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16 July 1986

David Tiktinsky - SS623 U.S. Nuclear Regulatory Commission Division of Waste Management Washington, D.C. 20555 "NRC Technical Assistance for Design Reviews" Contract No. NRC-02-85-002 FIN D1016

Dear David:

Enclosed is Progress Report No. 11 for the period 1-30 June 1986 on Task Orders No. 001 and 002, Contract NRC-02-85-002. Also enclosed is the summary sheet for the June voucher. Please call me if you have any questions.

Sincerely,

Roger D. Hart Program Manager

cc: J. Greeves, Engineering Branch Office of the Director, NMSS E. Wiggins, Division of Contracts DWM Document Control Room

Encl. rdh/ks

	WM-RES WM-RECORD File DIO16 Itasca UPDR/(B,N,S)
8608060074 860716 PDR WMRES EECITAS D-1016 PDR	DTiKtinsky Nstill
	(Return to WM, 623-SS) Sac
P.O. Box 14806 • Minneap	oolis, Minnesota 55414 • (612) 623-9599 3 3 2 3

ITASCA MONTHLY PROGRESS REPORT

Progress Report No. 11 NRC Technical Assistance for Design Reviews 16 July 1986 Contract No. NRC-02-85-002

Reporting Period: 1 - 30 June 1986

1. INTRODUCTION

This progress report summarizes the work performed during June 1986 on NRC Contract No. NRC-02-85-002. Task Order No. 001 work performed in June consisted of document reviews for BWIP and NNWSI, technical review of the Final Environmental Assessments, and attendance at the Rock Mechanics Symposium in Tuscaloosa. Work continued on the Site Technical Position on In-Situ Testing at BWIP and on the development of thermo-mechanical logic for FLAC for Task Order No. 002.

2. ACTIVITIES DURING THE REPORTING PERIOD

- A. On 6 June, Itasca transmitted the review of "Ground Motion Produced at Yucca Mountain from Pahute Mesa Underground Nuclear Explosions," by Luke J. Vortman (SAND85-1605, February 1986).
- B. L. Lorig attended NNWSI FEA review meetings in Silver Spring, 9-13 June. The trip report was transmitted on 17 June 1986.
- C. From 16-17 June, M. Board attended BWIP FEA review meetings in Silver Spring. The trip report was submitted on 23 June.
- D. M. Board completed and submitted the review of "Rock Mass Quality and Support Recommendations for Basalt at the Candidate Repository Horizon, Based on the Q-System" by N. Barton (SD-BWI-ER-012, Rev. 2, 1986) while at Silver Spring. NRC is to provide Itasca with a copy of this review.

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- E. R. Rajaram participated in the QA Review of the BWIP FEA at Silver Spring, 18-20 June 1986.
- F. Y. C. Kim attended the 27th U.S. Rock Mechanics Symposium in Tuscaloosa, 23-25 June 1986.
- G. From 23 to 27 June, the Richton Dome FEA Review meeting was held in Silver Spring. It was attended by K. Wahi and I. Farmer (25-27 June).
- H. J. Daemen attended the Deaf Smith FEA Review meeting in Silver Spring, 23-27 June 1986.
- I. On 26 June, Itasca received authorization to review the following documents:
 - (1) "The State of Insitu Stresses Determined by Hydraulic Fracturing at the Hanford Site," K. Kim et al (RHO-BW-ST-73P, 1986); and
 - (2) "Final Report: G-Tunnel Heated Block Experiment," R. Zimmerman et al (SAND 84-2620, 1986).
- J. The review of "Rock Mechanics Data Package," W. R. Sublette (SD-BWI-DP-041, 1983) was submitted on 27 June 1986.
- K. J. Daemen participated in the NNWSI FEA QA review from 30 June to 2 July in Silver Spring.

