compilation and synthesis of hydrologic data continued. In work on the geologic framework model, compilation of the AP-3.10Q package for the Site framework model and potentiometric data began, and related data packages were submitted. Transmittal of a preliminary version of the framework model to Sandia for scoping runs was completed. That version required a new framework not truncated with the water table and with each surface separately submitted without null data.

CLIMATE and PALEOHYDROLOGY

Work on paleoclimate, fracture-mineral dating and isotopic analysis of material from the ESF and alcoves continued during June. Editorial comments on the report titled *Ages and origins of calcite and opal in the Exploratory Studies Facility tunnel, Yucca Mountain, Nevada* were completed by the Publication Specialist, and the report was returned to the author. In efforts toward determination of water flux through the repository block, additional samples of pore water were analyzed for $^{234}U/^{238}U$ from the Paintbrush nonwelded hydrogeologic unit (PTn) in Alcove #3 and from sites within the welded Topopah Spring Tuff. Uranium isotopic values for these additional samples of pore water remained consistently lower than those of fracture minerals, perched water, or water from the shallow SZ beneath Yucca Mountain. Therefore, matrix water likely is isolated from fracture water responsible for fracture minerals and may not constitute a substantial contribution of recharge to the SZ. In addition, preliminary calculations were begun to estimate the amounts of recoil ^{234}U that may become available to percolating water as it flows downward below the PTn within the fracture network. Modeling the effects of that process will continue in the future but will be done as part of other fracture-mineral activities. Work on paleoclimate continued. Nineteen samples of water from Nye County and northern Amargosa Valley wells collected in May were processed for Sr and U isotopic analysis. Chemical separates were run on the thermal ionization mass spectrometer, and the resulting data will be reduced in July. Isotopic data for approximately 13 water samples bailed or pumped from shallow parts of several wells collected between December and March were reduced. Strontium concentrations ranged between 0.02 and 0.6 ppm, $^{87}Sr/^{86}Sr$ between 0.7102 and 0.7129, U concentrations between 0.9 and 9 ppb, and $^{234}U/^{238}U$ activity ratios between 3.9 and 5.0. Available strontium results were compiled along with major- and trace-element chemical analyses.

Staff continued work on the Analysis and Model Report (AMR) for future climate analyses, following AP-3.10Q. Other work included preparation and presentation of a synopsis of climate studies to the USGS Director and participation in meetings regarding data qualification for the Site Description.

SPECIAL STUDIES

Preparation of the Yucca Mountain Site Description Revision 1 (YMSD Rev. 1) continued. Changes were made relating to addition of newly obtained information and to making references more precise. The Site Stratigraphy section (including geochemistry and mineralogy) and final outline for geologic topics are now complete. The update of Surficial Processes is nearly complete, with most references now including page numbers where appropriate. Descriptive mineralogy and geochemistry (from what was the geochemistry chapter of YMSD Rev. 0) have been incorporated. In UZ Hydrology, major sections on infiltration and matrix hydrologic properties were reconfigured for YMSD Rev. 1, and work began on the section describing the gaseous-phase flow system. Although the reconfigured Infiltration section describes data collection and development of the original infiltration model, description of future infiltration in response to climate change cannot be completed until the infiltration analysis and model report (AMR) is far enough along to be abstracted. That is because YMSD Rev. 1 is expected to contain a summary of the climate and infiltration scenarios being developed for the Site Recommendation (SR) and License Application (LA), whereas YMSD Rev. 0 contained a summary of the scenarios developed for the VA. In the Matrix Properties section, new information was added to YMSD Rev. 1 on the results of the ESF PTn lateral-diversion study, the ESF moisture study, determination of unsaturated hydraulic conductivity using a centrifuge, and results of analysis of samples from the Busted Butte tracer site.

