

**PROJECT PLAN FOR
SEISMIC ROCK MECHANICS PROJECT**

Prepared for

**Nuclear Regulatory Commission
Contract NRC-02-93-005**

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**Revision 4
Change 3**

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CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

Revision: 4
Change: 3
Date: March 1994

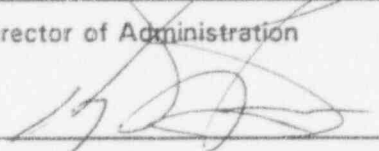
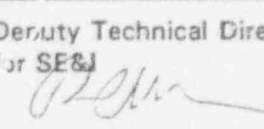
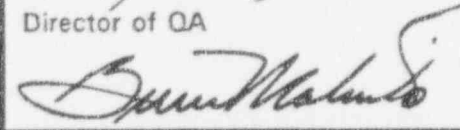
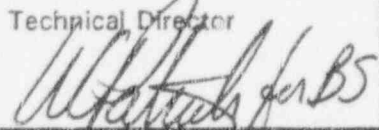
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EFFECTIVITY

Revision 4 of this document became effective on July 30, 1993.
This document consists of the pages and changes listed below.

<u>Page No.</u>	<u>Change No.</u>	<u>Date Effective</u>
Title Page	3	03/15/94
ii	3	03/15/94
iii - 3-31	0	07/30/93
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3-33 - 3-34	0	07/30/93
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3-36 - 3-41	0	07/30/93
3-42	3	03/15/94
3-43 - 4-1	0	07/30/93
4-2	3	03/15/94
4-3 - 4-6	0	07/30/93
4-7	3	03/15/94
5-1 - 5-3	0	07/30/93
A-1	2	12/10/93
A-2 - A-10	3	03/15/94
A-11 - A-15	1	09/25/93

Supersedes: Revision 4, Change 2 - December 1993

Director of Administration 	Date: 3/10/94	Deputy Technical Director for SE&I 	Date: 3/12/94
Director of QA 	Date: 3/12/94	Technical Director for BS 	Date: 3/12/94

3.2.7.3 Activities

Reports

Deliverables in the form of topical reports have been identified in Tasks 1 through 5, and Task 9. In Task 7, a final report will be developed that will be directed toward supporting the repository licensing function of the NRC. This report will include the following, as appropriate:

- Purpose of the report in relation to the licensing process
- Finding/issues addressed
- Summary description of the results of research to date
- Status of uncertainty resolution as a result of the research
- Recommended use of results

This final report will be submitted to NRC in FY94 as a Major Milestone. This major milestone report will then be subjected to peer review by 2 to 3 peers. After resolution of the comments by the peers, the final report will be submitted to NRC in FY95 as an Intermediate Milestone.

3.2.8 Task 8: Semi-Annual Research Reports

3.2.8.1 Objective

The objective of this task is to develop these technical documents and make them available to the technical community every 6 months.

3.2.8.2 Justification

This task will make the research findings available to the NRC and to the technical community semi-annually.

3.2.8.3 Activities

The activities of this task include preparation and submission of reports to the NRC.

3.2.9 Task 9: DECOVALEX Modeling and Laboratory Studies

3.2.9.1 Objective

The objective of this task is to study coupled TMH processes through (i) participating in the International Cooperative Project for the Development of Coupled Models and Their Validation Against Experiments in Nuclear Waste Isolation (DECOVALEX) and (ii) performing coupled laboratory experiments.

3.3 SCHEDULES, MILESTONES, AND DELIVERABLES

The milestones and deliverables in the form of reports are listed in Table 3-4 for Tasks 2 through 5 and 7 through 9. Task 1 has already been completed, and its report has been submitted to the NRC. The first three digits of the milestone number denote the project and task number (e.g., 032 indicates Task 2 of this, the third specific research project); the second three digits denote the fiscal year; and the last three digits identify the specific milestone within the task. In cases where multiple deliverables may be needed to support a single activity, an additional three digits have been added to indicate the sequential number of the deliverable within the activity.