3.0 <u>RESULTS</u>

- A. Document reviews comleted and submitted in June:
 - (1) "Ground Motion Produced at Yucca Mountain from Pahute Mesa Underground Nuclear Explosions," by Luke J. Vortman (SAND85-1605, February 1986)

Professional Labor: L. Lorig 12 hours

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(3) "Rock Mass Quality and Support Recommendations for Basalt at the Candidate Repository Horizon, Based on the Q-System" by N. Barton (SD-BWI-ER-012, Rev. 2, 1986) Professional Labor: M. Board 16 hours (4) Final Environmental Assessment Review — Deaf Smith Professional Labor: J. Daemen 24 hours (5) Final Environmental Assessment Review - Richton Dome Professional Labor: I. Farmer 80 hours (May & June) K. Wahi 34 hours (6) Final Environmental Assessment Review - BWIP Professional Labor: M. Board 40 hours R. Rajaram 50 hours (7) Final Environmental Assessment Review - NNWSI Professional Labor: J. Daemen 16 hours Document reviews initiated in June "Final Report: G-Tunnel Heated Block Experiment," R. Zimmerman et al (SAND 84-2620, 1986). Professional Labor: L. Lorig 11 hours

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(2) "Rock Mechanics Data Package," W. R. Sublette (SD-BWI-DP-041, 1983)

Professional Labor: M. Board 16 hours

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C. Other Works in Progress

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- (1) Site Technical Position on In-Situ Testing at BWIPProfessional Labor: M. Board 62 hours
- (2) Verification of thermal analysis capabilities in FLAC

Professional Labor: M. Mack 52 hours

(3) Thermal-mechanical Point Paper

Professional	Labor:	L.	Lorig	23	hours
		М.	Mack	48	hours
		К.	Wahi	5	hours

4.0 QUALITY ASSURANCE

Correspondence, document review logs, and trip logs were monitored and updated. BWIP documents were received and catalogued in the reference library.

5.0 **DIFFICULTIES**

No specific difficulties were experienced during this reporting period.

- 6.0 ACTIVITIES PLANNED FOR THE NEXT REPORTING PERIOD
- A. The Quality Assurance Reviews of the FEA for salt is scheduled for July in Silver Spring.
- B. The draft Technical Position for In-Situ Testing at BWIP will be completed and submitted for review.
- C. The In-Situ Testing Point Papers for salt and tuff will be initiated in July.

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- D. Document reviews for BWIP and NNWSI will be completed and submitted.
- E. Continued effort on the Thermal-mechanical Point Paper is scheduled.
- F. The verification of thermal analysis capabilities in FLAC will be completed and work begun on verifying the thermal analysis capabilities in MUDEC.
- G. A one-week geomechanical modeling session is scheduled to be held in Minneapolis, 14-18 July.

7.0 <u>MEETINGS/TRIPS DURING THE REPORTING PERIOD</u>

- A. A number of meetings were held in Silver Spring to review the Final Environmental Assessments. The dates and labor expenditures for these meetings are as follows.
 - (1) NNWSI FEA Review 9-13 June

L. Lorig 40 hours

(2) BWIP FEA Review — 16-17 June

M. Board 16 hours

(3) BWIP FEA QA Review — 18-20 June

R. Rajaram 30 hours

(4) Richton Dome FEA Review — 23-27 June

I.	Farmer	22	hours
К.	Wahi	51	hours

(5) Deaf Smith FEA Review - 23-27 June

J. Daemen 40 hours

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(6) NNWSI QA FEA Review — 30 June - 2 July

J. Daemen 16 hours

B. During the period from 23 to 25 June, Y. C. Kim attended the 27th U.S. Symposium on Rock Mechanics in Tuscaloosa, Alabama. Dr. Kim, along with J. Buckley and M. Nataraja, had written a paper for the symposium.

Y. C. Kim 32 hours

8.0 SCHEDULE AND COST PROJECTION

The summary sheet for the June invoice is attached. Costs are well within the limit authorized for both Task Orders No. 001 and No. 002. Several project milestones for Task Order No. 002 were scheduled for June but they conflicted with the FEA reviews. Therefore, the draft BWIP In-Situ Testing paper scheduled for a 16 June submittal will be submitted in mid-July. The NNWSI In-Situ Testing paper outline and meeting schedules will be delayed until August. It is planned to discuss the revised schedule with D. Tiktinsky during his visit to Minneapolis in mid-July.

