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October 23, 1989

Mr. K. J. Taylor
Advanced Technology Department
Idaho Operations Office - DOE
785 DOE Place
Idaho Falls, ID 83402

TRANSMITTAL OF INFORMATION - JLR-29-89

Dear Mr. Taylor:

Enclosed is the heat flow data provided EG&G by Dave Blackwell to close out our heat flow contract with Southern Methodist University.

Very truly yours

J. L. Renner
J. L. Renner
Geotechnology Programs

ks

Enclosure:
As Stated

cc: P. M. Brookshier, DOE-ID ✓
J. O. Zane, EG&G Idaho

BLACKWELL
HEAT FLOW
WORK ON EG&G
P.O. 1988-89

NEW HEAT FLOW DATA FOR OREGON AND WASHINGTON

by

David D. Blackwell and John Steele

Department of Geological Sciences
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Dallas, Texas 75275

Report to

E G & G IDAHO, INC.

January, 1989

NEW HEAT FLOW DATA FROM OREGON AND WASHINGTON

by

David D. Blackwell and John L. Steele

SUMMARY

One object of this study was to make thermal conductivity determinations, do terrain corrections, and calculate heat flow values for 9 holes drilled in 1983 and 1985 by the Washington Division of Natural Resources (Korosec, 1983, Barnett, 1986). Temperature gradient measurements had been previously made. The results of this effort are shown in Table 1. Useable data were obtained from eight of the nine holes (all except DNR85-6). Geothermal gradients range from 18 to over 309°C/km and heat flow values range from 23 to 220 mWm⁻² (the high value is at Baker Hot Springs). These data will be included in a paper now in preparation for the Journal of Geophysical Research (Blackwell et al., 1989). Samples from the 1988 drill holes were not received in time for measurements as part of this study. Those will be studied at a later time.

The second object was to work up heat flow values for recently obtained data, including industry exploration data that has become available, for the Oregon Cascade Range. As part of this study thermal conductivity values were estimated, and terrain corrections made for 21 sites in the Santian Pass - Foley hot springs area. In addition terrain corrections and thermal conductivity measurements were made for a number of wells for which data have been collected since the last comprehensive Cascade report (Blackwell et al., 1982). All these data are included in Table 2 (156 points).

TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU (SE)	NO TCU	UN GRAD (SE)	CO GRAD (SE)	CO H.F. (SE)	Q HF	LITHOLOGY SUMMARY
38N/ 8E 20		48-45.85	121-48.30	DNR83-3 9/20/83	2621	12.0 25.0			999.9			G	
						10.0 140.0	2.33 0.10	5	(269.0)	(309.0)	720	G	
10N/10E 19ACC		46-20.68	121-35.53	DNR85-1C 9/25/85	969	200.0 305.0	2.05 0.10	4	56.1 0.4	55.7	114	B	VOLC SEDS
10N/ 9E 21CAB		46-20.25	121-41.90	DNR85-2 10/ 3/85	762	25.0 148.6	1.86 0.20	5	71.7 1.2	67.8	126	C	VOLC SEDS
						90.0 145.0	1.86 0.20	5	63.2 2.5	60.2	112	B	
10N/10E 15DBA		46-21.10	121-32.85	DNR85-3 10/ 3/85	1317	80.0 109.7	1.48 0.10	5	34.5 0.5	44.6	66	B	VOLC SEDS AND BASALT
7N/12E 9CCC		46- 6.25	121-19.29	DNR85-4 10/ 2/85	872	25.0 75.0	1.29 0.13	5	47.8 3.2	43.0	55	C	BASALT AND SEDS
						25.0 141.6	1.29 0.13	5	52.5 4.8	47.2	61	C	
6N/10E 7ACD		46- 1.30	121-36.05	DNR85-5 10/ 2/85	1012	100.0 150.0						B	BASALT AND VOLC SEDS
						55.0 150.0	1.25 0.13	5	20.3 0.2	18.3	23	B	
5N/ 6E 29DDC		45-53.10	122- 4.65	DNR85-6 9/22/85	1183	55.0 150.0			-0.5 0.1			X	VOLC SEDS AND TUFFS
4N/ 7E 21CDB		45-48.70	121-57.25	DNR85-7C 10/ 4/85	347	50.0 100.0						G	VOLC SEDS
						300.0 350.0						G	
						45.0 330.0	1.77 0.15	4	88.5 0.2	79.4	149	G	
10N/ 4E 2DBA		46-22.65	122-15.95	DNR83-1 7/22/83	487	15.0 141.0	1.95 0.19	4	50.5 0.5	36.9	72	B	

REFERENCES CITED

- Barnett, B., The 1985 geothermal gradient drilling project for the state of Washington, Wash. Div. Geol. and Earth Resources, Open-file Rept. 86-2, 34pp, 1986.
- Blackwell, D.D., R.G. Bowen, D.A. Hull, J. Riccio, and J.L. Steele, Heat flow, volcanism and subduction in northern Oregon, J. Geophys. Res., 8, 8735-8754, 1982.
- Blackwell, D.D., J.L. Steele, S. Kelley, and M.A. Korosee, Heat flow and geothermal gradient studies in the state of Washington, in preparation, 1989.
- Korosee, M.A., The 1983 geothermal gradient and heat flow drilling project for the state of Washington, Wash. Div. Geol. and Earth Resources, Open-file Rept. 83-12, 13pp, 1984.

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TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
2N/11E 12BCA	SC	45-40.46	121-23.73	GUILL 2 12/11/81	214							X	BASALT (SEE GUILL
2N/11E 11DBA	SC	45-40.24	121-24.29	GUILL 1 12/11/81	199							X	VOLCANICS 31-305'
2N/ 8E 18ACD		45-39.43	121-51.97	RDH-DCFL 4/20/82	268	105.0 153.0	1.38 0.21	3	35.4	27.2	38	D	EAGLE CK MUDFLOW
2N/ 7E 28BDDA	SC	45-37.67	121-57.17	RDH-TCK 1/ 4/82	18	60.0 150.0	1.42 0.17	4	74.2 0.2	57.1	81	B	ANDESITE
2N/11E 30DDA	HC	45-37.45	121-29.07	FRMTNRWW 9/10/81	421	60.0 238.0			42.1 0.4	49.5		C	
1N/ 2E 15BCB	PW	45-34.40	122-33.30	PWB 6/17/81	6							X	GRAVEL
1N/ 3E 19BA	PW	45-33.57	122-28.90	PTLD 19 6/ 2/81	3							X	GRAVEL
1N/ 3E 23AB	PW	45-33.49	122-24.25	BONN PA 5/27/81	8							X	GRAVEL
1N/10E 19AD	HC	45-33.47	121-36.77	WESEMAN 4/25/80	414							X	CL SS GRAV CONGL
1N/ 3E 23AC	PW	45-33.45	122-23.78	REYNMET9 5/27/81	5	85.0 155.0			53.0	53.0		D	CLAY, SAND GRAVEL
1N/ 4E 27ADC	WC	45-32.46	122-17.61	RDH-CORQ 12/29/81	23	40.0 150.0	1.35 0.13	4	36.7	29.4	40	D	BASALT
1N/ 3E 33AD	PW	45-31.68	122-26.04	PTLD 33 6/ 2/81	61							C	
1N/ 6E 31CD	HC	45-31.19	122- 7.03	RDH-IM 4/11/79	743	0.0 153.0	1.85					X	VESICULAR BA SALT
1N/ 3E 31CDD	PW	45-31.17	122-29.37	PTLD 31 5/28/81	61	150.0 295.0			35.2 0.3	35.2		B	GRAV TO 137 CL & SD 295
1S/ 4E 1BCA	CW	45-30.88	122-15.90	RDH-HOW 1/ 4/82	174	65.0 150.0	1.35 0.13	4	39.9 0.2	35.0	47	B	CLAY TO 63MB ASALT TO 150
1S/ 4E 10BCA		45-30.00	122-18.32	RDH-CPCO 4/20/82	34	20.0 60.0	1.49 0.15	4	146.7	117.3	174	G	CLAY AND BSLT FRAG
1S/ 4E 11ACC	WC	45-29.90	122-16.70	RDH-SDRV 10/30/81	46	110.0 150.0	1.29 0.13	6	12.9 1.1	39.3	51	B	
1S/10E 18BD	DU	45-29.03	121-35.78	MORRIS 7/22/80	671	10.0 35.0			- 25.9 5.6			X	

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TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
1S/ 4E 16ADC	HC	45-29.02	122-18.82	MOLLERS 1/ 2/81	206	145.0 310.0						X	
1S/ 3E 160CD	HC	45-28.62	122-26.47	JAKSICH 7/16/81	250	45.0 117.0				4.0		X	
1S/ 5E 20BDA	HC	45-28.25	122-13.22	YOUNKERS 7/ 9/81	320	20.0 107.0				38.0		X	CLAY AND SANDSTONE
1S/ 4E 30AAA	HC	45-27.62	122-21.15	MARSTON 7/14/81	168	22.0 57.0				- 10.0		X	GRAVEL
2S/ 4E 21AAA	HC	45-23.33	122-18.65	NIETE 7/15/81	238	10.0 70.0			25.5	25.5		X	GRAVEL AND CLAY
2S/ 5E 26ACA	HC	45-22.18	122- 9.23	CHRVILLE 7/ 8/81	384	25.0 87.0			23.5 1.0	23.5		D	
3S/ 5E 20ADB	HC	45-17.83	122-12.67	R ELLIOT 7/10/81	451	15.0 60.5			10.0	10.0		X	CLAY AND BASALT
3S/ 4E 29BAD	HC	45-17.13	122-20.50	EMD-FERG 7/ 8/81	131	110.0 205.0			(45.0)	(36.0)		D	CLAY, GRAVL, BASALT
3S/ 4E 28BCC	HC	45-16.90	122-19.83	ROSENKRN 7/ 7/81	141	25.0 62.5						X	CLAY AND BASALT
4S/ 9E 28DD	HC	45-11.26	121-40.12	RDH-CL 1/ 5/79	1036	0.0 141.0	1.54 0.15	4				X	ANDESITE
5S/ 8E 32DD		45- 5.30	121-50.80	CL-1 1/23/81	841	70.1 112.8	(1.38)		47.6 1.6			C	
6S/ 6E 1AA		45- 5.15	122- 0.50	CL-4 9/23/81	511	100.6 149.4	(1.38)		81.4 0.6			C	
6S/ 7E 2DD		45- 4.75	121-55.20	CL-3 9/23/81	700	70.1 97.5	(1.38)		27.6 2.0			X	
6S/ 7E 29ABA	WH	45- 1.50	121-58.40	77AHS 3/23/78	573	0.0 460.0	1.67 0.13		(174.0)	(140.0)	231	G	BASALT, TUFF PYROCLASTICS
6S/ 7E 30BBC	WH	45- 1.33	122- 0.55	AHS-HI 6/ 5/86	524	0.0 20.0			(999.9)			G	
6S/ 7E 26DC		45- 0.75	121-54.90	CL-5 10/27/81	673	20.0 297.0			86.5 1.1			G	
6S/ 8E 31BD		45- 0.25	121-57.80	CL-3A-81 1/23/81	694	103.6 121.9	(1.38)		68.9 1.2	49.7	69	C	
						73.1 105.2	(1.38)		17.0 3.3			X	