Table 3-4. Schedules, milestones, and deliverables

Milestone Number	Milestone Type	Deliverable Description	Completion Date
032093-001	Major	Report for Laboratory Characterization of Jointed Rock	09/24/93
033094-001	Major	Report for Analytical Model/Computer Code Selection	12/30/93
034031-001	Intermediate	Report for Field Study of Mine Seismic Events	12/17/92
034094-002	Intermediate	Report for Scale Model Experiments	09/30/94
035094-002	Major	Report for Groundwater Hydrology Field Studies	07/18/94
037094-002	Major	Final Project Report	09/29/94
038093-002	Major	Semi-Annual Report 1992 — 2	02/12/93
038093-004	Major	Semi-Annual Report 1993 — 1	08/13/93
038094-002	Intermediate	Semi-Annual Report 1993 — 2	02/18/94
038094-004	Intermediate	Semi-Annual Report 1994 — 1	08/19/94
039093-002	Intermediate	Report on DECOVALEX Modeling Phase II	08/31/93
039094-002	Intermediate	Report on DECOVALEX MH Experiments, Phase I	09/30/94
039094-003	Intermediate	Report on DECOVALEX Modeling Phase III	09/30/94
037095-001	Intermediate	Peer Reviewed Final Project Report	01/31/95

4.2 QUALITY ASSURANCE

This research project will be conducted in accordance with applicable portions of the Center Quality Assurance Manual (CQAM) and applicable Operating Procedures. QA requirements applicable to project activities are identified in the Quality Requirements Application Matrix, which is issued periodically to Project Managers and Principal Investigators as specified in Quality Assurance Procedure (QAP)-013, Quality Planning. QA requirements, including those identified below, apply to work conducted by CNWRA personnel, other Divisions of SwRI, subcontractors, and consultants. Personnel performing activities affecting quality will be qualified in accordance with QAP-007, Professional Personnel Qualification.

4.2.1 Control of Computer Programs

Scientific and engineering computer programs (software) obtained from sources outside the CNWRA and developed, modified, or evaluated at the CNWRA will be controlled in accordance with Technical Operating Procedure (TOP)-018 Configuration Management and Control of Scientific and Engineering Computer Codes.

