See folder for memo to Browning from Prestholt 6-29-84

NNWSI PROJECT

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS PROJECT

MONTHLY REPORT

APRIL 1984

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UNITED STATES DEPARTMENT OF ENERGY

NEVADA OPERATIONS OFFICE

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SUMMARY

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS PROJECT

APRIL, 1984

KEY ACTIVITIES

WBS 2.1, Systems

A Code Verification (COVE) workshop was held on April 4-5, marking the conclusion of the first-phase benchmarking activity between flow and transport codes. The preliminary conclusions were that good comparisons were obtained of hydraulic heads and moisture contents; radionuclide transport may be described by diffusion equations alone; at higher convective fluxes, predicted concentrations may be sensitive to the numerical technique used to calculate velocities; and, accuracy of results for geologic modeling cannot be established absolutely.

A study entitled, "The Effect of Water Infiltration Rate on Spent Fuel Dissolution in a Repository in Tuff," was completed; and, the report, "Effective Stress Principle for Partially Saturated Media," was published.

WBS 2.2, Waste Package

Preliminary waste package conceptual designs have been completed for five-year-old spent fuel. These designs are needed to support a license application by documenting conformance with NRC requirements.

As part of thermal monitoring of the waste package design, temperature profiles were calculated for a problem consisting of a heat source in a volume of tuff. Four different three-dimensional heat transfer computer codes were used to calculate the results to obtain cross-verification of the codes. All four codes calculated the same results.

WBS 2.3, Site

The USGS open-file report, "Interpretations of Magnetic Anomalies at a Potential Repository Site Located in the Yucca Mountain Area, Nevada Test Site," was submitted to the printer.

Field sampling was completed at the middle Nye County and Lathrop Wells volcanic centers. The sampling confirmed the presence of hydrovolcanic deposits at both centers. Electron microprobe and X-ray diffraction analyses of ash samples from Yucca Mountain trenches are also complete. The report on the impact of hydrovolcanic studies on the volcanism program was completed, which fulfilled an April milestone.

WBS 2.4, Repository

Designs of the bridge over Fortymile Canyon and the rail switchyard layout were started by Bechtel National, Inc., which is the surface facility Architect-Engineer. Conceptual designs were begun for the buildings and surface facility layouts, and a Quality Assurance Program Plan was issued.

An assessment of the potential for natural radon contamination of the Yucca Mountain repository was confirmed by airborne radioactivity measurements at G-Tunnel. The assessment suggests that, despite a low radon emission rate, radon buildup can be expected in underground spaces. Therefore, designs and operating procedures will be developed with this in mind.

WBS 2.5, Regulatory/Institutional

The first meeting of the Performance Assessment National Review Group (PANRG) was held in April. The PANRG is comprised of nationally recognized experts in the fields of radionuclide transport, chemistry, hydrology, health physics, and related fields. The PANRG is to recommend specific actions that should be undertaken to assure the adequacy of technical approaches for demonstrating compliance with 10CFR60, 10CFR960, and 40CFR191.

A series of meetings were held with planning representatives of Clark County, Nye County, Henderson, and North Las Vegas to establish available and planned community services.

DOE/HQ and Weston comments on the NNWSI Project February 29, 1984, draft Environmental Assessment were received. Comments were categorized into those that could be addressed readily within the existing schedule to produce a June 1, 1984, draft and those that required further evaluation with regard to schedule impacts.

WBS 2.6, Exploratory Shaft

Internal review of the NNWSI Project Exploratory Shaft Test Plan was completed and comments were incorporated. The review focused on the technical feasibility of proposed tests, the rationale for the tests, and the integration of tests.

WBS 2.7, Test Facilities

Preparation began for the shut-down of the Spent Fuel Test-Climax (SFT-C) facility. All post-test in situ calibrations were completed and all instruments requiring laboratory calibration were removed and shipped to the appropriate calibration facility. A proposed plan for decommissioning the SFT-C facility was developed. Items that have either a known or a likely future use will be dismantled and removed; all other items will be mothballed in place.

Ten tours for over 200 visitors were conducted of both the SFT-C and E-MAD facilities during April.

At E-MAD, parameter search welds using the Plasma Arc welder on stainless steel were completed. The samples are being evaluated to determine capabilities for performing final closure weldments on materials for which the present E-MAD welding systems are not qualified.

WBS 2.9, Program Management

A program-wide Quality Assurance Coordination Group meeting was held in April to discuss the following issues: DOE/HQ QA guidance, NRC progress with regard to the endorsement of NQA-1 by Regulatory Guide 1.28, DOE/HQ participation in QA audits, graded QA, and the status of project QA plans.

A list of Level 1 milestones, completion schedules, and acceptance criteria was distributed to NNWSI Project participants in April and will be presented to the Change Control Board for baselining in May.

The schedule and agenda have been set for a Public Information Meeting to be held May 29 in Beatty, Nevada. Technical Project Officers from USGS, LLNL, LANL, and SNL will make presentations, as will the NNWSI Project Manager.

FUNDING OVERVIEW

The month-end programmatic estimated costs were $35,221,000 as compared with a planned $35,570,000 through the month of April.

The following are the year-to-date plans, costs, and variances through April, 1984:

		Plan	Cost	Variance	
2.1	Systems	$ 2,046,000	$ 1,741,000	$305,000	
2.2	Waste Package	2,642,000	2,581,000	61,000	
2.3	Site	12,967,000	12,997,000	<30,000>	
2.4	Repository	5,962,000	5,867,000	95,000	
2.5	Regulatory & Institutional	1,540,000	1,688,000	<148,000>	
2.6	Exploratory Shaft	1,492,000	1,436,000	56,000	
2.7	Test Facilities	3,870,000	4,090,000	<220,000>	(1)
2.9	Program Management	4,366,000	4,091,000	275,000	
	NTS Allocation	535,000	560,000	<25,000>	
	State Grant	150,000	170,000	<20,000>	
	TOTAL	$35,570,000	$35,221,000	$349,000	

This report is based on a $67M FY 1984 authorization. Overall, the project remains within budget.

Note:

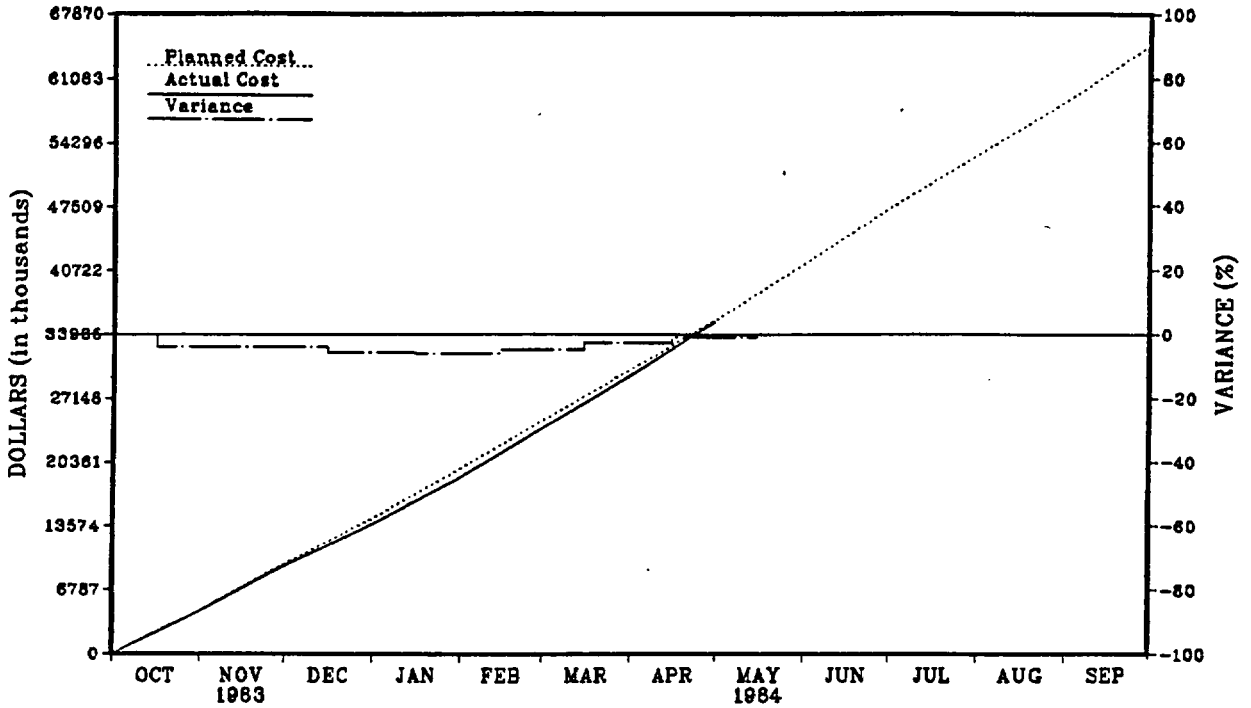
(1) Cost overrun is because of the cost carryover of $226,000 from the previous year.

MILESTONE CHANGES SINCE LAST REPORT

Milestone 447, Seal Development Plan for Repository to GRD for Review, has been delayed for thirty days because resources were diverted to EA production.

NNWSI Project

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	4559.	9581.	14393.	19713.	24850.	30297.	35570.	41467.	47325.	52977.	58686.	64639.
Cost (x1000)	4385.	9207.	13579.	18556.	23681.	29452.	35221.	0.	0.	0.	0.	0.
Variance (x1000)	174.	374.	814.	1157.	1169.	845.	349.	0.	0.	0.	0.	0.
% Variance	-4.	-4.	-6.	-6.	-5.	-3.	-1.	0.	0.	0.	0.	0.

NNWSI PLANNING & SCHEDULING
BUDGET BASELINE
APRIL 1984

CONTRACTORS	BEGINNING FUNDING	CHANGE	ENDING FUNDING
SNL	$17,800	-	$17,800
LLNL	8,298	-	8,298
LANL	9,090	-	9,090
USGS	7,777	-	7,777
SAI	5,861	-	5,861
REECO	9,498	-	9,498
H&N	470	-	470
F&S	1,168	-	1,168
WESTINGHOUSE	2,746	-	2,746
WSI	200	-	200
PAN AM	30	-	30
MISCELLANEOUS	579	-	579
NTS ALLOCATION	847	-	847
RESERVE	46	-	46
TOTAL (BA)	$64,410	-	$64,410
FORWARD FINANCING	(500)	-	(500)
CAPITAL EQUIPMENT	3,090	-	3,090
TOTAL (BA)	$67,000	-	$67,000

NNWSI PROJECT

PROJECT STATUS

2.1 SYSTEMS

OBJECTIVE

The objective of this task is to apply the concept of systems to the development and design of the repository, both the surface and subsurface facilities, and to the evaluation of the effectiveness of the geologic and hydrologic environment in isolating radionuclides.

ACTIVITIES

A draft of "Potential Impact of Mineral Dissolution and Precipitation on a Nuclear Waste Repository in Tuff," SAND84-0192, was completed. The report evaluates the potential for changes in hydrologic flow through the repository resulting from mineral dissolution and precipitation. Peer review of the report was started at the end of April.

A study entitled, "The Effect of Water Infiltration Rate on Spent Fuel Dissolution in a Repository in Tuff," SAND84-1007, was completed. The study evaluates the effects of various water infiltration rates on the dissolution rate of a spent fuel waste form.

The report, "Effective Stress Principle for Partially Saturated Media," SAND82-1977, was published. In the report, equations are derived that describe the coupling between rock deformation and fluid flow in multiphase, multiporous systems. The continuum theory of mixtures provides the framework for developing this theory for coupling fluid pressure and solid deformation in partially saturated media. This work supports the development and validation of the models used by Performance Assessment to describe the groundwater flow through the Topopah Spring unit to the water table.

An ongoing task during the last year has been a code verification (COVE) program in which NNWSI Project modelers have used various computer codes to solve a standard set of problems including some with representative data from Yucca Mountain. At the end of the COVE activity, the results will be compared

and conclusions will be drawn and documented relative to the strengths, limitations, and uses of the various computer codes that may be used for Performance Assessment. The first-phase results of the COVE exercise were presented and discussed in a two-day workshop April 4-5 in La Jolla. The workshop marked the conclusion of the first-phase benchmarking activity between the flow and transport codes SAGUARO, TRUST, TRUMP, TRACER3D, FEMTRAN, FEMWATER, and GWVIP. Some preliminary conclusions were drawn at the workshop that included the following:

- Good comparisons were obtained of hydraulic heads and moisture contents.

- Radionuclide transport may be described by diffusion equations alone.

- At higher convective fluxes, predicted concentrations may be sensitive to the numerical technique used to calculate velocities.

- Accuracy of results for geologic modeling cannot be established absolutely and must be estimated by examination of case-specific numerical stability studies.

PLANNED WORK

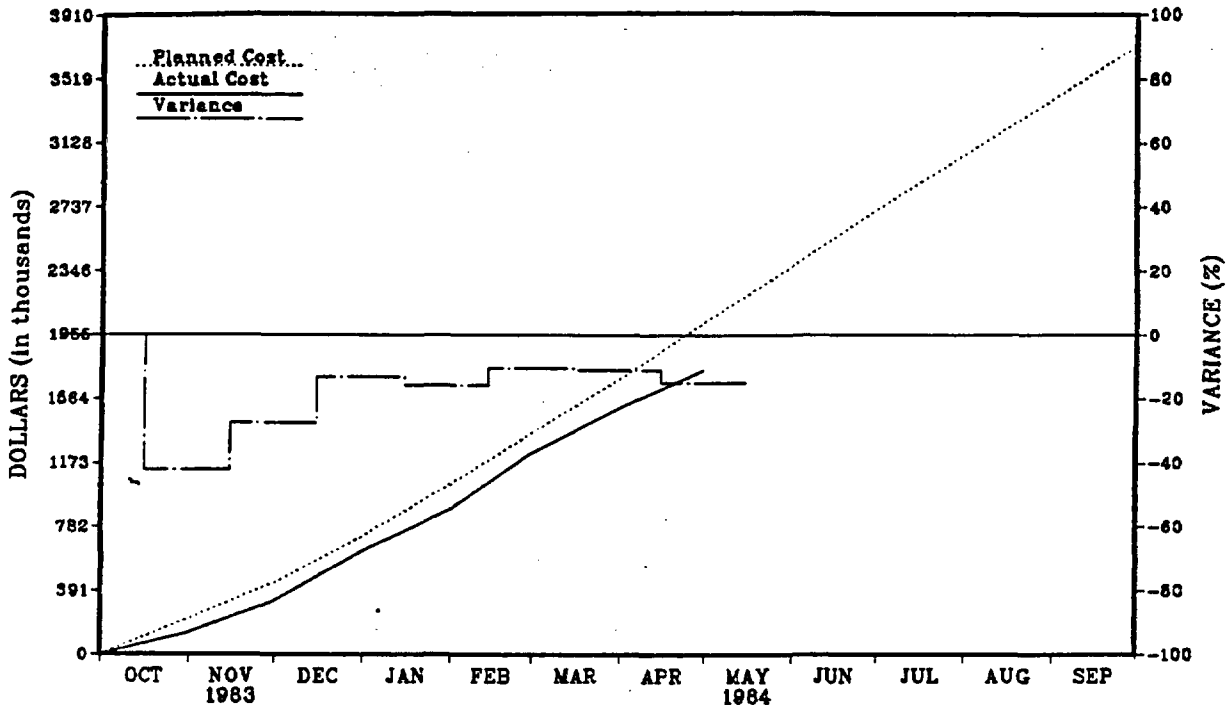
The second half of the study, "Preliminary Parametric Study of a Model of a Nuclear Waste Repository at Yucca Mountain, Nevada," is nearly complete. The first part of the study evaluated the relative contribution of engineered systems to meeting EPA radionuclide release limits in 40CFR191. The second half of the study addresses the effects of variations in the natural (site) system on meeting EPA release limits. The second part of the study will be ready for review by May 7.

PROBLEM AREAS AND ACTIONS TAKEN

None.

WBS 2.1, Systems

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	220.	442.	724.	1043.	1362.	1692.	2046.	2387.	2726.	3059.	3398.	3724.
Cost (x1000)	127.	320.	628.	877.	1219.	1504.	1741.	0.	0.	0.	0.	0.
Variance (x1000)	93.	122.	96.	166.	143.	188.	305.	0.	0.	0.	0.	0.
% Variance	-42.	-28.	-13.	-16.	-10.	-11.	-15.	0.	0.	0.	0.	0.

Variance Justification: The loss of a contract employee, whose replacement will not begin work unitl June, has reduced data base costs. In addition, there has been a reduction in costs due to EA efforts.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
SNL	2.1	PRELIMINARY PERFORMANCE ASSESSMENT FOR EA			△	◆								
SNL	2.1	PRELIMINARY SYSTEM DESCRIPTION DOCUMENT									△		◇	
SNL	2.1	USERS MANUAL FOR DATA BASE SYSTEM FOR PARTICIPANTS									△		◇	

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.2 WASTE PACKAGE

OBJECTIVE

The primary objective of this task is to develop a technical basis and engineering capability to design, test, and fabricate a waste package that is compatible with the hydrological conditions and geochemical environment in the unsaturated zone beneath Yucca Mountain.

ACTIVITIES

A summary was received from PNL of test conditions and results of the investigation to determine the stress corrosion susceptibility of candidate stainless steel specimens in gamma-irradiated environments. This investigation is being performed to aid in selection of the metals for the fabrication of waste canisters and of borehole liners; it is also being performed to aid in the characterization of the corrosion rates of these metals under repository conditions. The corrosion data will be used in performance assessment modeling and predicting long-term canister behavior that is needed for NRC repository licensing. The irradiation-corrosion tests are performed using duplicate U-bend specimens of 304 and 304L stainless steel, in both solution annealed condition and solution annealed and sensitized condition. The Type 304 stainless steel was incorporated into the test program to induce an early failure of the sensitized material. To date, no failures of Type 304L stainless steel have occurred; six sensitized Type 304 stainless steel samples have failed. Other than these six failures, the specimens appear to be in good condition and have no evidence either of pitting or of other non-uniform attack.

A report entitled, "Reference Waste Forms and Packing Materials for NNWSI," is in review. This report will be published as UCRL-53531.

Preliminary waste package conceptual designs have been completed for five-year-old spent fuel. These designs are necessary to support a license application by documenting conformance with NRC requirements for safe handling, transportation, emplacement, containment, and release rate. For boiling water reactor

(BWR) spent fuel, the canister contains either 12 pre-consolidated assemblies or 12 assemblies of repository consolidated pins in a space frame with six square receptacles. Six intact assemblies will also fit into the Type 304 stainless steel space frame. For pressurized water reactor (PWR) spent fuel, the same canister contains four assemblies of pre-consolidated pins or four assemblies of repository consolidated pins. The Type 304 stainless steel space frame consists of two square receptacles that could accommodate two intact assemblies. There are empty spaces inside the canisters that have resulted from attempting to fit square pegs into round holes. The spaces are filled with tuff to avoid potential criticality safety concerns from possible redistribution of fuel pins into these spaces over time. Stainless steel heat transfer pins run through the tuff to carry heat to the canister wall.

As part of thermal monitoring of the waste package design, temperature profiles were calculated for a problem consisting of a heat source in a volume of tuff using the LLNL three-dimensional heat transfer code, TACO3D. The results were compared to those calculated by the LLNL codes STALKS and TRUMP and the SNL code ARRAYF. All four codes calculated the same results. This exercise was a cross-verification of heat transfer codes in use by LLNL and SNL for a non-complex, three-dimensional model of a rock mass representing the vertical emplacement configuration.

Review and verification studies continued that are intended to determine the applicability of the previously developed code, WAPPA, to the performance analysis of waste packages in unsaturated tuff. This model is used to predict the long-term package performance for comparison with NRC performance objectives. A test problem has been defined to exercise the stress analysis module of the WAPPA mechanical submodel (FMODEL). This problem assumes an idealized, one-dimensional (axi-symmetric and plane strain) layered media for the waste package, and examines the stress and deformation of a 1 cm thick Type 304L stainless steel canister as a function of applied pressure. These calculations are in progress and the results will be compared with similar NIKE2D analyses. Work continued to define the requirements for a hydrologic submodel, which is compatible with the WAPPA code, to calculate unsaturated groundwater flow and radionuclide transport on the waste package scale.

High-frequency electromagnetic (HFEM) geotomography measurements were made in G-Tunnel after drainage of the fractured rock mass under gravity. This activity includes planning and implementation of an in situ test of the waste package environment. The results of this test will be used to aid in the validation of the models used in the waste package performance analysis. Subsequent sets of HFEM measurements were made both during and after injection of salt water to investigate the potential for increased resolution of the fracture system. This concluded the HFEM field measurement program; data reduction is now in progress. Two types of geotomographs are being prepared; absolute tomographs, which depict the condition of the rock between the boreholes at a given time, and relative tomographs. Conceptually, the relative tomographs subtract a baseline absolute image, which was obtained before water injection, from a subsequent absolute image. The resulting contrast should reveal changes induced by injected water in the fractured rock between the boreholes.

PLANNED WORK

To aid in characterization of the variability in the properties of Topopah Spring tuff (Tpt), a test has been started that will investigate the fracture healing process in Tpt that has been dehydrated due to a thermal pulse. A sample of Tpt containing a natural fracture was saturated with J-13 water and subjected to a confining pressure of 5.0 MPa. Electrodes were mounted on the sample surface and will be used to measure electrical resistance and capacitance of the sample.

Single-phase dissolution kinetics studies will begin using pure quartz crystal material. These studies will provide data for the geochemical modeling of experimental results obtained for tuff that consists predominately of quartz, cristobalite, and alkali feldspar with some phenocrysts of plagioclase. The rates of dissolution of these four minerals will be needed to complete the data base for the geochemical modeling code, EQ3/6.

Testing of simulated and fully active DHLW under saturated conditions using Tpt reaction vessels is being conducted at Savannah River Laboratory as part of a Defense Waste Processing Facility-NNWSI Project cooperative testing program to

investigate long-term radionuclide release rates from the waste package. Tests have been completed using simulated waste forms and glass made from Savannah River sludge. Results of solution analysis and glass surface alteration will be documented in a joint report. Reaction vessels used in the tests will be sent to LLNL where radionuclide distribution in the rock will be measured.

A preliminary test plan for studying the corrosion behavior of irradiated Zircaloy under repository-relevant conditions was reviewed. Initial tests will use bundles of defueled cladding segments that are partially wrapped in stainless steel to simulate canister material. The cladding bundle will be partially submerged in J-13 water and tuff. This will allow investigation of liquid and vapor phase corrosion in the same tests. These tests will be run at 90°C. Other tests will use deionized water and defueled Zircaloy at 170°C to investigate corrosion processes due to water-logged fuel inside an unbreached canister. Testing will start in the near future and will be conducted by the Westinghouse Hanford Company.

Evaluation and verification of WAPPA submodels will continue through this fiscal year. In FY 1985, these submodels will be incorporated into a waste package system model, which will have a flow/transport submodel and data bases for metal corrosion and waste form release rates, to predict the long term performance of the NNWSI Project waste package subsystem.

Reduction of HFEM data will continue, and interpretation of the resulting geotomographs will proceed. Boreholes will be cored between the holes used for the HFEM measurements to obtain field verification of the interpreted results. This field verification is a necessary part of assessing the suitability of this method for monitoring changes in saturation of fractured, welded tuff in the Waste Package Environment Tests in the Yucca Mountain Exploratory Shaft.

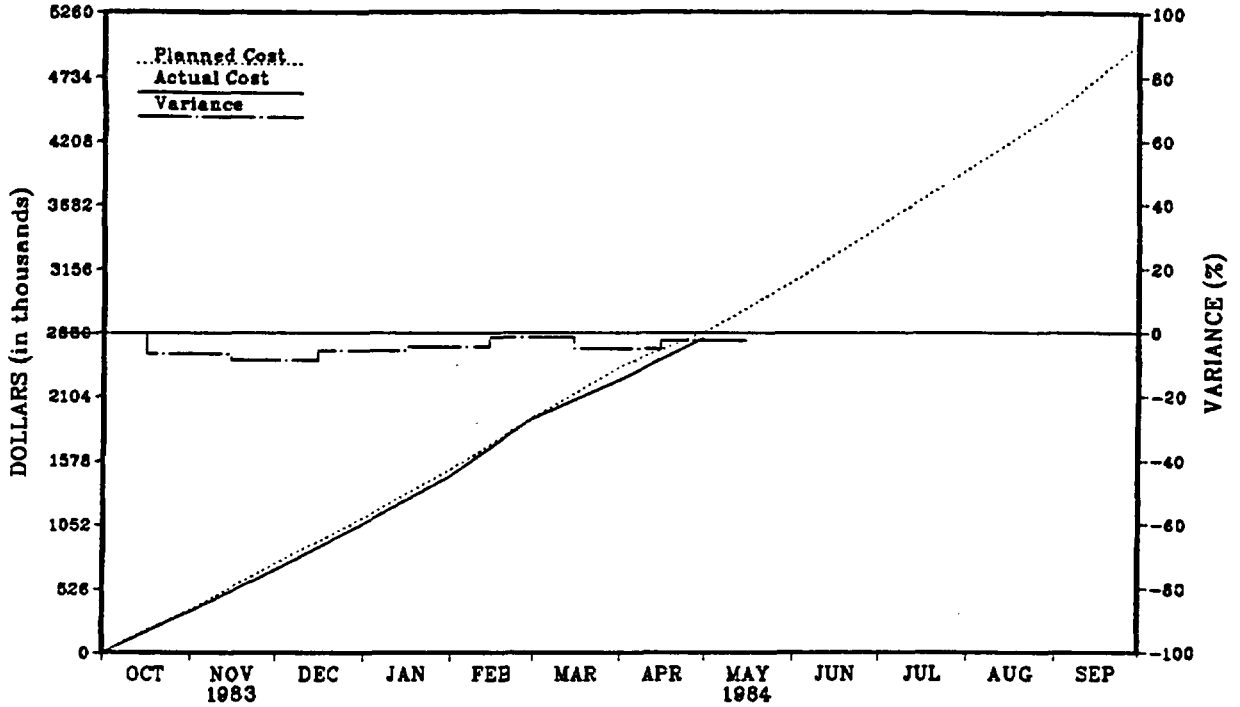
PROBLEM AREAS AND ACTIONS TAKEN

Receipt of glass testing materials from the Materials Characterization Council (MCC) has been consistently behind schedule. The actinide-doped glass which was requested for March 1 delivery was sent to LLNL in mid-April. The aged glass that was requested for June 1 will not be produced until August or

September. LLNL has been unable to get a firm delivery date from the MCC for production of that glass. Delay in receipt of materials from MCC, and uncertainties in delivery of the aged glass, has forced the delay of the start of several experiments. The impact on milestone dates will be assessed as soon as a delivery date is established for the aged glass.

