

**APPENDIX B**

**Fission Track Ages**

1. 05-01
2. 05-03
3. 05-04
4. 05-06
5. 05-07
6. 05-08
7. 05-10
8. 05-11
9. 05-12
10. 05-13
11. 05-16
12. 05-17
13. KA 1
14. KL 2
15. DK 3

**05-01 - Kulthieth Formation, Donald Ridge**

=====**ZetaAge Program v. 4.8 (Brandon 8/13/02)**=====

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05-01ab, U35Z-45,46

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.318E+05  
 RELATIVE ERROR (%): 1.89  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	Age	--95% CI--
1	1.00E+07	( 40)	9.51E+06	( 38)	6	505 164	44.2	27.6	70.8
2	8.07E+06	( 43)	7.32E+06	( 39)	8	388 124	46.3	29.3	73.4
3	4.80E+06	( 32)	6.76E+06	( 45)	10	359 107	30.0	18.4	48.1
4	4.63E+06	( 37)	4.00E+06	( 32)	12	212 75	48.5	29.4	80.5
5	3.88E+06	( 31)	4.13E+06	( 33)	12	219 76	39.5	23.4	66.5
6	4.50E+06	( 24)	7.70E+06	( 41)	8	408 128	24.7	14.2	41.8
7	3.00E+06	( 36)	3.00E+06	( 36)	18	159 53	42.0	25.7	68.6
8	3.45E+06	( 23)	8.86E+06	( 59)	10	470 123	16.5	9.7	27.0
9	4.32E+06	( 23)	5.26E+06	( 28)	8	279 105	34.6	19.0	62.1
10	5.15E+06	( 48)	7.61E+06	( 71)	14	404 97	28.5	19.3	41.7
11	1.72E+06	( 16)	2.79E+06	( 26)	14	148 58	26.0	13.0	50.1
12	4.32E+06	( 23)	4.32E+06	( 23)	8	229 95	42.0	22.5	78.3
13	7.76E+06	( 62)	4.88E+06	( 39)	12	259 83	66.6	44.0	102.2
14	6.17E+06	( 37)	1.28E+07	( 77)	9	682 157	20.3	13.3	30.4
15	6.01E+06	( 32)	1.03E+07	( 55)	8	548 149	24.5	15.3	38.6
16	4.00E+06	( 48)	5.01E+06	( 60)	18	266 69	33.7	22.5	50.0
17	3.54E+06	( 33)	6.33E+06	( 59)	14	336 88	23.6	14.9	36.7
18	8.71E+06	( 58)	1.01E+07	( 67)	10	534 132	36.4	25.1	52.6
19	2.38E+06	( 19)	1.38E+06	( 11)	12	73 43	72.0	32.8	167.4
20	6.76E+06	( 36)	3.75E+06	( 20)	8	199 88	75.2	42.6	137.1
21	5.26E+06	( 35)	4.05E+06	( 27)	10	215 82	54.4	32.0	93.4
22	3.94E+06	( 21)	3.75E+06	( 20)	8	199 88	44.1	22.8	85.6
23	2.57E+06	( 24)	4.08E+06	( 38)	14	216 70	26.6	15.2	45.5
24	5.15E+06	( 48)	6.65E+06	( 62)	14	353 90	32.6	21.8	48.3
25	6.38E+06	( 34)	7.51E+06	( 40)	8	398 126	35.8	21.9	57.9
26	5.51E+06	( 33)	9.84E+06	( 59)	9	525 138	23.5	14.8	36.5
27	7.32E+06	( 39)	9.01E+06	( 48)	8	481 139	34.0	21.7	53.0
28	6.26E+06	( 50)	1.00E+07	( 80)	12	534 121	26.2	18.0	37.8
29	4.72E+06	( 44)	3.43E+06	( 32)	14	183 65	57.4	35.6	93.5
30	5.38E+06	( 43)	6.26E+06	( 50)	12	334 95	36.0	23.3	55.2
31	5.26E+06	( 49)	5.79E+06	( 54)	14	309 85	38.0	25.2	57.0
32	4.00E+06	( 32)	4.75E+06	( 38)	12	254 82	35.3	21.3	57.9
33	2.92E+06	( 35)	3.75E+06	( 45)	18	200 60	32.6	20.3	51.8
34	7.13E+06	( 76)	9.01E+06	( 96)	16	481 100	33.1	24.2	45.3
35	2.79E+06	( 26)	2.68E+06	( 25)	14	143 57	43.5	24.1	78.4
36	6.01E+06	( 32)	8.07E+06	( 43)	8	430 132	31.2	19.1	50.4
37	2.00E+06	( 16)	3.63E+06	( 29)	12	194 72	23.2	11.7	44.0
38	3.88E+06	( 31)	4.50E+06	( 36)	12	240 80	36.1	21.5	59.9
39	4.69E+06	( 25)	3.00E+06	( 16)	8	160 79	65.0	33.5	130.2
40	4.88E+06	( 26)	7.13E+06	( 38)	8	380 123	28.7	16.7	48.4
41	7.13E+06	( 38)	4.88E+06	( 26)	8	260 102	60.9	36.1	104.5
42	4.50E+06	( 24)	5.26E+06	( 28)	8	280 106	35.9	19.9	64.1
43	4.80E+06	( 32)	6.61E+06	( 44)	10	352 106	30.5	18.7	49.1
44	4.63E+06	( 37)	7.01E+06	( 56)	12	374 100	27.7	17.7	42.7
45	3.13E+06	( 25)	1.75E+06	( 14)	12	93 49	74.1	37.3	154.2
46	6.26E+06	( 25)	3.25E+06	( 13)	6	174 95	79.7	39.6	169.7
47	3.42E+06	( 41)	3.59E+06	( 43)	18	191 58	39.9	25.3	62.7
48	3.53E+06	( 47)	6.53E+06	( 87)	20	348 76	22.7	15.5	32.7

