Notebook issued to Dr. David A. Ferrill
for use by Dr. Ray Dorelick (consultant)
– Apatite Fission Track Research
Issued 15 November 1994

PROJECT: Research on Tectonic Processes in the Central Basin and Range Region

CNWRA Project No: 20-5704-160

OBJECTIVES: SPECIFIC OBJECTIVES OF THIS RESEARCH ARE OUTLINED IN THE PROJECT PLAN ENTITLED "PROJECT PLAN FOR RESEARCH ON TECTONIC PROCESSES IN THE CENTRAL BASIN AND RANGE REGION" BY S.R. YOUNG, STIREWALT, G.L., & FERRILL, D.A. 1994 (REVISION 0, CHANGE 7).

Sent by: Kathy H. Spivey

CNWRA S/Notebook No. 34

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11/29/94 Location: Katy, TX

Personnel: Raymond A. Donelick Raymond A Donelick 11/29/94

Entries:

Samples were received via FedEx from SWRI on 11/9/94

Contents of the box were:

Sample vials labelled:	Quantity:
BMN-1	1
BMW-1	4
BMW-2	1
BMW-3	2
BMW-5	1

Sample bags labelled:	Quantity:
BMN-1	1
BMW-1	1
BMW-2	1
BMW-3	1
BMW-5	1

performed consolidation, hand mag sweeps of all sample vials. For each, a vial labelled as follows was created:

Hmags — hand mags
Fmags — Frantz mags
Ap — apatite fraction
Zr — zircon fraction

Location: Amoco Production Company

performed Frantz magnetic separation as follows on each sample

~~Samp~~	Slope	Tilt	Amperage	Non-mag Vial	Mag Vial
	25°	10°	0.5A	Ap	Fmag
	25°	10°	1.8A	Ap	Fmag

performed Lithium metatungstate separation on Ap fractions for all except BMW-1. Performed diiodomethane sep on all

Sample	LMT	DIM	Obs Ap	Obs Zr
BMN-1	X	X	maybe, yes	abund small
BMW-1		X	yes ?	v. few small
BMW-2	X	X	maybe	abund med-small
BMW-3	X		maybe	abund large
BMW-5	X		?	abund med-small

11/29/94

11/30/94 Location: Katy, TX

Entries:

continued DIM seps of samples; made grain mounts 2 per sample; epoxy 4:1 cured 1 hr @ 100°C RAD 12/1/94

11/29/94

set aside Zr separates for Ann Blyth - to be shipped

Donelick ~~Analysis~~ Number	SUERI Number
95-1	BMN-1
95-2	BMW-1
95-3	BMW-2
95-4	BMW-3
95-5	BMW-5

11/30/94

12/1/94 Location: Katy, TX

Entries:

polished grain mounts as follows:

a) by hand on 600 grit emory paper
b) on lap wheel 3μm grit Al_2O_3
c) on lap wheel 0.3μm grit Al_2O_3

age

etched mounts with acid as follows:

5.5M HNO_3 @ 21°C for 20 sec
rinsed twice with distilled water

12/1/94

age mounts: suffix A
length mounts: suffix B

phoned Shane Brightwell (TAMU-NSC) and arranged for A-Z irradiation on Monday 12/5/94

mounted low-U muscovite sheets on etched age mounts with low-Cl tape.

prepared irradiation package AM074:

12/1/94

1	CN1 – glass dosimeter	
2	93-1	
3	" -2	
4	-3	
5	-4	
6	-5	
7	-6	
8	-7	
9	-8	
10	-9	
11	-10	
12	-11	
13	95-1	positions 13-17
14	" -2	
15	-3	
16	-4	
17	-5	
18	CN1	

12/2/94

12/2/94

Location: Texas A+M University Nuclear Science Center

delivered AM074 (with AM073) to reactor for irradiation; cover letter (SB12294.doc on Compaq computer)

12/2/94

prepared Ct irradiation package; phoned RPI (no answer) and ARCO (response from Steve and Jeff). Will likely send to ARCO

prepared package of zircon separates for shipment to Ann Blythe – hasn't sent

12/5/94 Location: Amoco Production Company

performed frantz mag seps on all samples according to following steps:

Hmags – removed all magnetic minerals (metal filings, magnetite) using hand magnet

Fmags – 2 runs:

12/6/94

25° slope 10° tilt 0.5 A	} mags into Fmags
25° slope 10° tilt 1.0 A	} mags into Fmags

performed DIM (diiodomethane) seps.

All of above seps performed to varying degrees as pure as possible

Shipped Ct-irrad package to ARCO (Plano, TX) (cover letter jc12594.doc on IBM) AR007

12/20/94 Location: Rice University
etched micas for AM073, AM074 in 48% HF
for 13 mins at 23°C 12/20/94

12/21/94 Location: Katy, TX 12/21/94
counted dosimetrs for AM073; things
look good

etchd (4-IRRA) mounts in 5.5M HNO_3 for 20secs
at 21°C.