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Respectfully submitted,

Roger D. Hart Program Manager 16 July 1986

Attach. rdh/ks

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U.S. Divi Offi ATTE Wash Itas P.O. Minr	Nuclea ision of ice of t ENTION: nington, ee's Nam ica Cons Box 14 heapolis	, Minnesota 554	Section	(a) (b) (c) (d) (e) (f)	Title of Projec	011-86-071 :
		to contact: arkham (612-623-9	599)			
(g)	This v	oucher represents	reimburseable	costs	from June 1	thru_June 30, 1986
					AMOUNT	BILLED
•				(k) <u>C</u>	urrent Period	(1) Inception to Date
(h)	DIRECT			\$	7,374.58	\$ 31,521.31
	(2)	Materials, Suppl Noncapitalized Ed			-0-	-0-
	(3)	Consultants			29,193.96	52,863,37
	(4)	Travel - Domestic	6		1,980.86	9,805,37
	(5)	Subcontract			-0-	13.329.64
Ŭ	(6)	Other Costs			244.46	2.170.02
		TOTAL DIRECT CO	DSTS	_\$	38,793.86	\$ 109.689.71
(1)	G&T	CT COSTS A Expense 106% of		•		
	LUSL	Element (1)		<u>}</u>	7,817.06	\$33.412.61
		TOTAL DIRECT AN	IN THUTKEUT CUS		46,610.92	143.102.32_
(j)	FIXED-I	FEE EARNED			3,728.87	11.448.17
(m)	TOTAL /	AMOUNTS CLAIMED			50,339.79	154.550.49
(n)	ADJUST	IENTS				-0-
(0)	GRAND 1	TOTALS		\$	50,339.79	\$ 154.550.49

TASK ORDER-001

TASK 2 DOCUMENT REVIEWS

(h) DIRECT COSTS

(1) DIRECT LABOR

(1)	DIRECT LABOR		Hours		
	Labor Category	Name	Billed	Rate	<u>Total</u>
	Program Manager Admin. Manager	R. Hart L. Gaarder J. Markham	5.0 14.5 5.0	\$22.12 8.25 24.04	\$ 110.60 119.63 120.20
	Sr. Professional	M. Board L. Lorig	5.0 ₊ 80.0 ⁺ 23.0	22.02 19.95	1,761.60
	Secretarial QA	K. Sikora K. Sikora	16.5 1.5	9.28 9.28	153.12 <u>13.92</u>
	Total Direct Labo	or			\$2,737.92
(3)	CONSULTANTS				
	Labor	J. Daemen I. Farmer I. Farmer R. Rajaram K. Wahi	40.0 40.0° 40.0 50.0 34.0	\$57.75 57.75 57.75 66.00 57.4062	\$2,310.00 * 2,310.00 * 2,310.00 * 3,300.00 * 1,951.81 *
	Total Labor/Consu				\$12,181.81
(6)	OTHER COSTS				· ·
	Copies Telephone Postage			\$ 91.30 * 69.95 * <u>13.65</u> *	
	Total Other Costs	i .			<u>\$ 174.90</u>
	TOTAL DIRECT COST	S			\$15,094.63
(1)	INDIRECT COSTS				
÷	G & A Expense (1.	06 x Direct La	bor)		\$ 2,902.20
	TOTAL DIRECT AND	INDIRECT COSTS			\$17,996.83
(J)	FIXED FEE EARNED				<u>\$ 1,439.75</u>
(m)	TOTAL AMOUNT CLAI	MED			<u>\$19,436.58</u>

+ Includes 8 hours from May not previously claimed.
* May hours not previously claimed.
* Invoice attached