A meeting in Las Vegas on June 24 was intended to determine the relation between YMSD Rev. 1 and the process model reports (PMRs) and associated AMRs. Although critical decisions regarding the content of YMSD Rev. 1 were not made at the meeting, central issues and choices to be made by the Project certainly were clarified. The central issue is that YMSD Rev. 1 cannot contain the updated information on process models (such as infiltration, UZ flow and transport, etc.) being documented in the PMRs and AMRs unless YMSD Rev. 1 is delayed by about six months. An alternative to delaying YMSD Rev.1 would be to reduce its scope to those topics not covered extensively in the PMRs and AMRs to support SR, and then produce a "full blown" YMSD Rev. 2 to support LA. The DOE representatives (R. Levich and R. Patterson) at the meeting agreed to take this major issue back to YMSCO management for resolution.

As Site Characterization Progress Report #20 moved through DOE Headquarters review, several questions regarding the status of USGS references were raised and resolved during the month. Updated citation information was provided for the Forester and others climate-synthesis report, the Rousseau and others North Ramp UZ hydrogeology report, and the most recent Yang and others UZ hydrochemistry report. In addition, input was provided relative to the summary of the VA future-climate and infiltration scenarios that was included in the description of the Busted Butte field tracer test.

WATER-RESOURCES MONITORING

Monitoring of the tipping bucket rain-gauge network continued. All data were downloaded from the 17 bucket gauges during the first week of June. All stations were in good operating condition. Data are being reviewed and assembled into electronic data records. Data collected through July 31 will be included in submittals to the RPC/TDB.

USGS Level 3 Milestone Report

October 1, 1998 - June 30, 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	7/30/99		
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	7/29/99		
Geology of ECRB X-Drift Milestone Number: SPG42GM3	3/31/99	8/16/99		
Letter Report: 2nd Qtr FY99 Milestone Number: SSH14JM3	4/30/99	4/29/99	4/29/99	

USGS Level 4 Milestone Report

October 1, 1998 - June 30, 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	7/30/99		
ESF Monitoring Data Pkg to RPC/TDB Milestone Number: SPH336M4	2/19/99	7/30/99		
Alcove 1 Infil Expmt DP to RPC/TDB Milestone Number: SPH36M4	2/19/99	7/30/99		
Interp Rpt: Synthesis Frac Min Dating/Cl-36 Milestone Number: SPH28M4	2/26/99	7/2/99		
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		
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	7/30/99		
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	7/30/99		
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	
Core 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	7/30/99		
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	7/30/99		
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	
X-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	7/15/99		
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	7/30/99		
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	

USGS Level 4 Milestone Report

October 1, 1998 – June 30, 1999
Sorted by Baseline Date

Deliverable	Due Date	Expected Date	Completed Date	Comment
FY99 milestone (from FY98/outyears schedule) delivered in October				
Water-Level Altitude Data from the Periodic Network 10/1/97 through 6/30/98 Milestone SPH37KM4	10/30/98	10/30/98	10/9/98	Not in FY99 planning
Late FY98 milestones delivered in October				
Memo to TPO: Analy Cond for Input to Site Scale Mdl Milestone SPH253M4	9/30/98	9/30/98	10/2/98	
Memo to TPO: Analy Boundary Conds Oct-Jul 98 Milestone SPH225M4	9/30/98	9/30/98	10/2/98	
Memo to TPO: Chem/Iso Analy on Wtr Samples WT-17 Milestone SPC34CM4	9/15/97	9/30/98	10/8/98	

YMP PLANNING AND CONTROL SYSTEM (PACS)

MONTHLY COST/FTE REPORT

Participant U.S. Geological Surve
Date Prepared 7/14/99 07:54 AM

Fiscal Month/Year June 30, 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	46	1214	153	0	21	0	669	0	422
1.2.3	937	13699	4891	0	1073	0	11261	0	6748
1.2.4	1	-60	70	0	7	0	158	0	56
1.2.5	58	304	868	0	160	0	639	0	406
1.2.8	44	789	0	0	35	0	665	0	388
1.2.9	49	774	142	0	38	0	600	0	440
1.2.12	4	224	0	0	0	0	100	0	53
1.2.15	169	1565	1579	0	76	0	1831	0	1276
	1308	18509	7703	0	1410	0	15923	0	9789