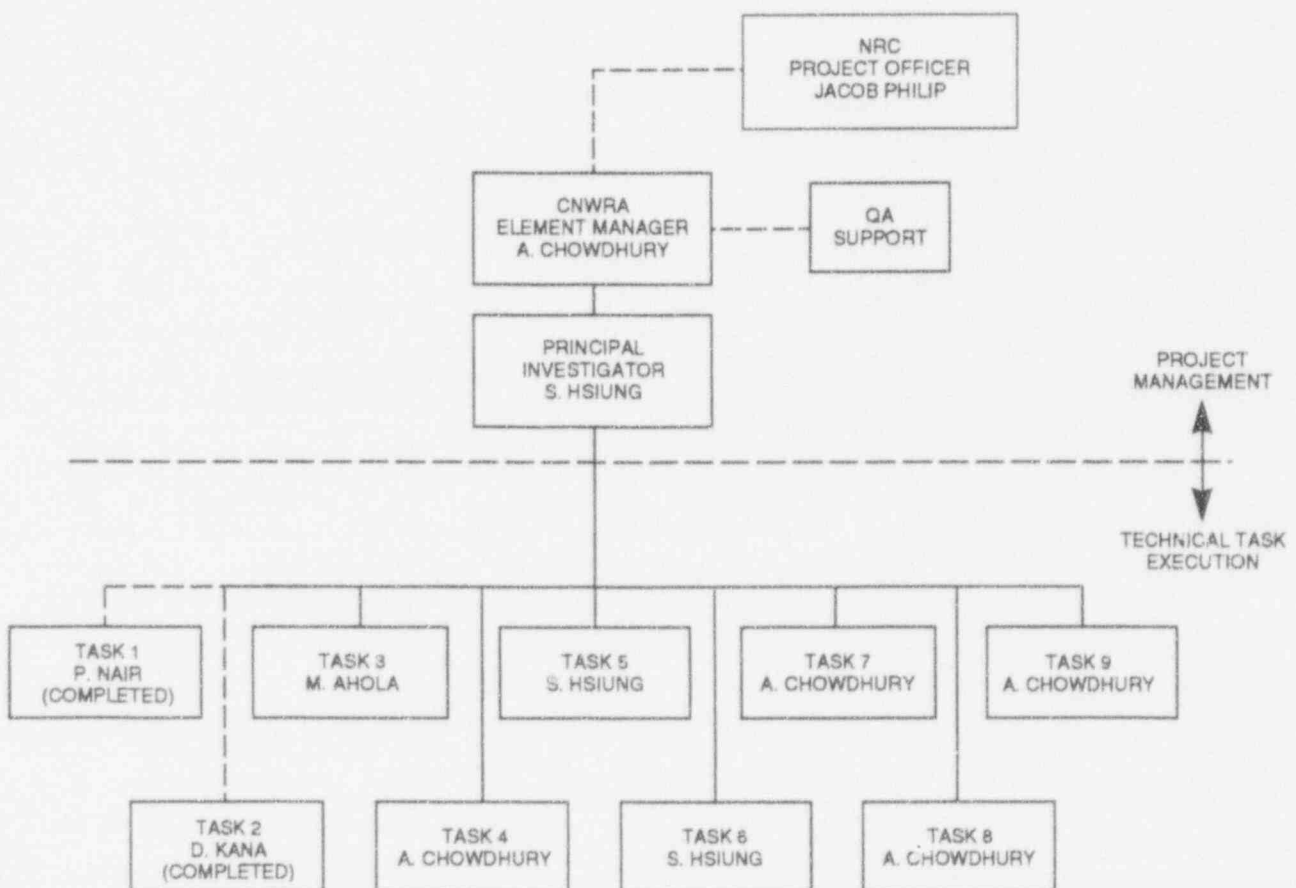


Figure 4-2. Project staff support

4.5 TRAVEL

The project personnel will incur expenses for travel and associated subsistence while conducting the business of the CNWRA in support of the Seismic Rock Mechanics Project. This will include collection of rock specimens, collection of NTS ground shock data, instrumented field studies, technical exchange meetings, NRC research program review meetings, technical conferences, and computer code training. Table 4-1 lists the travel requirements.

Table 4-3. Travel requirements

Purpose/Destination	FY94		FY95	
	No. Trips	No. Staff-days/Trip	No. Trips	No. Staff-days/Trip
TECHNICAL EXCHANGES/ PROGRAM REVIEW				
Washington, DC	3	4	3	5
Seattle, WA	1	5	-	-
Las Vegas, NV	2	5	-	-
Foreign TBD	1	7	3	5
U.S. TBD	3	5	5	5

Table A-1. Seismic Rock Mechanics Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	816	715	817	868	766	766	561	664	970	561	817	715	817	9,850
Center PI-3	888	775	891	969	891	775	891	775	891	775	891	775	1,046	11,232
Center PI-2	4,697	4,763	4,609	5,506	6,310	5,722	7,083	5,660	4,949	4,330	3,743	3,124	2,691	63,186
Center PI-1	1,826	1,790	1,854	2,408	3,452	2,515	2,557	1,556	1,556	1,534	1,598	1,534	1,577	25,757
Center Tech	191	191	181	461	1,093	371	361	391	381	381	231	90	90	4,414
Center Clerical	422	411	421	524	801	811	801	811	421	21	31	21	31	5,526
Center Labor	8,842	8,644	8,772	10,735	13,313	10,969	12,255	9,857	9,167	7,602	7,310	6,258	6,252	119,968
Center Burden	3,863	3,777	3,833	4,691	5,818	4,789	5,355	4,307	4,006	3,322	3,194	2,735	2,732	52,424
Center Overhead	8,513	8,322	8,445	10,335	12,818	10,552	11,799	9,490	8,806	7,320	7,038	6,026	6,019	115,502
SwRI PI-4	1,412	1,475	1,377	1,770	1,475	1,426	1,770	1,820	1,869	1,820	1,770	1,869	1,918	21,773
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	192	166	194	222	194	194	166	194	166	194	194	166	194	2,437