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TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
6S/ 7E 36DA		45- 0.00	121-53.40	CL-8 10/27/81	706	30.4 146.3	(1.38)		57.9 0.7	42.2	59	C	
7S/ 8E 9BC		44-58.65	121-50.70	CL-9 10/27/81	865	12.2 48.8			-43.2 3.0			X	
7S/ 7E 12DC		44-57.80	121-53.60	CL-7 10/27/81	731	82.3 118.9	(1.38)		59.8 1.1			C	
7S/ 7E 25BD		44-56.10	121-53.95	CL-6 10/27/81	755	30.5 109.7	(1.59)		17.4 0.5			X	
8S/ 1E 9BD	WC	44-53.47	122-41.63	WOLFF 4/30/80	338	30.0 100.0	(1.38)		34.9 4.7	33.2	46	C	BASALT
8S/18E 15DAC	BM	44-52.13	120-32.77	RAJ-M3 2/15/83	829	55.0 105.0						D	CLAY 22-82M TUFF TO 162M
8S/18E 22DCB	BM	44-51.25	120-33.20	RAJ-M2 2/15/83	817							X	CLAY AND TUFF
8S/ 8E 22BA		44-51.15	121-49.20	CL-13A 10/ 7/81	1181	76.2 118.9	(1.59)		17.9 0.8			X	
8S/ 8E 28	HC	44-51.10	121-49.90	CTGH-1 8/ 6/87	1146	500.0 1465.0	1.38 0.06	7	81.7	79.8	110	A	BASALTIC ANDESITE
8S/19E 24CAA	BM	44-50.55	120-28.47	RAJ-23 2/15/83	488	65.0 113.5						C	TUFF (CLARNO)
8S/19E 28CRC	BM	44-50.43	120-27.77	RAJ-19 2/15/83	457	25.0 75.0						C	ANDESITE FLW BRECCIA
8S/19E 31DAA	BM	44-49.70	120-29.08	RAJ-257 2/15/83	488	15.0 70.0						C	PHYLLITE
8S/18E 34CDA	BM	44-49.43	120-33.27	RAJ-20 2/15/83	587	50.0 105.0						C	TUFFACEOUS SED (CLARNO)
8S/18E 35CCD	BM	44-49.42	120-32.38	RAJ-D3 2/15/83	561	10.0 61.5						X	TUFFACEOUS SED (CLARNO)
9S/19E 5BAC	BM	44-49.13	120-28.57	RAJ-AW3 2/15/83	530	15.0 75.0						C	PHYLLITE
9S/ 7E 3CA	WH	44-49.10	121-56.10	SUN-BRA1 9/30/81	1219	30.0 138.0	(1.38)		63.5 0.5	67.5	(92)	C	WEATHERED VOLCANICS
9S/ 7E 7DDB	HC	44-48.10	121-59.50	SUN-BR5 9/30/81	957	50.0 150.0	(1.38)		55.4 0.3	61.7	(84)	C	ALTERED TUFF
9S/ 8E 18B		44-47.80	121-53.00	CL-10 11/ 9/81	852	30.5 42.6	(1.59)		34.1 0.8			D	

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TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
9S/ 7E 14ACA	WH	44-47.74	121-54.75	BRET77BB 3/11/78	823	80.0 360.0	1.80 0.09		100.8 0.5	81.4	146	G	BASALT & TUFF
9S/ 7E 27ADA	WH	44-45.99	121-55.70	SUN-BR10 9/30/81	828	30.0 153.0	(1.38)		94.9 0.7	67.3	(93)	C	AND, BASALT & TUFF
9S/ 7E 29CCB	WH	44-45.60	121-59.20	SUN-BR2 9/30/81	939	70.0 84.0	(1.38)		83.4 3.7	78.0	(109)	C	BASALT & TUFF
9S/ 7E 28CDA	WH	44-45.55	121-57.55	SUN58-28 8/12/82	823	250.0 856.0	1.51	5	148.0	148.0	222	G	OLIGOCENE TUFFS
						0.0 2457.0	1.88	13	56.0	56.0	105	B	
9S/ 7E 23CCD	WH	44-45.50	121-57.85	SUN-BR11 9/16/80	878	120.0 153.0	(1.38)		146.0 3.8	130.0	(180)	G	SOFT GREY CLAY
						60.0 110.0	(1.38)		189.8 1.1	172.5	(238)	G	
9S/ 7E 34DBB	WH	44-44.95	121-56.20	SUN-BRA4 9/30/81	939	20.0 150.0	(1.38)		103.6 0.2	96.2	(130)	G	BASALT & BSLT AND
9S/ 7E 36BAD	HC	44-44.80	121-53.60	SUN-BR12 10/ 2/81	895	50.0 154.0	(1.38)		86.7 0.5	77.3	(107)	C	ALT. BASALT & ANDESITE
10S/ 7E 9BBC	HC	44-43.55	121-57.95	SUN-BRA5 9/30/81	1329	115.0 152.0	(1.38)		68.6 0.6	92.6	(126)	G	BASALT & BSLT ANDESIT
						10.0 110.0	(1.38)		69.9 2.4	99.9	(138)	G	
10S/ 7E 23BCB	HC	44-41.60	121-55.55	SUNBRA10 9/30/81	817	85.0 152.0	(1.38)		115.6 0.5	84.2	(117)	C	BASALT & BSLT ANDESIT
10S/ 7E 24ACB	HC	44-41.60	121-53.65	SUNBRA11 10/ 1/81	975	50.0 145.0	(1.38)		87.4 0.4	78.9	(109)	C	ANDESITE & DACITE LAVA
10S/ 7E 20CBB	WH	44-41.45	121-59.20	SUN-BRA9 9/30/81	640	75.0 153.0	(1.38)		104.3 0.9	78.4	(108)	C	WELDED ASH TUFF
10S/ 7E 34ACA	HC	44-39.90	121-55.95	SUNBRA12 9/30/81	780	50.0 150.0	(1.38)		84.8 0.4	71.8	(100)	C	ANDESITE & BSLTC AND
11S/10E 5ACB	DU	44-38.78	121-33.47	RDH-CSRX 7/23/80	1194	25.0 153.0	1.72 0.21	4	18.2 1.1	21.4	37	D	LAVAS
12S/ 9E 1BCD	DU	44-33.70	121-36.42	RDH-GRRG 7/23/80	999	35.0 105.0	1.55 0.21	4	72.3 3.9	70.0	108	C	TUFF, CONGLO MERATE, BASA
						70.0 105.0	1.55 0.21	4	79.2 1.5	75.0	116	C	

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TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
16S/ 6E 1BC		44-12.18	122- 2.09	BN-4 9/ 2/81	535	9.0 146.0	(1.72)		67.3	53.3	92	C	ANDESITE
16S/14E 9DRB	HL	44-12.10	121- 3.33	MINSON 6/ 5/81	975	60.0 120.0 120.0 150.0 150.0 164.0						B B B	TUFFACEOUS SED, CLAY
16S/ 7E 2CA		44-12.00	121-55.90	SUNSA17 6/25/81	1493	3.3 106.7			-38.3 0.8			X	QUAT BASALT
16S/14E 16ABA	HL	44-11.63	121- 3.07	PB-1 4/30/81	1000	200.0 450.0 320.0 450.0						B B	VOL SED, TUF BASALT
16S/ 6E 9BC		44-11.30	122- 5.42	BN-5 11/ 2/81	584	85.0 145.0	(1.59)		7.3	6.8		X	QUAT VOL
16S/ 6E 13BB		44-10.45	122- 2.06	BN-6A-81 11/ 3/81	857	256.0 296.0	(1.59)		27.2	28.1	45	D	Q/T BASALT
16S/ 7E 19DA		44- 9.60	122- 0.20	SUNSA19 6/26/81	693	20.0 44.7	(1.59)		50.3	50.3	80	D	QUAT BASALT
16S/ 6E 21CA		44- 9.30	122- 5.30	BN-8-81 11/ 2/81	657	73.0 137.0	(1.59)		68.4	73.1	116	C	Q/T BASALT
16S/ 5E 30ABB	WH	44- 9.29	122-14.88	ST DAM 3 8/ 8/79	368	15.0 85.0	1.33	4	54.0	51.0	68	D	0-92 M ALLUV IUM, 92-123
16S/ 6E 30AD		44- 8.90	122- 7.40	SUNSS 6/26/81	666	50.0 167.0	(1.38)		86.9 0.4	81.8	113	C	TMT
16S/ 7E 21DC		44- 8.60	121-58.00	SUNSA20 6/26/81	1307	16.7 133.3			-18.3 -0.3			X	QUAT BASALT
16S/ 6E 36AB		44- 8.15	122- 1.36	BN-11-81 11/ 3/81	900	91.0 235.0	(1.59)		79.6	78.0	124	C	Q/T BASALT
18S/47E 3	WS	44- 1.94	116-57.27	ORE-IDA 7/20/81	654	0.0 3100.0 0.0 2700.0	1.50	22	54.8 0.5	54.8	82	B	PLIO/PLEIST SILTSTONE
							1.42	16	62.0 0.6	62.0	88	B	

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TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
19S/14E 24DD	HL	43-54.35	120-59.60	CRANWW 12/16/81	1280	100.0 384.0						C	QUAT BASALT
						200.0 360.0						C	
20S/12E 24BCB	HL	43-49.50	121-14.82	GEO-N-3 9/ 6/86	1786	1174.0 1220.0	1.80		53.2 10.0	53.2	96	C	BASALT AND RHY TUFF
21S/ 3E 17DA	WC	43-44.80	122-28.25	OAKR CW6 11/ 8/80	360	70.0 240.0	18.20		47.7 2.9	40.5	74	B	MUDSTONE AND SILTSTONE
						240.0 340.0	18.41		42.3	36.0	66	B	
21S/ 3E 26CAA		43-43.07	122-25.17	RDH-HCDS 11/ 8/80	427	30.0 160.0	1.55		36.9	31.3	49	B	SILICIFIED VOLCANICS
21S/13E 31CC	HL	43-42.50	121-13.50	USGS-NB2 7/17/81	1943	660.0 930.0	(1.46)		999.0	999.0	1594	G	TUFF, SED, BASALT
21S/ 4E 31BC		43-42.25	122-23.32	CTBEACH 9/23/80	475	15.0 4.0			52.7 0.5			D	
22S/ 4E 6ADD	WH	43-41.45	122-22.38	KITSON S 8/28/81	488	7.0 155.0	(1.38)		113.0	91.0	126	G	
22S/12E 25BD	HL	43-38.25	121-14.45	GEO-N-1 9/25/86	1754	1146.0 1226.0	1.80		83.7 44.0	83.7	151	G	BASALT AND RHY TUFF
26S/16E 18AA		43-19.08	120-52.05	FINE 3/20/80	1324	10.0 229.0			2.0 0.5			X	SEDIMENTARY ROCKS AND BA
26S/ 2W 23AAD	WC	43-17.83	122-53.49	SUSCRCPG 7/24/81	289	30.0 52.0	(1.59)		33.5 1.2	(27.0)	(43)	C	BASALT
26S/13W 26BDA	CR	43-17.39	124-12.54	MENASHA 8/28/79	85	70.0 160.0	1.38	2	14.8 0.2	16.2	22	D	SILTSTONE
26S/ 3E 25AAD	HC	43-17.02	122-24.01	TOKETEE 7/23/81	780	10.0 25.0			43.5 1.6	(32.0)		D	
27S/ 5W 23AA	CR	43-12.78	123-14.83	GLMEYER5 7/24/81	195	20.0 64.0	(1.59)		15.6 0.3	(14.8)	(23)	C	EOCENE BASALT
28S/13W 10DCB	CR	43- 9.28	124-13.20	BANGERT 8/24/79	34	150.0 315.0	1.30	1	32.4 0.3	30.9	40	C	SS SLTST
29S/ 6E 9BCB	HC	43- 5.61	122- 5.39	C LK PRK 8/ 2/81	1844	150.0 210.0			6.6 0.3			X	
31S/ 3E 3DAA	WH	42-54.20	122-26.46	USFS NUC 7/23/81	1024	0.0 50.0						X	