YMP PLANNING AND CONTROL SYSTEM (PACS)

MONTHLY COST/FTE REPORT

Participant U.S. Geological Survey
Date Prepared 7/14/99 07:54 AM

Fiscal Month/Year June 30, 1999

	CURRENT MONTH END						FISCAL YEAR		
SPAM	ACTUAL COSTS	PARTICIPANT HOURS	SUBCONTRACT HOURS	PURCHASE COMMITMENTS	SUBCONTRACT COMMITMENTS	ACCRUED COSTS	APPROVED BUDGET	APPROVED FUNDS	CUMMULATIVE COSTS
AMJX	46	448	868	0	160	0	639	0	393
AMMQ	-1	-60	0	0	7	0	123	0	53
AMNE	72	1656	225	0	74	0	1183	0	775
AMNT	3	0	70	0	0	0	35	0	3
AMNW	717	10713	2552	0	448	0	7952	0	4827
AMPP	222	3034	2267	0	606	0	3360	0	1898
AMPW	218	2339	1721	0	115	0	2431	0	1716
AMRF	15	379	0	0	0	0	200	0	124
	1292	18509	7703	0	1410	0	15923	0	9789

U.S. GEOLOGICAL SURVEY
ESTIMATED COSTS FOR October 1, 1998 June 30, 1999
7/8/99 9:36:38 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
0G1CHB1	Conduct Engineering Assurance Activitie	38.0	36.6	38.7	35.1	40.4	44.4	38.6	40.8	39.1	0.0	0.0	0.0	351.74
81912019U1	Engineering Assurance FY99	38.0	36.6	38.7	35.1	40.4	44.4	38.6	40.8	39.1	0.0	0.0	0.0	351.74
0G1CHB2	Personnel Qualifications - Deferred	3.0	3.9	4.3	3.5	3.9	2.2	0.3	-0.7	3.2	0.0	0.0	0.0	23.70
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	0.0	0.0	0.0	46.72
81912019UX	Support Line Organization, Docume	5.9	6.9	6.0	6.5	11.7	11.9	8.9	5.6	6.9	0.0	0.0	0.0	70.[illegible]
81912019		43.9	43.6	44.7	41.6	52.2	56.3	47.5	46.4	46.0	0.0	0.0	0.0	422.16
1.2.1		43.9	43.6	44.7	41.6	52.2	56.3	47.5	46.4	46.0	0.0	0.0	0.0	422.16
0G33124HBB	Conduct Air-K & Hydrochemistry Testing	62.0	11.7	23.1	11.6	4.0	11.9	2.5	0.0	2.1	0.0	0.0	0.0	128.94
0G33124HBF	Characterize Seepage into Alcoves I	14.1	18.6	18.7	8.8	13.8	0.8	2.7	0.0	2.3	0.0	0.0	0.0	79.85
0G33124HBG	Characterize Seepage into Alcoves II	1.7	4.1	7.7	21.1	23.7	12.6	0.0	40.6	0.0	0.0	0.0	0.0	111.57
0G33127HB2	Conduct Isotopic & Hydrochemical Analy	16.2	20.8	26.3	6.4	9.3	11.6	12.3	12.4	3.5	0.0	0.0	0.0	118.71
0G36221HB1	Conduct Fluid Inclusion Studies	4.4	20.9	12.0	10.0	11.7	8.3	14.6	-7.6	9.9	0.0	0.0	0.0	84.17
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	0.0	0.0	0.0	145.13
81912025U1	Moisture Monitoring & Fault Fractur	130.7	97.4	104.0	77.8	85.5	60.3	41.1	46.4	25.4	0.0	0.0	0.0	668.35
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	0.0	0.0	0.0	672.34
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	0.0	0.0	0.0	154.73
0G33132HB1	Cond Isotopic & Hydrochemical Studies	8.6	29.9	26.8	3.4	16.4	25.5	14.8	30.9	38.7	0.0	0.0	0.0	195.03
0G36221HB8	Paleodischarge at Nye County Sites	0.0	0.0	0.0	0.0	0.0	0.0	2.8	8.0	0.0	0.0	0.0	0.0	10.[illegible]
0G3XXXXHB1	Oversee Nye County Drilling Program	8.3	-5.2	4.8	1.9	11.8	7.2	19.0	11.0	-1.3	0.0	0.0	0.0	57.74
0G3XXXXHB3	Provide SMF Well-Site Support	0.0	3.9	30.9	36.5	27.0	22.9	6.5	-1.4	3.4	0.0	0.0	0.0	129.68
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	0.0	0.0	0.0	548.03
81912029		56.8	62.9	120.5	40.3	70.5	56.5	46.2	49.9	44.4	0.0	0.0	0.0	548.03
0G33133HB7	Comp. Geo. Interpretations - Geologic M	7.4	16.0	12.3	9.9	12.7	12.8	11.9	5.0	10.3	0.0	0.0	0.0	98.32
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	0.0	0.0	0.0	36.29
0G33133HB3	Refine Geologic Framework Model	0.0	0.4	8.4	3.1	3.5	6.7	7.3	9.8	18.9	0.0	0.0	0.0	58.20
0G33133HBB	Develop Regional SZ Model	0.0	6.3	15.6	23.0	39.9	25.1	32.2	18.2	21.6	0.0	0.0	0.0	181.88
0G33133HBD	Comp. Geo. Interpretations - Hydrostruc	2.4	13.6	-0.7	6.2	4.2	5.2	9.9	4.5	11.9	0.0	0.0	0.0	57.31
0G33133HBE	Comp. Geo. Interpretations - Cross Sect	2.1	6.5	17.5	9.7	13.7	13.8	16.8	11.7	20.1	0.0	0.0	0.0	111.87