49	3.63E+06	( 29)	3.63E+06	( 29)	12	194	72	41.8	24.1	72.5
50	5.79E+06	( 54)	7.19E+06	( 67)	14	383	94	33.7	23.1	49.0

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-01ab, U35Z-45,46

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2) (%)	Sum age (Ma)
					Age --95% CI--		Age --95% CI--
8	3.45E+06	( 23)	8.86E+06	( 59)	16.5 9.7 27.0	100.0	16.5 9.7 27.0
14	6.17E+06	( 37)	1.28E+07	( 77)	20.3 13.3 30.4	50.9	18.6 13.5 25.4
48	3.53E+06	( 47)	6.53E+06	( 87)	22.7 15.5 32.7	57.4	20.2 16.0 25.6
37	2.00E+06	( 16)	3.63E+06	( 29)	23.2 11.7 44.0	73.6	20.5 16.5 25.6
26	5.51E+06	( 33)	9.84E+06	( 59)	23.5 14.8 36.5	81.6	21.1 17.3 25.7
17	3.54E+06	( 33)	6.33E+06	( 59)	23.6 14.9 36.7	88.0	21.5 17.9 25.8
15	6.01E+06	( 32)	1.03E+07	( 55)	24.5 15.3 38.6	91.3	21.9 18.5 25.9
6	4.50E+06	( 24)	7.70E+06	( 41)	24.7 14.2 41.8	94.4	22.1 18.8 26.0
11	1.72E+06	( 16)	2.79E+06	( 26)	26.0 13.0 50.1	96.2	22.3 19.0 26.1
28	6.26E+06	( 50)	1.00E+07	( 80)	26.2 18.0 37.8	95.8	22.9 19.7 26.5
23	2.57E+06	( 24)	4.08E+06	( 38)	26.6 15.2 45.5	96.9	23.1 20.0 26.6
44	4.63E+06	( 37)	7.01E+06	( 56)	27.7 17.7 42.7	96.7	23.5 20.5 26.9
10	5.15E+06	( 48)	7.61E+06	( 71)	28.5 19.3 41.7	95.6	23.9 21.0 27.3
40	4.88E+06	( 26)	7.13E+06	( 38)	28.7 16.7 48.4	96.2	24.2 21.3 27.4
3	4.80E+06	( 32)	6.76E+06	( 45)	30.0 18.4 48.1	95.9	24.5 21.6 27.7
43	4.80E+06	( 32)	6.61E+06	( 44)	30.5 18.7 49.1	95.5	24.8 22.0 28.0
36	6.01E+06	( 32)	8.07E+06	( 43)	31.2 19.1 50.4	94.9	25.1 22.3 28.2
33	2.92E+06	( 35)	3.75E+06	( 45)	32.6 20.3 51.8	93.2	25.5 22.7 28.5
24	5.15E+06	( 48)	6.65E+06	( 62)	32.6 21.8 48.3	90.4	25.9 23.2 28.9
34	7.13E+06	( 76)	9.01E+06	( 96)	33.1 24.2 45.3	83.6	26.5 23.8 29.5
16	4.00E+06	( 48)	5.01E+06	( 60)	33.7 22.5 50.0	80.7	26.9 24.2 29.8
50	5.79E+06	( 54)	7.19E+06	( 67)	33.7 23.1 49.0	77.7	27.2 24.6 30.2
27	7.32E+06	( 39)	9.01E+06	( 48)	34.0 21.7 53.0	77.1	27.5 24.9 30.4