1/2/95 Location: Katy, TX

counted dosimetr micas for AM074: Nd = 4088.
CN1-glass

Sample	Rd	
95-1	4.088×10^6	tracks/cm²
-2	4.108×10^6	
-3	4.129×10^6	
-4	4.150×10^6	
-5	4.171×10^6	

1/2/95

1/12/95 Location: Katy, TX

Received two shipments of rocks from SWRI
Shipment 1: arrived 1/11/95

Box 1 of 2:
BMN-15 alone in box; rock chips
BMN-12 with BmN-13; rock chips
BmN-13 " " " "

Box 2 of 2:
BME-1 2 bags chips ready for pulverizer
BFH-3 1 bag clean sand ready for washing
1 bag course sand
1 bag rock chips
BmN-4 same as BFH-3
BmN-5 same as BFH-3

1/12/95

Shipment 2: arrived 1/12/95
Box 1 of 3:
BmN-6 2 bags chips ready for pulverizr
BmN-10 rock chips

Box 2 of 3:
BmE-2 ~~2 bags~~ 1 bag chips ready for pulverizr
1 bag rock chips
BmE-3 1 bag sand ready for washing
BFH-2 1 bag rock chips
1 bag sand ready for washing
BmN-2 2 bags rock chips ready for pulverizr

Box 3 of 3:

BFH-1 2 bags rockchip ready for pulverizer

BMN-19 unmarked rock with large saw cut and words "dike contact" with an arrow.

1/14/95 Location: Katy, TX

Entries:

Note: should have been written on 12/1/94:

videotaped age mounts as follows:

BMN-1 95-1A - Donelick number

AM074-13 - irradiation package position

Video tape time: 00:00:00

For each grain, assessment made of datability based on following criteria:

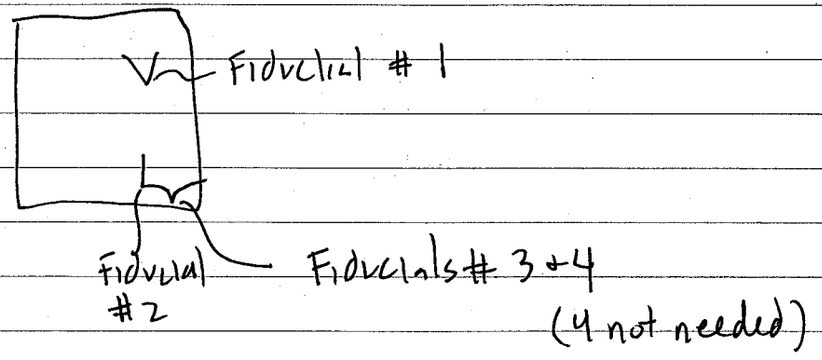
- > 50 μm diameter minimum
- relatively detect and dislocation free
- relatively fracture free
- parallel to c-axis

Once suitable grain is identified, etch pits are located on the apatite surface and their diameters parallel + perpendicular to the c-axis are measured using a digitizing tablet interfaced with a computer

Then a selected, clear area is identified, a grid of known area placed over it, and the number of fission tracks in the apatite crossing the etched surface and within the grid area are counted.

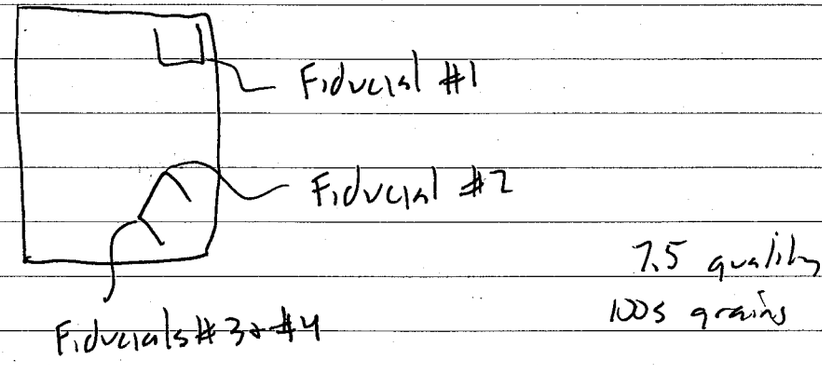
1/14/95

Detailed drawings are included in the attached report.



grains are pretty messy; lots of detects, dislocations, cracks.... 1000s grains; 7.5

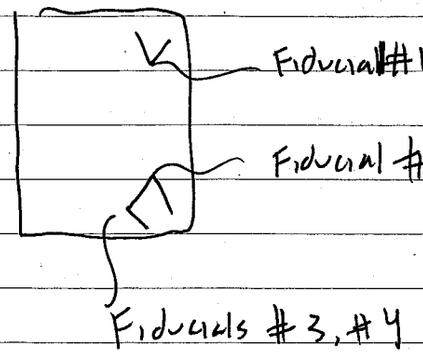
BMN-1 95-2A AM074-14 00:41:35



7.5 quality
100s grains

all procedures same as for BMN-1 above

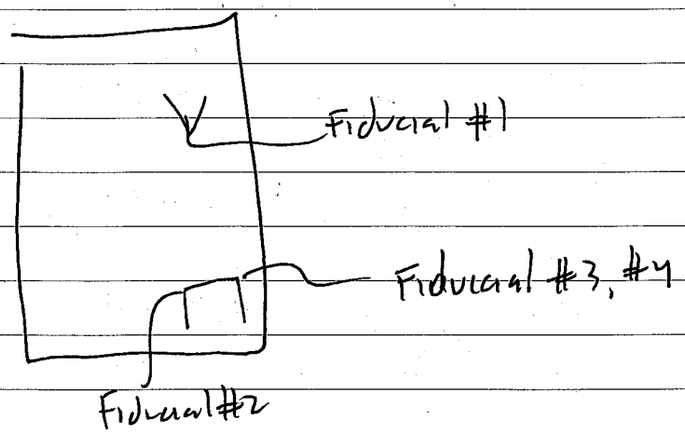
BMW-2 95-3D Amo74-15 00:19:09



1/14/95

procedures same as for BMN-1
1000s grains
5.0 quality
many young or low-U grains. Tracks outnumbered by detects 10:1