WBS 2.2, Waste Package

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	352.	734.	1107.	1509.	1932.	2356.	2642.	3066.	3509.	3976.	4450.	5015.
Cost (x1000)	329.	671.	1045.	1442.	1903.	2237.	2581.	0.	0.	0.	0.	0.
Variance (x1000)	23.	63.	62.	67.	29.	119.	61.	0.	0.	0.	0.	0.
% Variance	-7.	-9.	-6.	-4.	-2.	-5.	-2.	0.	0.	0.	0.	0.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
LLNL	2.2	SUMMARY LOGIC NETWORK FOR WP DESIGN AND DEVELOPMENT				▲								
LLNL	2.2	ESTABLISH INTERIM PRODUCT SPECIFICATIONS										△	◇	
LLNL	2.2	PRE-CLOSURE ANALYSIS OF SELECTED CONCEPTUAL DESIGNS											△	◇

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.3 SITE

OBJECTIVE

The objective of this task is to determine whether or not Yucca Mountain is a suitable location for a repository for high-level waste. The effort is divided into two areas of study. The first is the development of the understanding of the characteristics of the rock mass that lies below the surface of Yucca Mountain. This encompasses the study of the geology (structure and stratigraphy), hydrology (both saturated and unsaturated zone), geochemistry (chemical reactions that can be expected when waste is emplaced), and mineralogy and petrology (the study of the materials that will control the isolation and engineering characteristics of the rock). The second is the development of an understanding of the processes and events that could occur in the environs surrounding Yucca Mountain that could serve as a potential disruptive force to impact a repository. These efforts include the study of the tectonics, seismicity, volcanism, regional hydrology, paleohydrology, and paleoclimatology.

ACTIVITIES

As part of the development of advanced calculational capabilities for modeling geochemical processes in the repository environment, a series of EQ3NR and EQ6 runs were made for SNL to estimate the solubility of uranium in the presence of concrete and J-13 groundwater. The modeling results indicate that the dissolution of $Ca(OH)_2$ in the concrete will have little effect on uranium solubility in the unsaturated zone, where there is an unlimited supply of CO_2 and O_2. If CO_2 and O_2 are limited, the uranium solubility will decrease depending on the changes in the system's oxidation potential and pH.

A draft of the open-file report, "Stratigraphic and Structural Relations of Volcanic Rocks in Drill Holes USW GU-3 and USW G-3, Yucca Mountain, Nye County, Nevada," was submitted for review.

The USGS open-file report, "Interpretations of Magnetic Anomalies at a Potential Repository Site Located in the Yucca Mountain Area, Nevada Test Site," was submitted to the printer.

Work continued on magnetic studies of samples of the Tiva Canyon Member from drill hole USW GU-3 to provide orientation data. From about 75 to 80 samples, representing the Tiva Canyon Member in USW GU-3, have been analyzed. The data will be used in conjunction with fracture studies.

Drilling at test well UE-25c#3 continued from about 1000 ft to below 2200 ft. The "c" series wells will be used for conservative tracer tests to define groundwater flow paths and velocities in the Yucca Mountain region.

Field work was completed on the RV-2 trench across the Rock Vally fault and a detailed log of the trench is being compiled. Results correlate well with data obtained from previous trenching and will provide a detailed description of the fault.

The results from sampling and analysis of all groundwater pumped in the vicinity of Yucca Mountain are being reviewed. A report on these results is being written that is a June 30 DOE/HQ deliverable.

The analyses are almost complete of soluble chloride as a function of depth for the samples collected in February. The purpose of these measurements is to obtain data for selecting sampling sites to measure infiltration rates of the bomb pulse of ^{36}Cl in the last 25 years. Preliminary indications are that there are high concentrations of chloride in fractures near the top of Yucca Mountain and in flat areas in Yucca Wash and Fortymile Canyon; whereas, there are only low concentrations in a steeper region in Coyote Wash.

Equilibrium has been calculated for analcime, albite, and quartz using a more complete model of the configurational entropy of analcime that was developed last month. These calculations indicate that a nonideal component must be added to both the enthalpy and entropy of mixing to make the model fit both field and laboratory data. The nonideal components to the model are presently being added. Such detailed models are essential to understanding solid-phase

transitions in Yucca Mountain because these reactions typically involve very small changes in Gibbs energy. This model is considered essential because it will enable the use of the distribution of analcime in Yucca Mountain to help understand its past thermal and hydrologic history. It also provides a basis for development of thermodynamic models for clinoptilolite and mordenite.

Because all groundwaters contain particulates, which frequently are made of clays and can be highly adsorptive, their potential impact on geologic storage of radioactive waste is being examined. The TRACR3D code has been modified to model colloid transport. The code is being used to perform theoretical analyses and to model field data taken at various waste disposal sites near Los Alamos. The results that have been obtained to date indicate that colloid transport is important.

Quantitative petrographic analysis of rhyolitic microcrystalline groundmass zones of the Topopah Spring member was extended from drill core USW G-4 to USW G-1, USW GU-3, and UE-25a#1. Rhyolitic microcrystalline groundmass zones may provide one measure of stratigraphic position within the lower Topopah Spring member.

Field sampling of tephra was completed at the middle Nye Canyon and Lathrop Wells volcanic centers. This work confirmed the presence of hydrovolcanic deposits at both centers. Additionally, two thin horizons of pyroelastic surge deposits were discovered in the lower part of the main sequence of the Lathrop Wells cone; and they are in agreement with earlier interpretations. Electron microprobe and X-ray diffraction analyses of ash samples from Yucca Mountain trenches are complete. The ashes could have been derived from either the 1.2- or 0.3-million-year volcanic cycles; they cannot be distinguished using these analytical techniques. The report on the impact of hydrovolcanic studies on the volcanism program is complete and fulfills an April milestone.

A site visit to Yucca Mountain on April 3, 1984, was conducted to select potential meteorological monitoring sites. Potential sites were identified by analysis of topographical maps of the area before the site visit. Exposure of the potential sites was documented through photographs that will be used in conjunction with topo maps and SNL meteorologic data to narrow the potential

sites to preferred monitoring sites in the Meteorological Monitoring Plan that is in preparation.

PLANNED WORK

Drilling and casing of 11 seismic shot holes at NTS was initiated. The expected completion date for the drilling is May 11. These holes, along with 11 additional holes on adjacent BLM land, will be used in a seismic refraction survey.

A criteria meeting for unsaturated zone test well USW UZ-6 was held in Las Vegas on April 6. Final drilling and instrumentation planning and criteria revision are underway. It is anticipated that the hole will be spudded in the latter part of May.

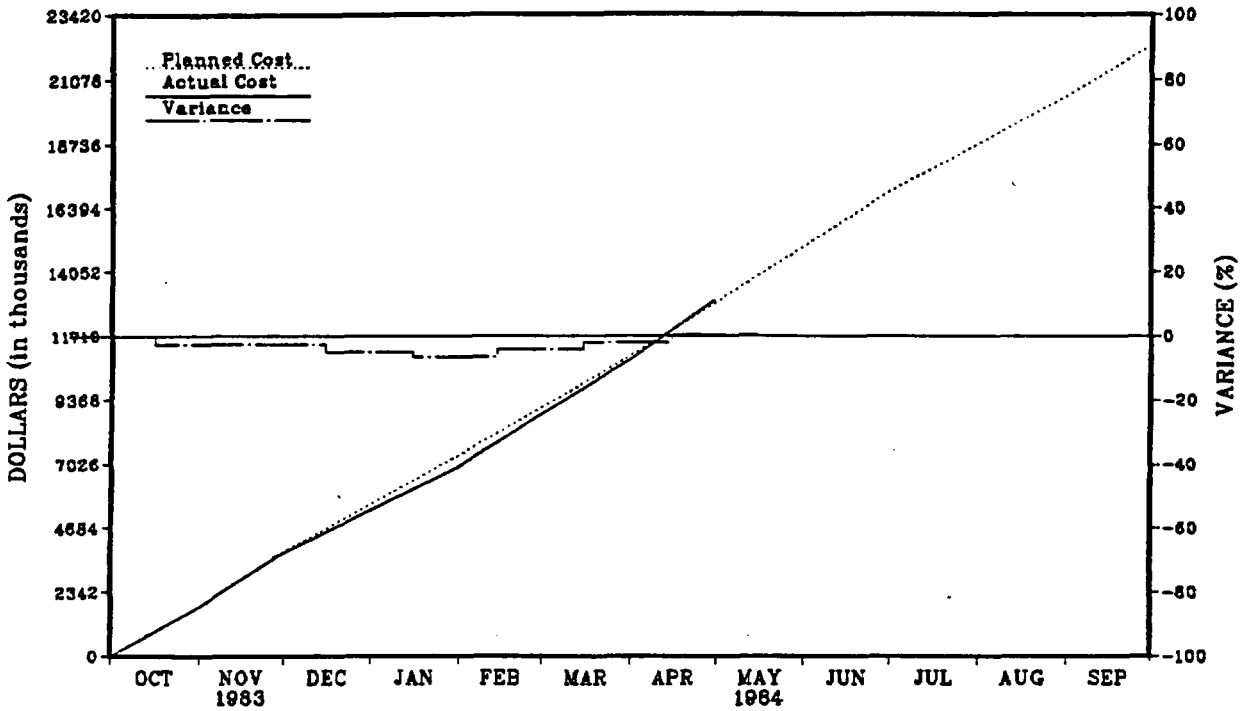
The WAFE computer code document will be completed in May, and TRACR3D will be submitted for publication.

PROBLEM AREAS AND ACTIONS TAKEN

Site monitoring activities provide the NNWSI Project with meteorological data from two ten-meter towers located at Yucca Mountain. The meteorological towers operated normally during April. However, direct transmission of meteorological data from Nevada Test Site was of poor quality for the last few weeks coincident with the change of phone numbers at Nevada Test Site. Data cassettes are being mailed to SNL until the problem can be resolved.

WBS 2.3, Site

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	1794.	3809.	5566.	7356.	9106.	11003.	12967.	15016.	17026.	18768.	20515.	22314.
Cost (x1000)	1748.	3707.	5285.	6869.	8726.	10785.	12997.	0.	0.	0.	0.	0.
Variance (x1000)	46.	102.	281.	487.	382.	218.	-30.	0.	0.	0.	0.	0.
% Variance	-3.	-3.	-6.	-7.	-4.	-2.	0.	0.	0.	0.	0.	0.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
LANL	2.3	DRAFT RPT. ESTIMATING WATER FLOW & RN TRANS. ALONG FLOW PATH					▲							
USGS	2.3	GROUNDWATER LEVEL DATA & PRELIM. POTENTIOMETRIC SURFACE MAPS, YM							◆		△	◇		
LANL	2.3	LETTER REPORT GROUNDWATER CHEMISTRY ALONG FLOW PATHS									△		◇	
LANL	2.3	COMPLETE REPORT ON VOLCANIC HAZARDS ANALYSIS											△	◇
LANL	2.3	PROGRESS RPT. ON 3-D MINERALOGIC MODEL OF YM											△	◇

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.4 REPOSITORY

OBJECTIVE

The objective of this task is to develop the engineering capability to design, construct, operate, and decommission a repository in tuff. Five specific technical areas are involved which include (1) the determination of the physical and mechanical properties of the rock matrix and rock mass important to the design and construction of an underground structure, (2) the engineering analysis and evaluation of the various technical details important to the design and operation of a repository, (3) the development of the techniques of sealing a repository as part of decommissioning, (4) the preparation of a site specific design that will be accommodated within the surface and subsurface constraints of Yucca Mountain, and (5) the design and development of the equipment to construct the repository, handle the waste and the waste package, and transfer the waste and the waste package within the repository system.

ACTIVITIES

Activities by the surface facility Architect-Engineer, Bechtel National, Inc., which were addressed at the Monthly Design Review meeting on April 24-25, include the following:

- Development of waste treatment alternatives;
- Review of regulatory and DOE criteria;
- Identification of interface areas with Parsons Brinckerhoff;
- Commencement of design of bridge over Fortymile Canyon, rail switchyard layout and conceptual designs for buildings and surface facility layouts; and
- Issue of Quality Assurance Program Plan.

An assessment of the potential for natural radon contamination of the Yucca Mountain repository has been performed. The assessment, confirmed by airborne radioactivity measurements at G-Tunnel, suggests that an emission rate of 10^{-16} Ci/cm^2-sec can be expected. However, even at this low rate, radon buildup can

be expected in underground spaces. Designs and operating procedures will be developed with this in mind.

An overview meeting to describe the NNWSI Project to Parsons, Brinckerhoff, Quade and Douglas, the Architect-Engineer for the underground repository conceptual design, was held on April 2 and 3 and was followed by a site tour on April 12 and 13.

The analysis task was completed of calculating the mechanical response of a fractured rock to hydrostatic and differential stress. These results, which will be documented in a forthcoming report, demonstrate the applicability and utility of the compliant joint material model in the JAC code in calculating "rock mass" response to load when joint and matrix properties are known.

On April 5, 1984, the heat was turned on for the third thermal cycle for the G-Tunnel Heated Block Experiment, which is a field experiment developed and conducted to measure and evaluate the thermal, mechanical, thermomechanical, and hydrothermal phenomena for welded tuff. When they have been integrated into thermal and mechanical analyses, the results will enhance capabilities to predict the responses of tuff to excavation of the underground facility portion of a repository and to evaluate effects of the heat released by the waste. The power level was set at 800W for each of the 14 heaters. The initial temperature for the block at the time of heater turn-on was 22°C. By the end of the month, the regions of the block nearest the heaters had reached a temperature of 94°C. The block is to be heated until the pore water is boiled out; this is expected to occur near the middle of May.

Work continued on the preparation of the horizontal small diameter heater experiment in welded tuff. A number of fractures intersect the heater hole and accompanying thermocouple holes. It is important to know the potential for fracture flow due to hydrothermal effects around the heater to understand the hydrothermal behavior of welded tuff. First, the fractures were mapped using a borescope and probable connecting fractures were identified. Next, low temperature fracture permeability measurements were made in the heater hole on two fractures and the flow was observed in the surrounding thermocouple holes. This observation confirmed that flow could occur during heating. Thermocouples

will be placed at the intersections of the two fractures and the thermocouple holes in an attempt to measure fracture flow. For reference, the fracture permeabilities were 1.0 and 4.5 cm/sec.

Experiments continued this month on time-dependent mechanical properties of NTS tuffs as a function of temperature and stress. The last test on Calico Hills tuff was completed this month after 67 days at stress. This sample exhibited the zeolite swelling phenomenon previously noted up to a stress of 60 MPa. The maximum rate of swelling coincides with the onset of dilatant microcracking, which suggests a coupling between the microcracking and the swelling phenomenon. Presumably, the microcracking allows increased penetration of water to unsaturated porosity that causes an increased rate of zeolite expansion from hydration. Analysis of results continues to formulate an empirical constitutive relationship for incorporation into predictive calculational models that will be applied to borehole sealing, ES experiment design and interpretation, and repository design and performance assessment.

During this period, the reactivity was addressed of sealing materials at elevated temperatures up to the maximum credible temperature expected around waste package emplacement drifts or boreholes in the Topopah Spring Member. The stability of concrete sealing materials is being tested at repository conditions to simulate probable exposure of certain fracture seals in the Topopah Spring Member. Following the conclusion of experiments at 200°C and 300°C, a test matrix at lower temperature was begun. The apparatus/experimental design was assembled and tested to expose test specimens of concrete to an environment simulating an undersaturated tuff repository host rock. The first apparatus enables testing of the sample at atmospheric pressure and at any temperature up to 100°C with an independent control upon the water vapor pressure/relative humidity of the system. Testing will be at 90°C with a water vapor pressure fixed at approximately 380-mm Hg, or about 75 percent of the saturation value. Simulated concrete specimens were prepared of prisms of Topopah Spring tuff that was cast as the core of a 5-cm diameter cylinder surrounded by 82-22 grout and cured at 38°C. Disks were cut from these cylinders, and four of them will be exposed from one to four months. Additional tests are progressing at completely saturated conditions in the rocking autoclave and at a saturated static environment at 150°C, with the first sampling period being conducted.

PLANNED WORK

Four computer programs have been written to calculate the differential thermo-mechanical stress across a material discontinuity. This is aimed primarily at calculations for the grout filled joint in the sealing program. Evaluation of these programs and the underlying physics is now under way.

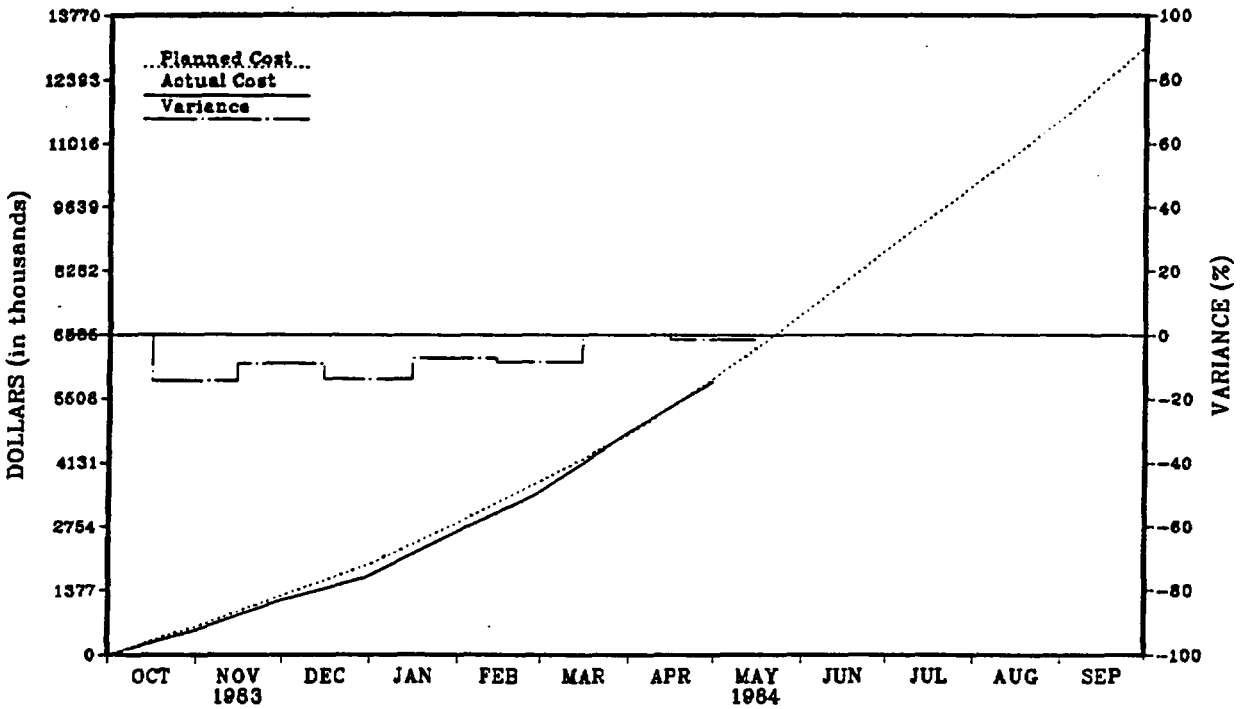
Samples of tuff concrete and grout that were developed in the materials development portion of the sealing program were forwarded to PNL to establish the unsaturated permeability relationships. The results from these analyses will be used in future hydrologic calculations.

PROBLEM AREAS AND ACTIONS TAKEN

None.

WBS 2.4, Repository

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	613.	1273.	1951.	2852.	3749.	4765.	5962.	7337.	8716.	10110.	11547.	13116.
Cost (x1000)	525.	1158.	1680.	2646.	3436.	4763.	5867.	0.	0.	0.	0.	0.
Variance (x1000)	88.	115.	271.	206.	313.	2.	95.	0.	0.	0.	0.	0.
% Variance	-14.	-9.	-14.	-7.	-8.	0.	-2.	0.	0.	0.	0.	0.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
SNL	2.4	SUBMIT SUMMARY LOGIC NETWORK FOR REPOSITORY				▲								
SNL	2.4	SEAL DEVELOPMENT PLAN FOR REPOSITORY							△	◇				

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.5 REGULATORY/INSTITUTIONAL

OBJECTIVE

The objective of the Regulatory/Institutional task is to provide the capability for interfacing with all the institutions and to meet the requirements identified in the various laws and regulations pertaining to the siting, design, and construction of a nuclear waste repository and a Test and Evaluation Facility. The principal laws and regulations which govern the licensing of such include the Atomic Energy Act of 1954, the National Environment Policy Act (NEPA) of 1969, and the Nuclear Waste Policy Act (NWPA) of 1982, 10 CFR Part 60 and 40 CFR Part 191. For ease of understanding, regulatory and institutional activities may be further subdivided into five categories: (1) Site Recommendation Report, (2) Repository Licensing, (3) Site Characterization Report/Site Characterization Plan (SCR/SCP), (4) Environmental Assessment, and (5) State Interactions.

ACTIVITIES

The following seven letters, or position statements, pertaining to the SCP working group were sent to DOE/HQ as requested by C. Cooley:

- Table of contents for SCP

  The NNWSI Project supported the position that RG 4.17 is to be the annotated table of contents; decontamination and decommissioning is to be addressed in an appendix.

- Review of proposed guidance for SCP

  The NNWSI Project agreed to DOE/HQ guidance for five SCPs; a draft SCP date of January 1, 1985; no suitability decisions in SCPs, and site-specific criteria will not be developed; and, numerical demonstration of compliance will not be presented.

- Performance assessment definitions for SCP

  HQ proposed the adoption of two types of performance assessments to support the SCP; preliminary performance assessments (PPAs) to cover postclosure aspects; and subsystem performance assessments (SPAs) to cover preclosure aspectS. The guidance was partially contradictory, and the NNWSI Project recommended dropping SPA.

- SCP Working Group charter

  The proposed charter was appropriate for a coordinating group, and the NNWSI Project supported the charter with only minor clarifying comments.

- Environmental issues in SCP

  During the March 20, 1984, SCP Coordinating Group meeting discussions, it was suggested that environmental, socioeconomics, and transportion issues be included in the SCP. The NNWSI Project developed a position statement based upon interpretation of paragraph 113 of the Nuclear Waste Policy Act (NWPA), as well as the precedent of the definition of site characterization used in the EA that such issues should not be presented in the SCP.

- Pre-SCP hearings

  In the SCP coordinating group conference call on February 29, the concern was expressed by DOE/HQ that the pre-EA public hearing did not address site characterization issues as required by the NWPA. Therefore, the licensing staff developed a correlation matrix to NVO-763, "Public Hearings Panels Report - A Summary of Public Concerns Regarding the Characterization of a Repository Site in Nevada," to demonstrate that the public hearings did address SCP issues. A copy of this matrix was forwarded to DOE/HQ.

- Accessible environment, groundwater travel time, disturbed zone and unsaturated zone performance objectives

  An NNWSI Project position statement was developed to address these four topics. The position supported the 10CFR60 definition of accessible environment. The position supported the interpretation that the most likely groundwater travel time is along the fastest likely path. For unsaturated zone performance objectives, the position noted that flux was a better performance measure than flow, but the NNWSI Project had been unable to develop a non-site specific flux performance objective.

- Site suitability criteria

  An effort was made to develop a position that argued against development of true site suitability criteria for inclusion in the first issuance of the SCP. A nearly final draft of the position was completed in April; but, as yet, the letter has not been sent to DOE/HQ.

A significantly revised SCP network was developed during the month and presented to the TPOs. Several significant aspects of the network are:

- The staggered event sequence reflects Environmental Assessment (EA) requirements.

- The only draft will be in November-December time frame.

- The development of Chapter 10 will begin early and will interface with Exploratory Shaft Test Plan activities.

- The network is based upon the assumption that site suitability criteria will not be developed.

- Sensitivity studies and regulatory goals will be used to rank test plans.

- The information obtained from NRC workshops will guide chapter development and content.