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	574	492	511	615	501	511	492	501	492	501	511	492	501	6,695
SwRI Labor	2,178	2,134	2,082	2,807	2,171	2,131	2,429	2,515	2,527	2,515	2,475	2,527	2,613	30,904
SwRI Burden	951	932	910	1,139	949	931	1,061	1,099	1,104	1,099	1,082	1,104	1,142	13,504
SwRI Overhead	3,630	3,557	3,470	4,346	3,618	3,552	4,048	4,192	4,212	4,192	4,126	4,212	4,356	51,513
ADP Services	218	218	218	698	242	218	218	218	218	660	218	218	218	3,770
Machine Shop	1,132	1,132	1,132	915	632	632	633	632	632	632	632	632	632	10,000
Material/Supply	1,934	1,933	1,934	2,420	3,048	3,073	3,029	3,058	1,941	815	799	824	811	25,619
Quality Assur.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	211	212	211	265	210	211	212	211	211	212	211	212	211	2,800
Tphone & Tgram	54	54	55	66	55	54	54	54	54	53	55	54	54	716
Travel	0	0	1,618	9,148	0	0	3,543	0	0	5,756	1,618	0	0	21,684
Consultants	1,290	1,376	1,204	3,252	1,290	1,376	946	946	1,032	2,554	946	1,032	946	18,200
Cler Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est excl. CFC, Fee	32,817	32,291	33,884	50,618	44,163	38,479	45,582	36,579	33,932	36,733	29,704	25,835	25,966	466,604
Center CFC	558	545	553	677	839	891	772	621	578	479	461	394	394	7,502
SwRI CFC	249	243	237	297	248	243	277	287	288	287	282	288	298	3,524
Tot Estimate Cost	33,622	33,079	34,675	51,592	45,250	39,413	46,632	37,487	34,797	37,499	30,447	26,517	26,678	477,688
Fee	2,624	2,583	2,711	4,303	3,754	3,271	3,875		2,884	3,122	2,525	2,196	2,209	39,165
Tot Cost with Fee	36,246	35,663	37,386	55,894	49,003	42,683	50,506	40,371	37,682	40,621	32,972	28,713	28,887	516,853
% Completion	7.01%	6.90%	7.23%	10.81%	9.48%	8.26%	9.77%	9.77%	7.29%	7.86%	6.38%	5.56%	5.59%	100.00%
Cumulative Cost	36,246	71,909	109,294	165,188	214,192	256,875	307,381	347,752	385,659	426,281	459,253	487,966	516,853	
Cumul Completion	7.01%	13.91%	21.15%	31.96%	41.44%	49.70%	59.47%	67.33%	74.62%	82.48%	88.86%	94.41%	100.00%	