BMW-3 95-4A Amo74-16 00:00:00

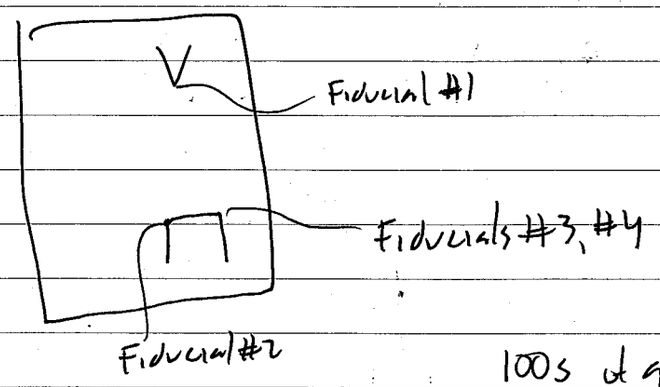


many more grains with tracks; looks to be best sample yet 1000s grains
9.5

procedures same as BMN-1

BML-5 95-5A Amo74-17 00:34:40

1/14/95



100s of grains
6.5

1/15/95 Location: Katy, TX
Entries:
counted mica detector for BMN-1. Using transformation program, located areas of mica in contact with areas of apatites counted and counted number of tracks in mica.

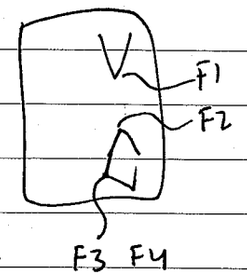
1/16/95 Location: Katy, TX
Entries:
counted mica detector for BMW-1
" " " " BMW-2
" " " " BMW-3
" " " " BML-5

1/19/95 Location: Katy, TX

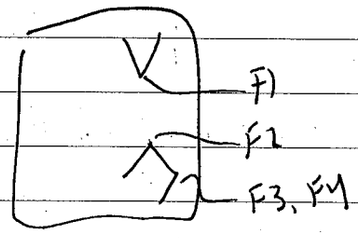
Entries:

measured track lengths

BMN-1B



BMW-1B



1/20/95 Location: Katy, TX

Entries:

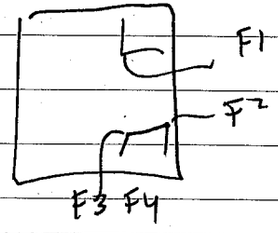
none - decide' not to work

1/22/95 Location: Katy TX

Entries:

measure track length

BMW-2B



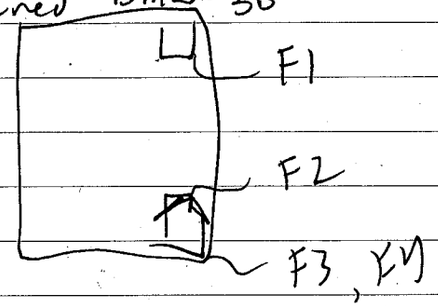
1/23/95 Location: Katy TX

Entries:

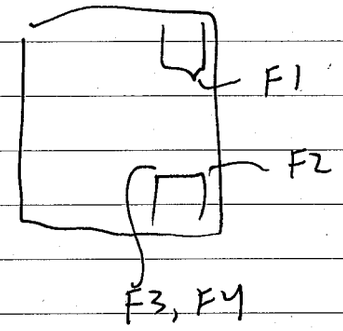
completed measurement of 95-3B (BMW-2B)

track lengths

measured BMW-3B



completed track lenth BMW-5B



prepared DA Report # 95

1/28/95 Location: Katy, TX

Entries:

~~tested~~ RAD

Samples	Donaldson #
BFH-1	104-1
BFH-2	-2
BFH-3	-3
BME-1	-4
BME-2	-5
BME-3	-6
(BMN) ~~BMN-4~~	-7
~~BMN-15~~	-8
~~BMN-10~~	-9
~~BMN-12~~	-10
~~BMN-13~~	-11
~~BMN-15~~	
~~BMN-19~~	
~~BMW-6~~	
RAD	
BMN-2	-7
BMN-4	-8
BMN-5	-9
BMN-10	-10
RAD 4/10/95 ~~BMN-12~~ BMW-12A	-11
BMN-13	-12
BMN-15	-13
BMN-19	-14
BMW-6	-15
RAD 4/10/95 BMW-12B	104-16

1/28/95 crushed BMN-19 (104-14) + washed
crushed BMN-15 (104-13) + washed
completed crushing all of remaining samples

1/30/95 Location: Katy TX
Entries:

washed samples in water after sieving through 300 μm nylon mesh.