The first meeting of the Performance Assessment National Review Group (PANRG) was held in Gaithersburg, Maryland, on April 17-18, 1984. The PANRG is comprised of a group of nationally recognized experts in the fields of radionuclide transport, chemistry, hydrology, health physics, and related fields; the PANRG is to recommend specific actions that should be undertaken to assure the adequacy of the technical approaches for demonstrating compliance with 10CFR60, 10CFR960, and 40CFR191. To do this, the PANRG will review the development, benchmark testing, verification, validation and application of the mathematical models that are employed by the GRD Projects to simulate the migration of radionuclides from the waste package to the accessible environment. A second important concern is the role of performance assessment in selecting and focusing test needs to data requirements.

D. Eagan (EPA) gave a presentation at the PANRG meeting on 40CFR191 and issued new Working Draft No. 4. Some important points from this presentation are as follows:

- The standard will be different if assurance requirements do not remain. If they are removed, the standard will probably have to be re-issued for public comment.

- The EPA feels that 2 km accessible environment is enough to provide geotechnical retardation at all sites about which they know.

- There is significant confusion in the community, including EPA, as to the meaning of confidence levels.

NRC also gave presentations at the PANRG meeting which addressed the following important points:

- The NRC will not commit to satisfying 40CFR191 as the only measure of repository performance.

- The NRC explanation of demonstrating EPA compliance was no more understandable than the EPA explanation.

- It was noted that age dating of water is also an acceptable method for demonstrating regional groundwater flow.

- The NRC code usage appears to be based upon simple codes; they are to be different from the codes used by the projects. The NRC will be using SWIFT.

- The NRC does not plan to have peer review.

- The aspects considered necessary and sufficient for licensing are retrievability, containment, release rate, groundwater travel time, and 40CFR191.

- Three-dimensional modeling will be used to define flow path; one-dimensional will be used for transport.

- The NRC wants to go to a rule-making process for early resolution of licensing issues.

Presentations were then given at the PANRG meeting by the projects. The ONWI presentation focused upon the assumption of Darcian flow and no groundwater movement in salt. The NNWSI Project presentation focused on the codes to be utilized and their stage of development.

The NNWSI Project licensing staff worked with Weston in the preparation of a DOE/HQ response to NRC that covers the 10CFR60 unsaturated zone amendment. The licensing staff also participated in a meeting at DOE/HQ on April 9, 1984, to present the NNWSI Project position to Ralph Stein and Mark Frei. The draft DOE/HQ position paralleled the NNWSI Project position on all significant aspects; however, DOE/HQ-Legal removed all references to the fact that travel time was not an appropriate measure of performance for saturated zone repositories. More importantly, the DOE/HQ position (draft) stated that DOE/HQ would attempt to furnish to NRC by May 15, 1984, a site performance objective

for the unsaturated zone to be used instead of the 1,000-year travel time. The licensing staff has not yet received a copy of the formal transmittal of the DOE/HQ position to NRC. D. Siefken of Weston gave a presentation at the April TPO meeting that outlined suggested considerations for this new performance objective. It is to be based upon the zone of dryness surrounding the repository due to heating caused by the emplaced waste.

During April, Working Draft No. 4 of 40CFR191 was received, and preparation of a response was initiated. The response to Working Draft No. 4 will follow the presentation logic of the response for working draft as well as emphasize concerns regarding the unsaturated zone. It is noted that, although a number of revisions have been made, some of which address WMPO concerns previously raised, specifically with respect to proper vadose zone recognitions, the location of the accessible environment, and the continued incorporation of assurance requirements relative to site selection comments are being drafted for transmittal to DOE/HQ.

After several discussions with NRC's Division of Waste Management and the local public document room branch, NRC decided to retain responsibility for establishing and operating public document rooms at commercial high-level waste repositories. Previously, NRC was entertaining the idea of placing the responsibility on DOE.

Discussions were held with NRC's Deputy General Counsel and Leonard Bickwit, former NRC General Counsel, to clarify the extent of NRC's authority over a party prior to the time the party becomes a licensee. There seems to be some legal ambiguity over the extent of NRC's authority, but it may be a minor issue since NRC does have the power to deny a license if they believe construction has not been completed according to their guidance.

DOE/HQ and Weston comments on the NNWSI Project February 29, 1984, draft EA working papers were received on April 10, 1984. Comments were categorized into those that could be addressed readily within the existing schedule to produce a June 1, 1984, draft and those that required further evaluation with regard to schedule impacts. Comments on EA comparability, major technical issues, and

specific comments on EA content were distributed to EA contributors for an evaluation of impacts.

A series of meetings, including the following, were held with representatives of local planning agencies to establish available and planned community services:

Area	Date	Contacts
Henderson	4/5/84	R. Heckendorf (City Planner) L. Lucas (Senior Planner) D. Starr (Fire Chief)
Clark County	4/6/84	D. Bechtel (Principal Planner)
N. Las Vegas	4/6/84	J. Poulos (Director) P. Reagle (Planning Technician)
Henderson	4/16/84	L. Lucas (Senior Planner)
Nye County	4/16/84 4/17/84	S. Bradhurst (Planning Consultant) S. Bradhurst (Planning Consultant) S. Mellington (BLM Planner)
N. Las Vegas	4/18/84	J. Poulos (Director)

PLANNED WORK

An investigation of the legal constraints and privileges of licensees versus non-licensees has begun. The following issues are being examined.

- What authority does the NRC have over a non-licensee operating in areas of NRC jurisdiction?

- What are the differences among licenses granted under 10CFR50, 10CFR60, and 10CFR20?

- What is the potential for issuance of limited work authorizations for repository construction work?

- What is the expected level of detail of NRC review of repository license, under 10CFR60, relative to similar reviews under 10CFR50 and 10CFR70?

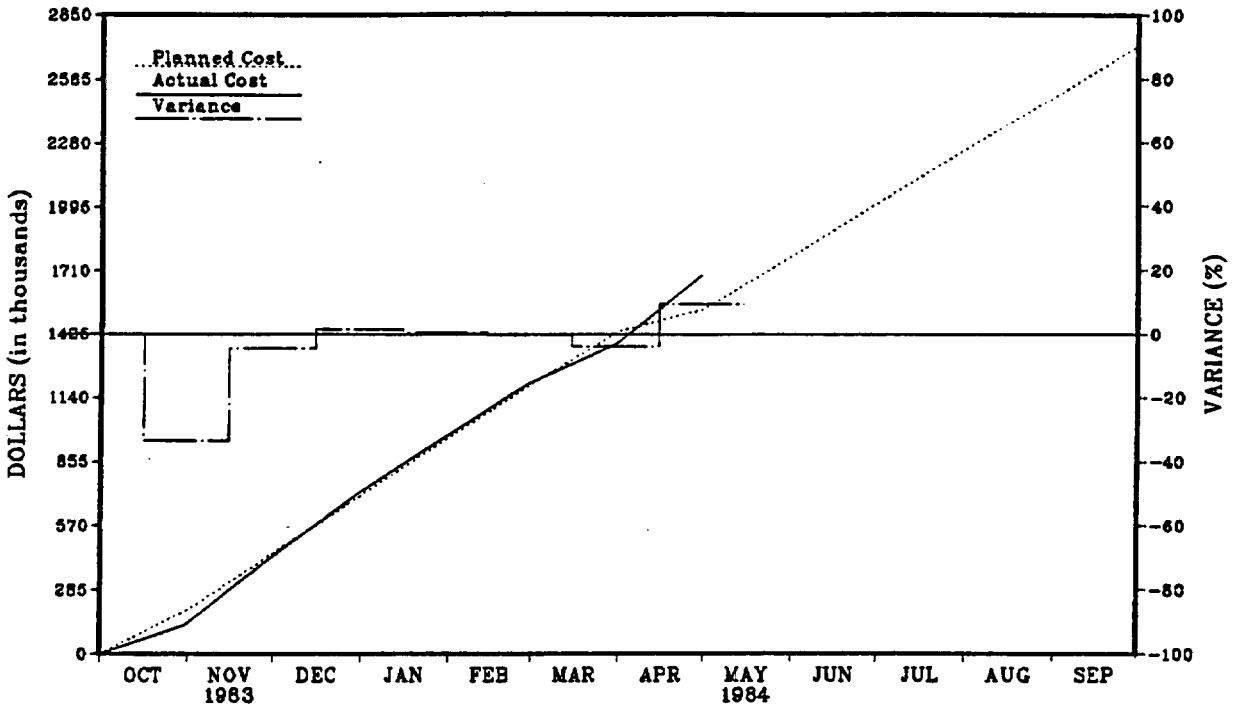
Work continues to produce a June 1 draft of the NNWSI Project Environmental Assessment.

PROBLEM AREAS AND ACTIONS TAKEN

None.

WBS 2.5, Regulatory and Institutional

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	196.	447.	708.	964.	1203.	1440.	1540.	1774.	2010.	2250.	2483.	2715.
Cost (x1000)	130.	427.	719.	969.	1199.	1383.	1688.	0.	0.	0.	0.	0.
Variance (x1000)	66.	20.	-11.	-5.	4.	57.	-148.	0.	0.	0.	0.	0.
% Variance	-34.	-4.	2.	1.	0.	-4.	10.	0.	0.	0.	0.	0.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
SAI	2.5	DRAFT EA												
WMPO	2.5	NNWSI REFERENCES FOR EA COMPLETE												
SAI	2.5	DRAFT SCP TO HQ												

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.6 EXPLORATORY SHAFT

OBJECTIVE

The objective of this task is to identify and plan the tests that need to be conducted at the repository horizon as a part of detailed site characterization, and to design and construct the Exploratory Shaft (ES) and the underground test area in Yucca Mountain. The primary focus of this effort will be to establish the basis for evaluating the unsaturated zone in a welded tuff formation. In addition, the effort will be conducted to define not only the nature of the unsaturated zone with regard to water content and water movement, but the nature of the natural barriers between the repository horizon and the static water level as well.

ACTIVITIES

The Integrated Data System (IDS) is a part of the ES supporting facilities. It provides a central facility to take measurements automatically and to control aspects of the ES tests. The initial shipment of the IDS development equipment has been received from the vendor. The equipment includes the central console, an equipment rack, terminals, printers, and other miscellaneous supplies. The remaining development system equipment is expected by May 4.

Internal review of the NNWSI Project Exploratory Shaft Test Plan (ESTP) was completed and comments were compiled. The review focused on the technical feasibility of proposed tests, the rationale for the tests, and the integration of tests. The review was made to provide confidence that information will be available from in situ tests that is needed for licensing.

PLANNED WORK

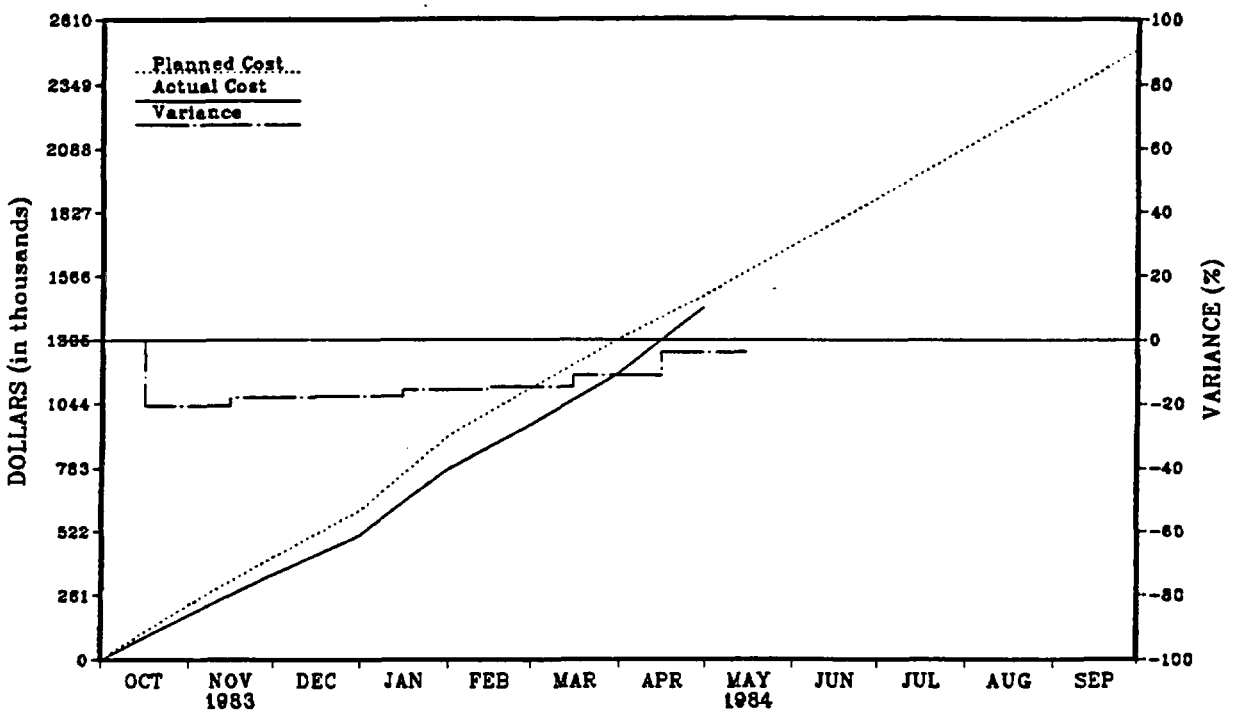
Revision of the ESTP will reflect both the input received from the March retreat and the comments of LLNL reviewers. The next ESTP Committee meeting is planned for June; by then the results of the retreat should be available.

PROBLEM AREAS AND ACTIONS TAKEN

The April 17-19 ESTP meeting was cancelled because of conflicts with EA and SCP efforts. A meeting was held on April 17 to discuss ESTP activities. Future ESTP effort will be constrained by higher priority activities (such as EA-related NRC workshops and the SCP).

WBS 2.6, Exploratory Shaft

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	224.	421.	612.	917.	1113.	1313.	1492.	1695.	1887.	2094.	2297.	2490.
Cost (x1000)	178.	346.	504.	773.	949.	1169.	1436.	0.	0.	0.	0.	0.
Variance (x1000)	46.	75.	108.	144.	164.	144.	56.	0.	0.	0.	0.	0.
% Variance	-21.	-18.	-18.	-16.	-15.	-11.	-4.	0.	0.	0.	0.	0.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
LANL	2.6	COMPLETE ESTP & SUBMIT TO HQ FOR FINAL REVIEW AND APPROVAL											△◇	

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.7 TEST FACILITIES

OBJECTIVE

The major objective of this task is the design, construction, and operation of the test facilities that support technology development for other waste management programs and other Geologic Repository Deployment (GRD) Projects. The two major facilities operated under this WBS element include the Climax Spent Fuel Test Facility and the E-MAD Facility.

ACTIVITIES

Spent Fuel Test-Climax (SFT-C)

The objectives of the SFT-C are to demonstrate the feasibility of storage and retrieval of spent nuclear fuel and to acquire data pertinent to the design, construction, and operation of a repository in crystalline rock. In situ stress measurements were completed in a fourth deep borehole, which has been designated ISS11. As with previous in situ stress measurements at the SFT-C, the recent results showed a high degree of variability in both magnitude and orientation. Secondary principal stresses were more consistent in the lower half of the borehole. Preliminary analyses indicate that maximum and minimum secondary stresses in the lower section of the borehole averaged 2210 $\pm$ 150 psi and 1070 $\pm$ 400 psi with orientations (as viewed looking down the borehole) of 30 $\pm$ 13° and 120 $\pm$ 13°, respectively. Data analysis is in progress and will be the subject of a forthcoming contractor report. The rock mass deformation modulus is also being determined by the petite sismique technique. Staff seismologists have completed planning activities for this series of measurements. Procurement of necessary transducers, switches, and cables was also completed late this month.

In preparation for shut-down of the SFT-C, the last set of IRAD vibrating-wire stressmeters was overcored in preparation for laboratory calibrations. All 26 extensometer units have been disassembled in preparation for testing the integrity of the connecting rods and anchorage systems of these units. Testing

of these components is necessary because of observed stress-corrosion cracking of some connecting rods and loss of pressure in some anchors. At this time, all post-test in situ calibrations are complete and all instruments requiring laboratory calibration have been removed and shipped to the appropriate calibration facility.

A proposed plan for decommissioning the SFT-C facility was developed. The fundamental approach is to dismantle and remove items that have either a known or a likely future use and to mothball all other items in place. To the extent possible, systems and associated spare parts are being maintained as functional units instead of being scavenged. Decommissioning activities also included final repairs and preventive maintenance to the Data Acquisition System air conditioning system, dismantling and shipping of the surface-control-skid radiation monitoring equipment, and replacement of all but one pit plug to their respective locations in the floor of the canister drift. The pit plug at CEH14 was placed adjacent to the pit to permit visual inspection of the emplacement hole and pit plug geometry by visitors at the SFT-C. The surface transport vehicle has been mothballed and the associated tractor was returned to the NTS motor pool.

Ten tours for 227 visitors were conducted of the SFT-C during April.

E-MAD

Sectioning of the canister which had contained fuel assembly D34 at the SFT-C facility was completed. The canister sections were decontaminated and preparations are being made for shipment to LLNL for metallurgical analysis. This canister had been partially immersed in water at the SFT-C facility because of a leaking liner.

The first parameter search weld using the Plasma Arc welder on stainless steel was completed. The Plasma Arc welder was modified to allow argon purge of the weld interior and new flowmeters were installed. A second stainless parameter search weld with argon purge, both with and without filler wire, was then

completed. Samples are being evaluated to determine capabilities for performing final closure weldments on materials for which the present E-MAD welding systems are not qualified, such as stainless steel for Plasma Arc welding.

Ten tours of the E-MAD facility were conducted for over 200 visitors; these tour groups include the following:

- April 2, Active Republican Women's Club
- April 2, California Radioactive Materials Management Forum
- April 3, Las Vegas Chamber of Commerce and Impact Priority Committee
- April 9, Alternative Means of Financing and Managing Radioactive Waste Facilities Advisory Panel
- April 10, Oak Ridge Assistant Manager for Safety and Environment and Consultant for DOE/HQ Communications and Training
- April 12, Acting Manager, DOE/Savannah River Operations Office
- April 12, LLNL Computer Operations Division
- April 17, Desert Lenten Experience Participants
- April 24, Project Officers - B61 Program
- April 25, Boeing, EPRI, DOE/Richland, and DOE/Germantown group

PLANNED WORK

Spent Fuel Test-Climax (SFT-C)

It is anticipated that May will be the last full month of underground access at the SFT-C. Four major activities will be completed: deformation modulus measurements by the Goodman jack technique, deformation modulus determinations by the petite sismique technique, rod and anchorage testing of the 26 borehole rod extensometer units, and decommissioning of the subsurface facilities. Current estimates are that funds are adequate to maintain subsurface access for about two weeks in June.

E-MAD

Preparations were completed for a second vendor visit to discuss the necessary equipment for performing eddy current and profilometry examinations of fuel

assemblies and disassembled fuel rods. Procurement of this equipment will provide the E-MAD facility with the capability to perform these additional examinations.

Fuel handling operations to open the canisters containing the fuel assemblies D01 and D04 will commence May. A new procedure was prepared for removal of the Material Interaction Test (MIT) capsules and the Thermal Elongation Device (TED) assemblies from the fuel assemblies. This procedure deletes the calorimeter fuel assembly decay heat rate measurement which was a part of the D06 fuel handling operations. In addition to removing the TED and MIT capsules for shipment to Hanford Engineering and Development Laboratory, full volume filtration, contamination surveys, and visual, photographic and videotape inspections will be performed.

Gas sampling operations will be performed on the canister containing fuel assembly D16 in preparation for emplacement of the canister in Drywell 3 in June.

In support of the at-reactor storage investigations, a two-day meeting was attended by DOE, Westinghouse WTSD-Nevada Operations, Pacific Northwest Laboratories (PNL), Electric Power Research Institute (EPRI), EG&G, and Virginia Electric Power Company (VEPCO) representatives to discuss preparation of a statement of work requested by DOE/Richland for a dry storage cask demonstration program. The commitment made as a result of this meeting was for WTSD-Nevada Operations to prepare detailed cost and schedule estimates for work which would be performed at the E-MAD facility for the VEPCO solicitation for cooperative agreement proposals (SCAP) activities. A recommendation was made to have three casks loaded and tested at the E-MAD facility and the fourth cask loaded at VEPCO's Surry Plant and shipped to DOE's TAN facility in Idaho. The casks and fuel will be removed from E-MAD to the TAN facility upon completion of testing. It is currently anticipated that the program will begin June 1.

PNL has requested that the total atmosphere of the fuel temperature test be evacuated and replaced with fresh air with each gas sample. This change in the gas sampling methodology is to monitor incremental release of fission product gases from a suspected failed fuel rod. LLNL has requested that a full volume

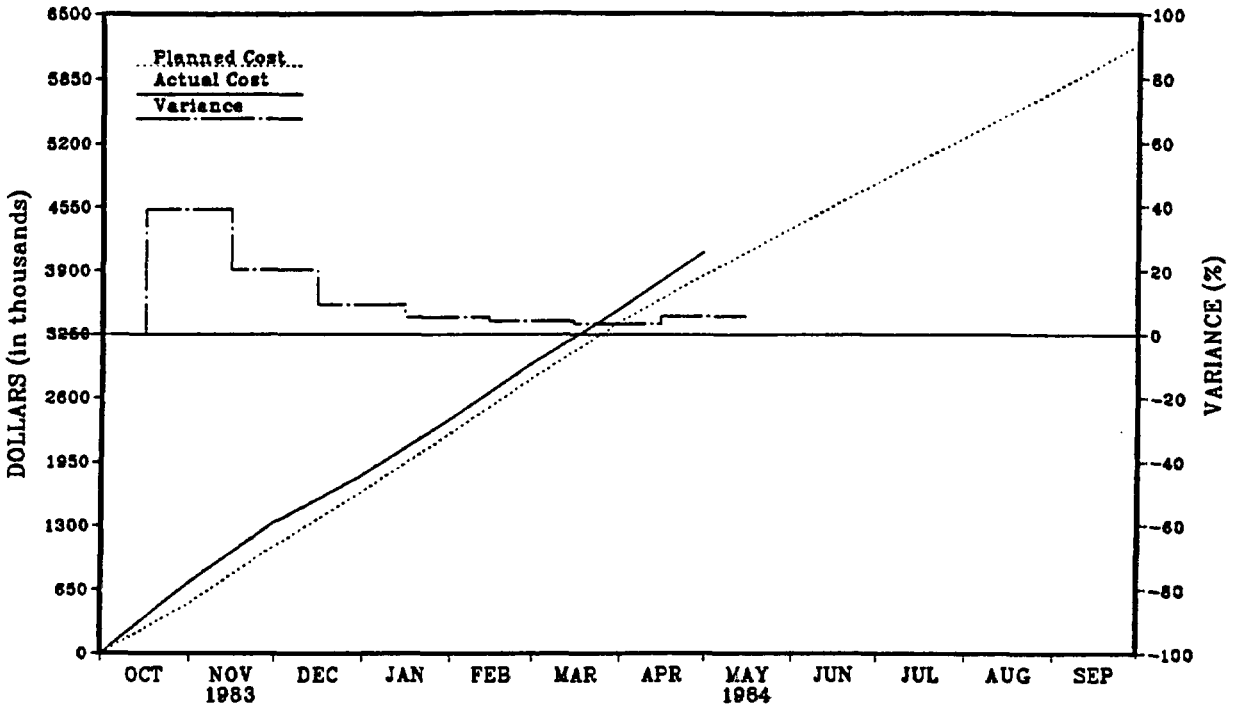
filtration gas sample to trap radioactive iodine be taken with the first atmosphere exchange. The revised fuel temperature test plan documenting the gas sampling change is under review. The revised sampling methodology will be initiated with the May gas sample.

PROBLEM AREAS AND ACTIONS TAKEN

Weather data were not collected during the month of April due to a malfunction in the recording equipment.

WBS 2.7, Test Facilities

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	506.	1100.	1651.	2249.	2815.	3369.	3870.	4337.	4797.	5258.	5728.	6198.
Cost (x1000)	705.	1323.	1803.	2373.	2932.	3503.	4090.	0.	0.	0.	0.	0.
Variance (x1000)	-199.	-223.	-152.	-124.	-117.	-114.	-220.	0.	0.	0.	0.	0.
% Variance	39.	20.	9.	6.	4.	3.	6.	0.	0.	0.	0.	0.

NNWSI LEVEL 1 MILESTONES

RESP. AGENCY	WBS	MILESTONE DESCRIPTION	O	N	D	J	F	M	A	M	J	J	A	S
LLNL	2.7	TERMINATION OF ROUTINE ACCESS AND LLNL TOUR SUPPORT TO SFT-C						△						◇
LLNL	2.7	COMPLETE DECISION ANALYSIS ON USE OF CLIMAX FACILITY								(OPEN)				

△ PLANNED MILESTONE COMPLETION DATE

▲ COMPLETED AS SCHEDULED

◇ REVISED MILESTONE COMPLETION DATE

◆ COMPLETED AS REVISED

2.8 LAND ACQUISITION

OBJECTIVE

The objective of this task is to maintain access to the land adjacent to the Nevada Test Site that is controlled by the U.S. Air Force and the Bureau of Land Management and to protect the land that could be used for a high-level waste repository and the surrounding buffer zones.

ACTIVITIES

None.

PLANNED WORK

To be included in future NNWSI Monthly Reports.

PROBLEM AREAS

None.