TASK ORDER-001

TASK 4 TECHNICAL MEETINGS

(h) DIRECT COSTS

\/	Difference of the second				
	DIRECT LABOR		Hours		
	Labor Category	Name	Billed	Rate	<u>Total</u>
	Admin. Manager	L. Gaarder	2.0	\$ 8.25	\$ 16.50
	-	J. Markham	4.0	24.04	96.16
	Sr. Professional	M. Board	16.0	22.02 19.95	352.32 798.00
	Secretarial	L. Lorig K. Sikora	40.0 2.5	9.28	23.20
	Secretaria	L. Gaarder	1.0	8.25	8.25
	QA	K. Sikora	1.0	9.28	9.28
	Total Direct Lab	or			\$1,303.71
(3)	CONSULTANTS				
	Labor	J. Daemen	56.0	\$57.75	\$3,234.00 *
		I. Farmer	22.0	57.75	1,270.50 * 1,980.00 *
		R. Rajaram K. Wahi	30.0 51.0	66.00 57.4062	2,927.72 *
		Y. Kim	32.0	55.00	1,760.00 *
	Total Labor/Cons				11,172.22
	Expenses/Travel	ai cancs		•	
From	Date To Tra	veller Purp	ose	Costs	
6722			eview	1) Airfare	\$860.00 *
	tination			2) Hotel	447.15 *
From				3) Meals	273.76 *
Tucs				4) Transportation	n 26.00 * 17.72 *
AZ	D. C.			5) Phone	
					\$1,624.63
	Date				
From		veller Purp		Costs	****
6/25		Farmer EA R	leview	1) Airfare	\$640.00 * 121.95 *
	<u>tination</u>			2) Hotel 3) Meals	74.00 *
From Tucs				4) Limousine.tax	
AZ	D.C.			17 21	\$857.65
•	Date				4001.00
From	To Tra	veller Purp		<u>Costs</u>	
6718	• • •	Rajaram EA R	eview	1) Airfare	\$500.00 *
	<u>tination</u>			2) Hotel	73.16 *
From				3) Car rental 4) Meals	134.29 * 58.60 *
IL	ago, Wash., D.C.	· ·		5) Parking	33.00 *
16	0.0.			6) Mileage	11.00 *
				7) Phone	9.84 *
		•			

\$819.89

TASK ORDER-001 TASK 4 TECHNICAL MEETINGS PAGE 2

(3) CONSULTANTS TRAVEL (Continued)

\$972.59

\$16,725.12

<u>Date</u> <u>From</u> <u>To</u> <u>Traveller</u> 6/23/86 6/25/86 Y. C. Kim <u>Destination</u> <u>From</u> <u>To</u> Tucson, Tuscaloosa, AZ Alabama	<u>Purpose</u> Rock Mechanics Symposium	<u>Costs</u> 1) Airfare 2) Registration 3) Hotel 4) Car rental 5) Meals 6) Taxis, gas 7) Phone	\$740.00 * 205.00 * 91.56 * 92.93 * 95.21 * 42.00 * 11.44 * \$1,278.14
Total Travel/Consultants			\$5,552.90

Total Consultants/ Labor & Travel

(4) TRAVEL

Data

<u>Dat</u> <u>From</u> <u>6/8/86</u> <u>Destina</u> <u>From</u> Mpls., MN	<u>To</u> 6/13/86	<u>Traveller</u> L. Lorig	<u>Purpose</u> EA Review	<u>Costs</u> 1) Airfare 2) Hotel 3) Meals 4) Telephone 5) Car rental 6) Taxis 7) Gas, parking	\$	580.00 244.75 78.28 79.63 228.72 17.00 11.63	* * * * *
		·		• .•• •	\$ 1	.240.01	

6/15/86 Destinati From 1	<u>[0</u> 5717/86 ion To Nash.,	<u>Traveller</u> M. Board	<u>Purpose</u> EA Review	sts Alrfare Hotel Meals Phone	\$ 580.00 97.90 60.00 2.95	* *
MN C	D.C.				\$ 740.85	

Total Travel/Employees

\$ 1,980.86

TASK ORDER-001 TASK 4 TECHNICAL MEETINGS PAGE 3

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(6)	OTHER COSTS		<u>Total</u>
(0)	Telephone \$	9.56 * 29.40 * <u>4.70</u> *	
	Total Other Costs		\$ 43.66
	TOTAL DIRECT COSTS	• .	\$20,053.35
(1)	<u>INDIRECT COSTS</u> G & A Expense (1.06 x Direct Labor)		<u>\$ 1,381.93</u>
	TOTAL DIRECT AND INDIRECT COSTS		\$21,435.28
(j)	FIXED FEE EARNED		\$ 1,714.82
(m)	TOTAL AMOUNT CLAIMED		\$23,150.10

* Invoice Attached.