A-2

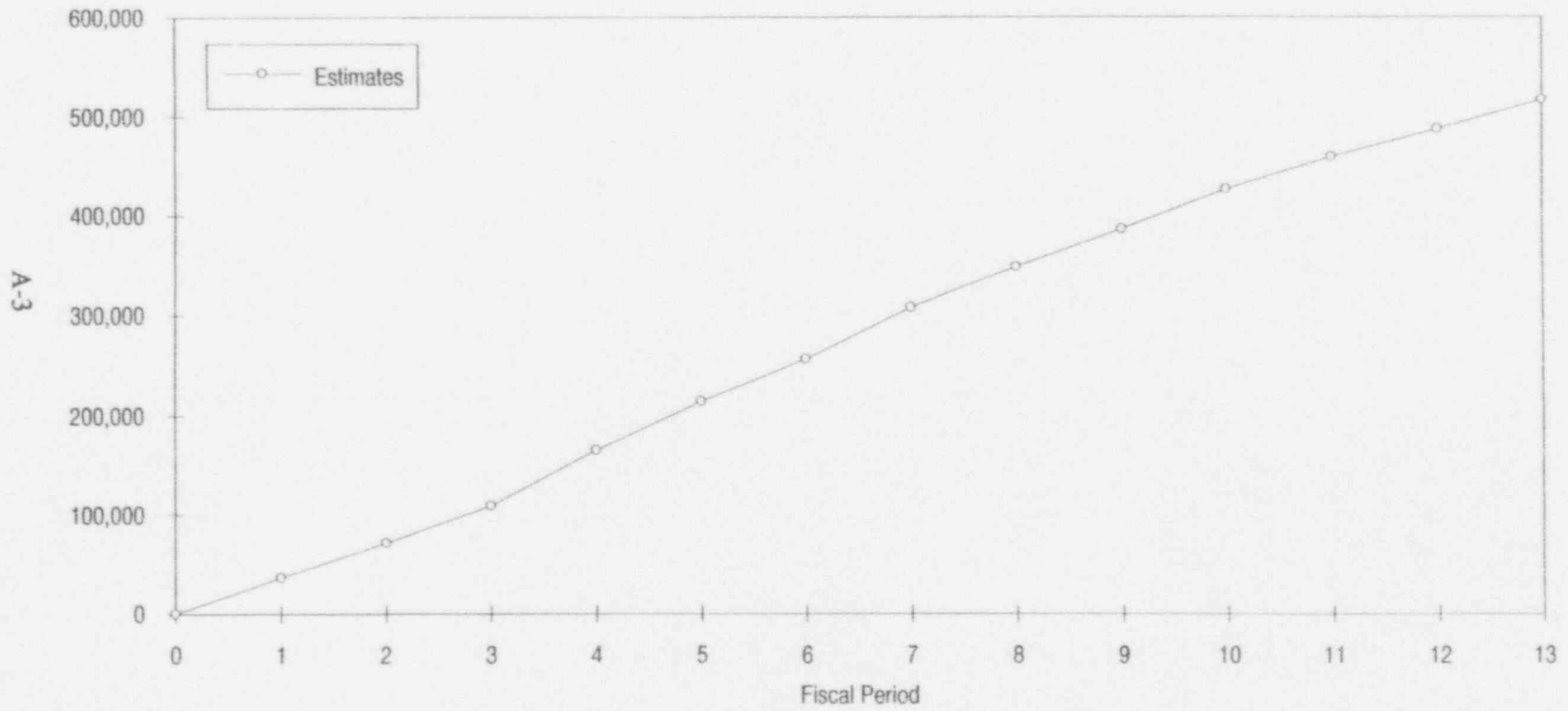


Figure A-1. Seismic Rock Mechanics Estimated Spending Plan, FY94

Table A-2. Seismic Rock Mechanics Estimated Labor Plan, FY94

Center Labor	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	16	14	16	17	15	15	11	13	19	11	16	14	16	193
Center PI-3	23	20	23	25	23	20	23	20	23	20	23	20	27	290
Center PI-2	152	154	149	178	204	185	229	183	160	140	121	101	87	2,043
Center PI-1	86	84	87	113	162	118	120	73	73	72	75	72	74	1,209
Center Tech	19	19	18	46	109	37	36	39	38	38	73	9	9	440
Center Clerical	41	40	41	51	76	79	78	79	41	2	3	2	3	538
Total Center Labor	337	331	334	430	591	454	497	407	354	283	261	218	216	4,713

SwRI Labor	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
SwRI PI-4	29	30	28	36	30	29	36	37	38	37	36	38	39	443
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	7	6	7	8	7	7	6	7	6	7	7	6	7	88
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	53	52	54	65	53	54	52	53	52	53	54	52	53	700
Total SwRI Labor	89	88	89	109	90	90	94	97	96	97	97	96	99	1,231

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Table A-3. Seismic Rock Mechanics Task 3 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center P1-4	0	153	0	0	153	0	0	0	153	0	0	153	0	612
Center P1-3	39	39	39	39	39	39	39	39	39	39	39	39	39	504
Center P1-2	185	185	155	402	773	93	31	31	31	31	0	0	0	1,948
Center P1-1	127	149	128	362	865	21	0	0	0	0	0	0	0	1,683
Center Tech	0	0	0	281	722	0	0	0	0	0	0	0	0	1,003
Center Classical	422	411	421	134	21	31	21	31	31	21	31	21	31	1,624
Center Labor	774	807	742	1,217	2,603	184	90	106	254	90	100	212	70	7,375
Center Burden	338	410	324	532	1,137	80	39	44	111	39	44	93	90	3,222
Center Overhead	745	903	715	1,172	2,506	177	87	97	244	87	97	205	87	7,100
SwRI P1-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Burden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP Services	109	109	109	133	121	109	109	109	109	109	109	109	109	1,453
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Assur	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Telephone & Tgram	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Travel	0	0	0	1,782	0	0	0	0	0	0	0	0	0	1,782
Consultants	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est esd. CFC, Fee	1,956	2,359	1,890	4,837	6,367	550	325	350	718	325	350	619	276	20,932
Center CFC	49	59	47	77	164	12	6	6	16	6	6	13	4	465
SwRI CFC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot Estimate Cost	2,014	2,418	1,937	4,913	6,531	561	331	356	734	331	356	632	280	21,398
Fee	157	189	151	411	541	47	28	30	61	28	30	53	23	1,748
Tot Cost with Fee	2,172	2,606	2,088	5,324	7,073	608	359	386	795	359	386	685	304	23,145
% Completion	6.01%	11.26%	9.02%	23.00%	30.56%	2.63%	1.55%	1.67%	3.43%	1.55%	1.67%	2.96%	1.31%	100.00%
Cumulative Cost	2,172	4,778	6,867	12,191	19,264	19,872	20,231	20,617	21,411	21,770	22,156	22,841	23,145	23,145
Costal Completion	6.01%	20.65%	29.67%	52.67%	83.23%	65.96%	67.41%	69.08%	92.51%	94.06%	95.73%	98.05%	100.00%	100.00%