2.9 PROGRAM MANAGEMENT

OBJECTIVE

The objective of this task is to manage all activities of the NNWSI Project by all contractors. The five major areas identified are: (1) Project Management, (2) Project Control, (3) Interface Activities, (4) Quality Assurance (QA), and (5) GRD Support.

ACTIVITIES

As part of the project monitoring system, the networks for 2.1, Systems; 2.3, Site; and 2.5, Regulatory and Institutional were updated to reflect data received during planning and scheduling sessions.

A list of Level 1 milestones, completion schedules, and acceptance criteria was distributed to the Technical Project Officers (TPOs) at the April TPO meeting, and will be presented to the Change Control Board (CCB) for baselining in May.

The NNWSI Project Quarterly Technical Report for the fourth quarter FY 1983 was received for policy review.

NVO-196-18, Rev. 2, the NNWSI Project QA Program Plan, will be composed of implementing procedures. Two of these procedures, QMP-07-01, Surveillance, and QMP-18-01, Audits, are in review. The target date for issuance is May 21.

A program-wide Quality Assurance Coordination Group meeting was held in Columbus, Ohio, on April 11-12. The topics covered included the following:

- Revised version of the DOE/HQ QA guidance
- Report on NRC progress with regard to the endorsement of NQA-1 by Regulatory Guide 1.28
- DOE/HQ participation in QA Audits
- Graded QA
- Status of NNWSI Project QA plans.

PLANNED WORK

NNWSI Project Quality Assurance (QA) audits have been scheduled at Argonne National Laboratory for May 11 and at USGS-Menlo Park for May 30-31 and June 1.

The NNWSI Project QA Plan, NVO-196-17, Rev. 2, has been approved and is at the printers. The target date for controlled issuance is May 21. A workshop will be held June 5-6 to provide interpretation and to answer questions.

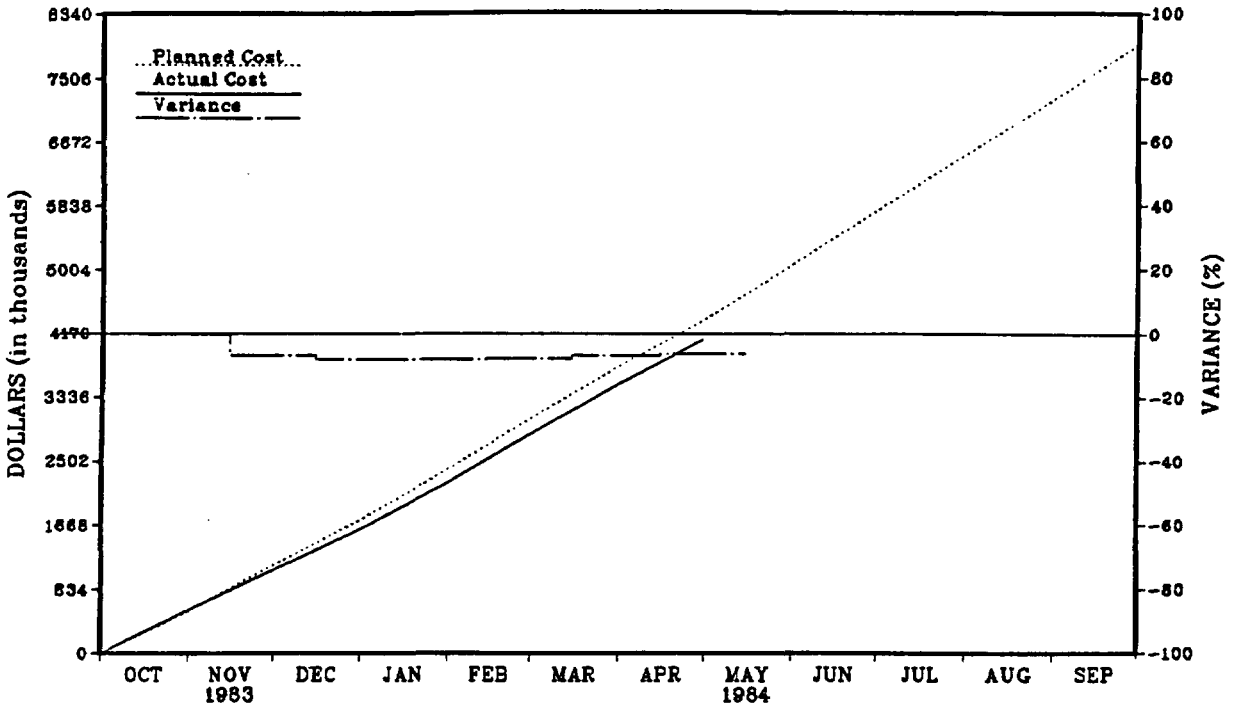
The schedule and agenda have been set for a Public Information Meeting to be held May 29 in Beatty, Nevada. TPOs from USGS, LLNL, SNL and LANL will make presentations, as will the NNWSI Project Manager.

PROBLEMS AREAS AND ACTIONS TAKEN

None.

WBS 2.9, Program Management

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	552.	1153.	1738.	2404.	3067.	3751.	4366.	5079.	5787.	6510.	7231.	7945.
Cost (x1000)	551.	1073.	1599.	2208.	2828.	3495.	4091.	0.	0.	0.	0.	0.
Variance (x1000)	1.	80.	139.	196.	239.	256.	275.	0.	0.	0.	0.	0.
% Variance	0.	-7.	-8.	-8.	-8.	-7.	-6.	0.	0.	0.	0.	0.

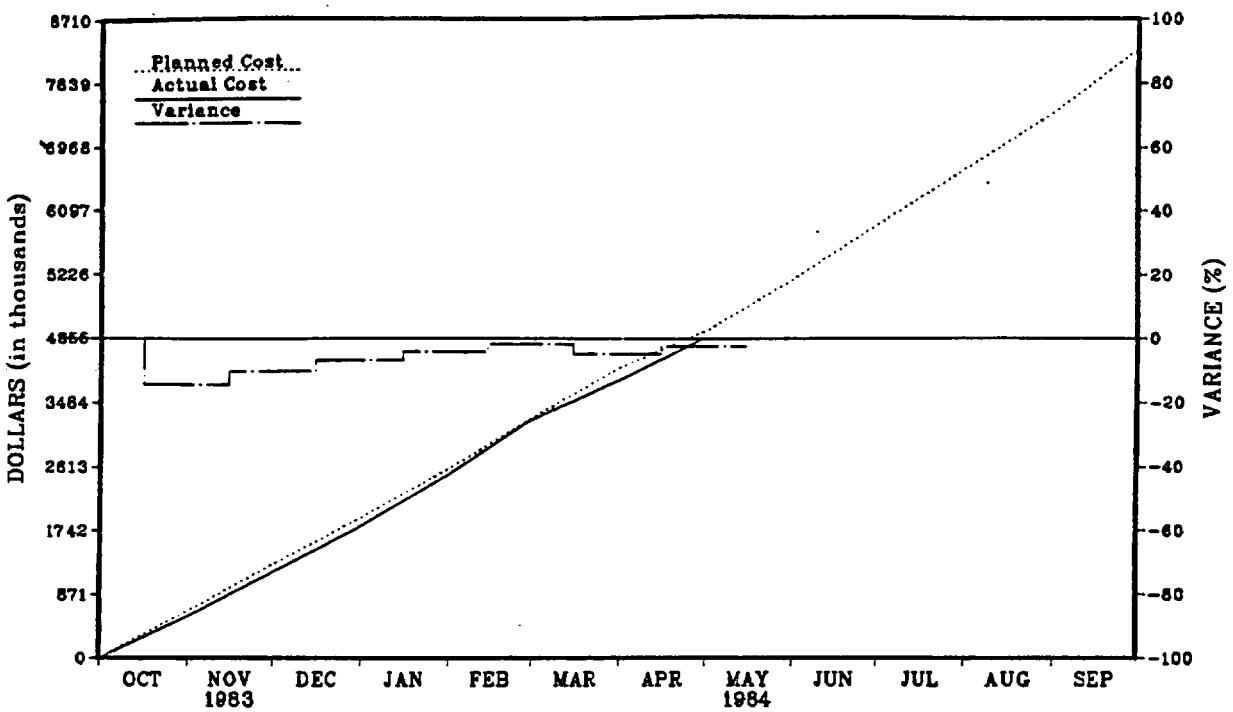
NNWSI PROJECT

PARTICIPANT

BUDGET vs COST

Lawrence Livermore National Laboratory

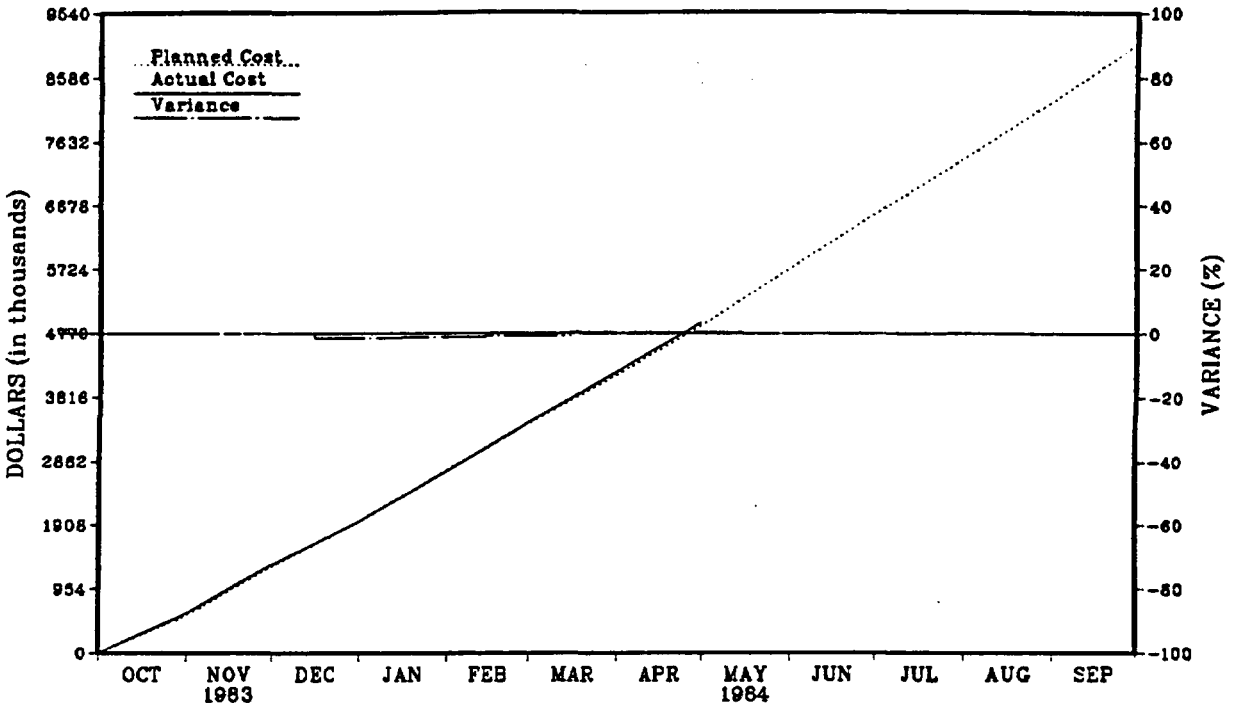
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	641.	1290.	1920.	2597.	3284.	3972.	4463.	5172.	5911.	6671.	7436.	8298.
Cost (x1000)	549.	1157.	1785.	2490.	3224.	3778.	4361.	0.	0.	0.	0.	0.
Variance (x1000)	92.	133.	135.	107.	60.	194.	102.	0.	0.	0.	0.	0.
% Variance	-14.	-10.	-7.	-4.	-2.	-5.	-2.	0.	0.	0.	0.	0.

Los Alamos National Laboratory

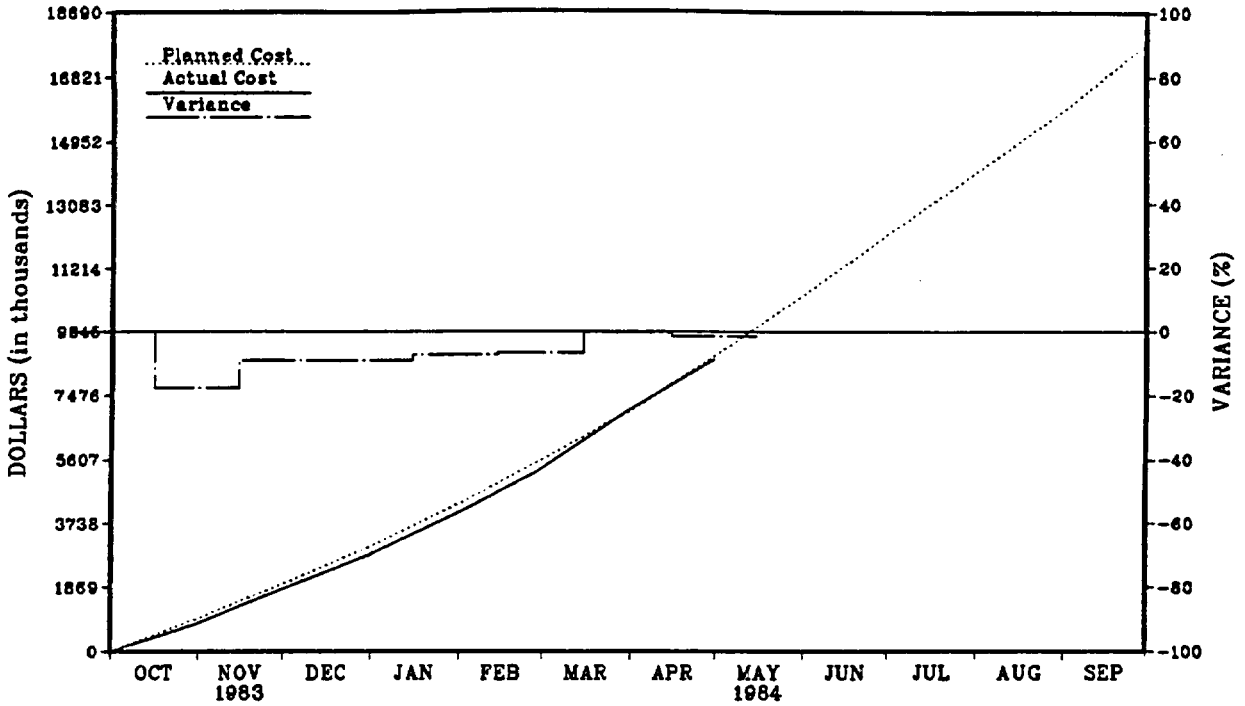
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	568.	1298.	1971.	2738.	3437.	4163.	4907.	5757.	6568.	7400.	8245.	9090.
Cost (x1000)	568.	1298.	1944.	2703.	3402.	4179.	4923.	0.	0.	0.	0.	0.
Variance (x1000)	0.	0.	27.	35.	35.	-16.	-16.	0.	0.	0.	0.	0.
% Variance	0.	0.	-1.	-1.	-1.	0.	0.	0.	0.	0.	0.	0.

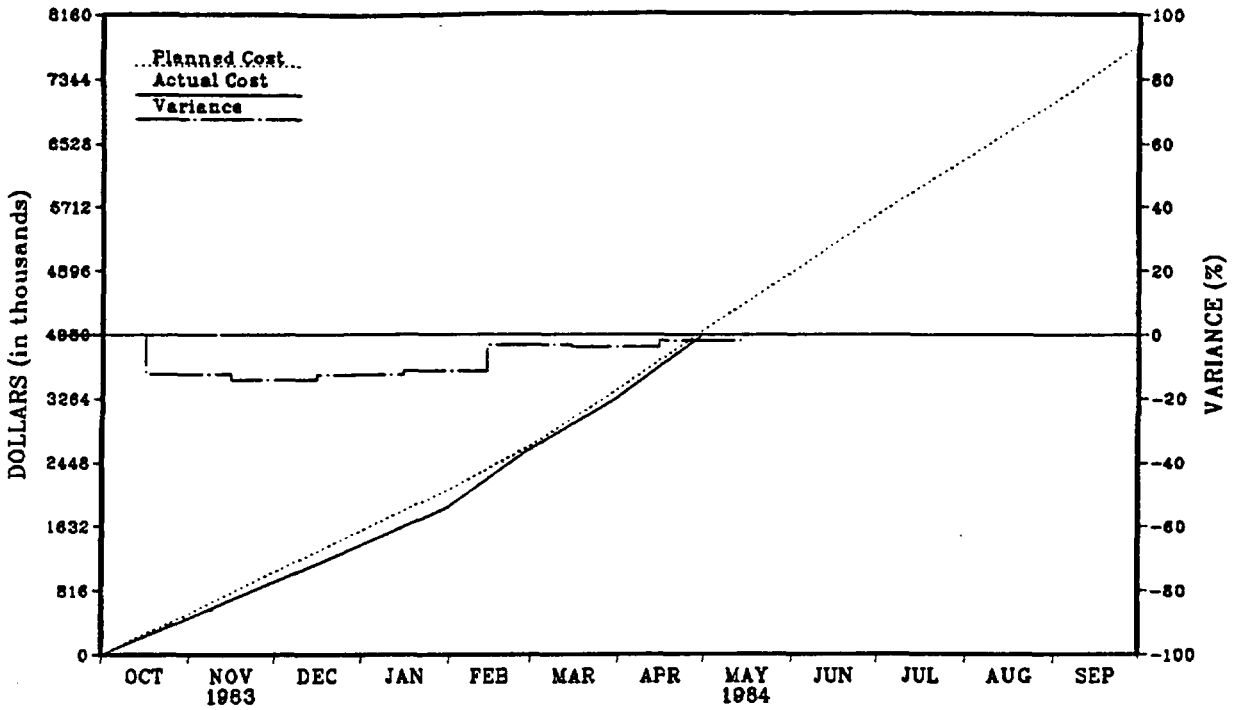
Sandia National Laboratories

GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	960.	1971.	3068.	4330.	5629.	7060.	8675.	10454.	12238.	14037.	15865.	17800.
Cost (x1000)	790.	1796.	2788.	4025.	5259.	7043.	8536.	0.	0.	0.	0.	0.
Variance (x1000)	170.	175.	280.	305.	370.	17.	139.	0.	0.	0.	0.	0.
% Variance	-18.	-9.	-9.	-7.	-7.	0.	-2.	0.	0.	0.	0.	0.

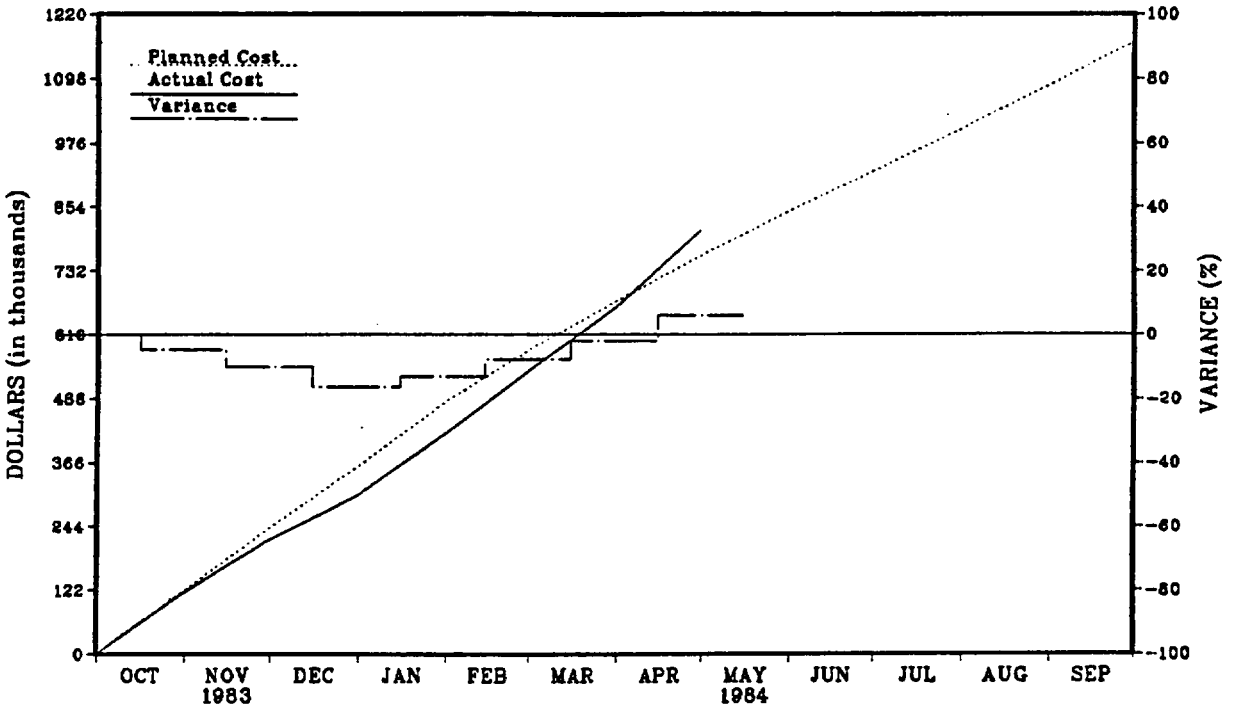
U. S. Geological Survey
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	524.	1060.	1583.	2108.	2676.	3402.	4145.	4883.	5608.	6334.	7055.	7777.
Cost (x1000)	459.	911.	1383.	1868.	2585.	3268.	4065.	0.	0.	0.	0.	0.
Variance (x1000)	65.	149.	200.	240.	91.	134.	80.	0.	0.	0.	0.	0.
% Variance	-12.	-14.	-13.	-11.	-3.	-4.	-2.	0.	0.	0.	0.	0.

Fenix and Scisson, Inc.

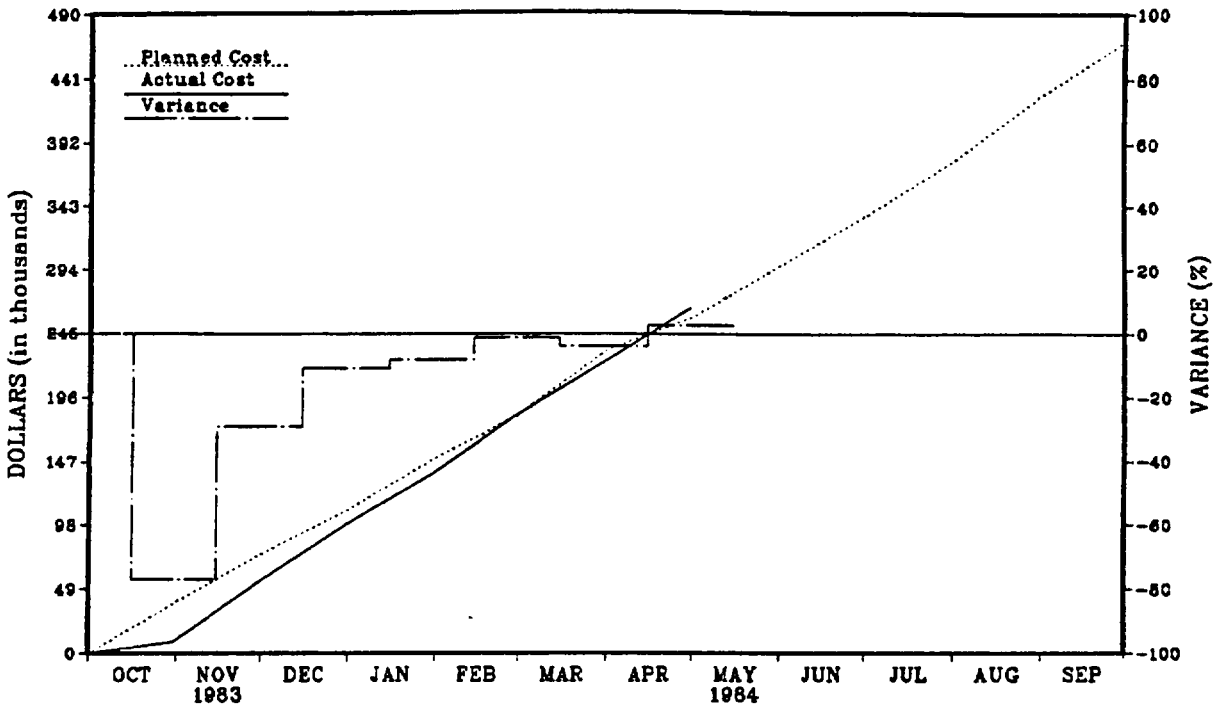
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	122.	243.	360.	485.	582.	676.	764.	847.	922.	1004.	1087.	1166.
Cost (x1000)	116.	218.	301.	421.	536.	662.	809.	0.	0.	0.	0.	0.
Variance (x1000)	6.	25.	59.	64.	46.	14.	-45.	0.	0.	0.	0.	0.
% Variance	-5.	-10.	-16.	-13.	-8.	-2.	6.	0.	0.	0.	0.	0.

Holmes and Narver, Inc.