U.S. GEOLOGICAL SURVEY
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		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
0G33133HBF	Comp. Geo. Interpretations - Amargosa	2.5	10.7	7.2	8.9	10.1	10.4	7.5	15.4	9.2	0.0	0.0	0.0	82.06
0G33133HBG	Hydrogeologic Framework Model	8.1	2.5	-6.0	0.9	9.6	6.6	3.5	9.1	9.7	0.0	0.0	0.0	44.00
0G33133HBH	Reduce Uncertainty - Recharge Work	0.0	0.0	2.2	0.8	1.9	3.0	3.7	3.0	2.8	0.0	0.0	0.0	17.48
0G33133HBI	Reduce Uncertainty - Hydrochemical Flo	0.0	0.0	3.5	6.0	12.3	6.5	10.4	2.0	5.6	0.0	0.0	0.0	46.41
0G33133HBJ	Ground Water Flow Modeling	0.4	12.7	20.7	9.0	6.4	15.2	6.7	9.5	17.4	0.0	0.0	0.0	98(
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	0.0	0.0	0.0	831.67
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	0.0	0.0	0.0	0.00
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	0.0	0.0	0.0	86.45
81912031UX	SZ Modeling & Hydrochem Studies (	0.0	0.0	86.1	-78.1	16.4	13.3	18.7	21.3	8.6	0.0	0.0	0.0	86.46
81912031		22.9	71.8	172.6	1.5	139.5	127.4	143.3	102.8	136.5	0.0	0.0	0.0	918.35
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	0.0	0.0	0.0	54.82
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	0.0	0.0	0.0	367.91
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	0.0	0.0	0.0	422.73
0G33124HB8	Eval Percolation Flux Across Repository	3.6	12.6	16.8	21.9	24.9	-2.9	11.7	20.2	37.0	0.0	0.0	0.0	145.82
0G33124HBD	Conduct Moisture Monitoring in the ESF	17.1	27.8	20.5	21.6	13.9	20.2	0.1	-111.9	-7.3	0.0	0.0	0.0	1.99
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	0.0	0.0	0.0	74.82
81912050U3	Moisture Monitoring & Infiltration St	41.9	26.3	42.3	46.2	38.2	21.2	20.8	-59.9	45.7	0.0	0.0	0.0	222.63
0G32212FB5	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
81912050UX	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	73.9	-17.9	72.0	0.0	0.0	0.0	775.(
0G32211HB3	Complete Stratigraphic Descriptions UZ-	0.6	8.3	11.8	4.0	7.8	4.1	1.5	2.2	1.0	0.0	0.0	0.0	41.29
0G32211HB5	Correlate Lithostratigraphy & Geophysic	0.0	0.0	0.2	0.8	0.0	0.0	0.2	31.7	14.4	0.0	0.0	0.0	47.28
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	0.0	0.0	0.0	22.40
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	0.0	0.0	0.0	39.87
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	0.0	0.0	0.0	128.06
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	0.0	0.0	0.0	97.00