OREGON 81-88

TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU (SE	NO TCU	UN GRAD [SE	CO GRAD [SE	CO H.F. [SE	Q HF	LITHOLOGY SUMMARY
31S/ 7E 10	WH	42-53.85	121-59.25	CE-CL-1 10/25/86	1859	0.0 405.0	(1.92)		250.0	250.0	481	G	ANDESITE
31S/ 2W 11BCA	WC	42-53.84	122-54.95	J WILSON 7/21/81	466	37.5 67.5	(1.88)		17.1 0.2	19.0	36	D	SILICIC TUFF
32S/ 3E 29BA	WH	42-45.82	122-29.30	USFS PRS 7/23/81	805	0.0 46.0						X	
33S/ 2E 17ADC	WH	42-42.15	122-36.02	LCKDMS12 7/22/81	683	55.0 130.0	1.55 0.03	4	67.7 1.2	60.5	94	B	BASALT
33S/ 2E 17ADD	WH	42-42.08	122-35.88	LCKDMS-2 7/22/81	597	60.0 92.5	(1.55)		59.9 1.0	53.5	83	C	BASALT
33S/36E 6DD		42-41.91	118-18.98	AN-A-5R 9/15/79		6.0 42.7			(75.7)	(75.7)		G	CLAY 0-230M BSLT 230-TD
33S/18E 23CBD	BR	42-41.65	120-34.09	COLLO 9/25/81		10.0 233.0	(1.26)		(409.3)	(314.8)	395	G	
34S/ 1W 4DDC	WC	42-38.26	122-49.22	MARTINSN 7/31/81	491	100.0 212.5	(1.59)		26.7 0.2	(22.3)	38	C	BASALT AND ANDESITE
34S/ 1E 34BBA	WC	42-34.69	122-41.66	R MATHER 7/30/81	555	20.0 52.5			23.7 1.0	(21.0)		D	BASALT ?
34S/ 1E 34AAD	WC	42-34.55	122-40.77	J VARGO 7/30/81	548	10.0 35.0			51.3 0.5	(45.0)		D	BASALT ?
35S/ 1E 13DAB	WC	42-31.58	122-38.47	C RAMBO 8/ 1/81	884	30.0 69.0			20.3 0.7			D	
36S/11E 14AAA		42-27.33	121-22.20	HICKEY 1/27/84	1317	0.0 354.0			34.5 0.3	34.5		B	YONNA FM BSLT FM 345M
						354.0 425.0	(1.59)		39.9 0.8	39.9	64	B	
36S/11E 13ACC		42-27.07	121-28.03	TUPPER 2/28/84	1318	5.0 65.0			112.1	112.1		C	YONNA FM ?
						5.0 100.0			82.5 5.4	82.5		C	
36S/10E 13CAA		42-26.97	121-21.60	SMITH 1/ 6/84	1320	0.0 110.0						X	
36S/11E 23DCA		42-25.80	121-22.37	VIEIRA 2/28/84	1316	10.0 35.0			147.0 3.3	147.0		C	YONNA FM
						35.0 50.0			86.8 2.2	86.8		C	

OREGON 81-88

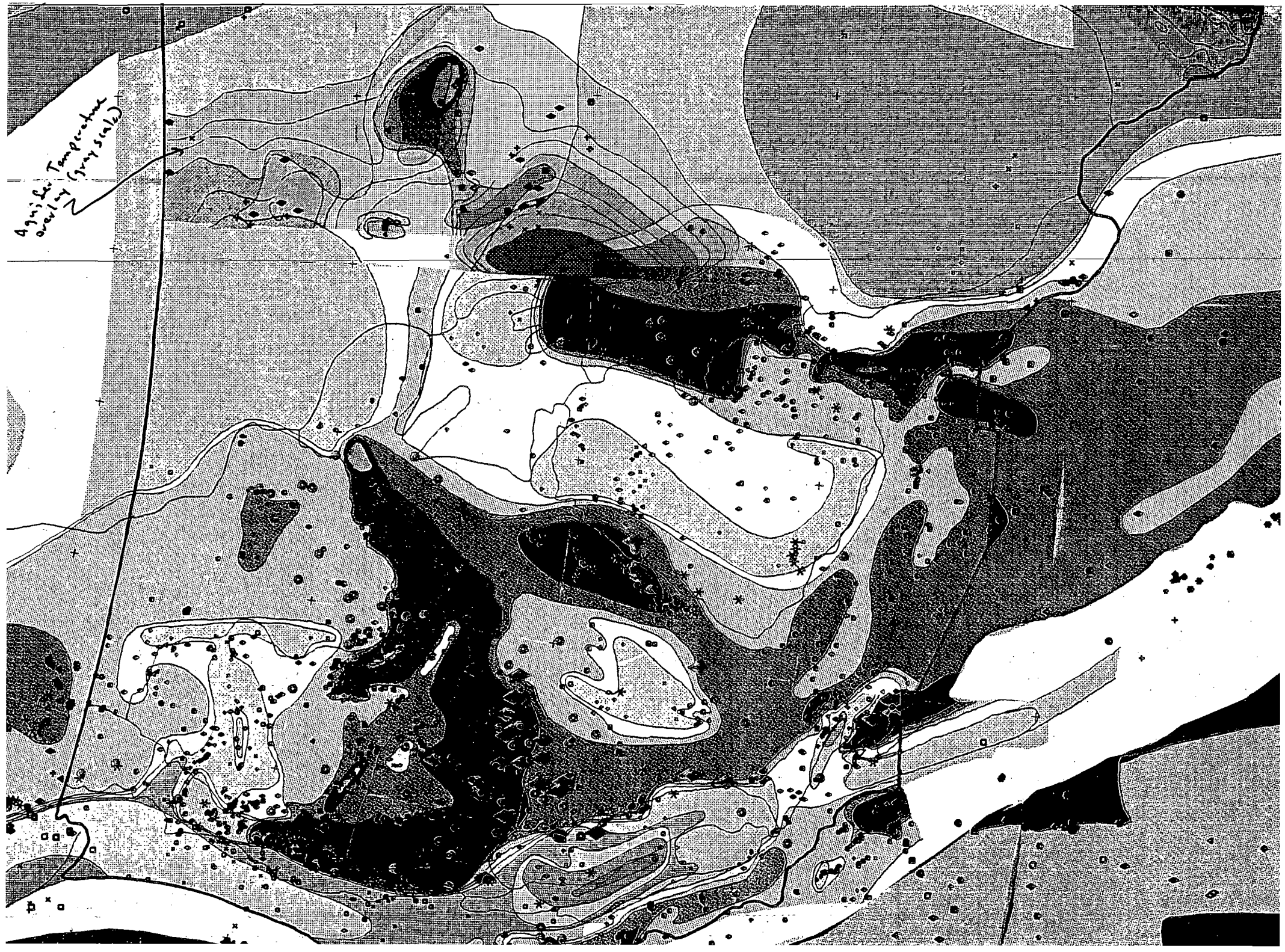
TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
37S/ 2E 4ADD		42-22.93	122-31.86	MORTEN 8/27/81	561	40.0 96.5	1.45	1	33.9 0.9	(28.0)	41	C	BASALT
38S/ 3E 12ADB	HC	42-17.00	122-24.47	LILYGLEN 8/ 4/81	1400	7.5 38.5			60.4 3.1	60.0		D	VOLCANIC SEDIMENTS
38S/ 2E 25EBB		42-14.57	122-32.39	J MILLER 8/26/81	1164	10.0 29.0			49.4 3.1	(43.0)		D	VOLCANIC SED AND BASALT
38S/ 9E 28AC	BR	42-14.27	121-45.99	MOLATORE 6/16/79	1359	10.0 80.0			999.0 0.9	990.0		G	
						10.0 305.0				(262.0)		G	
38S/ 2E 27CAA	WC	42-14.17	122-34.23	HARRGTON 8/30/81	963	20.0 46.0			70.1 0.5	(58.4)		C	VOLCANICS
38S/ 9E 28DAB	BR	42-14.03	121-45.36	OLSON 8/25/82	1289	45.0 115.0						G	SEDIMENT, BAS 96-203
						115.0 180.0						G	
						180.0 233.0						G	
38S/ 9E 28CAD	BR	42-13.97	121-46.02	STANKE 8/25/82	1289	0.0 53.0			999.0	999.0		G	SHALE
38S/ 9E 28DAC	BR	42-13.92	121-45.90	PARKS 8/25/82	1277	30.0 85.0			533.0	533.0		G	SHALE AND BASALT
						85.0 217.5				(460.0)	(460.0)	G	
38S/ 9E 28DCC	BR	42-13.80	121-45.85	ADAMSCHK 8/25/82	1280	0.0 71.0			999.0	999.0		G	SHALE
38S/ 9E 28DCD2	BR	42-13.75	121-45.73	CARROL 8/25/82	1286	0.0 98.5			830.0	830.0		G	
38S/ 2E 35ACC	WC	42-13.41	122-32.91	JM MILLR 8/ 4/81	1231	15.0 45.0			14.2 0.2			D	BASALT
38S/ 9E 32DAA	BR	42-13.17	121-46.60	MODOC LC 9/22/81	1247	0.0 629.0	(1.26)		(300.0)	(300.0)	377	G	SEDIMENTS AND BASALT
38S/ 1E 31DAD	KM	42-13.13	122-44.28	DOGMI-BF 8/27/82	505	70.0 105.0	1.87 0.15	3	56.3 1.8	50.7	95	G	SHALE AND DIORITE