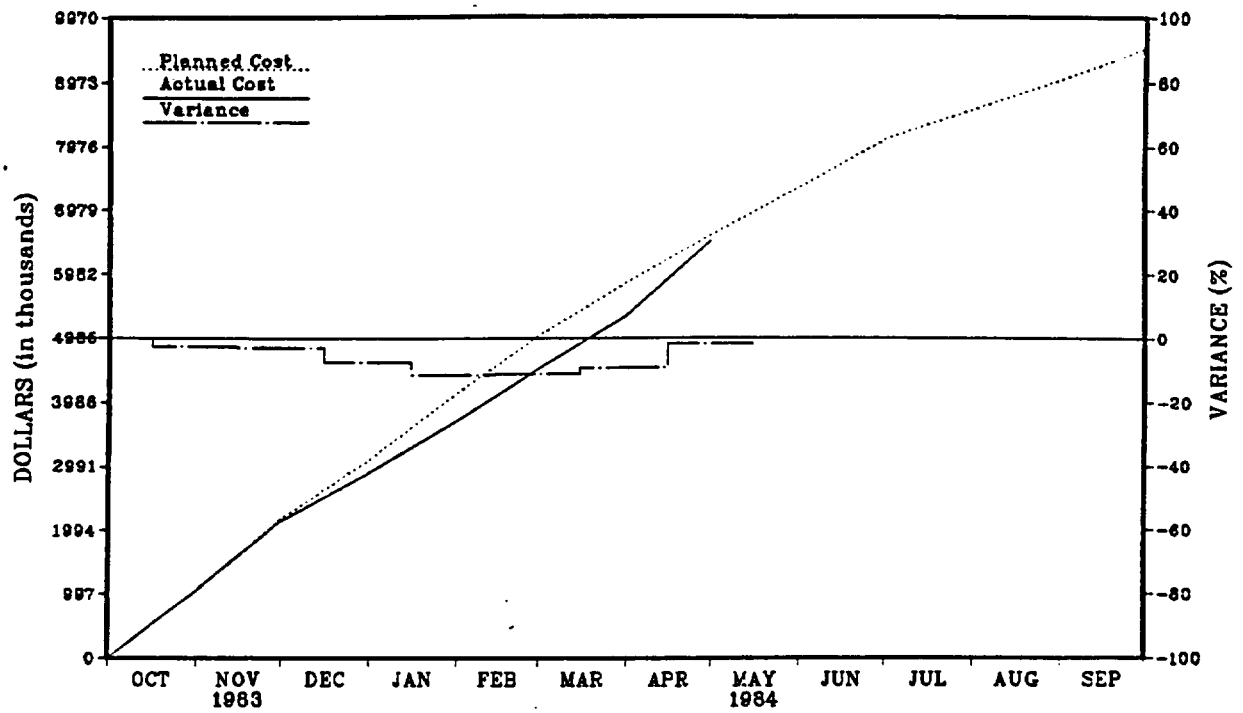
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	39.	76.	110.	150.	183.	233.	258.	298.	336.	379.	429.	470.
Cost (x1000)	9.	54.	98.	138.	181.	224.	265.	0.	0.	0.	0.	0.
Variance (x1000)	30.	22.	12.	12.	2.	9.	-7.	0.	0.	0.	0.	0.
% Variance	-77.	-29.	-11.	-8.	-1.	-4.	3.	0.	0.	0.	0.	0.

Reeco

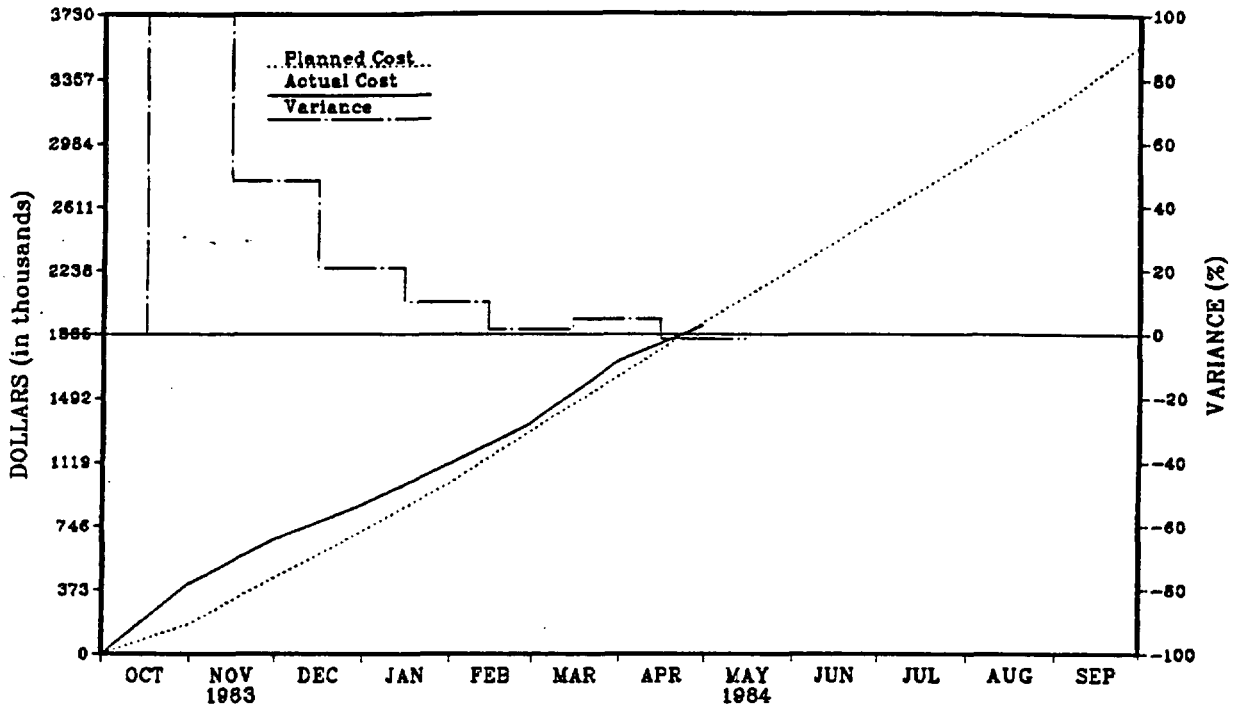
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	1042.	2182.	3094.	4156.	5043.	5871.	6605.	7346.	8091.	8557.	9023.	9498.
Cost (x1000)	1014.	2115.	2864.	3687.	4485.	5324.	6490.	0.	0.	0.	0.	0.
Variance (x1000)	28.	67.	230.	469.	558.	547.	115.	0.	0.	0.	0.	0.
% Variance	-3.	-3.	-7.	-11.	-11.	-9.	-2.	0.	0.	0.	0.	0.

Miscellaneous Contractors

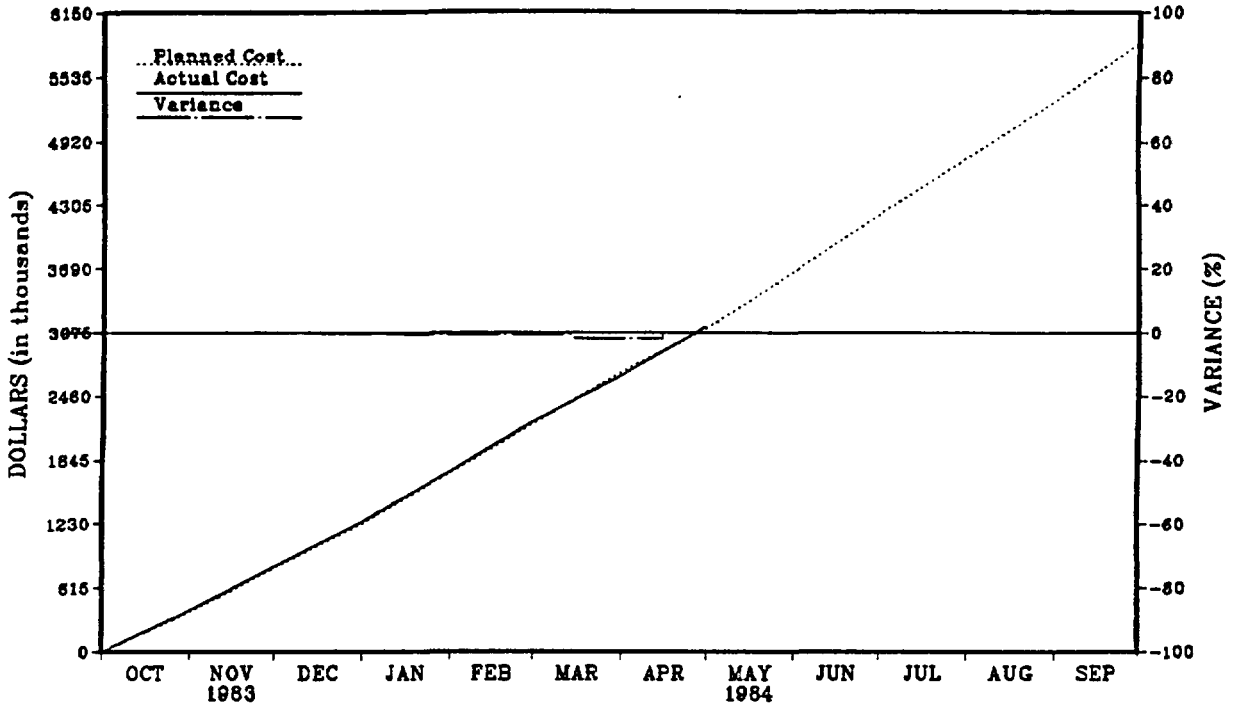
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	175.	448.	717.	1003.	1311.	1631.	1942.	2255.	2565.	2877.	3197.	3555.
Cost (x1000)	402.	665.	868.	1106.	1332.	1711.	1913.	0.	0.	0.	0.	0.
Variance (x1000)	-227.	-217.	-151.	-103.	-21.	-80.	29.	0.	0.	0.	0.	0.
% Variance	100.	48.	21.	10.	2.	5.	-1.	0.	0.	0.	0.	0.

Science Applications, Inc.

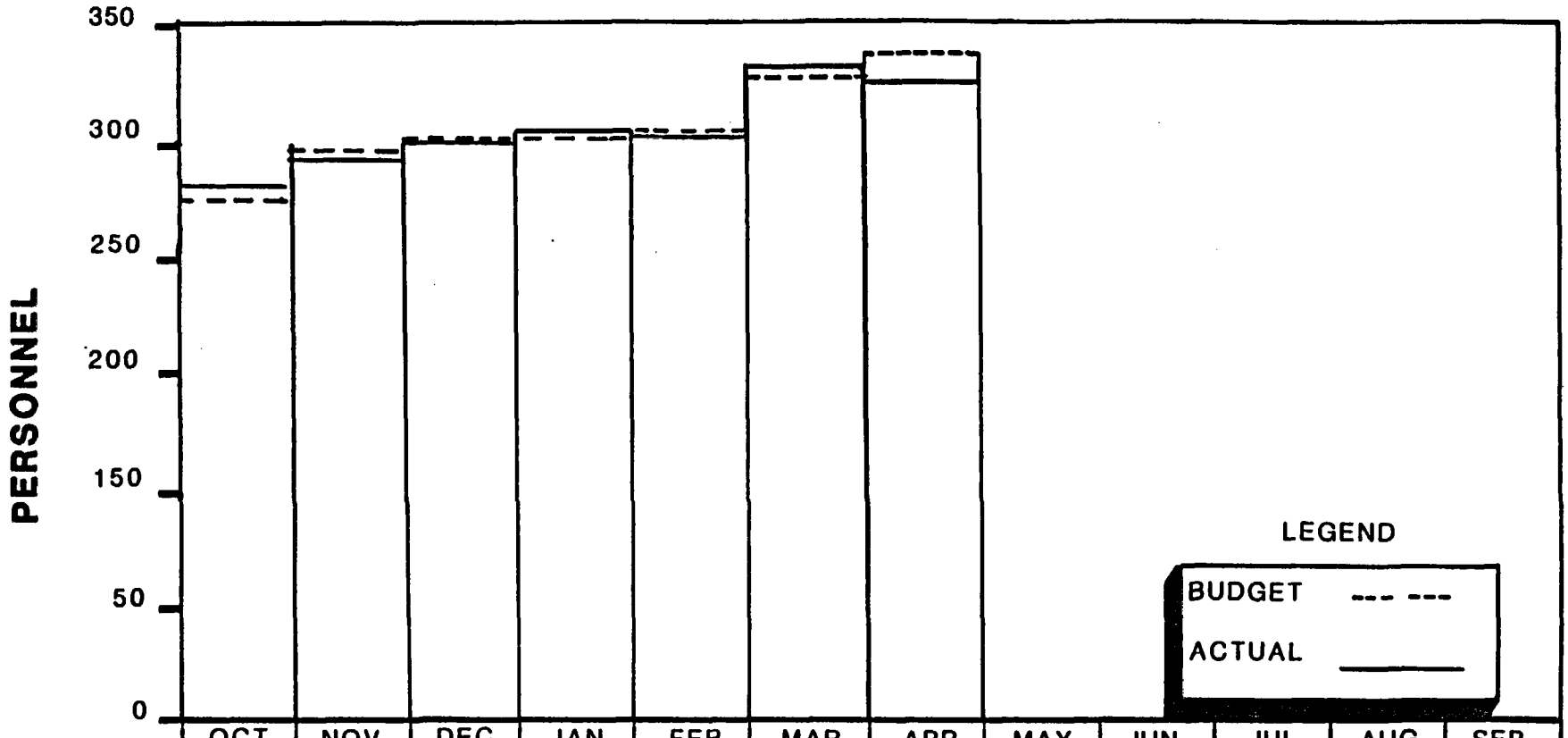
GOVERNMENT FISCAL YEAR 1984



Plan (x1000)	386.	811.	1234.	1727.	2204.	2701.	3126.	3673.	4219.	4766.	5310.	5861.
Cost (x1000)	386.	811.	1232.	1719.	2188.	2650.	3129.	0.	0.	0.	0.	0.
Variance (x1000)	0.	0.	2.	8.	16.	51.	-3.	0.	0.	0.	0.	0.
% Variance	0.	0.	0.	0.	-1.	-2.	0.	0.	0.	0.	0.	0.

NNWSI LEVEL I MILESTONES FY 1984

NNWSI NUMBER	WBS	RESP. AGENCY	MILESTONE DESCRIPTION	PLANNED COMPLETION DATE	ACTUAL COMPLETION DATE	REMARKS
M150	2112	SNL	PRELIMINARY PERFORMANCE ASSESSMENT FOR EA	01/15/84	01/15/84	
M151	2111	SNL	PRELIMINARY SYSTEM DESCRIPTION DOCUMENT	08/30/84		
M152	2111	SNL	USERS MANUAL FOR DATA BASE SYSTEM FOR PARTICIPANTS	08/30/84		
----	22	LLNL	SUMMARY LOGIC NETWORK FOR WP DESIGN AND DEVELOPMENT	01/16/84	01/16/84	
M250	2221	LLNL	ESTABLISH INTERIM PRODUCT SPECIFICATIONS	08/30/84		
M251	223	LLNL	PRE-CLOSURE ANALYSIS OF SELECTED CONCEPTUAL DESIGNS	09/28/84		
M352	2317	LANL	DRAFT RPT. ESTIMATING WATER FLOW & RN TRANS. ALONG FLOW PATH	02/02/84	02/02/84	
M353	2352	USGS	GROUNDWATER LEVEL DATA AND PRELIMINARY POTENTIOMETRIC-SURFACE MAPS, YUCCA MOUNTAIN AND VICINITY, NYE COUNTY, NV	06/29/84	04/30/84	
M354	2311	LANL	LETTER REPORT GROUNDWATER CHEMISTRY ALONG FLOW PATHS	08/30/84		
M356	2361	LANL	COMPLETE REPORT ON VOLCANIC HAZARDS ANALYSIS	09/28/84		
M355	232	LANL	PROGRESS RPT. ON 3-D MINERALOGIC MODEL OF YM	08/31/84		
M357.	2364	SNL	WEAPONS TEST SEISMIC REPORT	10/30/84		
----	24	SNL	SUBMIT SUMMARY LOGIC NETWORK FOR REPOSITORY	01/16/84	01/16/84	
M447	2431	SNL	SEAL DEVELOPMENT PLAN FOR REPOSITORY	05/30/84		
M592	252	SAI	DRAFT EA	02/29/84	02/29/84	
M523	25	WMPO	NNWSI REFERENCES FOR EA COMPLETE	08/01/84		
M521	254	SAI	DRAFT SCP TO HQ	08/15/84		
M660	2652	LANL	COMPLETE ESTP & SUBMIT TO HQ FOR FINAL REVIEW AND APPROVAL	08/31/84		
M701	271	LLNL	TERMINATION OF ROUTINE ACCESS AND LLNL TOUR SUPPORT TO SFT-C	09/30/84		
M706	271	LLNL	COMPLETE DECISION ANALYSIS ON USE OF CLIMAX FACILITY	OPEN (IN FY84)		



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BUDGET	276	291	292	299	301	329	332					
ACTUAL	278	286	291	301	300	332	323					
VARIANCE	(2)	5	1	(2)	1	(3)	9					

NNWSI PROJECT STAFFING

NNWSI Cost Variance Report
Actual Versus Planned Costs
U.S Geological Survey

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2331G REGIONAL GEOLOGY	P	7	13	20	26	33	39	46	52	59	66	73	80
	C	7	13	20	18	25	38	51	0	0	0	0	0
	V	0	0	0	8	8	1	-5	0	0	0	0	0
	%				31	24		11					
2332G SITE GEOLOGY	P	30	60	90	120	179	238	297	356	415	474	533	590
	C	30	58	88	193	236	293	345	0	0	0	0	0
	V	0	2	2	-73	-57	-55	-48	0	0	0	0	0
	%				61	32	23	16					
2333G REGIONAL GEOPHYSICS	P	50	100	150	200	250	334	417	500	583	665	747	829
	C	50	99	149	125	358	399	465	0	0	0	0	0
	V	0	1	1	75	-108	-65	-48	0	0	0	0	0
	%				38	43	19	12					
2334G SITE GEOPHYSICS	P	32	63	95	126	158	210	262	315	367	420	472	525
	C	32	62	94	176	227	267	310	0	0	0	0	0
	V	0	1	1	-50	-69	-57	-48	0	0	0	0	0
	%				40	44	27	18					
2335G REMOTE SENSING MAPPING	P	7	14	21	28	36	48	60	72	84	96	108	120
	C	7	14	21	12	53	59	72	0	0	0	0	0
	V	0	0	0	16	-17	-11	-12	0	0	0	0	0
	%				57	47	23	20					
2351G REGIONAL HYDROCHEMISTRY	P	12	24	36	48	60	80	100	120	140	160	180	200
	C	12	24	36	48	64	79	98	0	0	0	0	0
	V	0	0	0	0	-4	1	2	0	0	0	0	0
	%												
2352G GROUNDWATER FLOW ANAL.	P	28	56	84	112	153	198	243	289	334	379	424	470
	C	28	56	84	112	159	189	237	0	0	0	0	0
	V	0	0	0	0	-6	9	6	0	0	0	0	0
	%												
2353G SATURATED-ZONE HYDROLOGY	P	34	68	103	137	171	228	285	342	399	456	513	570
	C	34	67	103	139	220	236	303	0	0	0	0	0
	V	0	1	0	-2	-49	-8	-18	0	0	0	0	0
	%					29							
2354G UNSAT.-ZONE HYDROLOGY	P	49	98	147	197	247	329	411	493	575	657	739	825
	C	49	99	148	197	243	328	353	0	0	0	0	0
	V	0	-1	-1	0	4	1	58	0	0	0	0	0
	%							14					

NNWSI Cost Variance Report
Actual Versus Planned Costs
U.S Geological Survey (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2355G FUTURE HYDROLOGIC COND.	P	36	72	108	144	180	240	300	360	420	480	540	600
	C	36	72	108	144	64	184	251	0	0	0	0	0
	V	0	0	0	0	116	56	49	0	0	0	0	0
	%					64	23	16					
2356G GEOPHYSICS FOR HYDROLOGY	P	7	14	21	28	35	42	49	56	62	68	74	80
	C	7	14	20	26	26	36	50	0	0	0	0	0
	V	0	0	1	2	9	6	-1	0	0	0	0	0
	%					26	14						
2361G TECTONICS & VOLC.-USGS	P	65	130	194	257	320	381	455	525	595	665	735	805
	C	48	96	160	183	300	450	510	0	0	0	0	0
	V	17	34	34	74	20	-69	-55	0	0	0	0	0
	%	26	26	18	29		18	12					
2362G ROCK GEOCHRONOLOGY-USGS	P	12	25	37	50	62	75	87	100	112	125	137	150
	C	12	24	37	61	81	101	115	0	0	0	0	0
	V	0	1	0	-11	-19	-26	-28	0	0	0	0	0
	%				22	31	35	32					
2363G NATURAL SEISMICITY	P	42	84	126	171	216	271	326	381	436	491	546	600
	C	38	77	115	171	185	230	360	0	0	0	0	0
	V	4	7	11	0	31	41	-34	0	0	0	0	0
	%					14	15	10					
2382G DRILL, CONST, ENG-USGS	P	0	0	0	0	0	0	26	51	66	81	93	103
	C	0	0	0	0	0	10	26	0	0	0	0	0
	V	0	0	0	0	0	-10	0	0	0	0	0	0
	%												
251G REGULATORY INTERACT-USGS	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
252G ENVIRON ASSESS-USGS	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	10	15	19	0	0	0	0	0
	V	0	0	0	0	-10	-15	-19	0	0	0	0	0
	%												
254G SITE CHARACT PLAN-USGS	P	10	40	70	100	130	160	170	176	182	188	194	200
	C	15	29	39	49	80	69	98	0	0	0	0	0
	V	-5	11	31	51	50	91	72	0	0	0	0	0
	%	50	28	44	51	38	57	42					

NNWSI Cost Variance Report
Actual Versus Planned Costs
U.S Geological Survey (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2652G TEST PLAN-USGS	P	30	52	61	70	79	88	97	107	118	128	139	150
	C	12	24	33	42	34	23	58	0	0	0	0	0
	V	18	28	28	28	45	65	39	0	0	0	0	0
	%	60	54	46	40	57	74	40					
291G PROJECT MANAGE-USGS	P	20	40	60	80	100	120	140	160	180	200	220	240
	C	18	36	56	76	49	116	157	0	0	0	0	0
	V	2	4	4	4	51	4	-17	0	0	0	0	0
	%					51		12					
292G PROJECT CONTROL-USGS	P	46	92	138	184	230	276	322	368	414	460	506	550
	C	17	33	50	67	152	102	114	0	0	0	0	0
	V	29	59	88	117	78	174	208	0	0	0	0	0
	%	63	64	64	64	34	63	65					
293G INTERFACE ACT.-USGS	P	0	1	1	2	2	3	3	4	4	5	5	6
	C	0	1	2	2	2	3	14	0	0	0	0	0
	V	0	0	-1	0	0	0	-11	0	0	0	0	0
	%			100				367					
294G QUALITY ASSURANCE-USGS	P	5	10	15	20	25	30	35	40	45	50	55	60
	C	5	9	14	19	12	29	39	0	0	0	0	0
	V	0	1	1	1	13	1	-4	0	0	0	0	0
	%					52		11					
295G NWTS SUPPORT-USGS	P	2	4	6	8	10	12	14	16	18	20	22	24
	C	2	4	6	8	5	12	20	0	0	0	0	0
	V	0	0	0	0	5	0	-6	0	0	0	0	0
	%					50		43					
Total USGS	Plan	524	1060	1583	2108	2676	3402	4145	4883	5608	6334	7055	7777
Total USGS	Cost	459	911	1383	1868	2585	3268	4065	0	0	0	0	0
Total USGS	Variance	65	149	200	240	91	134	80	0	0	0	0	0
Total USGS	% Variance			13	11								

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		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2111S SYSTEMS DEFINITION	P	33	66	132	210	289	366	445	513	579	640	704	757
	C	21	38	87	143	214	281	326	0	0	0	0	0
	V	12	28	45	67	75	85	119	0	0	0	0	0
	%	36	42	34	32	26	23	27					
2112S SYSTEMS ANALYSIS	P	67	131	200	282	363	454	544	633	724	816	907	998
	C	14	79	202	246	320	402	455	0	0	0	0	0
	V	53	52	-2	36	43	52	89	0	0	0	0	0
	%	79	40		13	12	11	16					
2121S GEOSYSTEMS ANALYSIS	P	60	123	195	272	346	421	508	594	681	766	852	935
	C	36	90	145	219	285	340	372	0	0	0	0	0
	V	24	33	50	53	61	81	136	0	0	0	0	0
	%	40	27	26	19	18	19	27					
2122S ENGINEERED SYS. ANALYSIS	P	33	66	105	147	193	241	302	360	418	475	533	590
	C	20	37	68	96	167	191	246	0	0	0	0	0
	V	13	29	37	51	26	50	56	0	0	0	0	0
	%	39	44	35	35	13	21	19					
2123S COMPUTER CODE & ACQUIS.	P	27	56	92	132	171	210	247	287	324	362	402	444
	C	36	76	126	173	233	290	342	0	0	0	0	0
	V	-9	-20	-34	-41	-62	-80	-95	0	0	0	0	0
	%	33	36	37	31	36	38	38					
2364S WEAPONS-TEST SEISMICITY	P	49	98	146	193	225	264	304	344	385	440	495	550
	C	51	106	158	175	227	271	327	0	0	0	0	0
	V	-2	-8	-12	18	-2	-7	-23	0	0	0	0	0
	%												
239S SITE MONITORING	P	10	19	29	38	48	57	67	76	86	97	105	120
	C	0	0	0	5	11	19	28	0	0	0	0	0
	V	10	19	29	33	37	38	39	0	0	0	0	0
	%	100	100	100	87	77	67	58					
2411S SYSTEM ENGINEERING	P	57	114	171	228	285	342	399	456	514	572	630	691
	C	15	54	54	138	267	385	439	0	0	0	0	0
	V	42	60	117	90	18	-43	-40	0	0	0	0	0
	%	74	53	68	39		13	10					
2412S SURFACE FACILITIES	P	79	181	293	458	648	963	1369	1901	2310	2719	3136	3542
	C	130	303	386	533	712	1126	1559	0	0	0	0	0
	V	-51	-122	-93	-75	-64	-163	-190	0	0	0	0	0
	%	65	67	32	16		17	14					