3/1/95 Location: Katy, TX
Entries:

DA Number	SwRI Number	Crush	Grind	Wash	1st LMT
104-1	BFH-1	—	1/28/95	1/30/95	3/11/95
104-2	BFH-2	—	1/28/95	1/30/95	3/11/95
104-3	BFH-3	—	1/28/95	1/30/95	3/11/95
104-4	BME-1	—	1/28/95	1/30/95	3/11/95
104-5	BME-2	—	1/28/95	1/30/95	3/12/95
104-6	BME-3	—	1/28/95	1/30/95	3/12/95
104-7	BMN-2	—	1/28/95	1/30/95	3/12/95
104-8	BMN-4	—	1/28/95	1/30/95	3/12/95
104-9	BMN-5	—	1/28/95	1/30/95	3/12/95
104-10	BMN-10	1/28/95	→	1/30/95	3/12/95
104-11	RAD 4/10/95 ~~BMN-12~~ BMW-12A	1/28/95	→	1/30/95	3/13/95
104-12	BMN-13	1/28/95	→	1/30/95	3/13/95
104-13	BMN-15	1/28/95	→		3/13/95

DA Number	Swirl Number	Crush	Grind	Wash	1st LMT
104-14	BmN-19	1/28/95	⟶		3/3/95
104-15	BmW-6	—	1/28/95	1/30/95	3/13/95
RAD 4/19/95 104-16	BmW-12B	2/15/95	⟶		3/13/95

crush — reduce bulk rock to size not greater than about 0.5 cm across largest diameter. Use airless jackhammer, with 6" square steel plate striking rock, all on another steel plate

grind — Hosokawa Micron model SH Mikro 9600rpm Pulverizer. Pulverize to sand size, material from crushing step.

3/1/95

wash — sieve through 300μm opening, set aside coarse material; wash fine material vigorously in water until the water stands clear after a minute or two

1st LMT (LMT) — first pass through Lithium metatungstate. Immerse washed sand in LMT, stir at slow speed to facilitate settling of high density (heavy) mineral grains. Decant off coarse using stopcock at base of LMT + sand mixture; wash LMT + heavies mixture (decantate) with water; dry in air.

3/11/95 Location: Katy, TX
Entries:
performed LMT step for 104-1, 104-2, 104-3, 104-4

3/12/95 Location: Katy, TX
Entries:
performed LMT step for 104-5, 104-6, 104-7, 104-8, 104-9 104-10

3/13/95 Location: Katy, TX
Entries:
performed LMT step for 104-11, 104-12, 104-13, 104-14, 104-15, 104-16

3/14/95 Location: Katy, TX
Entries:
isolated H, F, L fractions for all of 104-1 through 104-16

3/15/95 Location: Katy, TX
Entries:
isolated Ap, Zr fractions for all of 104-1 through 104-16

3/25/95 Location: Katy, TX
Entries:
Shipped 104-1 through 104-16 Zircons to Ann Blythe

3/27/95 Location: TAMU
RAD Entries: delivered samples to TAMU NSL for irradiation.

4/19/95 Location: Katy, TX

Entries:

Received samples via FedEx as follows:

REP 106

	SWRI #	DA #	Box	Pieces
-	BMN-20	106-03	5	3
✓	SH-1	106-09	3	2
✓	SH-2	106-10	3	3
*	✓ BMN-21	106-04	3	2
*	- BME-18	106-02	3	3
	- BMW-16	106-07	2	4
*	- BME-17	106-01	2	4
*	- BMW-13	106-05	2	2
	- BMW-15	106-06	4	6
	✓ BMW-17A	106-08	1	2

Everything present, as marked on boxes.

* Rush - 3-4 weeks
- crushed

4/22/95 Location: Katy, TX

Entries:

BMN-21 → crushed - kept hand sample
BME-18 → crushed
BME-17 → crushed
BMW-13 → crushed

BMN-21 → pulverized
BME-18 → pulverized
BME-17 → pulverized
BMW-13 → pulverized

BMW-13 → sieved, washed, dried

4/23/95 Location: Katy, TX

Entries:

BMW-13 - washed sand into LMT - decant off lights - retain heavies
BME-18 → washed, sieved, dried
BME-17 → " " "
BMN-21 → " " "

BME-17 → put into LMT

4/24/95 Location: Katy, TX

BME-17 - put second funnel amount into LMT

4/25/95 Location: Katy, TX

Entries:

washed BME-17 lights
put BME-18 into LMT
completed sep on BME-18

4/26/95 Location: Katy, TX
Entries:
put BMN-21 into LMT

5/1/95 Location: Katy, TX
Entries:
separated hand magnetic fraction for each of 4 samples; following separates are available (A) date or Not available (NA) date.

	H	Ap	F	Zr	L	other
106-1	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	3.0-3.1 5/1/95
106-2	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	
106-4	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	
106-5	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	X 5/1/95	

H - hand mags; material magnetic enough to stick to hand magnet
Ap - apatite fraction @ 3.0-3.3 g cm^{-3}; non-magnetics
F - Frantz magnetic separates; magnetic fraction of 2 passes: 25° 13°

0.5A, 1.8A
Zr - zircon fraction ≥ 3.3 g cm^{-3}; non-magnetics
L - LMT floats < 3.0 g cm^{-3}
other - as defined

5/3/95 Location: Katy, TX
Entries:
made epoxy mounts; cured 50°C for 1hr 106-1, 106-2, 106-4, 106-5
polished
600 grit - cut grains in half
3 μm Al_2O_3
0.3 μm Al_2O_3 - to glass finish
etched
5.5M 21°C 20 s
mounted mica sheets with tape

To TAMU 3/27/95

Position in Amos 1	Sample No.	Position in Amos 8
1	CNI-T	
2	104-1	
3	104-2	
4	104-3	
5	104-4	
1	104-5	
7	104-6	
8	104-7	
9	104-8	
10	104-9	
11	104-10	
12	104-11	
13	104-12	
14	104-13	
15	104-14	
16	104-15	
17	104-16	
18	CNI-B	

5/4/95 Location: TAMU

Entries:

delivered samples to TAMU for neutron irradiation - Amos5

5/6/95 Location: Katy, TX

Entries:

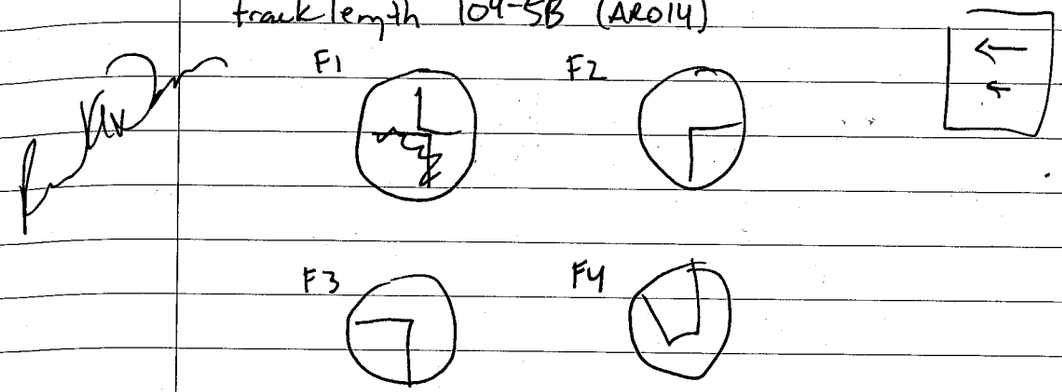
AR014 - irradiated in April previously measured; currently measuring as follows:

Sample	Track Length	Spont Avg	Indue Age
104-1	4/28/95	3/21/95	5/11/95
104-2	4/29/95	3/21/95	5/11/95
104-3	4/29/95	3/21/95	5/11/95
104-4	4/29/95	3/21/95	5/12/95
104-5	5/8/95	3/21/95	5/12/95
104-6	5/9/95	3/21/95	5/12/95
104-7	5/9/95	3/21/95	5/12/95
104-8	5/9/95	3/21/95	5/12/95
104-9	5/9/95	3/27/95	5/12/95
104-10	5/10/95	3/21/95	5/12/95
104-11	5/10/95	3/21/95	5/12/95
104-12	5/10/95	3/21/95	5/12/95
104-13	5/10/95	3/21/95	5/12/95
104-14	5/10/95	3/21/95	5/12/95
104-15	5/11/95	3/21/95	5/12/95
104-16	5/11/95	3/21/95	5/12/95

5/8/95 Location: Katy, TX

Entries:

track length 104-5B (AR014)

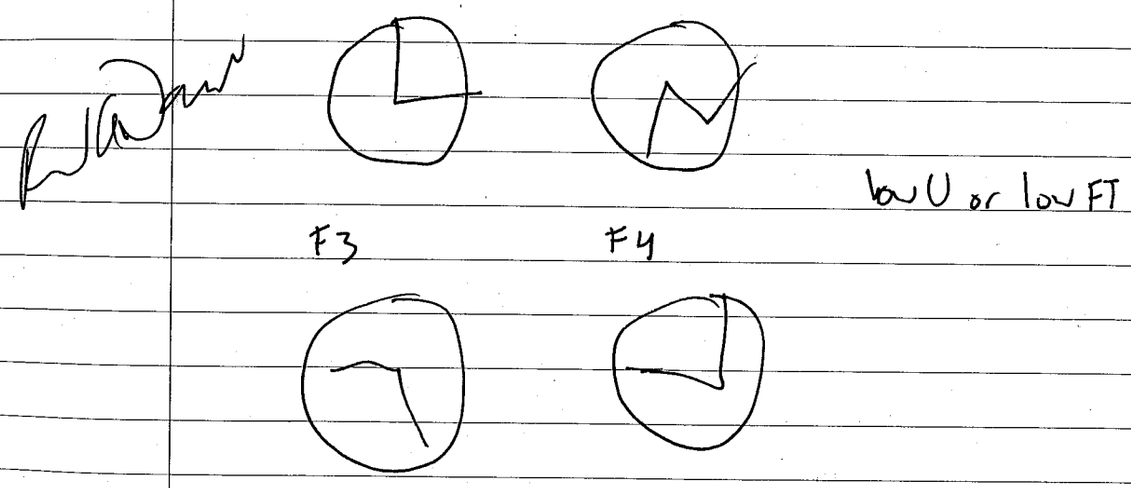


completed

5/9/95 Location: Katy, TX

Entries:

track length 104-6B (AR014)

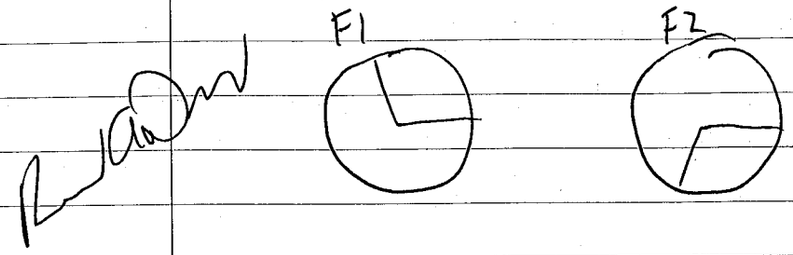


low U or low FT

completed

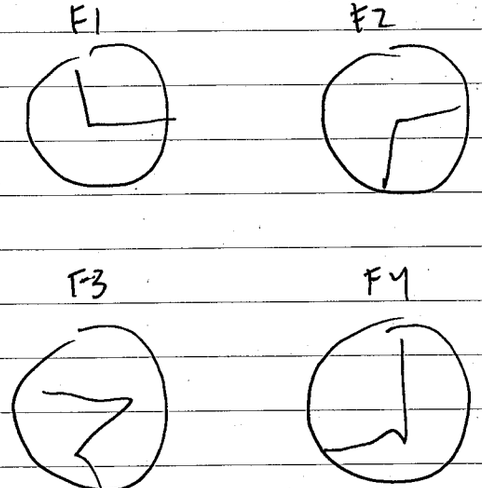
5/9/95 (continued)