OREGON 81-88

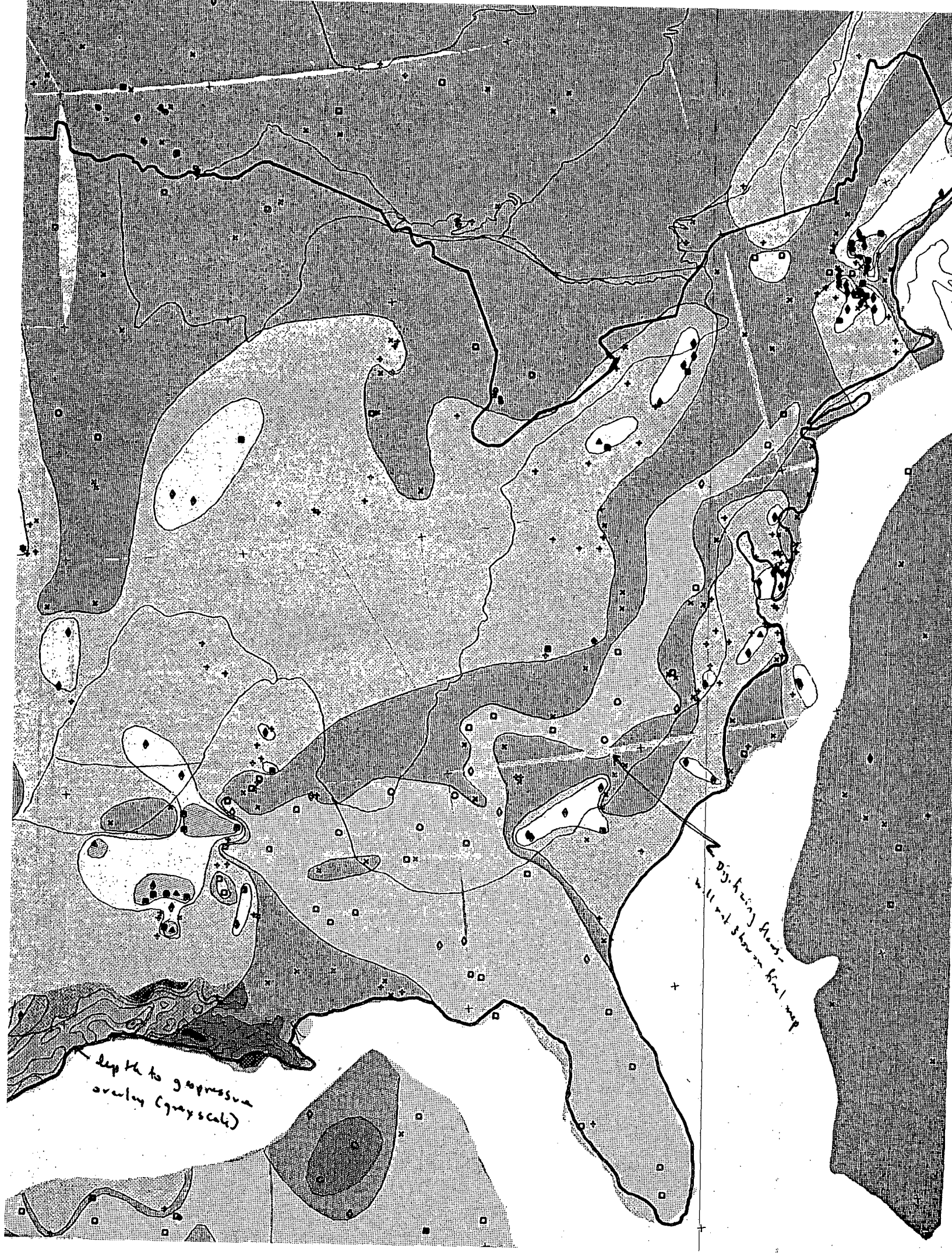
TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
39S/ 1E 4BBD	WC	42-12.74	122-42.76	ASHGH 3/31/82	536	20.0	(1.88)		49.4	44.6	84	G	SEDIMENTS AND GRANITE
						330.0			0.4				
39S/ 9E 1B8C		42-12.66	121-42.96	SHSTA SH 3/11/81	1284	40.0			48.9	44.0	83	G	
						70.0	(1.88)		0.4				
						105.0							
39S/ 1E 2BCB	WC	42-12.65	122-40.57	NED COOK 8/ 4/81	622	50.0	(1.88)		26.0	24.2	46	C	FINE SILT AND SANDSTON
						167.5			0.1				
						50.0	(1.88)		25.7	23.9	45	C	
						177.5			0.1				
39S/ 1E 4CDD	KM	42-12.05	122-42.52	DOGAMI-D 8/27/82	502	5.0	1.81	6	59.9	54.0	97	G	SHALE AND GRANITE
39S/ 1E 10BCB	KM	42-11.70	122-41.82	DOGMI-JC 8/27/82	573	60.0	1.78	4	31.1	29.3	51	B	SHALE
						153.0	0.21		0.3				
39S/ 1E 10CDB	KM	42-11.25	122-41.45	DOGMI-OC 8/27/82	603	65.0	1.75	7	25.7	24.2	42	B	SHALE
						122.5	0.21		0.2				
39S/ 1E 14DBB	KM	42-10.62	122-40.07	DOGMI-RG 8/27/82	635	95.0	1.66	2	28.6	27.0	45	C	SS TO 112 SHALE 112
						150.0	0.21		0.4				
39S/ 1E 15CDB	WC	42-10.42	122-41.33	STURDVNT 8/ 3/81	731	50.0	(3.05)		17.6	16.6	51	C	GRANITE
						212.5			0.1				
40S/ 7E 6	BR	42- 7.15	122- 2.50	TOPSEY C 8/ 1/81	1167	0.0						X	
						50.0							
40S/ 4E 5DB	HC	42- 7.08	122-22.50	DOGMI-CC 8/27/82	1055	10.0	1.23	8	30.1	27.4	34	B	BSLT 10-46M ANDES 46-99M
						46.0	0.04		2.1				
						46.0	1.23		8	40.4	36.7	45	
						99.0	0.04		0.9				
40S/ 3E 5DDD		42- 6.82	122-24.00	R MURRAY 8/27/81	1359	52.5	(1.59)		24.3	(30.4)	49	D	BASALT AND SEDIMENTS
40S/ 2E 12ACC		42- 6.32	122-31.77	LUCY HAR 8/26/81	817	10.0	(1.59)		49.3	(37.9)	60	D	BASALT
						47.0			2.8				
40S/ 2E 6BBD		42- 5.63	122-32.78	BOB FORD 8/25/81	963	10.0			23.5			D	FINE SED
						135.0							
40S/ 2E 16BDC	WC	42- 5.48	122-35.66	C ROSS 2 8/ 5/81	895	85.0			30.4	25.3		D	FINE SED
						97.0			3.2				

OREGON 81-88

TWN/RNG SECTION	TECT PROV	N LAT DEG MIN	W LONG DEG MIN	HOLE (DATE)	COLLAR ELEV	DEPTH RANGE	AVG TCU [SE]	NO TCU	UN GRAD [SE]	CO GRAD [SE]	CO H.F. [SE]	Q HF	LITHOLOGY SUMMARY
41S/ 9W 15CCC		42- 0.10	123-45.30	TAB 13 4/ 7/81	897	130.0 205.0	2.25 0.41	3	11.0 0.1	13.0	29	C	INTRUSIVE



Agriolobus Tamprocticus
overlying granules



depth to gastrovascular cavity (grayscale)

N. containing starch - will not show in final prep

-Re - 3/14/88
HR

March 10, 1988



Howard Ross
Earth Science Lab, UURI
391 Chipeta Way, Ste. C
Salt Lake City, Utah 84108

Dear Howard:

Enclosed are several items including: a copy of the extension approval for contract DE-FG07-86ID12623 from 9/30/87 to 12/31/87; a copy of a letter to Ken Taylor requesting another extension from 1/1/88 to 5/31/88; preliminary quarterly reports for the quarters ending 9/30/87 and 12/31/87 (the actual ones will come from the S.M.U. Grant accounting office with payment requests); and a draft copy of the final report. If you have questions or comments give me a call.

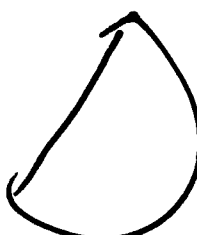
Sincerely,

A handwritten signature in cursive script that reads "D. Blackwell".


David D. Blackwell

DDB/mw

Enclosure



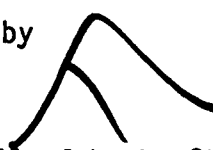
SOUTHERN METHODIST UNIVERSITY
GEOTHERMAL LABORATORY
INSTITUTE FOR THE STUDY OF EARTH AND MAN
Dallas, Texas 75275




U.S. GEOTHERMAL DATABASE AND OREGON
CASCADE THERMAL STUDIES

March, 1988

by



David D. Blackwell, John L. Steele,
and Larry Carter



Prepared under U.S. Department of Energy
Contract No. DE-FG07-86ID12623

U.S. GEOTHERMAL DATABASE AND OREGON
CASCADE THERMAL STUDIES

By
David D. Blackwell
John L. Steele
Larry Carter

March, 1988

Prepared Under U.S. Department of Energy
Contract No. DE-FG07-86ID12623

Department of Geological Sciences
Southern Methodist University
Dallas, Texas 75275

Technical Information Center
Office of Scientific and Technical Information
United States Department of Energy

D
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February 19, 1988



Mr. Ken Taylor, Project Manager
Advanced Technologies Division
U.S. DOE Idaho Operations Office
785 DOE Place
Idaho Falls, Idaho 83402

Dear Mr. Taylor:

I am requesting a no cost extension of the completion date of DOE contract DE-FG07-86ID12623 from 12/31/87 to 5/31/88. We are requesting this extension so that we can complete the final report. I will be sending the draft to Howard Ross at UURI sometime within the next week and expect to complete the report when I receive his review of the draft. To allow time to make sure that all the details are completed cleanly I am requesting an end date of May 31, 1988. This amount of time should allow us to bring the Geothermal Map of the North America through the review process and to the drafting stage (in GSA's hands). The map won't be published until sometime in the fall, however, as it will take GSA that long to go through the publication process.

Also, I understand there was some difficulty in locating the previous extension information. I have enclosed a copy of my letter and the extension form for your files. I have also included a copy of the letter and extension form and a final quarterly report to Howard Ross for his files.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "David D. Blackwell".

David D. Blackwell

DDB/mw

Enclosure

cc: Howard Ross

October 27, 1987



Ms. Susan Prestwich
U.S. DOE
785 DOE Place
Idaho Falls, ID 83402

Dear Susan:

We are approaching completion of the tasks associated with DOE contract DE-FG07-86ID12623 whose official end date was September 30, 1987. We expect to submit the final report within 45 days and all the field and laboratory work is done. We are preparing the final report at this time. Howard Ross suggested that it would be appropriate, nonetheless, to request an official, no-cost time extension to allow orderly termination of the project. Therefore I am requesting such an extension to December 31, 1987.

Sincerely,

David D. Blackwell
David D. Blackwell

DDB/mw

cc: Jeffrey Hoyles
Howard Ross
James Bruseth



July 6, 1988

Mr. Howard Ross
Earth Sciences Lab, UURI
391 Chipeta Way, Ste C
Salt Lake City, Utah 84108-1295

Dear Howard:

Enclosed are a couple of color copies of the map as promised. The distribution list for the copies of the final report for Grant No. DE-FG07-86ID12623 is as follows:

USDOE/DGHT	Washington	Marshall Reed	2
USDOE/IF	Idaho Falls	Ken Taylor	4
UURI	Salt Lake City	Howard Ross	2
USDOE/TIS	Oak Ridge		1

Sincerely,

A handwritten signature in cursive script, appearing to read "D. Blackwell".

David D. Blackwell

DDB/mw

Enclosure



Rec July 1, 1988
HFF



June 8, 1988

Mr. Howard Ross
Earth Sciences Laboratory
391 Chipeta Way, Suite A
Salt Lake City, UT 84108

Dear Howard:

Enclosed are 2 copies of the final report for DOE contract DE-FG07-86ID12623. I have also sent 4 copies to Ken Taylor, 2 to Marshall Reed, and 1 to DOE-TIC. Enclosed are several extra color prints of the geothermal map as well, in case you need to make extra copies of the report.