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		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2413S UNDERGROUND FACILITIES	P	54	99	148	199	266	321	432	563	805	1041	1272	1503
	C	76	162	182	230	172	269	335	0	0	0	0	0
	V	-22	-63	-34	-31	94	52	97	0	0	0	0	0
	%	41	64	23	16	35	16	22					
2414S DESIGN ANALYSIS & SUPPOR	P	99	194	306	419	530	642	764	889	991	1113	1234	1370
	C	42	95	151	308	487	656	772	0	0	0	0	0
	V	57	99	155	111	43	-14	-8	0	0	0	0	0
	%	58	51	51	26								
2415S EQUIPMENT DEVELOPMENT	P	42	87	123	177	231	284	338	392	473	511	578	761
	C	27	55	131	206	234	312	351	0	0	0	0	0
	V	15	32	-8	-29	-3	-28	-13	0	0	0	0	0
	%	36	37		16								
2421S ROCK MASS ANALYSIS	P	40	101	161	229	301	376	451	528	602	680	754	834
	C	90	134	119	164	202	334	391	0	0	0	0	0
	V	-50	-33	42	65	99	42	60	0	0	0	0	0
	%	125	33	26	28	33	11	13					
2422S FIELD TESTING-SNL	P	98	201	301	429	563	694	819	946	1077	1208	1340	1472
	C	59	148	232	388	466	581	727	0	0	0	0	0
	V	39	53	69	41	97	113	92	0	0	0	0	0
	%	40	26	23		17	16	11					
2423S LAB PROPERTIES-SNL	P	52	108	162	228	292	357	422	488	553	619	684	744
	C	29	65	160	250	335	398	458	0	0	0	0	0
	V	23	43	2	-22	-43	-41	-36	0	0	0	0	0
	%	44	40			15	11						
2424S WATER MIGRATION ANALYSIS	P	30	60	92	133	176	223	264	305	344	383	420	453
	C	14	36	69	104	141	175	211	0	0	0	0	0
	V	16	24	23	29	35	48	53	0	0	0	0	0
	%	53	40	25	22	20	22	20					
2431S SEAL PERF. REQUIREMENTS	P	29	60	92	127	163	201	233	265	297	329	361	389
	C	14	51	80	117	146	177	200	0	0	0	0	0
	V	15	9	12	10	17	24	33	0	0	0	0	0
	%	52		13		10	12	14					
2432S MATERIALS EVAL-SNL	P	7	15	30	45	61	78	95	115	135	157	176	195
	C	0	0	27	28	43	71	92	0	0	0	0	0
	V	7	15	3	17	18	7	3	0	0	0	0	0
	%	100	100		38	30							

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2433S SEAL DESIGN & TESTING	P	0	0	0	0	0	0	20	62	111	183	268	366
	C	0	0	0	0	0	0	3	0	0	0	0	0
	V	0	0	0	0	0	0	17	0	0	0	0	0
	%							85					
251S REGULATORY INTERACT-SNL	P	0	0	0	4	14	21	28	35	42	49	50	50
	C	0	2	2	2	3	3	0	0	0	0	0	0
	V	0	-2	-2	2	11	18	28	0	0	0	0	0
	%				50	79	86	100					
252S ENVIRON ASSESS-SNL	P	26	54	79	88	88	88	88	88	88	88	88	88
	C	-2	89	167	202	217	236	268	0	0	0	0	0
	V	28	-35	-88	-114	-129	-148	-180	0	0	0	0	0
	%	108	65	111	130	147	168	205					
253S INSTIT. STUDIES-SNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	5	5	5	5	6	6	6	0	0	0	0	0
	V	-5	-5	-5	-5	-6	-6	-6	0	0	0	0	0
	%												
254S SITE CHARACT PLAN-SNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2652S TEST PLAN-SNL	P	8	16	25	34	43	52	61	70	79	87	95	100
	C	1	2	2	3	10	35	53	0	0	0	0	0
	V	7	14	23	31	33	17	8	0	0	0	0	0
	%	88	88	92	91	77	33	13					
291S PROJECT MANAGE-SNL	P	7	15	25	35	46	57	62	67	73	78	81	82
	C	47	52	57	62	57	95	104	0	0	0	0	0
	V	-40	-37	-32	-27	-11	-38	-42	0	0	0	0	0
	%	571	247	128	77	24	67	68					
292S PROJECT CONTROL-SNL	P	26	53	80	116	153	186	223	259	296	334	371	409
	C	52	91	129	159	212	281	346	0	0	0	0	0
	V	-26	-38	-49	-43	-59	-95	-123	0	0	0	0	0
	%	100	72	61	37	39	51	55					
293S INTERFACE ACT.-SNL	P	5	10	15	19	23	27	31	35	39	43	47	49
	C	1	1	2	2	5	5	5	0	0	0	0	0
	V	4	9	13	17	18	22	26	0	0	0	0	0
	%	80	90	87	89	78	81	84					

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294S QUALITY ASSURANCE-SNL	P	11	22	33	44	55	67	79	91	108	131	154	174
	C	9	18	26	36	46	56	67	0	0	0	0	0
	V	2	4	7	8	9	11	12	0	0	0	0	0
	%		18	21	18	16	16	15					
295S NWTS SUPPORT-SNL	P	11	22	33	44	56	68	80	92	104	116	128	134
	C	3	7	21	31	41	48	53	0	0	0	0	0
	V	8	15	12	13	15	20	27	0	0	0	0	0
	%	73	68	36	30	27	29	34					
Total SNL	Plan	960	1971	3068	4330	5629	7060	8675	10454	12238	14037	15865	17800
Total SNL	Cost	790	1796	2788	4025	5259	7043	8536	0	0	0	0	0
Total SNL	Variance	170	175	280	305	370	17	139	0	0	0	0	0
Total SNL	% Variance												

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221L PACKAGE ENVIRONMENT	P	56	122	183	253	328	422	527	617	708	799	890	980
	C	47	114	186	274	360	444	529	0	0	0	0	0
	V	9	8	-3	-21	-32	-22	-2	0	0	0	0	0
	%												
2221L WASTE FORM	P	123	260	387	524	665	797	755	875	1030	1185	1340	1490
	C	63	156	313	450	576	635	676	0	0	0	0	0
	V	60	104	74	74	89	162	79	0	0	0	0	0
	%	49	40	19	14	13	20	10					
2222L METALS	P	86	177	268	363	467	558	631	731	831	948	1065	1180
	C	77	150	214	315	456	540	652	0	0	0	0	0
	V	9	27	54	48	11	18	-21	0	0	0	0	0
	%		15	20	13								
2223L PACKING	P	17	35	56	77	101	129	156	170	185	200	220	340
	C	54	75	92	106	129	133	148	0	0	0	0	0
	V	-37	-40	-36	-29	-28	-4	8	0	0	0	0	0
	%	218	114	64	38	28							
223L OTHER MATERIAL DESIGN	P	34	68	102	136	170	204	251	287	323	357	391	425
	C	45	86	116	148	180	221	243	0	0	0	0	0
	V	-11	-18	-14	-12	-10	-17	8	0	0	0	0	0
	%	32	26	14									
224L PERFORM. ANALYSIS & TEST	P	36	72	111	156	201	246	322	378	432	487	544	600
	C	43	90	124	149	202	264	333	0	0	0	0	0
	V	-7	-18	-13	7	-1	-18	-11	0	0	0	0	0
	%		25	12									
2319L GEOCHEM MODELING-EQ3/6	P	24	48	72	97	122	147	186	221	257	293	329	365
	C	0	0	38	87	153	151	183	0	0	0	0	0
	V	24	48	34	10	-31	-4	3	0	0	0	0	0
	%	100	100	47	10	25							
2382L DRILL, CONST, ENG-LLNL	P	12	22	32	42	42	42	55	60	60	60	60	60
	C	12	19	30	39	46	50	56	0	0	0	0	0
	V	0	3	2	3	-4	-8	-1	0	0	0	0	0
	%						19						
252L ENVIRON ASSESS-LLNL	P	8	16	24	31	38	45	18	20	22	24	25	25
	C	0	8	9	14	15	16	11	0	0	0	0	0
	V	8	8	15	17	23	29	7	0	0	0	0	0
	%	100	50	63	55	61	64	39					

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254L SITE CHARACT PLAN-LLNL	P	2	4	6	11	16	21	0	13	28	48	68	93
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	2	4	6	11	16	21	0	0	0	0	0	0
	%	100	100	100	100	100	100						
2652L TEST PLAN-LLNL	P	7	14	21	27	33	39	36	43	51	59	67	75
	C	1	6	9	10	14	29	39	0	0	0	0	0
	V	6	8	12	17	19	10	-3	0	0	0	0	0
	%	86	57	57	63	58	26						
271L CLIMAX-LLNL	P	180	340	490	656	821	986	1172	1342	1507	1672	1837	2000
	C	154	362	514	701	846	1002	1149	0	0	0	0	0
	V	26	-22	-24	-45	-25	-16	23	0	0	0	0	0
	%												
291L PROJECT MANAGE-LLNL	P	23	46	69	92	115	138	154	178	202	226	250	275
	C	21	36	56	77	99	130	159	0	0	0	0	0
	V	2	10	13	15	16	8	-5	0	0	0	0	0
	%		22	19	16	14							
292L PROJECT CONTROL-LLNL	P	8	16	24	32	40	48	41	50	60	70	80	90
	C	3	9	13	21	28	32	33	0	0	0	0	0
	V	5	7	11	11	12	16	8	0	0	0	0	0
	%	63	44	46	34	30	33	20					
293L INTERFACE ACT.-LLNL	P	3	6	9	12	15	18	18	22	26	30	33	35
	C	9	10	10	9	12	14	14	0	0	0	0	0
	V	-6	-4	-1	3	3	4	4	0	0	0	0	0
	%	200	67	11	25	20	22	22					
294L QUALITY ASSURANCE-LLNL	P	19	38	57	76	95	114	121	142	163	184	207	230
	C	19	37	52	76	90	100	116	0	0	0	0	0
	V	0	1	5	0	5	14	5	0	0	0	0	0
	%						12						
295L NWTS SUPPORT-LLNL	P	3	6	9	12	15	18	20	23	26	29	32	35
	C	1	-1	9	14	18	17	20	0	0	0	0	0
	V	2	7	0	-2	-3	1	0	0	0	0	0	0
	%	67	117		17	20							
Total LLNL	Plan	641	1290	1920	2597	3284	3972	4463	5172	5911	6671	7438	8298
Total LLNL	Cost	549	1157	1785	2490	3224	3778	4361	0	0	0	0	0
Total LLNL	Variance	92	133	135	107	60	194	102	0	0	0	0	0
Total LLNL	% Variance												

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2311A GROUNDWATER CHEMISTRY	P	77	136	183	230	276	323	369	417	463	510	558	590
	C	77	136	194	232	278	324	361	0	0	0	0	0
	V	0	0	-11	-2	-2	-1	8	0	0	0	0	0
	%												
2312A NATURAL ISOTOPE CHEM.	P	7	13	20	27	34	41	48	55	62	69	76	165
	C	7	13	19	25	31	39	44	0	0	0	0	0
	V	0	0	1	2	3	2	4	0	0	0	0	0
	%												
2313A HYDROTHERMAL GEOCHEM.	P	5	31	47	63	78	94	109	125	140	156	172	185
	C	5	31	46	59	72	86	99	0	0	0	0	0
	V	0	0	1	4	6	8	10	0	0	0	0	0
	%												
2314A SOLUBILITY DETERMINATION	P	16	85	130	175	218	263	332	418	501	585	670	750
	C	16	85	129	180	257	309	373	0	0	0	0	0
	V	0	0	1	-5	-39	-46	-41	0	0	0	0	0
	%					18	17	12					
2315A SORPTION & PRECIPITATION	P	132	180	271	365	469	574	675	772	862	956	1053	1140
	C	132	180	266	397	472	568	666	0	0	0	0	0
	V	0	0	5	-32	-3	6	9	0	0	0	0	0
	%												
2316A DYNAMIC XPORT PROCESS	P	2	62	98	134	168	203	237	274	308	344	381	405
	C	2	62	95	123	151	183	212	0	0	0	0	0
	V	0	0	3	11	17	20	25	0	0	0	0	0
	%					10		11					
2317A RETARDATION SENS. ANAL.	P	20	82	128	176	222	270	316	408	509	608	709	800
	C	20	82	136	178	235	294	357	0	0	0	0	0
	V	0	0	-8	-2	-13	-24	-41	0	0	0	0	0
	%							13					
2318A APPLIED DIFFUSION	P	1	15	24	33	41	50	58	67	76	85	94	100
	C	1	15	23	30	38	46	54	0	0	0	0	0
	V	0	0	1	3	3	4	4	0	0	0	0	0
	%												
232A MINERALOGY & PETROLOGY	P	84	189	295	405	516	634	746	869	982	1102	1227	1350
	C	84	189	279	377	473	610	724	0	0	0	0	0
	V	0	0	16	28	43	24	22	0	0	0	0	0
	%												

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2361A TECTONICS & VOLC.-LANL	P	1	31	45	59	73	87	101	115	128	142	156	160
	C	1	31	44	55	65	78	89	0	0	0	0	0
	V	0	0	1	4	8	9	12	0	0	0	0	0
	%					11	10	12					
2362A ROCK GEOCHRONOLOGY-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2381A CORE LIBRARY-LANL	P	4	15	24	32	40	48	56	65	73	81	90	95
	C	4	15	22	27	33	41	49	0	0	0	0	0
	V	0	0	2	5	7	7	7	0	0	0	0	0
	%				16	18	15	13					
2423A LAB PROPERTIES-LANL	P	0	0	0	43	48	53	59	64	69	74	79	85
	C	0	0	0	43	52	58	63	0	0	0	0	0
	V	0	0	0	0	-4	-5	-4	0	0	0	0	0
	%												
2432A MATERIALS EVAL-LANL	P	0	0	0	24	28	32	63	94	126	157	188	220
	C	0	0	0	24	28	32	48	0	0	0	0	0
	V	0	0	0	0	0	0	15	0	0	0	0	0
	%							24					
254A SITE CHARACT PLAN-LANL	P	11	30	42	58	76	95	114	133	151	169	187	200
	C	11	30	45	61	78	98	116	0	0	0	0	0
	V	0	0	-3	-3	-2	-3	-2	0	0	0	0	0
	%												
263A EVALUATION & TEST-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2651A TECHNICAL DIRECTION	P	59	124	198	277	350	425	490	551	605	661	719	775
	C	59	124	193	255	317	368	453	0	0	0	0	0
	V	0	0	5	22	33	57	37	0	0	0	0	0
	%						13						
2652A TEST PLAN-LANL	P	57	90	129	168	205	244	281	321	358	397	437	475
	C	57	90	128	166	206	284	321	0	0	0	0	0
	V	0	0	1	2	-1	-40	-40	0	0	0	0	0
	%						16	14					

NNWSI Cost Variance Report
Actual Versus Planned Costs
Los Alamos National Laboratory (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2653A SAFETY & QA-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
266A INTEGRATED DATA SYSTEM	P	33	65	89	122	154	187	219	253	285	316	339	360
	C	33	65	84	121	152	190	220	0	0	0	0	0
	V	0	0	5	1	2	-3	-1	0	0	0	0	0
	%												
291A PROJECT MANAGE-LANL	P	22	62	93	125	155	187	217	270	320	371	423	475
	C	22	62	93	127	161	203	238	0	0	0	0	0
	V	0	0	0	-2	-6	-16	-21	0	0	0	0	0
	%												
294A QUALITY ASSURANCE-LANL	P	37	88	155	222	286	353	417	486	550	617	687	760
	C	37	88	148	223	303	368	436	0	0	0	0	0
	V	0	0	7	-1	-17	-15	-19	0	0	0	0	0
	%												
Total LANL	Plan	568	1298	1971	2738	3437	4163	4907	5757	6568	7400	8245	9090
Total LANL	Cost	568	1298	1944	2703	3402	4179	4923	0	0	0	0	0
Total LANL	Variance	0	0	27	35	35	-16	-16	0	0	0	0	0
Total LANL	% Variance												

NNWSI Cost Variance Report
Actual Versus Planned Costs
REECO

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2381R CORE LIBRARY-REECO	P	14	29	43	58	72	87	101	116	130	145	160	175
	C	14	27	39	50	61	73	84	0	0	0	0	0
	V	0	2	4	8	11	14	17	0	0	0	0	0
	%				14	15	16	17					
2382R DRILL, CONST, ENG-REECO	P	812	1709	2409	3109	3748	4348	4948	5548	6148	6448	6748	7048
	C	812	1709	2260	2767	3310	3915	4831	0	0	0	0	0
	V	0	0	149	342	438	433	117	0	0	0	0	0
	%				11	12							
2422R FIELD TESTING-REECO	P	26	53	72	108	152	182	212	247	287	337	387	446
	C	28	54	84	101	133	165	192	0	0	0	0	0
	V	-2	-1	-12	7	19	17	20	0	0	0	0	0
	%			17		13							
2642R PROJECT OPERATIONS	P	10	20	30	140	150	160	170	180	190	210	230	250
	C	-2	1	9	113	125	128	147	0	0	0	0	0
	V	12	19	21	27	25	32	23	0	0	0	0	0
	%	120	95	70	19	17	20	14					
271R CLIMAX-REECO	P	100	210	298	418	518	609	609	609	609	609	609	609
	C	84	182	256	323	407	507	591	0	0	0	0	0
	V	16	28	42	95	111	102	18	0	0	0	0	0
	%			14	23	21	17						
272R E-MAD-REECO	P	64	129	193	258	322	387	451	516	580	645	710	775
	C	74	134	204	319	432	518	625	0	0	0	0	0
	V	-10	-5	-11	-61	-110	-131	-174	0	0	0	0	0
	%				24	34	34	39					
291R PROJECT MANAGE-REECO	P	3	6	9	12	15	18	21	24	27	30	33	35
	C	4	8	12	14	17	18	20	0	0	0	0	0
	V	-1	-2	-3	-2	-2	0	1	0	0	0	0	0
	%	33	33	33	17	13							
294R QUALITY ASSURANCE-REECO	P	13	26	40	53	66	80	93	106	120	133	146	160
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	13	26	40	53	66	80	93	0	0	0	0	0
	%	100	100	100	100	100	100	100					
Total REECO	Plan	1042	2182	3094	4156	5043	5871	6605	7346	8091	8557	9023	9498
Total REECO	Cost	1014	2115	2864	3687	4485	5324	6490	0	0	0	0	0
Total REECO	Variance	28	67	230	469	558	547	115	0	0	0	0	0
Total REECO	% Variance				11	11							

NNWSI Cost Variance Report
Actual Versus Planned Costs
Holmes & Narver

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2382H DRILL, CONST, ENG-H&N	P	9	17	25	34	42	50	50	50	50	50	50	50
	C	27	58	76	87	105	119	135	0	0	0	0	0
	V	-18	-41	-51	-53	-63	-69	-85	0	0	0	0	0
	%	200	241	204	156	150	138	170					
2422H FIELD TESTING-H&N	P	0	0	0	0	0	12	12	12	12	12	20	20
	C	1	1	5	12	17	23	24	0	0	0	0	0
	V	-1	-1	-5	-12	-17	-11	-12	0	0	0	0	0
	%						92	100					
251H REGULATORY INTERACT-H&N	P	10	20	30	40	50	60	70	82	94	106	118	130
	C	-28	-19	-5	4	8	17	19	0	0	0	0	0
	V	38	39	35	36	42	43	51	0	0	0	0	0
	%	380	195	117	90	84	72	73					
263H EVALUATION & TEST-H&N	P	8	16	24	32	40	48	56	76	96	119	142	165
	C	5	8	12	21	34	44	63	0	0	0	0	0
	V	3	8	12	11	6	4	-7	0	0	0	0	0
	%	38	50	50	34	15		13					
271H CLIMAX-H&N	P	5	8	10	15	15	20	20	20	20	20	20	20
	C	0	0	0	0	0	1	1	0	0	0	0	0
	V	5	8	10	15	15	19	19	0	0	0	0	0
	%	100	100	100	100	100	95	95					
272H E-MAD-H&N	P	0	1	1	2	2	3	3	4	4	5	5	5
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	1	1	2	2	3	3	0	0	0	0	0
	%		100	100	100	100	100	100					
294H QUALITY ASSURANCE-H&N	P	7	14	20	27	34	40	47	54	60	67	74	80
	C	4	6	10	14	17	20	23	0	0	0	0	0
	V	3	8	10	13	17	20	24	0	0	0	0	0
	%	43	57	50	48	50	50	51					
Total H&N	Plan	39	76	110	150	183	233	258	298	336	379	429	470
Total H&N	Cost	9	54	98	138	181	224	265	0	0	0	0	0
Total H&N	Variance	30	22	12	12	2	9	-7	0	0	0	0	0
Total H&N	% Variance	77	29	11									

NNWSI Cost Variance Report
Actual Versus Planned Costs
Fenix & Scisson, Inc.

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2382F DRILL, CONST, ENG-F&S	P	39	77	115	154	174	194	204	214	218	222	226	230
	C	41	74	102	143	178	218	268	0	0	0	0	0
	V	-2	3	13	11	-4	-24	-64	0	0	0	0	0
	%			11			12	31					
2383F FIELD GEOLOGY\HYDROLOGY	P	54	108	162	216	270	324	378	432	486	540	595	650
	C	45	87	124	172	223	279	344	0	0	0	0	0
	V	9	21	38	44	47	45	34	0	0	0	0	0
	%		19	23	20	17	14						
2422F FIELD TESTING-F&S	P	0	0	0	5	5	5	10	10	10	15	20	25
	C	0	0	0	0	1	1	2	0	0	0	0	0
	V	0	0	0	5	4	4	8	0	0	0	0	0
	%				100	80	80	80					
263F EVALUATION & TEST-F&S	P	12	24	35	47	59	70	82	94	105	117	129	140
	C	12	26	34	42	57	68	82	0	0	0	0	0
	V	0	-2	1	5	2	2	0	0	0	0	0	0
	%				11								
271F CLIMAX-F&S	P	10	20	28	36	40	43	43	43	43	43	43	43
	C	12	20	25	37	45	55	61	0	0	0	0	0
	V	-2	0	3	-1	-5	-12	-18	0	0	0	0	0
	%			11		13	28	42					
294F QUALITY ASSURANCE-F&S	P	7	14	20	27	34	40	47	54	60	67	74	80
	C	6	11	16	27	32	41	52	0	0	0	0	0
	V	1	3	4	0	2	-1	-5	0	0	0	0	0
	%		21	20				11					
Total F&S	Plan	122	243	360	485	582	676	764	847	922	1004	1087	1168
Total F&S	Cost	116	218	301	421	536	662	809	0	0	0	0	0
Total F&S	Variance	6	25	59	64	46	14	-45	0	0	0	0	0
Total F&S	% Variance			16	13								

NNWSI Cost Variance Report
Actual Versus Planned Costs
Miscellaneous Contractors

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2352B GROUNDWATER FLOW ANAL.	P	0	0	0	0	39	78	117	156	195	234	273	350
	C	0	0	0	0	0	137	63	0	0	0	0	0
	V	0	0	0	0	39	-59	54	0	0	0	0	0
	%					100	76	46					
2384P SITE PHOTOGRAPHY(PAN AM)	P	1	1	1	23	23	25	25	27	27	29	29	30
	C	1	1	1	23	23	24	25	0	0	0	0	0
	V	0	0	0	0	0	1	0	0	0	0	0	0
	%												
239U ENVIR CHARACT-DRI\UNR	P	4	9	19	29	44	59	79	99	119	139	159	179
	C	0	2	9	19	29	35	51	0	0	0	0	0
	V	4	7	10	10	15	24	28	0	0	0	0	0
	%	100	78	53	34	34	41	35					
239N ENVIR CHARACT-ST OF NV	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	-2	-2	-2	-2	-2	-2	0	0	0	0	0
	V	0	2	2	2	2	2	2	0	0	0	0	0
	%												
239E ENVIR CHARACT-EG&G	P	6	12	16	20	24	28	32	36	40	44	48	50
	C	6	12	14	16	16	19	22	0	0	0	0	0
	V	0	0	2	4	8	9	10	0	0	0	0	0
	%			13	20	33	32	31					
272W E-MAD-WESTINGHOUSE	P	147	392	631	864	1097	1341	1572	1803	2034	2264	2504	2746
	C	381	625	804	993	1202	1420	1663	0	0	0	0	0
	V	-234	-233	-173	-129	-105	-79	-91	0	0	0	0	0
	%	159	59	27	15								
291I PROJECT MANAGE-WSI	P	17	34	50	67	84	100	117	134	150	167	184	200
	C	14	27	42	57	64	78	91	0	0	0	0	0
	V	3	7	8	10	20	22	26	0	0	0	0	0
	%		21	16	15	24	22	22					
Total MISC	Plan	175	448	717	1003	1311	1631	1942	2255	2565	2877	3197	3555
Total MISC	Cost	402	665	868	1106	1332	1711	1913	0	0	0	0	0
Total MISC	Variance	-227	-217	-151	-103	-21	-80	29	0	0	0	0	0
Total MISC	% Variance	130	48	21	10								