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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	0.0	0.0	0.0	15.14
81912210U1	Geologic Studies FY99	53.1	32.8	22.8	39.4	40.1	31.6	46.2	57.4	67.6	0.0	0.0	0.0	391.04
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	0.0	0.0	0.0	414
0G33123HB2	Hydraulic properties - Busted Butte Core	0.0	4.6	-0.7	0.8	1.2	21.6	28.6	49.1	28.7	0.0	0.0	0.0	133.88
0G33124HBF	Characterize Seepage into Alcoves I	0.0	13.7	13.0	0.5	-10.3	1.4	7.5	3.1	15.4	0.0	0.0	0.0	44.31
0G33124HBG	Characterize Seepage into Alcoves II	0.0	4.3	0.0	0.0	2.3	8.3	52.3	-5.7	13.0	0.0	0.0	0.0	74.52
0G33127HB2	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	0.0	0.0	0.0	30.33
0G33127HB4	Chlorine 36 Validation Studies	0.0	0.0	0.0	0.0	9.5	8.8	12.5	6.9	19.7	0.0	0.0	0.0	57.45
0G36221HB1	Continue Fluid Inclusion Studies	0.0	0.0	0.0	0.0	0.0	0.0	20.8	33.1	29.1	0.0	0.0	0.0	83.01
0G36221HB1	Continue 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
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	0.0	0.0	0.0	0.00
81912215U1	Moisture Monitoring & Fault Fractur	0.0	22.6	12.4	1.3	4.0	40.1	131.0	90.8	121.3	0.0	0.0	0.0	423.48
0G36221HB7	Paleodischarge/Paleoclimate - Deferred	0.0	0.0	15.2	8.4	0.1	7.3	4.7	4.3	-1.7	0.0	0.0	0.0	38.30
81912215UX	Paleodischarge/Paleoclimate (Deferr	0.0	0.0	15.2	8.4	0.1	7.3	4.7	4.3	-1.7	0.0	0.0	0.0	38.30
81912215		0.0	22.6	27.6	9.7	4.1	47.5	135.7	95.0	119.6	0.0	0.0	0.0	461.78
0G33131HB3	C-Well Demobilization	0.0	0.0	0.0	0.0	0.0	0.7	1.8	4.9	12.7	0.0	0.0	0.0	20.22
0G33132HB1	Cond Isotopic & Hydrochemical Studies	0.0	0.0	0.0	0.0	0.7	0.4	3.6	-2.6	7.3	0.0	0.0	0.0	9.32
0G36221HB9	Paleodischarge at Nye County Sites	0.0	0.0	0.0	0.0	2.8	0.0	0.0	7.3	6.9	0.0	0.0	0.0	17.0
0G3XXXXHB2	Oversee Nye County Drilling Program	0.0	0.0	0.0	0.0	0.0	0.9	8.4	8.7	4.9	0.0	0.0	0.0	22.
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	0.0	0.0	0.0	69.54
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	0.0	0.0	0.0	68.06
0G33131HBG	SZ Hydrologic Testing	9.0	7.2	2.8	4.9	9.2	6.1	13.0	22.7	44.7	0.0	0.0	0.0	119.57
81912245UX	SZ Testing & UZ Hydrochemistry (De	9.0	11.2	10.6	17.0	17.3	15.5	20.0	33.3	53.7	0.0	0.0	0.0	187.64
81912245		9.0	11.2	10.6	17.0	20.9	17.6	33.8	51.7	85.5	0.0	0.0	0.0	257.18
0G39BHB9	Support Preparation of the WDLA	26.3	23.1	54.1	24.5	40.0	45.1	40.7	33.4	46.5	0.0	0.0	0.0	333.63
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	0.0	0.0	0.0	333.63
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	0.0	0.0	0.0	64.82
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