Sincerely,

David D. Blackwell

DDB/mw

Enclosures

U.S. DEPARTMENT OF ENERGY
NOTICE OF FINANCIAL ASSISTANCE AWARD
(See Instructions on Reverse)

Under the authority of Public Law 93-410 and
subject to legislation, regulations and policies applicable to (cite legislative program title):
Geothermal R&D Act of 1977

1. PROJECT TITLE <u>Geothermal Map of the U.S./Heat Flow Analysis</u>		2. INSTRUMENT TYPE <input checked="" type="checkbox"/> GRANT <input type="checkbox"/> COOPERATIVE AGREEMENT	
3. RECIPIENT (Name, address, zip code, area code and telephone no.) <u>Southern Methodist University Department of Geological Sciences Dallas, TX 75275</u>		4. INSTRUMENT NO. <u>DE-FG07-86ID12623</u>	5. AMENDMENT NO. <u>A002</u>
8. RECIPIENT PROJECT DIRECTOR (Name and telephone No.) <u>Dr. David Blackwell (214) 692-2745</u>		6. BUDGET PERIOD FROM: <u>12/30/86</u> THRU: <u>12/31/87</u>	7. PROJECT PERIOD FROM: <u>11/1/85</u> THRU: <u>12/31/87</u>
9. RECIPIENT BUSINESS OFFICER (Name and telephone No.) <u>Ms. Jo Featherston (214) 692-2018</u>		10. TYPE OF AWARD <input type="checkbox"/> NEW <input type="checkbox"/> CONTINUATION <input type="checkbox"/> RENEWAL <input type="checkbox"/> REVISION <input checked="" type="checkbox"/> SUPPLEMENT	
11. DOE PROJECT OFFICER (Name, address, zip code, telephone No.) <u>Susan Prestwich (208) 526-1147 US DOE - Idaho Operations Office 785 DOE Place - Idaho Falls, ID 83402</u>		12. ADMINISTERED FOR DOE BY (Name, address, zip code, telephone No.) <u>R. Jeffrey Hoyles (208) 526-0790 U. S. Department of Energy Idaho Operations Office 785 DOE Place - Idaho Falls, ID 83402</u>	

13. RECIPIENT TYPE

<input type="checkbox"/> STATE GOV'T	<input type="checkbox"/> INDIAN TRIBAL GOV'T	<input type="checkbox"/> HOSPITAL	<input type="checkbox"/> FOR PROFIT ORGANIZATION	<input type="checkbox"/> INDIVIDUAL
<input type="checkbox"/> LOCAL GOV'T	<input type="checkbox"/> INSTITUTION OF HIGHER EDUCATION	<input type="checkbox"/> OTHER NONPROFIT ORGANIZATION	<input type="checkbox"/> C <input type="checkbox"/> P <input type="checkbox"/> SP	<input type="checkbox"/> OTHER (Specify)

14. ACCOUNTING AND APPROPRIATIONS DATA				15. EMPLOYER I.D. NUMBER/SSN
a. Appropriation Symbol	b. B & R Number	c. FT/AFP/OC	d. CFA Number	

16. BUDGET AND FUNDING INFORMATION		b. CUMULATIVE DOE OBLIGATIONS	
a. CURRENT BUDGET PERIOD INFORMATION			
(1) DOE Funds Obligated This Action	\$ <u>-0-</u>	(1) This Budget Period [Total of lines a.(1) and a.(3)]	\$ <u>73,790.00</u>
(2) DOE Funds Authorized for Carry Over	\$ <u>-0-</u>	(2) Prior Budget Periods	\$ <u>42,000.00</u>
(3) DOE Funds Previously Obligated in this Budget Period	\$ <u>58,058.00</u>	(3) Project Period to Date [Total of lines b. (1) and b. (2)]	\$ <u>115,790.00</u>
(4) DOE Share of Total Approved Budget	\$ <u>115,790.00</u>		
(5) Recipient Share of Total Approved Budget	\$ <u>-0-</u>		
(6) Total Approved Budget	\$ <u>115,790.00</u>		

17. TOTAL ESTIMATED COST OF PROJECT \$ _____
(This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)

18. AWARD/AGREEMENT TERMS AND CONDITIONS

This award/agreement consists of this form plus the following:

a. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)

b. Applicable program regulations (specify) _____ (Date) _____

c. DOE Assistance Regulations, 10 CFR Part-600, as amended, Subparts A and B (Grants) or C (Cooperative Agreements).

d. Application/proposal dated 1/27/86, as submitted with changes as negotiated

19. REMARKS
The purpose of this amendment is to extend the project period to allow for preparation of the final report. This is a no cost extension.

20. EVIDENCE OF RECIPIENT ACCEPTANCE <u>Mildred B. Haenel</u> <u>12/18/87</u> (Signature of Authorized Recipient Official) (Date) <u>Mildred B. Haenel</u> (Name) <u>Director ad interim, Research Administration</u> (Title)	21. AWARDED BY <u>R. Jeffrey Hoyles</u> <u>12/15/87</u> (Signature) (Date) <u>R. Jeffrey Hoyles</u> (Name) <u>Contracting Officer</u> (Title)
--	--

NOTICE OF FINANCIAL ASSISTANCE AWARD
(See Instructions on Reverse)

93-410

and

Under the authority of Public Law subject to legislation, regulations and policies applicable to (cite legislative program title):

Geothermal R&D Act of 1977

1. PROJECT TITLE Geothermal Map of the U.S./Heat Flow Analysis		2. INSTRUMENT TYPE <input checked="" type="checkbox"/> GRANT <input type="checkbox"/> COOPERATIVE AGREEMENT	
3. RECIPIENT (Name, address, zip code, area code and telephone no.) Southern Methodist University Department of Geological Sciences Dallas, TX 75275		4. INSTRUMENT NO. DE-FG07-86ID12623	5. AMENDMENT NO. A002
8. RECIPIENT PROJECT DIRECTOR (Name and telephone No.) Dr. David Blackwell (214) 692-2745		6. BUDGET PERIOD FROM: 8/1/86 THRU: 8/31/87	
9. RECIPIENT BUSINESS OFFICER (Name and telephone No.) Ms. Jo Featherston (214) 692-2018		7. PROJECT PERIOD FROM: 11/1/85 THRU: 9/30/87	
11. DOE PROJECT OFFICER (Name, address, zip code, telephone No.) Susan Prestwich (208) 526-1147 U.S. DOE, Idaho Operations Office 785 DOE Place, Idaho Falls, ID 83402		10. TYPE OF AWARD <input type="checkbox"/> NEW <input type="checkbox"/> CONTINUATION <input type="checkbox"/> RENEWAL <input type="checkbox"/> REVISION <input checked="" type="checkbox"/> SUPPLEMENT	
		12. ADMINISTERED FOR DOE BY (Name, address, zip code, telephone No.) R. Jeffrey Hoyles (208) 526-0790 U.S. Department of Energy Idaho Operations Office 785 DOE Place Idaho Falls, ID 83402	

13. RECIPIENT TYPE

<input type="checkbox"/> STATE GOVT	<input type="checkbox"/> INDIAN TRIBAL GOVT	<input type="checkbox"/> HOSPITAL	<input type="checkbox"/> FOR PROFIT ORGANIZATION	<input type="checkbox"/> INDIVIDUAL
<input type="checkbox"/> LOCAL GOVT	<input checked="" type="checkbox"/> INSTITUTION OF HIGHER EDUCATION	<input type="checkbox"/> OTHER NONPROFIT ORGANIZATION	<input type="checkbox"/> C <input type="checkbox"/> P <input type="checkbox"/> SP	<input type="checkbox"/> OTHER (Specify)

14. ACCOUNTING AND APPROPRIATIONS DATA				15. EMPLOYER I.D. NUMBER/SSN
a. Appropriation Symbol 89 x 0224.91	b. B & R Number AM1015100	c. FT/AFP/IOC ID-74-91/410	d. CFA Number	

16. BUDGET AND FUNDING INFORMATION	
a. CURRENT BUDGET PERIOD INFORMATION	b. CUMULATIVE DOE OBLIGATIONS
(1) DOE Funds Obligated This Action \$ 15,705.00	(1) This Budget Period \$ 73,790.00 [Total of lines a. (1) and a. (3)]
(2) DOE Funds Authorized for Carry Over \$ -0-	(2) Prior Budget Periods \$ 42,000.00
(3) DOE Funds Previously Obligated in this Budget Period \$ 58,085.00	(3) Project Period to Date \$ 115,790.00 [Total of lines b. (1) and b. (2)]
(4) DOE Share of Total Approved Budget \$ 115,790.00	
(5) Recipient Share of Total Approved Budget \$ -0-	
(6) Total Approved Budget \$ 115,790.00	

17. TOTAL ESTIMATED COST OF PROJECT \$ _____
(This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)

18. AWARD/AGREEMENT TERMS AND CONDITIONS

This award/agreement consists of this form plus the following:

a. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)

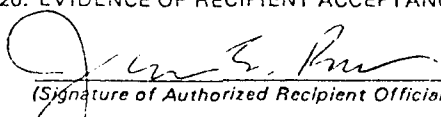
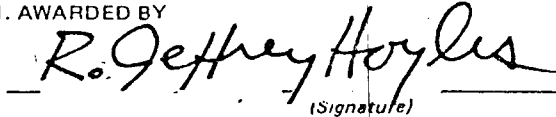
b. Applicable program regulations (specify) _____ (Date) _____

c. DOE Assistance Regulations, 10 CFR Part-600, as amended, Subparts A and B (Grants) or C (Cooperative Agreements).

d. Application/proposal dated 1/27/86, as submitted with changes as negotiated

19. REMARKS

This Grant consists of this NFAA and Budget Information; Additional funds of \$15,705 are hereby obligated which extends the project period to 9/30/87.

20. EVIDENCE OF RECIPIENT ACCEPTANCE	21. AWARDED BY
 (Signature of Authorized Recipient Official)	 (Signature)
James E. Bruseth, Ph.D (Name)	R. Jeffrey Hoyles (Name)
Director, Research Administration (Title)	Contracting Officer (Title)
9/15/87 (Date)	9/12/87 (Date)

FEDERAL ASSISTANCE BUDGET INFORMATION FORM

FORM EIA 459C
(10/80)

FORM APPROVED
OMB No. 1900 0127

1. Program/Project Identification No. DE-FG07-861D12623	2. Program/Project Title Geothermal Map of the U.S./Heat Flow Analysis
3. Name and Address Southern Methodist University Department of Geological Sciences Dallas, TX 75275	4. Program/Project Start Date 8/1/86
	5. Completion Date 9/31/87

SECTION A - BUDGET SUMMARY

Grant Program, Function or Activity (a)	Federal Catalog No. (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non Federal (d)	Federal (e)	Non Federal (f)	Total (g)
1. 12623		\$	\$	\$ 15,705	\$	\$ 15,705
2.						
3.						
4.						
5. TOTALS		\$	\$	\$	\$	\$

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	- Grant Program, Function or Activity				Total (5)
	(1) ModA002	(2)	(3)	(4)	
a. Personnel	\$ 7,950	\$	\$	\$	\$ 7,950
b. Fringe Benefits	1,159				1,159
c. Travel					
d. Equipment					
e. Supplies	750				750
f. Contractual	1,500				1,500
g. Construction					
h. Other					
i. Total Direct Charges	11,359				11,359
j. Indirect Charges	4,346				4,346
k. TOTALS	\$ 15,705	\$	\$	\$	\$ 15,705
7. Program Income	\$ -0-	\$	\$	\$	\$ -0-

SMIL
contract**REPORT DISTRIBUTION LIST**

DE-FG07-

U. S. Department of Energy
Idaho Operations Office
785 DOE Place
Idaho Falls, ID 83402

- A ATTN: Peggy Brookshier, Program Manager
 Energy & Technology Division
- B ATTN: Ronald A. King
 Contracts Management Division
- C ATTN: E. G. Jones, Director
 Financial Management Division
- D University of Utah Research Institute
 Earth Science Laboratory
 391 Chipeta Way, Suite A
 Salt Lake City, UT 84108
 ATTN: Duncan Foley
- E U. S. Department of Energy
 Technical Information Center
 P.O. Box 62
 Oak Ridge, TN 37830

93-410

Under the authority of Public Law subject to legislation, regulations and policies applicable to (cite legislative program title):