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
239T CLIMATIC MONITORING	P	0	0	0	0	0	0	10	42	74	106	138	170
	C	0	0	0	0	0	0	8	0	0	0	0	0
	V	0	0	0	0	0	0	2	0	0	0	0	0
	%							20					
251T REGULATORY INTERACT-SAI	P	45	120	201	301	376	451	397	397	397	397	397	397
	C	45	120	201	301	432	505	566	0	0	0	0	0
	V	0	0	0	0	-56	-54	-169	0	0	0	0	0
	%					15	12	43					
252T ENVIRON ASSESS-SAI	P	84	163	256	331	415	499	495	572	649	726	803	880
	C	84	163	256	331	350	418	496	0	0	0	0	0
	V	0	0	0	0	65	81	-1	0	0	0	0	0
	%					16	16						
253T INSTITUT. STUDIES-SAI	P	0	0	0	0	0	0	92	122	152	182	212	242
	C	0	0	0	0	0	0	89	0	0	0	0	0
	V	0	0	0	0	0	0	3	0	0	0	0	0
	%												
254T SITE CHARACT PLAN-SAI	P	0	0	0	0	0	0	68	136	205	273	341	410
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	68	0	0	0	0	0
	%							100					
2652T TEST PLAN-SAI	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
291T PROJECT MANAGE-SAI	P	137	273	379	519	659	819	936	1072	1209	1345	1481	1618
	C	137	273	379	512	633	800	903	0	0	0	0	0
	V	0	0	0	7	26	19	33	0	0	0	0	0
	%												
292T PROJECT CONTROL-SAI	P	84	179	285	410	535	660	845	1004	1162	1321	1479	1638
	C	84	179	284	412	574	687	798	0	0	0	0	0
	V	0	0	1	-2	-39	-27	47	0	0	0	0	0
	%												
293T INTERFACE ACT.-SAI	P	0	0	3	6	9	12	25	29	32	36	39	43
	C	0	0	2	8	17	22	23	0	0	0	0	0
	V	0	0	1	-2	-8	-10	2	0	0	0	0	0
	%			33	33	89	83						

NNWSI Cost Variance Report
Actual Versus Planned Costs
Science Applications, Inc. (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
294T QUALITY ASSURANCE-SAI	P	36	76	110	160	210	260	258	299	339	380	420	463
	C	36	76	110	155	182	218	246	0	0	0	0	0
	V	0	0	0	5	28	42	12	0	0	0	0	0
	%					13	16						
295T NWTS SUPPORT-SAI	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
Total SAI	Plan	386	811	1234	1727	2204	2701	3126	3673	4219	4766	5310	5861
Total SAI	Cost	386	811	1232	1719	2188	2650	3129	0	0	0	0	0
Total SAI	Variance	0	0	2	8	16	51	-3	0	0	0	0	0
Total SAI	% Variance												

NNWSI Cost Variance Report
Actual Versus Planned Costs
Consolidated by WBS Element

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2 NNWSI	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
21 SYSTEMS	P	220	442	724	1043	1362	1692	2046	2387	2726	3059	3398	3724
	C	127	320	628	877	1219	1504	1741	0	0	0	0	0
	V	93	122	96	166	143	188	305	0	0	0	0	0
	%	42	28	13	16	10	11	15					
211 SYSTEMS DEFIN. & PERF.	P	100	197	332	492	652	820	989	1146	1303	1456	1611	1755
	C	35	117	289	389	534	683	781	0	0	0	0	0
	V	65	80	43	103	118	137	208	0	0	0	0	0
	%	65	41	13	21	18	17	21					
2111S SYSTEMS DEFINITION	P	33	66	132	210	289	366	445	513	579	640	704	757
	C	21	38	87	143	214	281	326	0	0	0	0	0
	V	12	28	45	67	75	85	119	0	0	0	0	0
	%	36	42	34	32	26	23	27					
2112S SYSTEMS ANALYSIS	P	67	131	200	282	363	454	544	633	724	816	907	998
	C	14	79	202	246	320	402	455	0	0	0	0	0
	V	53	52	-2	36	43	52	89	0	0	0	0	0
	%	79	40		13	12	11	16					
212 SUBSYSTEMS ANALYSIS	P	120	245	392	551	710	872	1057	1241	1423	1603	1787	1969
	C	92	203	339	488	685	821	960	0	0	0	0	0
	V	28	42	53	63	25	51	97	0	0	0	0	0
	%		17	14	11								
2121S GEOSYSTEMS ANALYSIS	P	60	123	195	272	346	421	508	594	681	766	852	935
	C	36	90	145	219	285	340	372	0	0	0	0	0
	V	24	33	50	53	61	81	136	0	0	0	0	0
	%	40	27	26	19	18	19	27					
2122S ENGINEERED SYS. ANALYSIS	P	33	66	105	147	193	241	302	360	418	475	533	590
	C	20	37	68	96	167	191	246	0	0	0	0	0
	V	13	29	37	51	26	50	56	0	0	0	0	0
	%	39	44	35	35	13	21	19					
2123S COMPUTER CODE & ACQUIS.	P	27	56	92	132	171	210	247	287	324	362	402	444
	C	36	76	126	173	233	290	342	0	0	0	0	0
	V	-9	-20	-34	-41	-62	-80	-95	0	0	0	0	0
	%	33	36	37	31	36	38	38					

Actual Versus Planned Costs
Consolidated by WBS Element (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
22 WASTE PACKAGE	P	352	734	1107	1509	1932	2356	2642	3058	3509	3976	4450	5015
	C	329	671	1045	1442	1903	2237	2581	0	0	0	0	0
	V	23	63	62	67	29	119	61	0	0	0	0	0
	%												
221L PACKAGE ENVIRONMENT	P	56	122	183	253	328	422	527	617	708	799	890	980
	C	47	114	186	274	360	444	529	0	0	0	0	0
	V	9	8	-3	-21	-32	-22	-2	0	0	0	0	0
	%												
222 MATERIAL DEV. & TEST	P	226	472	711	964	1233	1484	1542	1776	2046	2333	2625	3010
	C	194	381	619	871	1161	1308	1476	0	0	0	0	0
	V	32	91	92	93	72	176	66	0	0	0	0	0
	%		19	13			12						
2222L METALS	P	86	177	268	363	467	558	631	731	831	948	1065	1180
	C	77	150	214	315	456	540	652	0	0	0	0	0
	V	9	27	54	48	11	18	-21	0	0	0	0	0
	%		15	20	13								
2221L WASTE FORM	P	123	260	387	524	665	797	755	875	1030	1185	1340	1490
	C	63	156	313	450	576	635	676	0	0	0	0	0
	V	60	104	74	74	89	162	79	0	0	0	0	0
	%	49	40	19	14	13	20	10					
2223L PACKING	P	17	35	56	77	101	129	156	170	185	200	220	340
	C	54	75	92	106	129	133	148	0	0	0	0	0
	V	-37	-40	-36	-29	-28	-4	8	0	0	0	0	0
	%	218	114	64	38	28							
2319L GEOCHEM MODELING-EQ3/6	P	24	48	72	97	122	147	186	221	257	293	329	365
	C	0	0	38	87	153	151	183	0	0	0	0	0
	V	24	48	34	10	-31	-4	3	0	0	0	0	0
	%	100	100	47	10	25							
223L OTHER MATERIAL DESIGN	P	34	68	102	136	170	204	251	287	323	357	391	425
	C	45	86	116	148	180	221	243	0	0	0	0	0
	V	-11	-18	-14	-12	-10	-17	8	0	0	0	0	0
	%	32	26	14									
224L PERFORM. ANALYSIS & TEST	P	36	72	111	156	201	246	322	378	432	487	544	600
	C	43	90	124	149	202	264	333	0	0	0	0	0
	V	-7	-18	-13	7	-1	-18	-11	0	0	0	0	0
	%		25	12									

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
23 SITE	P	1794	3809	5566	7356	9108	11003	12967	15018	17026	18768	20515	22314
	C	1748	3707	5285	6869	8726	10785	12997	0	0	0	0	0
	V	46	102	281	487	382	218	-30	0	0	0	0	0
	%												
231 GEOCHEMISTRY	P	260	604	901	1203	1506	1818	2144	2536	2921	3313	3713	4135
	C	260	604	908	1224	1534	1849	2166	0	0	0	0	0
	V	0	0	-7	-21	-28	-31	-22	0	0	0	0	0
	%												
2311A GROUNDWATER CHEMISTRY	P	77	136	183	230	276	323	369	417	463	510	558	590
	C	77	136	194	232	278	324	361	0	0	0	0	0
	V	0	0	-11	-2	-2	-1	8	0	0	0	0	0
	%												
2312A NATURAL ISOTOPE CHEM.	P	7	13	20	27	34	41	48	55	62	69	76	165
	C	7	13	19	25	31	39	44	0	0	0	0	0
	V	0	0	1	2	3	2	4	0	0	0	0	0
	%												
2313A HYDROTHERMAL GEOCHEM.	P	5	31	47	63	78	94	109	125	140	156	172	185
	C	5	31	46	59	72	86	99	0	0	0	0	0
	V	0	0	1	4	6	8	10	0	0	0	0	0
	%												
2314A SOLUBILITY DETERMINATION	P	16	85	130	175	218	263	332	418	501	585	670	750
	C	16	85	129	180	257	309	373	0	0	0	0	0
	V	0	0	1	-5	-39	-46	-41	0	0	0	0	0
	%					18	17	12					
2315A SORPTION & PRECIPITATION	P	132	180	271	365	469	574	675	772	862	956	1053	1140
	C	132	180	266	397	472	568	666	0	0	0	0	0
	V	0	0	5	-32	-3	6	9	0	0	0	0	0
	%												
2316A DYNAMIC XPORT PROCESS	P	2	62	98	134	168	203	237	274	308	344	381	405
	C	2	62	95	123	151	183	212	0	0	0	0	0
	V	0	0	3	11	17	20	25	0	0	0	0	0
	%					10		11					
2317A RETARDATION SENS. ANAL.	P	20	82	128	176	222	270	316	408	509	608	709	800
	C	20	82	136	178	235	294	357	0	0	0	0	0
	V	0	0	-8	-2	-13	-24	-41	0	0	0	0	0
	%							13					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2318A APPLIED DIFFUSION	P	1	15	24	33	41	50	58	67	76	85	94	100
	C	1	15	23	30	38	46	54	0	0	0	0	0
	V	0	0	1	3	3	4	4	0	0	0	0	0
	%												
232A MINERALOGY & PETROLOGY	P	84	189	295	405	516	634	746	869	982	1102	1227	1350
	C	84	189	279	377	473	610	724	0	0	0	0	0
	V	0	0	16	28	43	24	22	0	0	0	0	0
	%												
233 GEOLOGY	P	126	250	376	500	656	869	1082	1295	1508	1721	1933	2144
	C	126	246	372	524	899	1056	1243	0	0	0	0	0
	V	0	4	4	-24	-243	-187	-161	0	0	0	0	0
	%					37	22	15					
2331G REGIONAL GEOLOGY	P	7	13	20	26	33	39	46	52	59	66	73	80
	C	7	13	20	18	25	38	51	0	0	0	0	0
	V	0	0	0	8	8	1	-5	0	0	0	0	0
	%				31	24		11					
2332G SITE GEOLOGY	P	30	60	90	120	179	238	297	356	415	474	533	590
	C	30	58	88	193	236	293	345	0	0	0	0	0
	V	0	2	2	-73	-57	-55	-48	0	0	0	0	0
	%				61	32	23	16					
2333G REGIONAL GEOPHYSICS	P	50	100	150	200	250	334	417	500	583	665	747	829
	C	50	99	149	125	358	399	465	0	0	0	0	0
	V	0	1	1	75	-108	-65	-48	0	0	0	0	0
	%				38	43	19	12					
2334G SITE GEOPHYSICS	P	32	63	95	126	158	210	262	315	367	420	472	525
	C	32	62	94	176	227	267	310	0	0	0	0	0
	V	0	1	1	-50	-69	-57	-48	0	0	0	0	0
	%				40	44	27	18					
2335G REMOTE SENSING MAPPING	P	7	14	21	28	36	48	60	72	84	96	108	120
	C	7	14	21	12	53	59	72	0	0	0	0	0
	V	0	0	0	16	-17	-11	-12	0	0	0	0	0
	%				57	47	23	20					
235 HYDROLOGY	P	166	332	499	666	885	1195	1505	1816	2125	2434	2743	3095
	C	166	332	499	666	776	1189	1355	0	0	0	0	0
	V	0	0	0	0	109	6	150	0	0	0	0	0
	%					12							

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2351G REGIONAL HYDROCHEMISTRY	P	12	24	36	48	60	80	100	120	140	160	180	200
	C	12	24	36	48	64	79	98	0	0	0	0	0
	V	0	0	0	0	-4	1	2	0	0	0	0	0
	%												
2352G GROUNDWATER FLOW ANAL.	P	28	56	84	112	153	198	243	289	334	379	424	470
	C	28	56	84	112	159	189	237	0	0	0	0	0
	V	0	0	0	0	-6	9	6	0	0	0	0	0
	%												
2353G SATURATED-ZONE HYDROLOGY	P	34	68	103	137	171	228	285	342	399	456	513	570
	C	34	67	103	139	220	236	303	0	0	0	0	0
	V	0	1	0	-2	-49	-8	-18	0	0	0	0	0
	%					29							
2354G UNSAT.-ZONE HYDROLOGY	P	49	98	147	197	247	329	411	493	575	657	739	825
	C	49	99	148	197	243	328	353	0	0	0	0	0
	V	0	-1	-1	0	4	1	58	0	0	0	0	0
	%							14					
2355G FUTURE HYDROLOGIC COND.	P	36	72	108	144	180	240	300	360	420	480	540	600
	C	36	72	108	144	64	184	251	0	0	0	0	0
	V	0	0	0	0	116	56	49	0	0	0	0	0
	%					64	23	16					
2356G GEOPHYSICS FOR HYDROLOGY	P	7	14	21	28	35	42	49	56	62	68	74	80
	C	7	14	20	26	26	36	50	0	0	0	0	0
	V	0	0	1	2	9	6	-1	0	0	0	0	0
	%					26	14						
236 SITE STABILITY	P	169	368	548	730	896	1078	1273	1465	1656	1863	2069	2265
	C	150	334	514	645	858	1130	1401	0	0	0	0	0
	V	19	34	34	85	38	-52	-128	0	0	0	0	0
	%				12			10					
2361 TECTONCIS AND VOLCANISM	P	66	161	239	316	393	468	556	640	723	807	891	965
	C	49	127	204	238	365	528	599	0	0	0	0	0
	V	17	34	35	78	28	-60	-43	0	0	0	0	0
	%	26	21	15	25		13						
2361A TECTONICS & VOLC.-LANL	P	1	31	45	59	73	87	101	115	128	142	156	160
	C	1	31	44	55	65	78	89	0	0	0	0	0
	V	0	0	1	4	8	9	12	0	0	0	0	0
	%					11	10	12					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2361G TECTONICS & VOLC.-USGS	P	65	130	194	257	320	381	455	525	595	665	735	805
	C	48	96	160	183	300	450	510	0	0	0	0	0
	V	17	34	34	74	20	-69	-55	0	0	0	0	0
	%	26	26	18	29		18	12					
2362 ROCK GEOCHRONOLOGY	P	12	25	37	50	62	75	87	100	112	125	137	150
	C	12	24	37	61	81	101	115	0	0	0	0	0
	V	0	1	0	-11	-19	-26	-28	0	0	0	0	0
	%				22	31	35	32					
2362A ROCK GEOCHRONOLOGY-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2362G ROCK GEOCHRONOLOGY-USGS	P	12	25	37	50	62	75	87	100	112	125	137	150
	C	12	24	37	61	81	101	115	0	0	0	0	0
	V	0	1	0	-11	-19	-26	-28	0	0	0	0	0
	%				22	31	35	32					
2363G NATURAL SEISMICITY	P	42	84	126	171	216	271	326	381	436	491	546	600
	C	38	77	115	171	185	230	360	0	0	0	0	0
	V	4	7	11	0	31	41	-34	0	0	0	0	0
	%					14	15	10					
2364S WEAPONS-TEST SEISMICITY	P	49	98	146	193	225	264	304	344	385	440	495	550
	C	51	106	158	175	227	271	327	0	0	0	0	0
	V	-2	-8	-12	18	-2	-7	-23	0	0	0	0	0
	%												
238 FIELD & ENGINEERING SUPP	P	945	1978	2811	3668	4411	5118	5843	6563	7258	7656	8051	8441
	C	956	1990	2654	3308	3979	4729	5818	0	0	0	0	0
	V	-11	-12	157	360	432	389	25	0	0	0	0	0
	%												
2381 CORE LIBRARY	P	18	44	67	90	112	135	157	181	203	226	250	270
	C	18	42	61	77	94	114	133	0	0	0	0	0
	V	0	2	6	13	18	21	24	0	0	0	0	0
	%				14	16	16	15					
2381A CORE LIBRARY-LANL	P	4	15	24	32	40	48	56	65	73	81	90	95
	C	4	15	22	27	33	41	49	0	0	0	0	0
	V	0	0	2	5	7	7	7	0	0	0	0	0
	%				16	18	15	13					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2381F CORE LIBRARY-F&S	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2381R CORE LIBRARY-REECO	P	14	29	43	58	72	87	101	116	130	145	160	175
	C	14	27	39	50	61	73	84	0	0	0	0	0
	V	0	2	4	8	11	14	17	0	0	0	0	0
	%				14	15	16	17					
2382 DRILLING & CONSTRUCTION	P	872	1825	2581	3339	4006	4634	5283	5923	6542	6861	7177	7491
	C	892	1860	2468	3036	3639	4312	5316	0	0	0	0	0
	V	-20	-35	113	303	367	322	-33	0	0	0	0	0
	%												
2382F DRILL, CONST, ENG-F&S	P	39	77	115	154	174	194	204	214	218	222	226	230
	C	41	74	102	143	178	218	268	0	0	0	0	0
	V	-2	3	13	11	-4	-24	-64	0	0	0	0	0
	%			11			12	31					
2382G DRILL, CONST, ENG-USGS	P	0	0	0	0	0	0	26	51	66	81	93	103
	C	0	0	0	0	0	10	26	0	0	0	0	0
	V	0	0	0	0	0	-10	0	0	0	0	0	0
	%												
2382H DRILL, CONST, ENG-H&N	P	9	17	25	34	42	50	50	50	50	50	50	50
	C	27	58	76	87	105	119	135	0	0	0	0	0
	V	-18	-41	-51	-53	-63	-69	-85	0	0	0	0	0
	%	200	241	204	156	150	138	170					
2382L DRILL, CONST, ENG-LLNL	P	12	22	32	42	42	42	55	60	60	60	60	60
	C	12	19	30	39	46	50	56	0	0	0	0	0
	V	0	3	2	3	-4	-8	-1	0	0	0	0	0
	%						19						
2382R DRILL, CONST, ENG-REECO	P	812	1709	2409	3109	3748	4348	4948	5548	6148	6448	6748	7048
	C	812	1709	2260	2767	3310	3915	4831	0	0	0	0	0
	V	0	0	149	342	438	433	117	0	0	0	0	0
	%				11	12							
2383F FIELD GEOLOGY\HYDROLOGY	P	54	108	162	216	270	324	378	432	486	540	595	650
	C	45	87	124	172	223	279	344	0	0	0	0	0
	V	9	21	38	44	47	45	34	0	0	0	0	0
	%		19	23	20	17	14						

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2384P SITE PHOTOGRAPHY(PAN AM)	P	1	1	1	23	23	25	25	27	27	29	29	30
	C	1	1	1	23	23	24	25	0	0	0	0	0
	V	0	0	0	0	0	1	0	0	0	0	0	0
	%												
239 ENVIRONMENTAL CHARACTER	P	20	40	64	87	116	144	188	253	319	386	450	519
	C	6	12	21	38	54	71	107	0	0	0	0	0
	V	14	28	43	49	62	73	81	0	0	0	0	0
	%	70	70	67	56	53	51	43					
239E ENVIR CHARACT-EG&G	P	6	12	16	20	24	28	32	36	40	44	48	50
	C	6	12	14	16	16	19	22	0	0	0	0	0
	V	0	0	2	4	8	9	10	0	0	0	0	0
	%			13	20	33	32	31					
239N ENVIR CHARACT-ST OF NV	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	-2	-2	-2	-2	-2	-2	0	0	0	0	0
	V	0	2	2	2	2	2	2	0	0	0	0	0
	%												
239S SITE MONITORING	P	10	19	29	38	48	57	67	76	86	97	105	120
	C	0	0	0	5	11	19	28	0	0	0	0	0
	V	10	19	29	33	37	38	39	0	0	0	0	0
	%	100	100	100	87	77	67	58					
239T CLIMATIC MONITORING	P	0	0	0	0	0	0	10	42	74	106	138	170
	C	0	0	0	0	0	0	8	0	0	0	0	0
	V	0	0	0	0	0	0	2	0	0	0	0	0
	%							20					
239U ENVIR CHARACT-DRI\UNR	P	4	9	19	29	44	59	79	99	119	139	159	179
	C	0	2	9	19	29	35	51	0	0	0	0	0
	V	4	7	10	10	15	24	28	0	0	0	0	0
	%	100	78	53	34	34	41	35					
24 REPOSITORY	P	613	1273	1951	2852	3749	4765	5962	7337	8716	10110	11547	13116
	C	525	1158	1680	2646	3436	4763	5867	0	0	0	0	0
	V	88	115	271	206	313	2	95	0	0	0	0	0
	%			14									
241 REPOSITORY DESIGN	P	331	675	1041	1481	1960	2552	3302	4201	5093	5956	6850	7867
	C	290	669	904	1415	1872	2748	3456	0	0	0	0	0
	V	41	6	137	66	88	-196	-154	0	0	0	0	0
	%			13									