9	4.32E+06	( 23)	5.26E+06	( 28)	34.6 19.0 62.1	78.4	27.7 25.0 30.5
32	4.00E+06	( 32)	4.75E+06	( 38)	35.3 21.3 57.9	78.0	27.9 25.3 30.7
25	6.38E+06	( 34)	7.51E+06	( 40)	35.8 21.9 57.9	77.0	28.1 25.5 31.0
42	4.50E+06	( 24)	5.26E+06	( 28)	35.9 19.9 64.1	77.7	28.2 25.7 31.1
30	5.38E+06	( 43)	6.26E+06	( 50)	36.0 23.3 55.2	75.9	28.5 25.9 31.3
38	3.88E+06	( 31)	4.50E+06	( 36)	36.1 21.5 59.9	76.0	28.7 26.1 31.5
18	8.71E+06	( 58)	1.01E+07	( 67)	36.4 25.1 52.6	72.4	29.0 26.5 31.8
31	5.26E+06	( 49)	5.79E+06	( 54)	38.0 25.2 57.0	68.2	29.3 26.8 32.1
5	3.88E+06	( 31)	4.13E+06	( 33)	39.5 23.4 66.5	66.1	29.5 27.0 32.3
47	3.42E+06	( 41)	3.59E+06	( 43)	39.9 25.3 62.7	61.6	29.8 27.2 32.6
49	3.63E+06	( 29)	3.63E+06	( 29)	41.8 24.1 72.5	58.2	30.0 27.4 32.8
7	3.00E+06	( 36)	3.00E+06	( 36)	42.0 25.7 68.6	53.2	30.2 27.7 33.0
12	4.32E+06	( 23)	4.32E+06	( 23)	42.0 22.5 78.3	52.1	30.4 27.8 33.2
35	2.79E+06	( 26)	2.68E+06	( 25)	43.5 24.1 78.4	49.1	30.6 28.0 33.3
22	3.94E+06	( 21)	3.75E+06	( 20)	44.1 22.8 85.6	47.5	30.7 28.2 33.5
1	1.00E+07	( 40)	9.51E+06	( 38)	44.2 27.6 70.8	40.7	31.0 28.4 33.8
2	8.07E+06	( 43)	7.32E+06	( 39)	46.3 29.3 73.4	31.7	31.3 28.7 34.1
4	4.63E+06	( 37)	4.00E+06	( 32)	48.5 29.4 80.5	24.1	31.6 29.0 34.4
21	5.26E+06	( 35)	4.05E+06	( 27)	54.4 32.0 93.4	14.9	31.9 29.3 34.7
29	4.72E+06	( 44)	3.43E+06	( 32)	57.4 35.6 93.5	6.3	32.3 29.7 35.1
41	7.13E+06	( 38)	4.88E+06	( 26)	60.9 36.1 104.5	2.4	32.7 30.1 35.5
39	4.69E+06	( 25)	3.00E+06	( 16)	65.0 33.5 130.2	1.2	32.9 30.3 35.8
13	7.76E+06	( 62)	4.88E+06	( 39)	66.6 44.0 102.2	0.1	33.6 30.9 36.4
19	2.38E+06	( 19)	1.38E+06	( 11)	72.0 32.8 167.4	0.0	33.8 31.1 36.6
45	3.13E+06	( 25)	1.75E+06	( 14)	74.1 37.3 154.2	0.0	34.0 31.4 36.9
20	6.76E+06	( 36)	3.75E+06	( 20)	75.2 42.6 137.1	0.0	34.4 31.7 37.3
46	6.26E+06	( 25)	3.25E+06	( 13)	79.7 39.6 169.7	0.0	34.7 32.0 37.6
POOL	4.67E+06	( 1772)	5.66E+06	( 2148)		0.0	34.7 32.0 37.6