Geothermal R&D Act of 1977

1. PROJECT TITLE
Geothermal Map of the U.S./Heat Flow Analysis

2. INSTRUMENT TYPE
 GRANT COOPERATIVE AGREEMENT

4. INSTRUMENT NO.
DE-FG07-86ID12623

5. AMENDMENT NO.
A001

3. RECIPIENT (Name, address, zip code, area code and telephone no.)
Southern Methodist University
Department of Geological Sciences
Dallas, TX 75275

6. BUDGET PERIOD
FROM 8/1/86 THRU 7/31/87

7. PROJECT PERIOD
FROM 11/1/85 THRU 7/31/87

8. RECIPIENT PROJECT DIRECTOR (Name and telephone No.)
Dr. David Blackwell (214) 692-2745

9. RECIPIENT BUSINESS OFFICER (Name and telephone No.)
Ms. Jo Featherston (214) 692-2018

10. TYPE OF AWARD
 NEW CONTINUATION RENEWAL
 REVISION SUPPLEMENT

11. DOE PROJECT OFFICER (Name, address, zip code, telephone No.)
Susan Prestwich (208) 526-1147
U.S. DOE, Idaho Operations Office
785 DOE Place, Idaho Falls, ID 83402

12. ADMINISTERED FOR DOE BY (Name, address, zip code, telephone No.)
Ronald A. King (208) 526-0790
U.S. Department of Energy
Idaho Operations Office
785 DOE Place
Idaho Falls, ID 83402

13. RECIPIENT TYPE
 STATE GOV'T INDIAN TRIBAL GOV'T HOSPITAL FOR PROFIT ORGANIZATION INDIVIDUAL
 LOCAL GOV'T INSTITUTION OF HIGHER EDUCATION OTHER NONPROFIT ORGANIZATION C P SP OTHER (Specify)

14. ACCOUNTING AND APPROPRIATIONS DATA

a. Appropriation Symbol	b. B & R Number	c. FT/AFP/OC	d. CFA Number
89 x 0224.91	AM1015100	ID-64-91/250	

15. EMPLOYER I.D. NUMBER/SSN

16. BUDGET AND FUNDING INFORMATION

a. CURRENT BUDGET PERIOD INFORMATION		b. CUMULATIVE DOE OBLIGATIONS	
(1) DOE Funds Obligated This Action	\$ 58,085	(1) This Budget Period [Total of lines a. (1) and a. (3)]	\$ 58,085
(2) DOE Funds Authorized for Carry Over	\$ 28,475	(2) Prior Budget Periods	\$ 42,000
(3) DOE Funds Previously Obligated in this Budget Period	\$ -0-	(3) Project Period to Date [Total of lines b. (1) and b. (2)]	\$ 100,085
(4) DOE Share of Total Approved Budget	\$ 86,560		
(5) Recipient Share of Total Approved Budget	\$ -0-		
(6) Total Approved Budget	\$ 86,560		

17. TOTAL ESTIMATED COST OF PROJECT \$ _____
 (This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)

18. AWARD/AGREEMENT TERMS AND CONDITIONS

This award/agreement consists of this form plus the following:

a. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)

b. Applicable program regulations (specify) _____ (Date) _____

c. DOE Assistance Regulations, 10 CFR Part-600, as amended, Subparts A and B (Grants) or C (Cooperative Agreement) → 7/31/87

d. Application/proposal dated 1/27/86, as submitted with changes as negotiated

19. REMARKS
 This Grant consists of this NFAA; Budget Information; and Statement of Work. Additional funds of \$58,085 are hereby obligated which extends the project period to 7/31/87.

20. EVIDENCE OF RECIPIENT ACCEPTANCE

James E. Bruseth 8/7/86
 (Signature of Authorized Recipient Official) (Date)
 James E. Bruseth (Name)
 Director, Research Administration (Title)

21. AWARDED BY

William C. Drake 7/25/86
 (Signature) (Date)
 William C. Drake (Name)
 Contracting Officer (Title)

FEDERAL ASSISTANCE BUDGET INFORMATION FORM

FORM EIA-459C
110100

FORM APPROVED
OMB No. 1900-0127

1 Program/Project Identification No. DE-FG07-861D12623	2 Program/Project Title Geothermal Map of the U.S./Heat Flow Analysis
3 Name and Address Southern Methodist University Department of Geological Sciences Dallas, TX 75275	4 Program/Project Start Date 8/1/86
	5 Completion Date 7/31/87

SECTION A - BUDGET SUMMARY

Grant Program, Function or Activity (a)	Federal Catalog No (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1 12623		\$	\$	\$ 58,085	\$	\$ 58,085
2						
3						
4						
5 TOTALS		\$	\$	\$ 58,085	\$	\$ 58,085

SECTION B - BUDGET CATEGORIES

6 Object Class Categories	Grant Program, Function or Activity				Total (5)
	Now Oblig. (1)	*Authorized Carryover	(3)	(4)	
a Personnel	\$ 26,936	\$ 16,857	\$	\$	\$ 43,793
b Fringe Benefits	3,458	2,135			5,593
c Travel	8,800	814			9,614
d Equipment	-0-	-0-			-0-
e Supplies	2,000	317			2,317
f Contractual	-0-	-0-			-0-
g Construction	-0-	-0-			-0-
h Other	1,400	-0-			1,400
i Total Direct Charges	42,594	20,123			62,717
j Indirect Charges	15,491	8,352			23,843
k TOTALS	\$ 58,085	\$ 28,475	\$	\$	\$ 86,560
7 Program Income	\$ -0-	\$ -0-	\$	\$	\$ -0-

* Authorized carryover of uncosted budget from the original grant. Original budget period was authorized to 9/30/86. Carryover dollars can be costed through that date.

1.0 Introduction

The specific work to be conducted as described by the Scope is in support of Caldera Reservoir Investigations to provide thermal data to support research to understand the nature of the deep hydrothermal resource of the Cascades Volcanic region.

2.0 Scope

To collect thermal conductivity and other physical measurements, calculate heat flow values, and interpret the thermal results in terms of regional tectonic and geothermal models for all cost-shared thermal gradient holes drilled under the Caldera Investigations Program solicitations during the extent of the program.

3.0 Applicable Documents

SCAP No. DE-SC07-851D12580 "For Cascades Deep Thermal Gradient Drilling"

SCAP No. DE-SC07-861D12632 "Geothermal Research Holes in the Cascades"

4.0 Technical Tasks

1. Conduct thermal conductivity and other physical measurements in each gradient hole
2. Calculate heat flow values
3. Interpret thermal results in terms of regional tectonic and Geothermal models
4. Prepare reports

5.0 Reports Data and Other Deliverables

1. Annual Data Report
2. Final technical report, incorporating data and interpretation

6.0 Special Considerations

Not applicable

NOTICE OF FINANCIAL ASSISTANCE AWARD
(See Instructions on Reverse)

Authority of Public Law 93-410 and
legislation, regulations and policies applicable to (cite legislative program title):

Geothermal R&D ACT of 1977

<p>1. SUBJECT TITLE Geothermal Map of the United States</p> <p>3. RECIPIENT (Name, address, zip code, area code and telephone no.) Southern Methodist University Department of Geological Sciences Dallas, TX 75275</p> <p>4. RECIPIENT PROJECT DIRECTOR (Name and telephone No.) David Blackwell (214) 692-2745</p> <p>5. RECIPIENT BUSINESS OFFICER (Name and telephone No.) Jo Featherston (214) 692-2018</p> <p>6. PROJECT OFFICER (Name, address, zip code, telephone No.) Peggy A. M. Brookshier (208) 526-1403 U.S. DOE, Idaho Operations Office 785 DOE Place, Idaho Falls, ID 83402</p>	<p>2. INSTRUMENT TYPE <input checked="" type="checkbox"/> GRANT <input type="checkbox"/> COOPERATIVE AGREEMENT</p> <p>4. INSTRUMENT NO. DE-FG07-86ID12623 5. AMENDMENT NO. ORIG</p> <p>6. BUDGET PERIOD FROM: 11/1/85 THRU: 9/30/86 7. PROJECT PERIOD FROM: 11/1/85 THRU: 9/30/86</p> <p>10. TYPE OF AWARD <input checked="" type="checkbox"/> NEW <input type="checkbox"/> CONTINUATION <input type="checkbox"/> RENEWAL <input type="checkbox"/> REVISION <input type="checkbox"/> SUPPLEMENT</p> <p>12. ADMINISTERED FOR DOE BY (Name, address, zip code, telephone No.) Ronald A. King (208) 526-0790 785 DOE Place Idaho Falls, ID 83402</p>
---	--

8. RECIPIENT TYPE

<input type="checkbox"/> STATE GOV'T	<input type="checkbox"/> INDIAN TRIBAL GOV'T	<input type="checkbox"/> HOSPITAL	<input type="checkbox"/> FOR PROFIT ORGANIZATION	<input type="checkbox"/> INDIVIDUAL
<input type="checkbox"/> LOCAL GOV'T	<input checked="" type="checkbox"/> INSTITUTION OF HIGHER EDUCATION	<input type="checkbox"/> OTHER NONPROFIT ORGANIZATION	<input type="checkbox"/> C <input type="checkbox"/> P <input type="checkbox"/> SP	<input type="checkbox"/> OTHER (Specify)

9. ACCOUNTING AND APPROPRIATIONS DATA				15. EMPLOYER I.D. NUMBER/SSN
Appropriation Symbol	b. B & R Number	c. FT/AFP/OC	d. CFA Number	
224.91	AM1015100	ID-64-91/410		

10. BUDGET AND FUNDING INFORMATION		b. CUMULATIVE DOE OBLIGATIONS	
CURRENT BUDGET PERIOD INFORMATION			
DOE Funds Obligated This Action	\$ 42,000	(1) This Budget Period [Total of lines a.(1) and a.(3)]	\$ 42,000
DOE Funds Authorized for Carry Over	\$ -	(2) Prior Budget Periods	\$ -
DOE Funds Previously Obligated in this Budget Period	\$ -	(3) Project Period to Date [Total of lines b. (1) and b. (2)]	\$ 42,000
DOE Share of Total Approved Budget	\$ 42,000		
Recipient Share of Total Approved Budget	\$ -		
Total Approved Budget	\$ 42,000		

11. TOTAL ESTIMATED COST OF PROJECT \$ _____
This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.

13. AWARD/AGREEMENT TERMS AND CONDITIONS

award/agreement consists of this form plus the following:

- 1. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)
- 2. Applicable program regulations (specify) N/A (Date) _____
- 3. DOE Assistance Regulations, 10 CFR Part-600, as amended, Subparts A and B (Grants) or C (Cooperative Agreements).
- 4. Application/proposal dated _____, as submitted with changes as negotiated

14. REMARKS This Grant consists of this NFAA, Part I - Budget Plan, Part II - Conditions, Part III - Statement of Work. The DOE Financial Assistance Rules (10 CFR Part 600) and Circulars A-21 and A-110 are incorporated by reference and attached hereto.