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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	0.0	0.0	0.0	33.56
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
81916105U2	Review of Literature and Special Stu	19.7	1.6	28.6	14.4	4.8	7.8	11.8	3.2	19.0	0.0	0.0	0.0	110.86
0G32836HB2	Tectonic Closeout Activities	0.0	1.5	0.9	1.8	7.7	5.0	43.2	21.3	8.7	0.0	0.0	0.0	90[illegible]
0G33121HB1	Coupled Infiltration Surface Water Flow	0.0	1.8	4.7	4.4	15.7	28.9	13.9	44.2	16.4	0.0	0.0	0.0	129.92
0G33123HB1	Surface Based Testing Closeout Activitie	0.0	9.1	46.7	44.5	34.2	31.1	27.6	41.1	27.4	0.0	0.0	0.0	261.69
0G36221HB6	Climate Closeout Activities	0.0	12.1	49.1	19.4	21.6	53.2	8.7	19.9	43.5	0.0	0.0	0.0	227.56
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	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	0.01
0G39BHA1	Support Topical Rpts; NWTRB, ACNW,	5.8	-5.1	0.5	1.9	3.2	18.2	8.1	3.5	-0.4	0.0	0.0	0.0	35.77
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	0.0	0.0	0.0	133.16
0G39HB2	Support Hydrologic Modeling Team Clos	0.0	0.0	0.0	0.0	4.4	20.5	11.1	10.9	18.9	0.0	0.0	0.0	65.72
81916105U3	Technical Interactions and Special P	10.7	22.3	103.7	77.5	92.7	198.7	133.3	178.5	147.7	0.0	0.0	0.0	965.11
81916105		56.7	47.0	186.4	116.4	137.5	251.6	185.8	215.0	213.2	0.0	0.0	0.0	1,409.60
0G33127HB1	Conduct Chem. & Isotopic Analyses Drift	9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	0.0	0.0	0.0	80.17
81916107U1	Isotope Support for Thermal Testing	9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	0.0	0.0	0.0	80.17
81916107		9.3	17.9	5.4	16.0	10.4	4.6	2.4	5.2	9.1	0.0	0.0	0.0	80.17
0G33131HB1	Conduct Water-Level Monitoring	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	0.0	0.0	0.0	123.[illegible]
81917027U1	Long-Term PC Monitoring FY99	7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	0.0	0.0	0.0	123.[illegible]
81917027		7.3	8.3	9.3	19.9	11.8	16.5	25.4	9.8	15.2	0.0	0.0	0.0	123.57
		0.0	3.4	2.5	2.4	4.3	1.0	4.6	2.2	0.5	0.0	0.0	0.0	20.72
	Unfunded Work	91.7	97.0	-23.4	-11.6	-1.7	-50.5	-86.4	0.4	5.6	0.0	0.0	0.0	21.09
0G31HB1	Support Scientific Programs Mgmt & Int	9.8	24.6	16.0	21.8	17.2	22.3	22.4	19.1	18.4	0.0	0.0	0.0	171.72
0G31HB2	Manage Nevada Operations/Earth Scien	40.4	57.7	45.8	37.6	29.2	39.8	48.2	25.6	13.7	0.0	0.0	0.0	338.04
81919090U1	USGS SP&I FY99	141.9	182.7	40.9	50.2	49.1	12.5	-11.3	47.3	38.2	0.0	0.0	0.0	551.56
0G39BHA1C	Provide Site Investigations Technical Su	27.1	38.5	34.1	55.6	40.0	46.3	65.6	102.5	87.2	0.0	0.0	0.0	496.99
0G39BHA1D	Provide Quality Checks for Documents	0.0	0.0	0.0	1.3	8.0	8.0	3.1	11.7	6.6	0.0	0.0	0.0	38.69
81919090U3	USGS Site Investigations Technical	27.1	38.5	34.1	56.9	48.1	54.2	68.6	114.3	93.8	0.0	0.0	0.0	535.68