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 300.2, 17.2

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 34.7, 33.3 -- 36.2 ( -1.4 +1.5)  
 95% CONF. INTERVAL (Ma): 32.0 -- 37.6 ( -2.7 +2.9)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.1416, 49  
 CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 35.6, 33.8 -- 37.6 ( -1.9 +2.0)  
 95% CONF. INTERVAL (Ma): 32.1 -- 39.6 ( -3.6 +3.9)  
 AGE DISPERSION (%): 23.8

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 32.9, 31.6 -- 34.3 ( -1.4 +1.4)  
 95% CONF. INTERVAL (Ma): 30.3 -- 35.8 ( -2.6 +2.8)  
 NUMBER AND PERCENTAGE OF GRAINS: 45, 90%

Kernel factor = .6 (Ratio of kernel window size to standard error)  
 Number of grains = 50  
 PEAKS IN PROBABILITY DISTRIBUTION  
 The modes in the distribution are found by inspecting the derivatives  
 of the probability density as a function of Z.  
 Probability distribution uses grain-only standard errors.  
 Total probability mass integrates to N (= number of grains).  
 Probability density is given as grains per delta Z=0.1.  
 At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 16.63 to 78.76 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
34.33	6.211	38.13

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
14.90	0.231	1.42
23.66	3.050	18.73
34.22	6.211	38.13
67.01	1.748	10.73

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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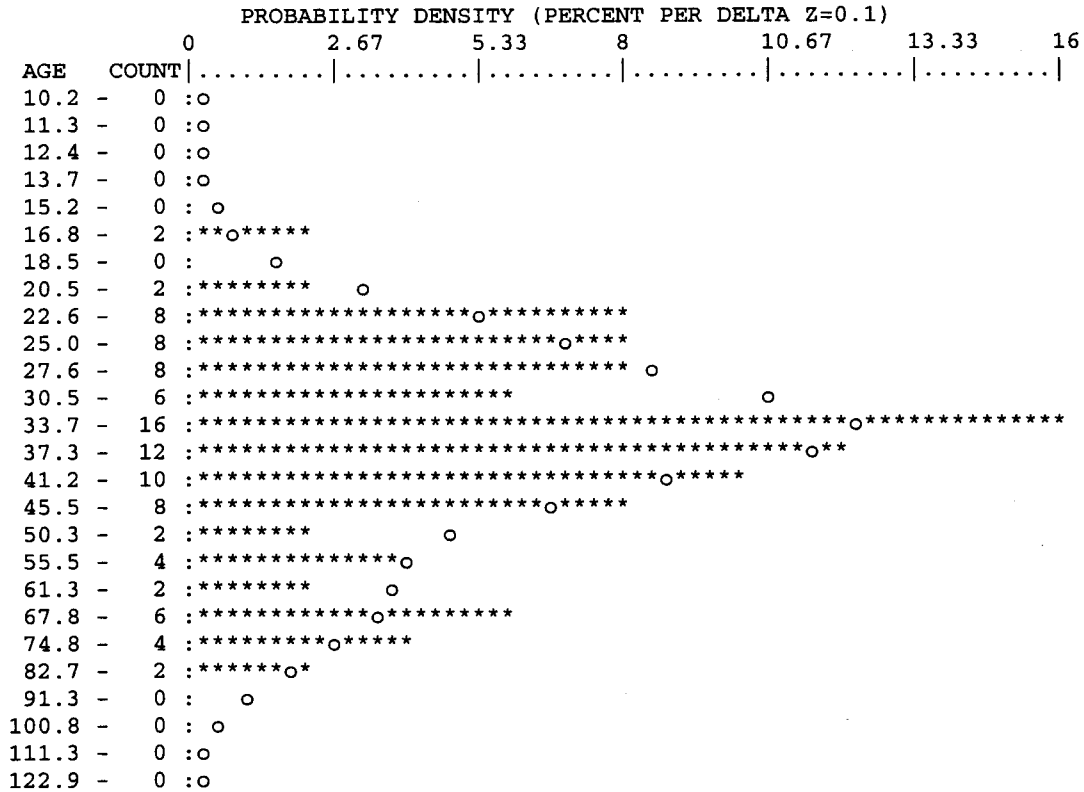
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05-01ab, U35Z-45,46