length for 104-7B (AR014)



completed

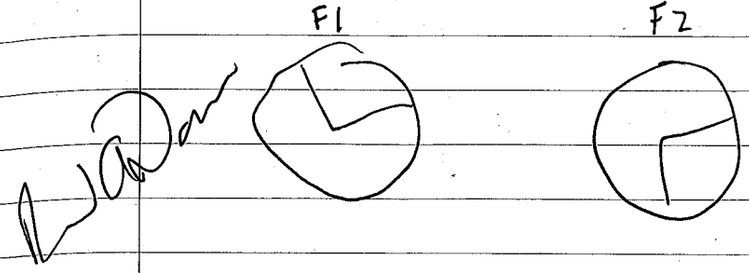
length for 104-8B (AR014)



Completed

5/9/95 (continued)

length for 104-9B (AR1014)



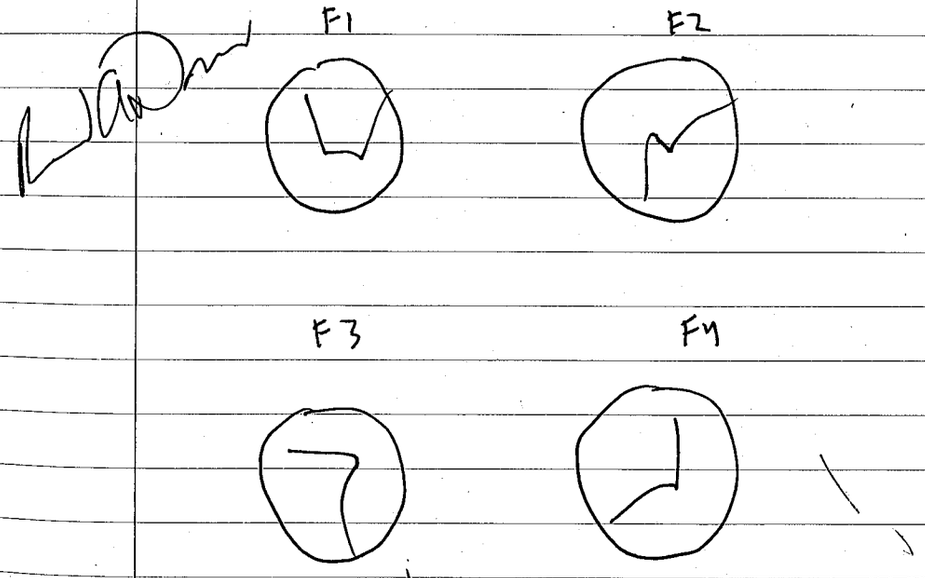
a lot like 104-6

Completed

5/10/95 Location: Katy, TX

Entries:

track length for 104-10B (AR014)



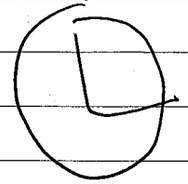
Completed

5/10/95 Location: Katy, TX (continued)

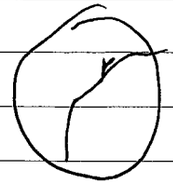
Entries:

track length for 104-11B (AR014)

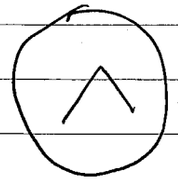
F1



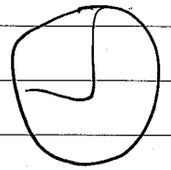
F2



F3



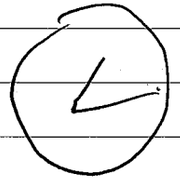
F4



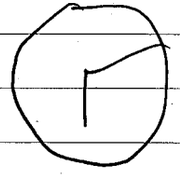
completed

track length for 104-12B (AR014)

F1

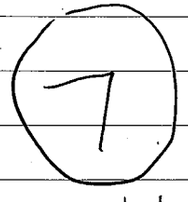


F2

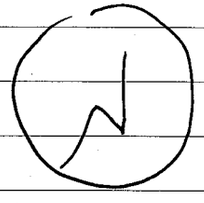


took photo - degenetw

F3



F4

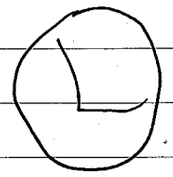


completed

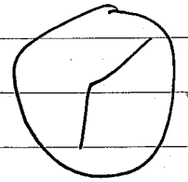
5/10/95 (continued)

track length for 104-13B (AR014 RAD)

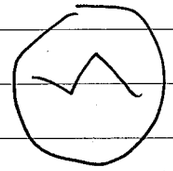
F1



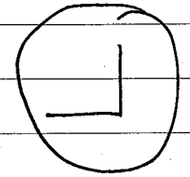
F2



F3



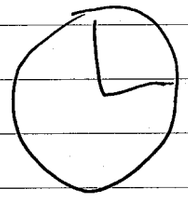
F4



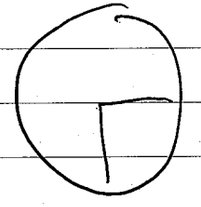
Completed

track length for 104-14B (AR014)