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0G39BHA1F 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
81919090U4 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
81919090	169.0	221.2	75.0	107.2	97.1	66.8	57.4	161.6	132.0	0.0	0.0	0.0	1,087.25
1.2.3	640.4	704.9	854.2	569.1	727.4	759.5	791.2	780.8	920.4	0.0	0.0	0.0	6,747.[illegible]
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	0.0	0.0	52.94
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	0.0	0.0	52.94
81912382	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	-1.4	0.0	0.0	0.0	52.94
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	0.0	0.0	0.0	2.61
81912383U1 EBS Testing for LADS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.61
81912383	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	2.61
1.2.4	0.0	0.0	5.9	2.0	6.9	5.9	7.1	26.5	1.2	0.0	0.0	0.0	55.55
0G54XX Provide Support to Performance Assess	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	0.0	0.0	0.0	65.65
81912220U1 USGS Support to Performance Asse	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	0.0	0.0	0.0	65.65
81912220	0.9	6.1	5.4	11.8	5.1	6.6	8.1	5.7	15.9	0.0	0.0	0.0	65.65
0G535HB1 Provide Technical Data Coordination	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	0.0	0.0	0.0	339.85
81912470U1 Technical Data Management FY99	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	0.0	0.0	0.0	339.85
81912470	38.8	31.1	43.1	25.4	35.6	41.7	40.4	42.0	41.9	0.0	0.0	0.0	339.85
1.2.5	39.7	37.2	48.5	37.2	40.6	48.3	48.4	47.7	57.8	0.0	0.0	0.0	405.50
0G825HB1 Implement Federal Safety & Occupation	6.8	7.6	7.9	7.9	6.7	8.8	7.8	8.7	9.0	0.0	0.0	0.0	71.21
81919121U1 Federal Occupational Safety & Healt	6.8	7.6	7.9	7.9	6.7	8.8	7.8	8.7	9.0	0.0	0.0	0.0	71.21
0G847HB1 Conduct Water Resources Studies	15.8	34.0	25.0	23.2	27.4	31.9	53.7	39.8	19.0	0.0	0.0	0.0	269.84
81919121U2 Water Resources FY99	15.8	34.0	25.0	23.2	27.4	31.9	53.7	39.8	19.0	0.0	0.0	0.0	269.84
0G847HB2 Water Appropriation Hearings	0.0	0.7	0.6	0.0	0.0	0.0	7.3	7.8	15.8	0.0	0.0	0.0	32.27
81919121U3 Water Appropriation Hearings	0.0	0.7	0.6	0.0	0.0	0.0	7.3	7.8	15.8	0.0	0.0	0.0	32.27
0G84XHB3 Tipping Bucket Rain Gage Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.9	0.0	0.0	0.0	0.0	14.90
81919121U4 Precipitation Gage Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	9.0	5.9	0.0	0.0	0.0	0.0	14.90
81919121	22.6	42.3	33.5	31.1	34.1	40.7	77.8	62.2	43.8	0.0	0.0	0.0	388.21