Table A-4. Seismic Rock Mechanics Task 4 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	153	102	153	153	102	153	102	102	153	102	153	102	153	1,684
Center PI-3	77	116	77	155	77	116	271	271	271	271	271	271	349	2,595
Center PI-2	616	680	588	1,423	1,887	1,887	3,773	2,227	1,577	990	959	990	928	18,526
Center PI-1	0	0	0	852	1,705	1,705	1,833	852	852	852	852	852	831	11,186
Center Tech	40	40	30	50	40	40	30	40	40	40	30	40	40	521
Center Chemical	0	0	0	390	781	781	781	390	390	0	0	0	0	3,903
Center Labor	869	939	848	3,024	4,592	4,682	6,790	4,273	3,285	2,256	2,266	2,256	2,301	36,999
Center Burden	380	410	371	1,321	2,007	2,046	2,967	1,867	1,435	986	990	986	1,005	16,780
Center Overhead	555	904	817	2,911	4,421	4,507	6,537	4,114	3,182	2,172	2,181	2,172	2,215	36,969
SwRI PI-4	584	590	590	736	590	590	984	984	984	984	984	984	1,082	10,666
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	192	166	194	222	194	194	166	194	166	194	194	166	194	2,437
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	249	208	218	265	218	218	208	218	208	218	218	208	218	2,869
SwRI Labor	1,025	965	1,002	1,224	1,002	1,002	1,358	1,395	1,358	1,395	1,395	1,358	1,494	15,972
SwRI Burden	448	422	438	535	438	438	593	610	593	610	610	593	653	6,990
SwRI Overhead	1,708	1,508	1,670	2,041	1,670	1,670	2,264	2,326	2,264	2,326	2,326	2,264	2,490	26,623
ADP Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	243	243	243	1,427	2,478	2,502	2,458	2,488	1,370	245	229	253	240	14,419
Quality Assur.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Telephone & Tigram	9	10	9	12	10	9	9	10	9	10	9	10	9	125
Travel	0	0	0	1,782	0	0	1,825	0	0	1,782	0	0	0	5,489
Consultants	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear From Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est excl. CFC, Fee	5,565	5,500	5,397	14,277	16,616	16,855	24,442	17,083	13,476	11,780	10,005	9,891	10,406	161,755
Center CFC	56	59	53	191	289	295	428	269	207	142	143	142	145	2,420
SwRI CFC	117	110	114	140	114	114	155	159	155	159	159	155	170	1,821
Tot Estimate Cost	5,738	5,669	5,565	14,607	17,020	17,264	25,484	17,512	13,838	12,061	10,307	10,188	10,722	165,996
Fee	445	440	432	1,214	1,412	1,433	2,117	1,452	1,145	1,031	850	841	865	13,667
Tot Cost with Fee	6,184	6,109	5,997	15,821	18,432	18,697	27,601	18,964	14,984	13,083	11,158	11,029	11,606	179,664
% Completion	7.13%	3.40%	3.34%	8.81%	10.28%	10.41%	15.36%	10.56%	8.34%	7.28%	5.21%	6.14%	6.46%	100.00%
Cumulative Cost	6,184	12,293	13,290	34,111	52,543	71,240	98,841	117,805	132,788	145,871	157,029	168,058	179,664	179,664
Cumulative Completion	7.13%	6.94%	10.16%	18.98%	29.25%	39.65%	55.01%	66.57%	73.91%	81.19%	87.46%	93.54%	100.00%	100.00%

Table A-5. Seismic Rock Mechanics Task 5 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PH-4	102	51	102	102	51	102	0	102	153	0	102	51	102	1,021
Center PH-3	77	39	77	39	77	39	77	39	77	39	77	39	77	774
Center PH-2	247	217	247	464	1,392	1,392	1,299	1,361	1,392	1,392	866	217	247	10,732
Center PH-1	43	21	43	21	43	21	43	21	43	21	43	21	43	427
Center Tech	0	0	0	48	281	281	281	291	291	291	150	0	0	1,906
Center Chemical	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Labor	469	328	470	666	1,844	1,835	1,700	1,814	1,966	1,743	1,239	328	470	14,860
Center Burden	205	143	205	291	806	802	743	793	855	782	541	143	205	6,494
Center Overhead	452	315	452	641	1,775	1,767	1,637	1,746	1,883	1,678	1,193	315	452	14,307
SwRI PH-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PH-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PH-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PH-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Burden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Matsent/Supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Assur	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	60	61	60	76	60	60	61	60	60	61	60	61	60	600
Telephone & Tgrams	7	7	7	8	7	7	7	7	7	7	7	7	7	91
Travel	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consultants	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est Excl. CFC, Fee	1,193	854	1,194	1,683	4,492	4,470	4,148	4,420	4,761	4,249	3,040	854	1,194	36,551
Center CFC	30	21	30	42	116	116	107	114	123	110	78	21	30	937
SwRI CFC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Estimate Cost	1,223	875	1,224	1,725	4,608	4,586	4,255	4,534	4,884	4,359	3,118	875	1,224	37,488
Fee	95	68	96	143	392	380	353	376	405	361	258	73	95	3,090
Total Cost with Fee	1,318	943	1,319	1,868	4,999	4,966	4,607	4,910	5,289	4,720	3,376	947	1,319	40,579
% Completion	8.75%	2.32%	3.25%	4.60%	12.30%	12.24%	11.30%	12.10%	13.03%	11.63%	8.32%	2.33%	3.27%	100.00%
Cumulative Cost	1,318	2,261	3,580	5,448	10,438	15,404	20,011	24,921	30,210	34,930	38,306	39,254	40,579	40,579
Cumulative Completion	8.75%	5.57%	8.82%	13.43%	25.72%	37.96%	49.31%	61.41%	74.45%	86.08%	94.43%	96.73%	100.00%	100.00%