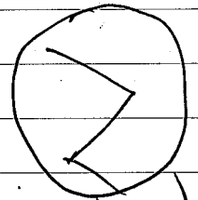
F1



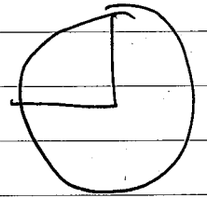
F2



F3



F4



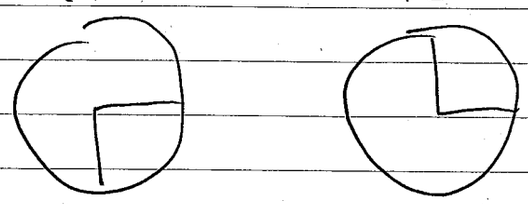
completed

5/11/95 Location: Katy, TX

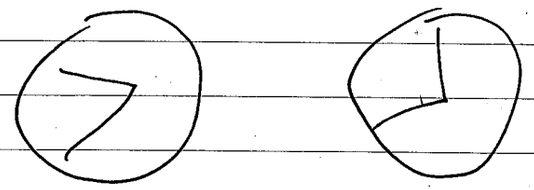
Entries:

track length for 104-15 (AR014)

F1 F2



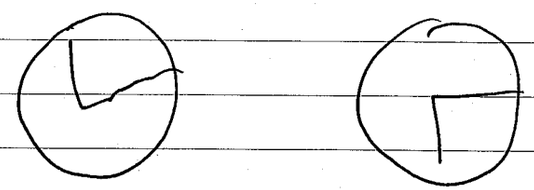
F3 F4



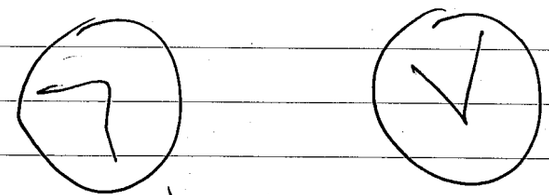
Completed

track length for 104-16 (AR014)

F1 F2



F3 F4



completed

5/11/95 (continued)

Amo81-1 CN1-T counted ρ_d

Amo81-18 CN1-B counted ρ_d

104-1A – measured ρ_i for each grain Amo81-2

104-2A – measured ρ_i for each grain Amo81-3

104-3A – measured ρ_i for each grain Amo81-4

5/12/95 Location: Katy, TX

Entries:

104-4A – measured ρ_i for each grain Amo81-5

104-5A – measured ρ_i for each grain Amo81-6

104-6A – measured ρ_i for each grain Amo81-7

104-7A – measured ρ_i for each grain Amo81-8

104-8A – measured ρ_i for each grain Amo81-9

104-9A – measured ρ_i for each grain Amo81-10

104-10A – measured ρ_i for each grain Amo81-11

104-11A – measured ρ_i for each grain Amo81-12

104-12A – measured ρ_i for each grain Amo81-13

104-13A – measured ρ_i for each grain Amo81-14 LAD

104-14A – measured ρ_i for each grain Amo81-15

104-15A – measured ρ_i for each grain Amo81-16

104-16A – measured ρ_i for each grain Amo81-17

5/13/95 Location: Katy, TX

Entries:

etched 106-1B, 106-2B, 106-4B, 106-5B in 5.5m HNO_3 for ~~20~~ RAD 20 sec @ 21°C.

5/13/95 (continued)

Seeing 18 for table

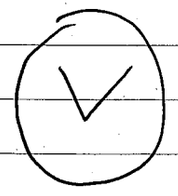
SH-1 – 106-9	crushed, pulverized, sieved, washed
SH-2 – 106-10	crushed, pulverized, sieved, washed
BMN-20 – 106-5	crushed, pulverized, sieved, washed
BMV-15 – 106-6	crushed, pulverized, sieved, washed
BMV-16 – 106-7	crushed, pulverized, sieved, washed
BMV-17A – 106-8	crushed, pulverized, sieved, washed

5/14/95 Location: Katy, TX

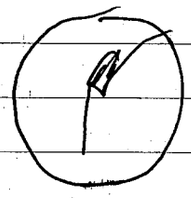
Entries:

track length for 106-1 (AR017) 100's of grains lots of defects

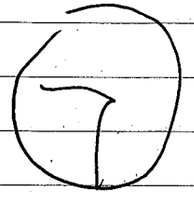
F1



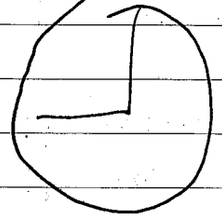
F2



F3



F4

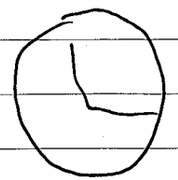


completed: no track lengths measured

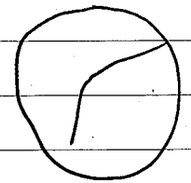
5/14/95 (continued)