TASK ORDER-002

TASK 1 SITE SPECIFIC IN-SITU TESTING POINT PAPERS

(h) **DIRECT COSTS**

N /	······································				
(1)	DIRECT LABOR		Hours		
	Labor Category	Name	Billed	<u>Rate</u>	<u>Total</u>
	Admin. Manager	L. Gaarder J. Markham	1.0	\$ 8.25 24.04	\$
	Sr. Professional Secretarial	M. Board K. Sikora	62.0 13.5	22.12 9.28	1,371.44 <u>125.28</u>
	Total Direct Labo	or			\$1,577.09
(6)	OTHER COSTS				:
	Communications Copies Postage			\$ 4.35 * 12.30 * 2.19 *	
	Total Other Costs	1			<u>\$ 18.84</u>
(i)	TOTAL DIRECT COST INDIRECT COSTS	S			\$1,595.93
	G & A Expense (1.	06 x Direct L	abor)		\$1,671.72
	TOTAL DIRECT AND	INDIRECT COST	S		\$3,267.65
(j)	FIXED FEE EARNED				261.41
(m)	TOTAL AMOUNTS CLA	IMED			\$3,529.06

* Invoice attached.

TASK ORDER-002

TASK 2 THERMOMECHANICAL ANALYSIS

(h) DIRECT COSTS

(1)	DIRECT LABOR		Hours		
	Labor Category	Name	Billed	Rate	<u>Total</u>
	Program Manager Admin. Manager	R. Hart L. Gaarder J. Markham	1.0 1.0 2.0	\$22.12 8.25 24.04	\$22.12 8.25 48.08
	Sr. Professional Asst. Profession. Secretarial	L. Lorig M. Mack K. Sikora	23.0 100.0 2.0	19.95 12.00 9.28	458.85 1,200.00 <u>18.56</u>
	Total Direct Labo	r .			\$1,755.86
(3)	CONSULTANTS				
	Labor	K. Wahi	5.0	57.4062	\$ 287.03*
(6)	OTHER COSTS	<u>.</u>			
	Copies Postage			6.50 * .56 *	
	Total Other Costs				\$ 7.06
	TOTAL DIRECT COST				\$2,049.95
(1)	G & A Expense (1.	06 x Direct La	abor)		\$1,861.21
	TOTAL DIRECT AND	INDIRECT COST	S .		\$3,911.16
(j)	FIXED FEE EARNED				312.89
(m)	TOTAL AMOUNT CLAI	MED			\$4,224.05

* Invoice attached.

Jul-86 TASK ORDER 001

TASK LABOR SUMMARY

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TASK 2 REVIEW OF DOCUMENTS

	BUDGETED	TOTAL	HRS
LABOR CATEGORY		HRS BILLED	
PROGRAM MGR	96	28	68
PROGRAM MGR ADMIN MGR	120	28 63.5	56.5
SR. PROFFESSION	980	428.5	551.5
ASST PROFESSION	300	428.5	300
SR. REVIEWER	48	0	81
QA	48	14	34
SECRETARIAL	200	14 192.5	7.5
TOTAL ITASCA	1792	726.5	1065.5
CONSULTANT			
J. DAEMEN I. FARMER	168	148	20
I. FARMER	88	80	8
ASST PROFESSION	208	0	208
R. BARNES	0	20	-20
K. WAHI	0		-74
R. RAJARAM	0	50	-50
TOTAL CONSULT	464	372	92
SUBCONTRACTOR-N	NC		
PRIN INVEST	256	22	234
SR ENGINEER	144		144
ENGINEER/GEOL	208		179
DRAFTING CLERICAL	0		-2
CLERICAL	100	27	73
TOTAL SUBCONT	708	80	628
	222222	EEEEEE	
TOTAL TASK	2964	1178.5	1785.5