Table A-6. Seismic Rock Mechanics Task 7 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center P-4	153	102	153	153	102	153	102	102	153	102	153	102	153	1,684
Center P-3	309	271	310	349	310	271	116	116	116	116	116	116	194	2,711
Center P-2	649	711	650	835	650	680	309	340	309	309	309	340	309	6,432
Center P-1	128	107	128	145	128	107	0	0	0	0	0	0	0	746
Center Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Chemical	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Labor	1,239	1,191	1,240	1,486	1,189	1,211	528	559	579	528	579	559	556	11,543
Center Burden	541	521	542	649	520	529	231	244	253	231	253	244	267	5,044
Center Overhead	1,193	1,147	1,194	1,431	1,145	1,166	508	538	557	508	557	538	532	11,114
SwRI P1-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Burden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Assur	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Telephone & Tigram	8	7	8	9	8	7	8	7	8	7	8	7	8	100
Travel	0	0	0	1,610	0	0	0	0	0	0	0	0	0	1,610
Consultants	344	344	258	430	344	344	0	0	0	0	0	0	0	2,064
Car/Perm Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Stcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est and. CFC, Fee	3,324	3,210	3,243	5,615	3,246	3,258	1,274	1,347	1,397	1,273	1,397	1,347	1,593	31,474
Center CFC	78	75	78	94	75	76	33	35	36	33	36	35	41	727
SwRI CFC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot Estimate Cost	3,402	3,285	3,321	5,709	3,321	3,334	1,307	1,383	1,433	1,306	1,433	1,383	1,634	32,201
Fee	286	257	259	477	273	277	106	115	119	106	119	115	135	2,626
Tot Cost with Fee	3,688	3,541	3,580	6,186	3,594	3,611	1,416	1,497	1,552	1,415	1,552	1,497	1,768	34,827
% Completion	6.99%	10.17%	10.29%	17.76%	10.20%	10.37%	4.06%	4.30%	4.46%	4.06%	4.46%	4.30%	5.05%	100.00%
Cumulative Cost	3,688	7,229	10,790	16,976	20,530	24,141	25,557	27,054	28,605	30,100	31,572	33,069	34,827	
Cumal Completion	6.99%	20.70%	30.96%	48.74%	58.95%	69.32%	73.36%	77.68%	82.14%	86.20%	90.65%	94.95%	100.00%	

Table A-7. Seismic Rock Mechanics Task 8 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	9	10	11	12	13	Total
Center P1-4	153	102	153	153	102	153	102	102	102	153	102	153	1,684
Center P1-3	77	39	77	77	77	39	77	39	39	77	39	77	774
Center P1-2	371	340	340	433	371	340	340	340	340	340	340	371	4,629
Center P1-1	212	213	213	256	213	192	213	213	192	213	213	213	2,769
Center Tec'	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Obical	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Labor	813	694	764	881	764	724	733	694	673	764	694	815	9,867
Center Burden	355	303	343	385	324	315	320	303	294	343	303	356	4,312
Center Overhead	783	668	755	848	735	667	706	668	648	755	668	785	9,500
SwRI P1-4	49	49	0	49	49	49	0	49	49	0	49	49	492
SwRI P1-3	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-2	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI P1-1	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Labor	49	49	0	49	49	49	0	49	49	0	49	49	492
SwRI Burden	21	21	0	21	21	21	0	21	21	0	21	21	214
SwRI Overhead	82	82	0	82	82	82	0	82	82	0	82	82	820
ADP Services	0	0	0	0	0	0	0	0	0	0	0	0	0
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Assur	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	151	151	151	189	150	151	151	151	151	151	151	151	2,000
Phones & Tgram	0	0	0	0	0	0	0	0	0	0	0	0	0
Travel	0	0	0	0	0	0	0	0	0	0	0	0	0
Consultants	0	0	0	0	0	0	0	0	0	0	0	0	0
Old Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0
Est excl. CFC, Fee	2,256	1,969	2,032	2,455	2,136	2,041	1,910	1,969	1,918	2,032	1,969	2,259	27,207
Center CFC	51	44	49	56	48	46	46	44	42	49	44	51	622
SwRI CFC	6	6	6	6	6	6	6	6	6	6	6	6	56
Total Estimate Cost	2,313	2,019	2,082	2,516	2,189	2,082	1,956	2,019	1,966	2,082	2,019	2,316	27,885
Fee	180	158	163	209	182	173	162	157	153	173	167	192	2,281
Total Cost with Fee	2,493	2,176	2,244	2,725	2,371	2,256	2,118	2,166	2,129	2,254	2,186	2,508	30,166
% Completion	8.29%	7.21%	7.44%	9.63%	7.86%	7.51%	7.02%	7.25%	7.06%	7.47%	7.25%	8.31%	100.00%
Cumulative Cost	2,493	4,669	6,914	9,638	12,009	14,275	16,393	18,579	20,717	22,971	25,471	27,657	30,166
Cumulative Completion	8.29%	15.48%	22.92%	31.95%	39.61%	47.32%	54.34%	61.59%	69.91%	78.44%	86.96%	95.41%	100.00%