track length for 106-2 (AR017) 10s

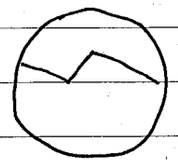
F1



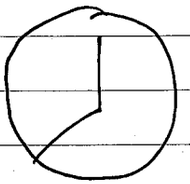
F2



F3



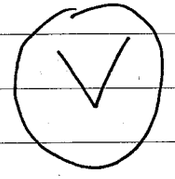
F4



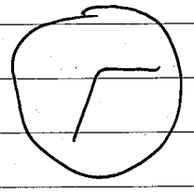
completed

track length for 106-4 (AR017) 10s

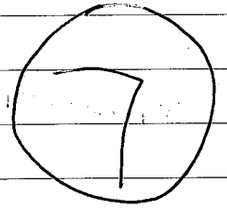
F1



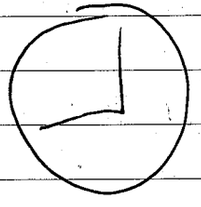
F2



F3



F4

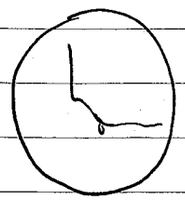


completed

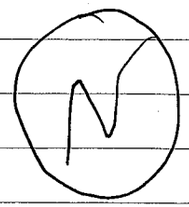
5/14/95 (continued)

track length for 106-5 (ALO17) 100s

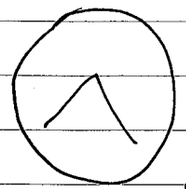
F1



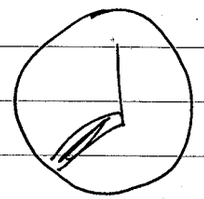
F2



F3



F4



completed

5/15/95 Location: Katy, TX

Entries:

put 106-6 into LMT - separated heavies from lights; washed.

put 106-10 into LMT - separated heavies from lights

put 106-3 into LMT - separated heavies from lights

AM085-1 - counted pd

AM085-10 - counted pd

5/15/95 (cont) AM085

1 CN1 - Corning glass CN-1
2 DR - Durango, natural
3 FC - Fish canyon, natural
4 SB-1A - Rice
5 PP-78A - Rice
6 106-1A
7 106-2A
8 106-4A
9 106-5A
10 CN1

had previously counted ps values for all grains on 5/3/95.

106-1A - measured pi for each grain AM085-6
grains are very poor, 100s
definitely has tracks

106-2A - measured pi for each grain AM085-7
excellent sample 100s

106-4A - measured pi for each grain AM085-8
poor sample 1s

106-5A - measured pi for each grain AM085-9
low U? grains; pretty detect rich,
fair 1000s

5/16/95 At this point, I have given up on this book because it is too time consuming to use it and it is totally disorganized. I have decided to resort to my summary sheets that I have been keeping.

5/16/95

Pages 35 Through 49 Are Intentionally Left Blank

8/31/95 Location: 4819 Katy-Hockley Rd Katy TX

Entries:

Sorted through Spivey letter of July specifying samples to be re-analyzed. Correlated Kathy's numbers with DAI sample numbers.

9/1/95 Location: 4819 Katy-Hockley Rd Katy TX

Entries:

pulled following separates for track length mount preparation:

#	# Grains Observed (from DA Reps 95, 104, 106)	mounts to be made
95-1	1000s	3
95-3	1000s	3
95-5	100s	3
104-5	100s	3
104-6	1000s	~~3~~
104-10	10s	2
104-13	10s	2
104-14	1000s	3
106-1	100s	3
106-5	1000s	3
104-7	1000s	3
~~RAD 104-15~~ 104-11	1000s	3
~~RAD 106-10~~ 104-15	1000s RAD	3
106-9	10s	1

age and length re-analysis ↑

length re-analysis ↓

9/2/95 Location: 4819 Katy-Hockley Rd Katy, TX

Entries:

prepared materials for grain mounts

9/4/95 Location: 4819 Katy-Hockley Rd Katy, TX.

Entries:

Made grain mounts as follows:

#	Mounts Made	Polished	Comments
95-1	3		100s visible
95-3	3		100s visible
95-5	3		100s visible
104-5	3		100s visible
104-6	3		1000s visible
104-10	RAD ~~3~~		100s visible; used all
104-13	2		unclear what is there; used all
104-14	3		1000s visible
106-1	3		unclear what is there
106-5	3		1000s visible
104-7	3		10s visible
104-11	3		10s visible
104-15	3		100s visible
106-9	~~0~~ 1 RAD		~~Diq~~. small amount left; used all of it.

cured @ 80°c for 60 min.

THIS BOOK HAS BEEN REVIEWED FOR COMPLIANCE WITH QAP 001. THE PROCEEDURE FOR SAMPLE PREPARATION IS DESCRIBED IN NOTEBOOK 99. THE ACTUAL FISSION TRACK IS PROCEEDURE IS WELL KNOWN AND DOCUMENTED IN THE LITERATURE, SEE WAGNER, G AND VAN DEN HUTE P. (1992) FISSION-TRACK DATING PUBLISHED BY VERLAG IN THEIR SOLID EARTH SCIENCE LIBRARY, VOL 6. BOUND DATA OF ANALYSES AND DATA REDUCTION ACCOMPANY THIS SCI NOTEBOOK.

A. Lawrence McKenzie
9/16/97

ALSO SEE: BURTNER, R.L., NIGRINI, A AND DONELICK (1994) THERMOCHRONOLOGY OF LOWER CRETACEOUS SOURCE ROCKS IN THE IDAHO-WYOMING THRUST BELT, AAPG BULL. V 78 P 1613-1636 ESPECIALLY APPENDIX 2

THIS BOOK WILL NO LONGER BE USED AND WILL BE ARCHIVED, EFFECTIVE 4/18/97.

M. L. McKaye

4/18/97