Jul-86 TASK ORDER 001

TASK LABOR SUMMARY

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TASK	4	TECHNICAL	MEETINGS
TUON	-		

		TOTAL	
LABOR CATEGORY	HRS	HRS BILLED	REMAINING
PROGRAM MGR	62	28	34
ADMIN MGR	76		
PRIN INVESTIGAT			
SR PROFFESSION SR REVIEW	1108 0	284 24	824 -24
QA	32		
SECRETARIAL	148		91
TOTAL ITASCA	2014	476	1538
CONSULTANT			
J. DAEMEN	588		460
I. FARMER	104	61	43
K. WAHI	0	109	-109
R. RAJARAM Y. KIM	0	30 32	-30 -32
TOTAL CONSULT	692	360	332
SUBCONTRACTOR-NW	с -		
PRIN INVESTIGAT	588		487
CLERICAL	44	28	16
TOTAL SUBCONT	632	129	503
IOIAL SUBCONI	052	123	505
	zezzz		\$2525 5
TASK TOTAL	3338	965	2373
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TASK ORDER TOT	6545	2168	4377

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TASK LABOR SUMMARY

Jul-86 TASK ORDER 002 TASK 1 SUBTACT SITE SPECIFIC IN-SITU TESTING POINT PAPERS SUBTASK 1 BWIP

LABOR CATEGORY	BUDGETED HRS	TOTAL HRS BILLED	HRS REMAINING
PROGRAM MGR	24	2	22
ADMIN MGR	32	11	21
SR PROFFESSION	304	285	19
SR REVIEW	4	0	
QA	16	2.5	13.5
SECRETARIAL	42	25.5	16.5
TOTAL ITASCA	422	326	96
SUBCONTRACTOR-N	WC		
PRIN INVESTIGAT	72	0	72
CLERICAL	8	õ	8
TOTAL SUBCONT	80	0	80
		62822	seer
SUBTASK TOTAL	502	326	176

	Jul-86		TASK	LABOR	SUMMARY
ASK 2		THERMOMECHANICAL			
SUBTASK	1	THERMOMECHANICAL	ANALYSES		

SUBTASK I	THERMOMECHANICAL ANALISES		
LABOR CATEGORY	BUDGETED HRS	TOTAL HRS BILLED	
PROGRAM MGR	30		27
ADMIN MGR	40		38
SR PROFFESSION			401
ASST. PROFESSIO			19
SR REVIEW	8	0	8
QA	8	1.5	6.5
SECRETARIAL	56	2.5	53.5
TOTAL ITASCA	654	101	553
CONSULTANT			
K. WAHI	80	5	75
TOTAL CONSULT	80	5	75
SUBTASK TOTAL	734	106	628
TASK 2	THERMOMECH	ANICAL ANALY	SEC .
		ANICAL MODEL	
	BUDGETED		HRS
LABOR CATEGORY	HRS	HRS BILLED	REMAINING

TASK 2		THERMOMECHANICAL	ANALYSES
SUBTASK	2	THERMOMECHANICAL	MODELING

	BUDGETED	TOTAL	HRS
LABOR CATEGORY	HRS	HRS BILLED	REMAINING
PROGRAM MGR	24	0	24 31
ADMIN MGR	32	Ţ	
SR PROFFESSION	160	0	160
ASST. PROFESSIO	240	52	188
SR REVIEW	80	0	80
QA	8	0	8
SECRETARIAL	56	0	56
TOTAL ITASCA	600	53	547
	22222	22222	ينية بين حدة بين بين عبد بين حدة بين بين
SUBTASK TOTAL	600	53	547
	sessa		SEEEE
TASK TOTAL	1334	159	1175
	22222	=====	EEEEE
TASK ORDER TOT	3114	485	2629