Table A-8. Seismic Rock Mechanics Task 9 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	255	204	255	306	255	204	255	255	204	255	255	204	255	3,164
Center PI-3	309	271	310	349	310	271	310	271	310	271	310	271	310	3,873
Center PI-2	2,627	2,629	2,629	1,949	1,237	1,330	1,330	1,361	1,268	1,268	1,237	1,237	835	20,938
Center PI-1	1,316	1,300	1,343	767	469	469	469	469	448	469	490	448	490	8,945
Center Tech	151	150	150	90	50	50	50	60	50	50	50	50	50	1,004
Center Clerical	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Labor	4,658	4,555	4,687	3,461	2,321	2,324	2,414	2,416	2,280	2,313	2,343	2,210	1,941	37,923
Center Burden	2,036	1,990	2,048	1,512	1,014	1,016	1,055	1,056	996	1,011	1,024	966	848	16,573
Center Overhead	4,485	4,385	4,513	3,332	2,235	2,238	2,324	2,326	2,195	2,227	2,255	2,128	1,868	36,513
SwRI PI-4	779	836	787	984	836	787	787	787	836	787	787	836	787	10,615
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	325	284	293	350	284	293	284	284	284	284	293	284	284	3,825
SwRI Labor	1,104	1,120	1,080	1,334	1,120	1,080	1,071	1,071	1,120	1,071	1,080	1,120	1,071	14,440
SwRI Expenses	482	489	472	583	489	472	468	468	489	468	472	489	488	6,310
SwRI Overhead	1,840	1,867	1,801	2,223	1,867	1,801	1,785	1,785	1,867	1,785	1,801	1,867	1,785	24,070
ADP Services	109	109	109	565	121	109	109	109	109	541	109	109	109	2,317
Machine Shop	1,132	1,132	1,132	915	632	632	633	632	632	632	632	632	632	10,000
Material/Supply	1,691	1,690	1,691	993	570	571	571	570	571	570	570	571	571	11,200
Quality Assur.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tphone & Tgrams	30	30	31	37	30	31	30	30	30	30	31	30	30	400
Travel	0	0	1,618	3,974	0	0	1,618	0	0	3,974	1,618	0	0	12,803
Consultants	946	1,032	946	2,822	946	1,032	946	946	1,032	2,564	946	1,032	946	16,136
Clar Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est excl. CFC, Fee	18,513	18,399	20,128	21,751	11,346	11,306	13,024	11,409	11,321	17,187	12,880	11,154	10,268	188,685
Center CFC	294	267	295	218	146	146	152	152	144	146	148	139	122	2,391
SwRI CFC	126	128	123	152	128	123	122	122	126	122	123	128	122	1,647
Tot Estimate Cost	18,932	18,814	20,546	22,121	11,620	11,575	13,296	11,683	11,593	17,454	13,151	11,421	10,513	192,722
Fee	1,481	1,472	1,610	1,649	964	961	1,107	970	962	1,461	1,095	948	873	15,753
Tot Cost with Fee	20,413	20,286	22,157	23,970	12,584	12,536	14,405	12,653	12,555	18,915	14,246	12,369	11,385	208,475
% Completion	7.09%	9.73%	10.62%	11.50%	6.04%	6.01%	6.91%	6.07%	6.02%	9.07%	6.83%	5.93%	5.46%	100.00%
Cumulative Cost	20,413	40,699	62,856	86,826	99,410	111,946	126,351	139,004	151,559	170,474	184,720	197,099	208,475	
Cumul Completion	7.09%	19.52%	30.15%	41.65%	47.58%	53.70%	60.61%	66.69%	72.70%	81.77%	88.61%	94.54%	100.00%	

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