NNWSI Cost Variance Report
Actual Versus Planned Costs
Consolidated by WBS Element (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2411S SYSTEM ENGINEERING	P	57	114	171	228	285	342	399	456	514	572	630	691
	C	15	54	54	138	267	385	439	0	0	0	0	0
	V	42	60	117	90	18	-43	-40	0	0	0	0	0
	%	74	53	68	39		13	10					
2412S SURFACE FACILITIES	P	79	181	293	458	648	963	1369	1901	2310	2719	3136	3542
	C	130	303	386	533	712	1126	1559	0	0	0	0	0
	V	-51	-122	-93	-75	-64	-163	-190	0	0	0	0	0
	%	65	67	32	16		17	14					
2413S UNDERGROUND FACILITIES	P	54	99	148	199	266	321	432	563	805	1041	1272	1503
	C	76	162	182	230	172	269	335	0	0	0	0	0
	V	-22	-63	-34	-31	94	52	97	0	0	0	0	0
	%	41	64	23	16	35	16	22					
2414S DESIGN ANALYSIS & SUPPOR	P	99	194	306	419	530	642	764	889	991	1113	1234	1370
	C	42	95	151	308	487	656	772	0	0	0	0	0
	V	57	99	155	111	43	-14	-8	0	0	0	0	0
	%	58	51	51	26								
2415S EQUIPMENT DEVELOPMENT	P	42	87	123	177	231	284	338	392	473	511	578	761
	C	27	55	131	206	234	312	351	0	0	0	0	0
	V	15	32	-8	-29	-3	-28	-13	0	0	0	0	0
	%	36	37		16								
242 TUFF ROCK PROPERTIES	P	246	523	788	1175	1537	1902	2249	2600	2954	3328	3704	4079
	C	221	438	669	1062	1347	1735	2068	0	0	0	0	0
	V	25	85	119	113	190	167	181	0	0	0	0	0
	%		16	15		12							
2421S ROCK MASS ANALYSIS	P	40	101	161	229	301	376	451	528	602	680	754	834
	C	90	134	119	164	202	334	391	0	0	0	0	0
	V	-50	-33	42	65	99	42	60	0	0	0	0	0
	%	125	33	26	28	33	11	13					
2422 FIELD TESTING	P	124	254	373	542	720	893	1053	1215	1386	1572	1767	1963
	C	88	203	321	501	617	770	945	0	0	0	0	0
	V	36	51	52	41	103	123	108	0	0	0	0	0
	%	29	20	14		14	14	10					
2422F FIELD TESTING-F&S	P	0	0	0	5	5	5	10	10	10	15	20	25
	C	0	0	0	0	1	1	2	0	0	0	0	0
	V	0	0	0	5	4	4	8	0	0	0	0	0
	%				100	80	80	80					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2422H FIELD TESTING-H&N	P	0	0	0	0	0	12	12	12	12	12	20	20
	C	1	1	5	12	17	23	24	0	0	0	0	0
	V	-1	-1	-5	-12	-17	-11	-12	0	0	0	0	0
	%						92	100					
2422R FIELD TESTING-REECO	P	26	53	72	108	152	182	212	247	287	337	387	446
	C	28	54	84	101	133	165	192	0	0	0	0	0
	V	-2	-1	-12	7	19	17	20	0	0	0	0	0
	%			17		13							
2422S FIELD TESTING-SNL	P	98	201	301	429	563	694	819	946	1077	1208	1340	1472
	C	59	148	232	388	466	581	727	0	0	0	0	0
	V	39	53	69	41	97	113	92	0	0	0	0	0
	%	40	26	23		17	16	11					
2423 LABORATORY PROPERTIES	P	52	108	162	271	340	410	481	552	622	693	763	829
	C	29	65	160	293	387	456	521	0	0	0	0	0
	V	23	43	2	-22	-47	-46	-40	0	0	0	0	0
	%	44	40			14	11						
2423A LAB PROPERTIES-LANL	P	0	0	0	43	48	53	59	64	69	74	79	85
	C	0	0	0	43	52	58	63	0	0	0	0	0
	V	0	0	0	0	-4	-5	-4	0	0	0	0	0
	%												
2423H LAB PROPERTIES-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2423S LAB PROPERTIES-SNL	P	52	108	162	228	292	357	422	488	553	619	684	744
	C	29	65	160	250	335	398	458	0	0	0	0	0
	V	23	43	2	-22	-43	-41	-36	0	0	0	0	0
	%	44	40			15	11						
2423R LAB PROPERTIES-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2424S WATER MIGRATION ANALYSIS	P	30	60	92	133	176	223	264	305	344	383	420	453
	C	14	36	69	104	141	175	211	0	0	0	0	0
	V	16	24	23	29	35	48	53	0	0	0	0	0
	%	53	40	25	22	20	22	20					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
243 SEALING	P	36	75	122	196	252	311	411	536	669	826	993	1170
	C	14	51	107	169	217	280	343	0	0	0	0	0
	V	22	24	15	27	35	31	68	0	0	0	0	0
	%	61	32	12	14	14		17					
2431S SEAL PERF. REQUIREMENTS	P	29	60	92	127	163	201	233	265	297	329	361	389
	C	14	51	80	117	146	177	200	0	0	0	0	0
	V	15	9	12	10	17	24	33	0	0	0	0	0
	%	52		13		10	12	14					
2432 MATERIALS EVALUATION	P	7	15	30	69	89	110	158	209	261	314	364	415
	C	0	0	27	52	71	103	140	0	0	0	0	0
	V	7	15	3	17	18	7	18	0	0	0	0	0
	%	100	100		25	20		11					
2432A MATERIALS EVAL-LANL	P	0	0	0	24	28	32	63	94	126	157	188	220
	C	0	0	0	24	28	32	48	0	0	0	0	0
	V	0	0	0	0	0	0	15	0	0	0	0	0
	%							24					
2432S MATERIALS EVAL-SNL	P	7	15	30	45	61	78	95	115	135	157	176	195
	C	0	0	27	28	43	71	92	0	0	0	0	0
	V	7	15	3	17	18	7	3	0	0	0	0	0
	%	100	100		38	30							
2433S SEAL DESIGN & TESTING	P	0	0	0	0	0	0	20	62	111	183	268	366
	C	0	0	0	0	0	0	3	0	0	0	0	0
	V	0	0	0	0	0	0	17	0	0	0	0	0
	%							85					
25 REGULATORY INTERACTIONS	P	196	447	708	964	1203	1440	1540	1774	2010	2250	2483	2715
	C	130	427	719	969	1199	1383	1688	0	0	0	0	0
	V	66	20	-11	-5	4	57	-148	0	0	0	0	0
	%	34											
251 REGULATORY INTERACTIONS	P	55	140	231	345	440	532	495	514	533	552	565	577
	C	17	103	198	307	443	525	585	0	0	0	0	0
	V	38	37	33	38	-3	7	-90	0	0	0	0	0
	%	69	26	14	11			18					
251A REGULATORY INTERACT-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
251G REGULATORY INTERACT-USGS	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
251H REGULATORY INTERACT-H&N	P	10	20	30	40	50	60	70	82	94	106	118	130
	C	-28	-19	-5	4	8	17	19	0	0	0	0	0
	V	38	39	35	36	42	43	51	0	0	0	0	0
	%	380	195	117	90	84	72	73					
251L REGULATORY INTERACT-LLNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
251S REGULATORY INTERACT-SNL	P	0	0	0	4	14	21	28	35	42	49	50	50
	C	0	2	2	2	3	3	0	0	0	0	0	0
	V	0	-2	-2	2	11	18	28	0	0	0	0	0
	%				50	79	86	100					
251T REGULATORY INTERACT-SAI	P	45	120	201	301	376	451	397	397	397	397	397	397
	C	45	120	201	301	432	505	566	0	0	0	0	0
	V	0	0	0	0	-56	-54	-169	0	0	0	0	0
	%					15	12	43					
252G ENVIRON ASSESS-USGS	P	118	233	359	450	541	632	601	680	759	838	916	993
	C	82	260	432	547	592	685	794	0	0	0	0	0
	V	36	-27	-73	-97	-51	-53	-193	0	0	0	0	0
	%	31		20	22			32					
252H ENVIRON ASSESS-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
252L ENVIRON ASSESS-LLNL	P	8	16	24	31	38	45	18	20	22	24	25	25
	C	0	8	9	14	15	16	11	0	0	0	0	0
	V	8	8	15	17	23	29	7	0	0	0	0	0
	%	100	50	63	55	61	64	39					
252S ENVIRON ASSESS-SNL	P	26	54	79	88	88	88	88	88	88	88	88	88
	C	-2	89	167	202	217	236	268	0	0	0	0	0
	V	28	-35	-88	-114	-129	-148	-180	0	0	0	0	0
	%	108	65	111	130	147	168	205					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
252T ENVIRON ASSESS-SAI	P	84	163	256	331	415	499	495	572	649	726	803	880
	C	84	163	256	331	350	418	496	0	0	0	0	0
	V	0	0	0	0	65	81	-1	0	0	0	0	0
	%					16	16						
253T INSTITUT. STUDIES-SAI	P	0	0	0	0	0	0	92	122	152	182	212	242
	C	5	5	5	5	6	6	95	0	0	0	0	0
	V	-5	-5	-5	-5	-6	-6	-3	0	0	0	0	0
	%												
253S INSTIT. STUDIES-SNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	5	5	5	5	6	6	6	0	0	0	0	0
	V	-5	-5	-5	-5	-6	-6	-6	0	0	0	0	0
	%												
253T INSTIT. STUDIES-SAI	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
254 SITE CHARACT. PLAN	P	23	74	118	169	222	276	352	458	566	678	790	903
	C	26	59	84	110	158	167	214	0	0	0	0	0
	V	-3	15	34	59	64	109	138	0	0	0	0	0
	%		20	29	35	29	39	39					
254A SITE CHARACT PLAN-LANL	P	11	30	42	58	76	95	114	133	151	169	187	200
	C	11	30	45	61	78	98	116	0	0	0	0	0
	V	0	0	-3	-3	-2	-3	-2	0	0	0	0	0
	%												
254G SITE CHARACT PLAN-USGS	P	10	40	70	100	130	160	170	176	182	188	194	200
	C	15	29	39	49	80	69	98	0	0	0	0	0
	V	-5	11	31	51	50	91	72	0	0	0	0	0
	%	50	28	44	51	38	57	42					
254H SITE CHARACT PLAN-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
254L SITE CHARACT PLAN-LLNL	P	2	4	6	11	16	21	0	13	28	48	68	93
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	2	4	6	11	16	21	0	0	0	0	0	0
	%	100	100	100	100	100	100						

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
254S SITE CHARACT PLAN-SNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
254T SITE CHARACT PLAN-SAI	P	0	0	0	0	0	0	68	136	205	273	341	410
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	68	0	0	0	0	0
	%							100					
26 EXPLORATORY SHAFT	P	224	421	612	917	1113	1313	1492	1695	1887	2094	2297	2490
	C	178	346	504	773	949	1169	1436	0	0	0	0	0
	V	46	75	108	144	164	144	56	0	0	0	0	0
	%		18	18	16	15	11						
261 SURFACE FACILITIES	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
261R SURFACE FACILITIES-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2611 SITE AND ROADS	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2611H SITE & ROADS-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2611R SITE & ROADS-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2612 UTILITIES AND COMM.	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2613 BUILDINGS	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2613H BUILDINGS-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2613R BUILDINGS-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2614 MINE PLANT	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2614F MINE PLANT-F&S	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2614H MINE PLANT-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2614R MINE PLANT-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
262 SUBSURFACE FACILITIES	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
262F SUBSURFACE FAC-F&S	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
262H SUBSURFACE FAC-H&N	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
262R SUBSURFACE FAC-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
263 EVALUATION AND TESTING	P	20	40	59	79	99	118	138	170	201	236	271	305
	C	17	34	46	63	91	112	145	0	0	0	0	0
	V	3	6	13	16	8	6	-7	0	0	0	0	0
	%			22	20								
263A EVALUATION & TEST-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
263F EVALUATION & TEST-F&S	P	12	24	35	47	59	70	82	94	105	117	129	140
	C	12	26	34	42	57	68	82	0	0	0	0	0
	V	0	-2	1	5	2	2	0	0	0	0	0	0
	%				11								
263G EVALUATION & TEST-USGS	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
263H EVALUATION & TEST-H&N	P	8	16	24	32	40	48	56	76	96	119	142	165
	C	5	8	12	21	34	44	63	0	0	0	0	0
	V	3	8	12	11	6	4	-7	0	0	0	0	0
	%	38	50	50	34	15		13					
263L EVALUATION & TEST-LLNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
263S EVALUATION & TEST-SNL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
264R MAINTENANCE AND OPER.	P	10	20	30	140	150	160	170	180	190	210	230	250
	C	-2	1	9	113	125	128	147	0	0	0	0	0
	V	12	19	21	27	25	32	23	0	0	0	0	0
	%	120	95	70	19	17	20	14					
2642R PROJECT OPERATIONS	P	10	20	30	140	150	160	170	180	190	210	230	250
	C	-2	1	9	113	125	128	147	0	0	0	0	0
	V	12	19	21	27	25	32	23	0	0	0	0	0
	%	120	95	70	19	17	20	14					
265 PLAN AND DESIGN REQ.	P	161	296	434	576	710	848	965	1092	1211	1332	1457	1575
	C	130	246	365	476	581	739	924	0	0	0	0	0
	V	31	50	69	100	129	109	41	0	0	0	0	0
	%		17	16	17	18	13						
2651A TECHNICAL DIRECTION	P	59	124	198	277	350	425	490	551	605	661	719	775
	C	59	124	193	255	317	368	453	0	0	0	0	0
	V	0	0	5	22	33	57	37	0	0	0	0	0
	%						13						
2652 TEST PLAN	P	102	172	236	299	360	423	475	541	606	671	738	800
	C	71	122	172	221	264	371	471	0	0	0	0	0
	V	31	50	64	78	96	52	4	0	0	0	0	0
	%	30	29	27	26	27	12						
2652A TEST PLAN-LANL	P	57	90	129	168	205	244	281	321	358	397	437	475
	C	57	90	128	166	206	284	321	0	0	0	0	0
	V	0	0	1	2	-1	-40	-40	0	0	0	0	0
	%						16	14					
2652G TEST PLAN-USGS	P	30	52	61	70	79	88	97	107	118	128	139	150
	C	12	24	33	42	34	23	58	0	0	0	0	0
	V	18	28	28	28	45	65	39	0	0	0	0	0
	%	60	54	46	40	57	74	40					
2652L TEST PLAN-LLNL	P	7	14	21	27	33	39	36	43	51	59	67	75
	C	1	6	9	10	14	29	39	0	0	0	0	0
	V	6	8	12	17	19	10	-3	0	0	0	0	0
	%	86	57	57	63	58	26						
2652S TEST PLAN-SNL	P	8	16	25	34	43	52	61	70	79	87	95	100
	C	1	2	2	3	10	35	53	0	0	0	0	0
	V	7	14	23	31	33	17	8	0	0	0	0	0
	%	88	88	92	91	77	33	13					

Actual Versus Planned Costs
Consolidated by WBS Element (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2652T TEST PLAN-SAI	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2653 SAFETY & QUAL. ASSURANCE	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2653A SAFETY & QA-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2654R SAFETY & QA-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
266A INTEGRATED DATA SYSTEM	P	33	65	89	122	154	187	219	253	285	316	339	360
	C	33	65	84	121	152	190	220	0	0	0	0	0
	V	0	0	5	1	2	-3	-1	0	0	0	0	0
	%												
27 TEST FACILITIES	P	506	1100	1651	2249	2815	3389	3870	4337	4797	5258	5728	6198
	C	705	1323	1803	2373	2932	3503	4090	0	0	0	0	0
	V	-199	-223	-152	-124	-117	-114	-220	0	0	0	0	0
	%	39	20										
271 CLIMAX	P	295	578	826	1125	1394	1658	1844	2014	2179	2344	2509	2672
	C	250	564	795	1061	1298	1565	1802	0	0	0	0	0
	V	45	14	31	64	96	93	42	0	0	0	0	0
	%												
271F CLIMAX-F&S	P	10	20	28	36	40	43	43	43	43	43	43	43
	C	12	20	25	37	45	55	61	0	0	0	0	0
	V	-2	0	3	-1	-5	-12	-18	0	0	0	0	0
	%			11		13	28	42					
271H CLIMAX-H&N	P	5	8	10	15	15	20	20	20	20	20	20	20
	C	0	0	0	0	0	1	1	0	0	0	0	0
	V	5	8	10	15	15	19	19	0	0	0	0	0
	%	100	100	100	100	100	95	95					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
271L CLIMAX-LLNL	P	180	340	490	656	821	986	1172	1342	1507	1672	1837	2000
	C	154	362	514	701	846	1002	1149	0	0	0	0	0
	V	26	-22	-24	-45	-25	-16	23	0	0	0	0	0
	%												
271R CLIMAX-REECO	P	100	210	298	418	518	609	609	609	609	609	609	609
	C	84	182	256	323	407	507	591	0	0	0	0	0
	V	16	28	42	95	111	102	18	0	0	0	0	0
	%			14	23	21	17						
271W CLIMAX-WESTINGHOUSE	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
272 E-MAD	P	211	522	825	1124	1421	1731	2026	2323	2618	2914	3219	3526
	C	455	759	1008	1312	1634	1938	2288	0	0	0	0	0
	V	-244	-237	-183	-188	-213	-207	-262	0	0	0	0	0
	%	116	45	22	17	15	12	13					
272F E-MAD-F&S	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
272H E-MAD-H&N	P	0	1	1	2	2	3	3	4	4	5	5	5
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	1	1	2	2	3	3	0	0	0	0	0
	%		100	100	100	100	100	100					
272R E-MAD-REECO	P	64	129	193	258	322	387	451	516	580	645	710	775
	C	74	134	204	319	432	518	625	0	0	0	0	0
	V	-10	-5	-11	-61	-110	-131	-174	0	0	0	0	0
	%				24	34	34	39					
272W E-MAD-WESTINGHOUSE	P	147	392	631	864	1097	1341	1572	1803	2034	2264	2504	2746
	C	381	625	804	993	1202	1420	1663	0	0	0	0	0
	V	-234	-233	-173	-129	-105	-79	-91	0	0	0	0	0
	%	159	59	27	15								
28 LAND ACQUISTION	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
29 PROGRAM MANAGEMENT	P	552	1153	1738	2404	3067	3751	4366	5079	5787	6510	7231	7945
	C	551	1073	1599	2208	2828	3495	4091	0	0	0	0	0
	V	1	80	139	196	239	256	275	0	0	0	0	0
	%												
291 PROJECT MANAGEMENT	P	229	476	685	930	1174	1439	1647	1905	2161	2417	2672	2925
	C	263	494	695	925	1080	1440	1672	0	0	0	0	0
	V	-34	-18	-10	5	94	-1	-25	0	0	0	0	0
	%												
291A PROJECT MANAGE-LANL	P	22	62	93	125	155	187	217	270	320	371	423	475
	C	22	62	93	127	161	203	238	0	0	0	0	0
	V	0	0	0	-2	-6	-16	-21	0	0	0	0	0
	%												
291G PROJECT MANAGE-USGS	P	20	40	60	80	100	120	140	160	180	200	220	240
	C	18	36	56	76	49	116	157	0	0	0	0	0
	V	2	4	4	4	51	4	-17	0	0	0	0	0
	%					51		12					
291I PROJECT MANAGE-WSI	P	17	34	50	67	84	100	117	134	150	167	184	200
	C	14	27	42	57	64	78	91	0	0	0	0	0
	V	3	7	8	10	20	22	26	0	0	0	0	0
	%		21	16	15	24	22	22					
291L PROJECT MANAGE-LLNL	P	23	46	69	92	115	138	154	178	202	226	250	275
	C	21	36	56	77	99	130	159	0	0	0	0	0
	V	2	10	13	15	16	8	-5	0	0	0	0	0
	%		22	19	16	14							
291R PROJECT MANAGE-REECO	P	3	6	9	12	15	18	21	24	27	30	33	35
	C	4	8	12	14	17	18	20	0	0	0	0	0
	V	-1	-2	-3	-2	-2	0	1	0	0	0	0	0
	%	33	33	33	17	13							
291S PROJECT MANAGE-SNL	P	7	15	25	35	46	57	62	67	73	78	81	82
	C	47	52	57	62	57	95	104	0	0	0	0	0
	V	-40	-37	-32	-27	-11	-38	-42	0	0	0	0	0
	%	571	247	128	77	24	67	68					
291T PROJECT MANAGE-SAI	P	137	273	379	519	659	819	936	1072	1209	1345	1481	1618
	C	137	273	379	512	633	800	903	0	0	0	0	0
	V	0	0	0	7	26	19	33	0	0	0	0	0
	%												

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
292 PROJECT CONTROL	P	164	340	527	742	958	1170	1431	1681	1932	2185	2436	2687
	C	156	312	476	659	966	1102	1291	0	0	0	0	0
	V	8	28	51	83	-8	68	140	0	0	0	0	0
	%				11								
292A PROJECT CONTROL-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
292G PROJECT CONTROL-USGS	P	46	92	138	184	230	276	322	368	414	460	506	550
	C	17	33	50	67	152	102	114	0	0	0	0	0
	V	29	59	88	117	78	174	208	0	0	0	0	0
	%	63	64	64	64	34	63	65					
292L PROJECT CONTROL-LLNL	P	8	16	24	32	40	48	41	50	60	70	80	90
	C	3	9	13	21	28	32	33	0	0	0	0	0
	V	5	7	11	11	12	16	8	0	0	0	0	0
	%	63	44	46	34	30	33	20					
292S PROJECT CONTROL-SNL	P	26	53	80	116	153	186	223	259	296	334	371	409
	C	52	91	129	159	212	281	346	0	0	0	0	0
	V	-26	-38	-49	-43	-59	-95	-123	0	0	0	0	0
	%	100	72	61	37	39	51	55					
292T PROJECT CONTROL-SAI	P	84	179	285	410	535	660	845	1004	1162	1321	1479	1638
	C	84	179	284	412	574	687	798	0	0	0	0	0
	V	0	0	1	-2	-39	-27	47	0	0	0	0	0
	%												
293 INTERFACE ACTIVITIES	P	8	17	28	39	49	60	77	90	101	114	124	133
	C	10	12	16	21	36	44	56	0	0	0	0	0
	V	-2	5	12	18	13	16	21	0	0	0	0	0
	%		29	43	46	27	27	27					
293A INTERFACE ACT.-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
293G INTERFACE ACT.-USGS	P	0	1	1	2	2	3	3	4	4	5	5	6
	C	0	1	2	2	2	3	14	0	0	0	0	0
	V	0	0	-1	0	0	0	-11	0	0	0	0	0
	%			100				367					

Actual Versus Planned Costs
Consolidated by WBS Element (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
293L INTERFACE ACT.-LLNL	P	3	6	9	12	15	18	18	22	26	30	33	35
	C	9	10	10	9	12	14	14	0	0	0	0	0
	V	-6	-4	-1	3	3	4	4	0	0	0	0	0
	%	200	67	11	25	20	22	22					
293R INTERFACE ACT.-REECO	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
293S INTERFACE ACT.-SNL	P	5	10	15	19	23	27	31	35	39	43	47	49
	C	1	1	2	2	5	5	5	0	0	0	0	0
	V	4	9	13	17	18	22	26	0	0	0	0	0
	%	80	90	87	89	78	81	84					
293T INTERFACE ACT.-SAI	P	0	0	3	6	9	12	25	29	32	36	39	43
	C	0	0	2	8	17	22	23	0	0	0	0	0
	V	0	0	1	-2	-8	-10	2	0	0	0	0	0
	%			33	33	89	83						
294 QUALITY ASSURANCE	P	135	288	450	629	805	984	1097	1272	1445	1629	1817	2007
	C	116	245	376	550	682	832	979	0	0	0	0	0
	V	19	43	74	79	123	152	118	0	0	0	0	0
	%			16	13	15	15	11					
294A QUALITY ASSURANCE-LANL	P	37	88	155	222	286	353	417	486	550	617	687	760
	C	37	88	148	223	303	368	436	0	0	0	0	0
	V	0	0	7	-1	-17	-15	-19	0	0	0	0	0
	%												
294F QUALITY ASSURANCE-F&S	P	7	14	20	27	34	40	47	54	60	67	74	80
	C	6	11	16	27	32	41	52	0	0	0	0	0
	V	1	3	4	0	2	-1	-5	0	0	0	0	0
	%		21	20				11					
294G QUALITY ASSURANCE-USGS	P	5	10	15	20	25	30	35	40	45	50	55	60
	C	5	9	14	19	12	29	39	0	0	0	0	0
	V	0	1	1	1	13	1	-4	0	0	0	0	0
	%					52		11					
294H QUALITY ASSURANCE-H&N	P	7	14	20	27	34	40	47	54	60	67	74	80
	C	4	6	10	14	17	20	23	0	0	0	0	0
	V	3	8	10	13	17	20	24	0	0	0	0	0
	%	43	57	50	48	50	50	51					

Actual Versus Planned Costs
Consolidated by WBS Element (Continued)

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
294L QUALITY ASSURANCE-LLNL	P	19	38	57	76	95	114	121	142	163	184	207	230
	C	19	37	52	76	90	100	116	0	0	0	0	0
	V	0	1	5	0	5	14	5	0	0	0	0	0
	%						12						
294R QUALITY ASSURANCE-REECO	P	13	26	40	53	66	80	93	106	120	133	146	160
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	13	26	40	53	66	80	93	0	0	0	0	0
	%	100	100	100	100	100	100	100					
294S QUALITY ASSURANCE-SNL	P	11	22	33	44	55	67	79	91	108	131	154	174
	C	9	18	26	36	46	56	67	0	0	0	0	0
	V	2	4	7	8	9	11	12	0	0	0	0	0
	%		18	21	18	16	16	15					
294T QUALITY ASSURANCE-SAI	P	36	76	110	160	210	260	258	299	339	380	420	463
	C	36	76	110	155	182	218	246	0	0	0	0	0
	V	0	0	0	5	28	42	12	0	0	0	0	0
	%					13	16						
295 NWTS SUPPORT	P	16	32	48	64	81	98	114	131	148	165	182	193
	C	6	10	36	53	64	77	93	0	0	0	0	0
	V	10	22	12	11	17	21	21	0	0	0	0	0
	%	63	69	25	17	21	21	18					
295A NWTS SUPPORT-LANL	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
295G NWTS SUPPORT-USGS	P	2	4	6	8	10	12	14	16	18	20	22	24
	C	2	4	6	8	5	12	20	0	0	0	0	0
	V	0	0	0	0	5	0	-6	0	0	0	0	0
	%					50		43					
295L NWTS SUPPORT-LLNL	P	3	6	9	12	15	18	20	23	26	29	32	35
	C	1	-1	9	14	18	17	20	0	0	0	0	0
	V	2	7	0	-2	-3	1	0	0	0	0	0	0
	%	67	117		17	20							
295S NWTS SUPPORT-SNL	P	11	22	33	44	56	68	80	92	104	116	128	134
	C	3	7	21	31	41	48	53	0	0	0	0	0
	V	8	15	12	13	15	20	27	0	0	0	0	0
	%	73	68	36	30	27	29	34					

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
295T NWTS SUPPORT-SAI	P	0	0	0	0	0	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0	0	0	0	0	0
	V	0	0	0	0	0	0	0	0	0	0	0	0
	%												
2352B GROUNDWATER FLOW ANAL.	P	0	0	0	0	39	78	117	156	195	234	273	350
	C	0	0	0	0	0	137	63	0	0	0	0	0
	V	0	0	0	0	39	-59	54	0	0	0	0	0
	%					100	76	46					
Total Project Plan		4457	9379	14057	19294	24349	29709	34885	40685	46458	52025	57649	63517
Total Project Cost		4293	9025	13263	18157	23192	28839	34491	0	0	0	0	0
Total Project Variance		164	354	794	1137	1157	870	394	0	0	0	0	0
NTS ALLOCATION	P	92	182	246	319	391	463	535	607	667	727	787	847
	C	92	182	246	319	389	463	560	0	0	0	0	0
	V	0	0	0	0	2	0	-25	0	0	0	0	0
STATE GRANT	P	10	20	90	100	110	125	150	175	200	225	250	275
	C	0	0	70	80	100	150	170	0	0	0	0	0
	V	10	20	20	20	10	-25	-20	0	0	0	0	0
Total Project Plan		4559	9581	14393	19713	24850	30297	35570	41467	47325	52977	58686	64639
Total Project Cost		4385	9207	13579	18556	23681	29452	35221	0	0	0	0	0
Total Project Variance		174	374	814	1157	1169	845	349	0	0	0	0	0