16. EVIDENCE OF RECIPIENT ACCEPTANCE

Mildred B. Haenel 1/10/86
(Signature of Authorized Recipient Official) (Date)

Mildred B. Haenel
(Name)
Director, Research Administration
(Title)

21. AWARDED BY

William C. Drake 11/26/85
(Signature) (Date)

William C. Drake
(Name)
Contracting Officer
(Title)

GEOHERMAL MAP OF THE UNITED STATES

Budget Plan

November 1, 1985 - October 31, 1986

SALARIES

Principal Investigator David D. Blackwell 50% 1 mo., Summer 86 @ \$59,800/9 mos.		\$ 3,322
Co-Principal Investigator John Steele 45% 7 mos. @ \$28,870/12 mos. 45% 3 mos. @ \$30,475/12 mos.		7,547 3,428
Graduate Research Assistant 50% 7 mos. @ \$1,400/mo. 100% 3 mos. @ \$1,500/mo.		4,900 4,500
Secretary 10% 10 mos. @ \$14,000/CY		<u>1,167</u>
TOTAL SALARIES		\$ 24,864

EMPLOYEE BENEFITS

19.2% Principal Investigator	\$ 638	
20.7% Co-Principal Investigator & Secretary	<u>2,513</u>	3,151

MISCELLANEOUS SUPPLIES & SHIPPING

467

TRAVEL

National Meeting for P.I. and Co-P.I.		<u>1,200</u>
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TOTAL DIRECT COSTS		\$ 29,682
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INDIRECT COSTS (41.5% MTDC)		<u>12,318</u>
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TOTAL PROJECT COSTS		<u><u>\$ 42,000</u></u>
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**U.S. DEPARTMENT OF ENERGY
FEDERAL ASSISTANCE REPORTING CHECKLIST**

FORM EIA-485A
(10/80)

FORM APPROVED
OMB NO. 1900-0127

1. Identification Number: DE-FG07-86ID12623	2. Program/Project Title: Geothermal Research																																																
3. Recipient: SOUTHERN METHODIST UNIVERSITY																																																	
4. Reporting Requirements:	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;"></th> <th style="width:15%;">Frequency</th> <th style="width:15%;">No. of Copies</th> <th style="width:20%;">Addressees</th> </tr> </thead> <tbody> <tr> <td colspan="4">PROGRAM/PROJECT MANAGEMENT REPORTING</td> </tr> <tr> <td><input type="checkbox"/> Federal Assistance Milestone Plan</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Federal Assistance Budget Information Form</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Federal Assistance Management Summary Report</td> <td>Q</td> <td>1,1,1</td> <td>A,B,C</td> </tr> <tr> <td><input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report</td> <td>Q</td> <td>1,1,1</td> <td>A,B,D</td> </tr> <tr> <td><input checked="" type="checkbox"/> Financial Status Report, OMB Form 269</td> <td>Y,F</td> <td>1,1</td> <td>A,C</td> </tr> <tr> <td colspan="4">TECHNICAL INFORMATION REPORTING</td> </tr> <tr> <td><input checked="" type="checkbox"/> Notice of Energy RD&D</td> <td>Y</td> <td>1,1</td> <td>A,E</td> </tr> <tr> <td><input type="checkbox"/> Technical Progress Report</td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Topical Report</td> <td>A*</td> <td>1,1,1</td> <td>A,B,D</td> </tr> <tr> <td><input checked="" type="checkbox"/> Final Technical Report</td> <td>F*</td> <td>1,1,1</td> <td>A,B,D</td> </tr> </tbody> </table>		Frequency	No. of Copies	Addressees	PROGRAM/PROJECT MANAGEMENT REPORTING				<input type="checkbox"/> Federal Assistance Milestone Plan				<input type="checkbox"/> Federal Assistance Budget Information Form				<input checked="" type="checkbox"/> Federal Assistance Management Summary Report	Q	1,1,1	A,B,C	<input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report	Q	1,1,1	A,B,D	<input checked="" type="checkbox"/> Financial Status Report, OMB Form 269	Y,F	1,1	A,C	TECHNICAL INFORMATION REPORTING				<input checked="" type="checkbox"/> Notice of Energy RD&D	Y	1,1	A,E	<input type="checkbox"/> Technical Progress Report				<input checked="" type="checkbox"/> Topical Report	A*	1,1,1	A,B,D	<input checked="" type="checkbox"/> Final Technical Report	F*	1,1,1	A,B,D
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<input checked="" type="checkbox"/> Final Technical Report	F*	1,1,1	A,B,D																																														
FREQUENCY CODES AND DUE DATES: A - As Necessary; within 5 calendar days after events F - Final 90 calendar days after the performance of the effort ends Q - Quarterly; within 30 days after end of calendar quarter or portion thereof. O - One time after project starts; within 30 days after award. X - Required with proposals or with the application or with significant planning changes. Y - Yearly; 30 days after the end of program year. (Financial Status Reports 90 days). S - Semiannually; within 30 days after end of program fiscal half year.																																																	
5. Special Instructions: Topical report will include comprehensive data base. D I S C U S S I O N																																																	
6. Prepared by: (Signature and Date)	7. Reviewed by: (Signature and Date) <i>Ronald B. King</i> 10/29/85																																																

STATEMENT OF WORK
SOUTHERN METHODIST UNIVERSITY

1. Compile existing heat flow data for the United States from published and unpublished sources, including Department of Energy funded work by other researchers, and other data as may be made available. Include location information, heat flow values, and appropriate other thermal data. Prepare draft map of heat flow data, including contours of heat flow.
2. Compile, where available, existing data about temperatures in selected regional aquifers. Prepare a map and contour these data.
3. Compile additional appropriate geothermal data, as time and funds permit. These data may include thermal springs and wells, sites of Quaternary volcanism, and possible sites of magma chambers.
4. Assemble the heat flow data into a comprehensive data base.
5. Prepare and publish a report which summarizes the work of the program, and includes the heat flow data base compiled during this effort.
6. Provide overall project management and complete report on tasks in a timely manner. Management reports shall be provided as defined by the attached DOE form EIA 459A - Reporting Requirements Checklist. The original Final Report for this grant will be due on the original due date. The required reports are also summarized as follows:

Rec 7/13/87
HPE



July 9, 1987

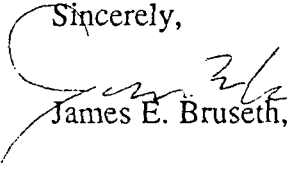
Ms. Susan Prestwich
U.S. Department of Energy
Idaho Operations Office
785 DOE Place
Idaho Falls, Idaho 83402

Dear Ms. Prestwich:

Enclosed is a duplicate copy of a letter Dr. Blackwell submitted in April to Dr. Marshall Reed. The letter requested additional support for Dr. Blackwell's DOE grant (#DE-FG07-86ID12623). I am sending this copy to you at the request of Dr. Howard Ross.

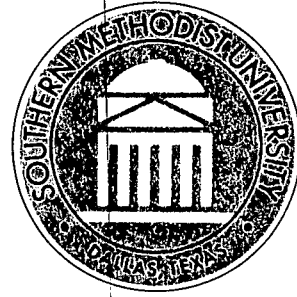
I appreciate your consideration of this request for additional support, and if I can supply further information, please let me know.

Sincerely,


James E. Bruseth, Ph.D.

xc: Dr. Howard Ross ✓
Dr. David Blackwell

copy: Duncan Foley



September 6, 1985

Ms. Peggy Brookshier
U.S. DOE
785 DOE Place
Idaho Falls, Idaho 83402

Dear Ms. Brookshier:

Enclosed is a copy of a revised budget and work plan for S.M.U. proposal number 50532 "Geothermal Map of the United States". If you need additional supporting information of a technical nature, contact me. University grant and contract information can be obtained from Mildred Haenel (692-2033). Thanks for your consideration.

Sincerely yours,

A handwritten signature in cursive script that reads "David D. Blackwell".

David D. Blackwell
Chairman

DDB:ban
Enc.

SMU
add to update sheets
10-15-85

A PROPOSAL TO

DEPARTMENT OF ENERGY

SUBMITTED BY:

SOUTHERN METHODIST UNIVERSITY
FOR ITS
INSTITUTE FOR THE STUDY OF EARTH & MAN
DALLAS, TEXAS 75275

FOR

A GEOTHERMAL MAP OF THE UNITED STATES

PERIOD: NOVEMBER 1, 1985

TO

OCTOBER 31, 1986

or Dec. 31, 1986 in text

AMOUNT: \$ 42,000

Prepared by:

David D. Blackwell
David D. Blackwell, Ph.D.
Principal Investigator
(214) 692-2745

Approved for
SOUTHERN METHODIST UNIVERSITY

By Mildred B. Haenel
Mildred B. Haenel, Director
Research Administration
(214) 692-2033

Geothermal Map of the United States

This project involves compilation of existing geothermal data for the United States. The object of this compilation is to prepare a geothermal map for the United States which will be part of a 1:5,000,000 scale Geothermal Map of North America to be published as part of the Geological Society of America's Centennial Decade of North American Geology project (DNAG). Data to be included on the map will be heat flow sites, heat flow values, contours of heat flow, and contours of temperature on selected aquifers as data permit. Also included will be hot spring locations and sites of Quaternary volcanism and possible magma chambers. In addition to preparation of the geothermal data for map presentation, the heat flow data will be assembled into a computer database which will be made publically available to those interested in geothermal studies. This comprehensive database will be built on data collection carried out during the past few years as part of the state-coupled resource assessment program funded by U.S.DOE/DGE. This database will be useful for government planning, private sector geothermal exploration and evaluation, and academic studies. The completion date for map compilation is October 31, 1986, with completion of the database compilation and a final report of results on December 31, 1986. Investigators at Southern Methodist University will be in overall charge of the direction and compilation of the map and database. Compilation of the data will be by personnel at S.M.U. in cooperation with individual investigators familiar with particular areas. The completeness of the ancillary information in the database will depend on the level of involvement of the original investigators that can be obtained either voluntarily or by subcontract.

no hot wells?

print out of hf data -> DOE/NIS

data beyond SCP?

SEP - 5 1985

GEOHERMAL MAP OF THE UNITED STATES

Proposed Budget

November 1, 1985 - October 31, 1986

SALARIES

Principal Investigator

David D. Blackwell

50% 1 mo., Summer 86 @ \$59,800/9 mos.

\$ 3,322

Co-Principal Investigator

John Steele

45% 7 mos. @ \$28,870/12 mos.

45% 3 mos. @ \$30,475/12 mos.

7,547

7% 31 low

3,428

Graduate Research Assistant

50% 7 mos. @ \$1,400/mo.

100% 3 mos. @ \$1,500/mo.

4,900

4,500

Secretary

10% 10 mos. @ \$14,000/CY

1,167

TOTAL SALARIES

\$ 24,864 ✓

EMPLOYEE BENEFITS

19.2% Principal Investigator

\$ 638

20.7% Co-Principal Investigator &

Secretary

2,513

3,151

MISCELLANEOUS SUPPLIES & SHIPPING

(467)

ah ha!

TRAVEL

National Meeting for P.I. and Co-P.I.

1,200

TOTAL DIRECT COSTS

\$ 29,682 ✓

INDIRECT COSTS (41.5% MTDC)

12,318 ✓

TOTAL PROJECT COSTS

\$ 42,000.03

UURI

EARTH SCIENCE LABORATORY
391 CHIPETA WAY, SUITE C
SALT LAKE CITY, UTAH 84108-1295
TELEPHONE 801-524-3422

Sept. 19, 1985

MEMORANDUM

TO: Peggy Brookshier
FROM: Duncan Foley
RE: Attached SMU evaluation

I have enclosed my evaluation of the SMU proposal for compiling a heat flow data base. I have discussed the work and the proposed statement of work with David Blackwell, and he did not have any objections when I read it to him. A few additional points are worth noting:

1. This will be a heat flow data base. David does not intend to compile thermal gradient data, as he feels it would be too time consuming for the level of funding they have.
2. The exact format of the final report remains to be specified. David will provide the data in computer disk, tape, or paper print out format. If DOE has a preference (perhaps paper for NTIS?), this should be specified in the Statement of Work.
3. I have requested resumes from David and John Steele, which should be arriving shortly.
4. The ultimate success of this program is dependant upon the Geological Society of America publishing the map. The thermal map will be part of a series on North America, and publication has begun on some of the books in this series. The time requirements of the GSA will hopefully mean that this project will be more timely than the past SMU work.