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	1.2.8	22.6	42.3	33.5	31.1	34.1	40.7	77.8	62.2	43.8	0.0	0.0	0.0	388.21
0G912HB1	Provide TPO Office Support	14.3	26.9	25.2	27.2	23.6	31.0	38.8	32.3	33.6	0.0	0.0	0.0	253.04
81919135U1	USGS Project Management FY99	14.3	26.9	25.2	27.2	23.6	31.0	38.8	32.3	33.6	0.0	0.0	0.0	253.04
0G922HB1	Conduct Project Control Activities	27.7	22.4	19.7	20.6	18.2	22.0	21.2	19.3	15.8	0.0	0.0	0.0	186.9
81919135U2	USGS Project Control FY99	27.7	22.4	19.7	20.6	18.2	22.0	21.2	19.3	15.8	0.0	0.0	0.0	186.9
81919135		42.0	49.3	44.9	47.8	41.8	53.1	60.0	51.7	49.4	0.0	0.0	0.0	439.97
	1.2.9	42.0	49.3	44.9	47.8	41.8	53.1	60.0	51.7	49.4	0.0	0.0	0.0	439.97
0GC522HB1	Conduct Satellite Records Operations	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	0.0	0.0	0.0	52.98
81919197U1	USGS Satellite Records Operations	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	0.0	0.0	0.0	52.98
81919197		10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	0.0	0.0	0.0	52.98
	1.2.12	10.3	8.8	10.2	4.1	3.6	4.1	4.0	3.9	4.0	0.0	0.0	0.0	52.98
0GF23HB1	Provide Support/Personnel Services	18.8	22.6	23.1	26.2	22.7	22.0	21.8	17.5	-4.6	0.0	0.0	0.0	170.15
0GF23HB5	Provide Procurement & Property Manag	0.0	0.0	0.0	0.0	5.7	6.7	10.0	13.8	37.0	0.0	0.0	0.0	73.20
0GF23HB6	Provide Computer Support	13.6	25.2	16.1	18.3	39.8	33.0	33.8	28.1	49.6	0.0	0.0	0.0	257.65
81919110U1	Personnel, Procurement, Property S	32.4	47.8	39.2	44.5	68.2	61.8	65.6	59.4	82.0	0.0	0.0	0.0	501.01
0GF23HB2	Provide Facilities Management (space)	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	65.3	0.0	0.0	0.0	588.00
0GF23HB3	Provide Facilities Management (comput	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	0.0	0.0	0.0	123.00
0GF23HB4	Provide Facilities Management (other)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.0	0.0	0.0	22.50
81919110U2	Facilities Management (USGS)	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	0.0	0.0	0.0	733.5
0GF3HB1	Provide USGS Training Support	6.1	1.7	4.1	4.8	3.7	6.8	4.6	4.5	5.2	0.0	0.0	0.0	41.50
81919111U1	USGS Training Support	6.1	1.7	4.1	4.8	3.7	6.8	4.6	4.5	5.2	0.0	0.0	0.0	41.50
81919110		120.0	131.0	124.8	130.8	153.4	150.1	151.7	145.4	168.7	0.0	0.0	0.0	1,276.01
	1.2.15	120.0	131.0	124.8	130.8	153.4	150.1	151.7	145.4	168.7	0.0	0.0	0.0	1,276.01

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1.2 OPERATING	919.0	1,017.0	1,166.8	863.7	1,060.1	1,118.0	1,187.8	1,164.6	1,291.2	0.0	0.0	0.0	9,788.18
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	1,187.8	1,164.6	1,291.2	0.0	0.0	0.0	9,788.18
FTEs													
FEDERAL	86.0	96.4	99.5	88.5	78.9	92.4	110.1	107.2	107.0	0.0	0.0	0.0	
CONTRACT	29.2	27.4	32.8	26.9	27.5	33.2	36.4	34.7	49.4	0.0	0.0	0.0	
TOTAL	115.2	123.7	132.4	115.4	106.4	125.6	146.4	141.9	156.4	0.0	0.0	0.0	