David reiterated his interest in obtaining more funding for this work, and said that he would keep in touch with Marshall. He also will be calling you about mid-October, to find out the progress on getting him money.

Please call if you have any questions.

Sept. 19, 1985

MEMORANDUM

TO: Peggy Brookshier
FROM: Duncan Foley
RE: Attached SMU evaluation

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Please call if you have any questions.

TECHNICAL EVALUATION OF GRANT PROPOSAL

TITLE: A Geothermal Map of the United States

SUBMITTED TO: DOE/ID (via HQ)

SUBMITTED BY: Dr. David Blackwell
Department of Geological Sciences
Southern Methodist University
Dallas, TX 75275
phone: 214-692-2745

AMOUNT REQUESTED: \$42,000

AMOUNT SUGGESTED: \$42,000

PROPOSED DURATION: Nov. 1, 1985 to Dec. 31, 1986

PROJECT DESCRIPTION: SMU proposes to compile data for a geothermal map of the United States, which will be published independantly of this proposal by the Geological Society of America. Data to be compiled include heat flow sites, heat flow values, heat flow contours, and temperatures on selected aquifers. Hot springs and young volcanic activity may also be compiled. The data compiled, but not the map, will be made publically available through this effort.

GENERAL REMARKS:

1. Work Statement: Sept. 6, 1985, suggested work plan has been revised to reflect task oriented order for work, and is appropriate as revised.

2. Task Changes: No major revisions.

3. Cost Information: Adequate as provided; assurances and negotiated rate agreement are not attached to proposal.

SPECIFIC REMARKS

1. Manhours: Adequate to perform and supervise work

2. Materials: Minimal supplies requested

3. Subcontracts: None as part of this proposal, but subsequent proposals may list extensive subcontracting, to aid in efficiency of data gathering.

4. Travel and Per Diem: One professional meeting for PI and Co-PI is all that is listed.

5. Other Direct Costs: Salary completes costs; computing, other

costs will be paid by SMU (although not shown as a cost share).

6. Proposers Capability to Meet the Objectives: SMU is highly capable of meeting the task outlines. They have a track record, however, in being late with deliverables. This will have to be closely monitored during the program.

7. Key Personnel Qualifications: David Blackwell and John Steele have the experience and skills to accomplish this work. They are nationally known in the heat flow field, and will provide a high quality product.

8. Anticipated Objectives and Probability of Success: The objective of compiling relevant heat flow data should be easily achieved. They have a high probability of success with this. Their ability to compile other data sets will depend on the willingness of other researchers to share information; this has a good probability of success, but may be limited by the format of such data, which may not be directly usable. Eventual publication of the map is dependant upon the Geological Society of America; this has a high probability of happening, as this map will be part of a series.

SUGGESTED STATEMENT OF WORK
SOUTHERN METHODIST UNIVERSITY

1. Compile existing heat flow data for the United States from published and unpublished sources, including Department of Energy funded work by other researchers, and other data as may be made available. Include location information, heat flow values, and appropriate other thermal data. Prepare draft map of heat flow data, including contours of heat flow.
2. Compile, where available, existing data about temperatures in selected regional aquifers. Prepare a map and contour these data.
3. Compile additional appropriate geothermal data, as time and funds permit. These data may include thermal springs and wells, sites of Quaternary volcanism, and possible sites of magma chambers.
4. Assemble the heat flow data into a comprehensive data base.
5. Prepare and publish a report which summarizes the work of the program, and includes the heat flow data base compiled during this effort.
6. Provide overall project management and complete report on tasks in a timely manner. Management reports shall be provided as defined by the attached DOE form EIA 459A Reporting Requirements Checklist. The original Final Report for this grant will be due on the original due date. The required reports are also summarized as follows:

JUSTIFICATION FOR OTHER THAN FULL
AND OPEN COMPETITION

SOUTHERN METHODIST UNIVERSITY

A Geothermal Map of the United States

I have reviewed the Justification for Other Than Full and Open Competition and DOE Order 4200 1b. This research proposal represents a unique and innovative concept that is not otherwise available to DOE and does not resemble the substance of a pending competitive procurement.

Project Manager


Peggy A. M. Brookshier

Contracting Officer

William C. Drake

U.S. DEPARTMENT OF ENERGY

DOE F 4220.2 (6-80) (Formerly PR-415) SMALL BUSINESS/LABOR SURPLUS SET-ASIDE REVIEW		I.D. NO. _____
ITEM TITLE/DESCRIPTION <i>Unsolicited Proposal - Geothermal Map of the U.S. Southern Methodist Univ.</i>		SMALL BUSINESS SIZE STANDARD RECOMMENDED BY S.B. SPECIALIST EMPLOYEES NUMBER _____ DOLLAR \$ _____ SIC CODE: _____
PROGRAM OFFICE: <i>Advanced Technology</i>	PROCURING ACTIVITY: <i>Contracts</i>	
SB/LS PARTICIPATION WAS CONSIDERED IN THE PREPARATION OF THIS PROCUREMENT ITEM AND FOLLOWING IS RECOMMENDED: <input type="checkbox"/> Small Business Set-Aside _____% \$ _____ <input type="checkbox"/> Labor Surplus Set-Aside _____% \$ _____ <input type="checkbox"/> SBA Section 8(a) Procurement <input checked="" type="checkbox"/> Set-Aside Action Not Recommended		NAME AND LOCATION OF PROPOSED SOURCE: (If Sole Source) <i>Southern Methodist Univ. Dallas, TX</i> <input type="checkbox"/> Small Business <input type="checkbox"/> Minority <input type="checkbox"/> Labor Surplus Firm <input checked="" type="checkbox"/> Other
SET-ASIDE NOT FEASIBLE BECAUSE: <input type="checkbox"/> No Reasonable Expectation of Receiving Sufficient Offers from SB/LS Firms to Assure Award* <input type="checkbox"/> Program Objectives Dictate Broadest Possible Solicitation to Obtain "Best Available" Expertise* <input type="checkbox"/> Solicitation if for "Best Idea/Approach" R&D Effort <input type="checkbox"/> Continuing and Directly Related R&D Effort. Competitive Procurement Not Feasible for Economic and/or Technical Reasons <input type="checkbox"/> Procurement is for Completion or Within-Scope Expansion of Current Contract <input type="checkbox"/> This is for Extension of Current Services to Allow Preparation/Award of Competitive Follow on Procurement <input type="checkbox"/> Sole Source as Determined Under Current DOE Policy Directives <input checked="" type="checkbox"/> Funding of Unsolicited Proposal Under Current DOE Policy Directives <input type="checkbox"/> Other* <small>*Explanation Required</small>		EXPLANATION/ADDITIONAL COMMENT: <i>Justification was prepared and signed by DOE-HQ</i>
		SMALL BUSINESS SPECIALIST CONSULTED (Check One) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		<i>6-1403</i> TELEPHONE <i>10/8/85</i> DATE
SMALL BUSINESS SPECIALIST'S ENDORSEMENT <input type="checkbox"/> Accepts <input type="checkbox"/> Requests Reevaluation <input type="checkbox"/> Request Solicitation of SB/LS Sources Attached <input type="checkbox"/> Request Special SB/LS/MB Incentive Provisions (Attached) <input type="checkbox"/> Other Comments/Attached		SMALL BUSINESS SPECIALIST _____ DATE _____
REEVALUATION OF RECOMMENDATIONS/FINDINGS <input type="checkbox"/> Reaffirmed <input type="checkbox"/> Set-Aside Feasible AUTHORIZING PROGRAM OFFICIAL _____ DATE _____	REVIEWED BY SBA <input type="checkbox"/> Request Solicitation of SB Sources Attached SBA Form 70 Attached <input type="checkbox"/> Yes <input type="checkbox"/> No SBA REPRESENTATIVE _____ DATE _____	
PROCUREMENT OFFICER'S ACTION <input type="checkbox"/> SB/LB Set-Aside <input type="checkbox"/> Set-Aside Not Initiated <input type="checkbox"/> Other Recommendations/Request Noted and Appropriate Action Taken PROCUREMENT OFFICER _____ DATE _____	CONTRACT NO.(S) _____	SB/MB/OTHER _____

ORIGINAL-CONTRACT FILE (FULLY EXECUTED)

U.S. Department of Energy
Procurement Request-Authorization

1. To Awarding Office <u>Contracts Management Div</u>		3. PR Number <u>07-86 ID 12623 000</u>
2. From Initiating Office <u>Advanced Technology Div</u>		4. Change/Correction to a PR in Process? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		5. If Item 4 is yes, enter PR correction Letter
		6. <input type="checkbox"/> Procurement <input checked="" type="checkbox"/> Assistance
		7. Consistent with Principal Purpose of Program? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8. Action Description/Title (180 char. max.) <u>Unsolicited Proposal For Geothermal Map of the United States</u>		

If award is competitive, has list of sources been attached? <input type="checkbox"/> Yes <input type="checkbox"/> No		If Non-Competitive, Complete Items 9-11.	
9. Name <u>Southern Methodist University</u>	11. Address <u>Dallas, TX 75275</u>		
10. Division <u>Dept of Geological Sciences</u>			
12. For Procurement Actions Only: Product or Service Code			
13. For Assistance Actions Only: CFDA Number <u>81.087</u>		14. Cooperative Agreement <input type="checkbox"/>	15. Grant <input checked="" type="checkbox"/>
16. Controlled Deliverable For All Actions	17. Kind of Award Action (Recommended) <u>1A</u>	18. Master Bin	19. Desired Award Date Mo Day Year
20. Unsolicited Proposal Number <u>U850015</u>	21. Project Number		
22. Government Property <input type="checkbox"/> F-Furnished, P-Purchased, N-Not involved			

FINANCIAL DATA			
23. Government Share <u>42,000</u>	24. Awardee Share	25. Total	

FY FUNDS COMMITTED						
26. Approp. Symbol	27. B&R Number	28. Dollar Amt.	29. Allotment	30. Object Class	31. AFP	32. CFA
<u>89X0224-91</u>	<u>AM115700</u>	<u>42000</u>	<u>50-64-91</u>	<u>410</u>		
From Continuation Sheet				35. Project Period from <u>11/1/85</u> thru <u>10/31/86</u>		
34. Total Funds this PR <u>42,000</u>				36. Budget Period from <u>11/1/85</u> thru <u>10/31/86</u>		

PROJECT MANAGER/INITIATOR			
37. Name <u>Peggy A.M. Breakshier</u>	38. Signature <u>Peggy A.M. Breakshier</u>	39. Date <u>10/8/85</u>	40. Office Code
			41. FTS Telephone Number <u>523-4488</u>

PROGRAM REVIEWING OFFICIAL		
42. Name <u>Charles E. Gilmore</u>	43. Signature <u>Charles E Gilmore</u>	44. Date <u>10-8-85</u>

PROGRAM OFFICE BUDGET OFFICIAL	
45. Name <u>Dennis R. Bell</u>	46. Signature <u>Dennis Bell</u>

CERTIFYING OFFICIAL. I hereby certify that the funds cited in item 34 are available		
47. Name <u>Frank J Smith</u>	48. Signature <u>Frank J Smith</u>	49. Date <u>10/8</u>