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-03 - Kulthieth Formation, North of Donald Ridge**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-03ab, U35Z-47,48

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.295E+05  
 RELATIVE ERROR (%): 1.92  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	Age	--95% CI--
1	3.28E+06	( 35)	3.00E+06	( 32)	16	161 57	45.5	27.4	75.9
2	8.26E+06	( 33)	3.25E+06	( 13)	6	174 95	104.4	54.0	216.1
3	5.56E+06	( 37)	4.50E+06	( 30)	10	241 88	51.3	30.8	85.9
4	5.51E+06	( 22)	4.50E+06	( 18)	6	241 113	50.8	26.0	100.3
5	3.86E+06	( 36)	5.79E+06	( 54)	14	310 85	27.8	17.7	43.2
6	4.93E+06	( 46)	6.33E+06	( 59)	14	339 89	32.5	21.6	48.6
7	4.70E+06	( 47)	7.71E+06	( 77)	15	413 95	25.5	17.3	37.1
8	2.50E+06	( 15)	5.51E+06	( 33)	9	295 103	19.1	9.6	35.9
9	2.44E+06	( 13)	3.19E+06	( 17)	8	171 82	32.0	14.2	69.5
10	3.30E+06	( 22)	4.20E+06	( 28)	10	225 85	32.8	17.8	59.3
11	8.45E+06	( 45)	6.76E+06	( 36)	8	362 121	51.9	32.8	82.9
12	3.57E+06	( 19)	4.69E+06	( 25)	8	251 100	31.7	16.5	59.8
13	5.63E+06	( 45)	5.88E+06	( 47)	12	315 92	39.9	25.9	61.3
14	3.34E+06	( 20)	3.17E+06	( 19)	9	170 77	43.8	22.2	86.6
15	1.16E+07	( 62)	1.16E+07	( 62)	8	624 160	41.6	28.8	60.2
16	6.57E+06	( 35)	6.57E+06	( 35)	8	352 119	41.6	25.3	68.5
17	5.51E+06	( 44)	1.08E+07	( 86)	12	577 126	21.4	14.5	31.1
18	3.13E+06	( 25)	2.63E+06	( 21)	12	141 61	49.5	26.6	92.9
19	5.79E+06	( 54)	9.87E+06	( 92)	14	529 112	24.5	17.1	34.7
20	2.63E+06	( 14)	4.69E+06	( 25)	8	251 100	23.5	11.2	46.6
21	5.26E+06	( 21)	5.51E+06	( 22)	6	295 125	39.8	20.8	75.7
22	7.51E+06	( 25)	7.81E+06	( 26)	5	418 163	40.0	22.2	72.1
23	6.38E+06	( 34)	6.94E+06	( 37)	8	372 122	38.3	23.3	62.7
24	4.41E+06	( 47)	5.35E+06	( 57)	16	287 76	34.4	22.8	51.5
25	3.75E+06	( 25)	3.00E+06	( 20)	10	161 71	51.9	27.7	98.5
26	2.68E+06	( 25)	3.00E+06	( 28)	14	162 61	37.0	20.7	65.7
27	6.86E+06	( 64)	2.57E+06	( 24)	14	139 56	109.4	67.8	182.9
28	4.75E+06	( 38)	4.75E+06	( 38)	12	256 83	41.4	25.7	66.7
29	5.26E+06	( 42)	7.01E+06	( 56)	12	378 102	31.1	20.3	47.2
30	8.11E+06	( 54)	7.51E+06	( 50)	10	404 115	44.7	29.8	67.1
31	9.51E+06	( 38)	5.26E+06	( 21)	6	283 123	74.5	42.8	133.6
32	4.80E+06	( 48)	6.91E+06	( 69)	15	372 90	28.9	19.5	42.3
33	2.75E+06	( 22)	4.25E+06	( 34)	12	229 79	26.9	14.9	47.2
34	4.25E+06	( 34)	4.88E+06	( 39)	12	263 84	36.1	22.1	58.7
35	3.25E+06	( 26)	2.38E+06	( 19)	12	128 58	56.5	30.2	107.9
36	7.88E+06	( 42)	6.57E+06	( 35)	8	354 120	49.6	30.9	80.1
37	5.86E+06	( 39)	1.01E+07	( 67)	10	542 134	24.2	15.8	36.4
38	6.46E+06	( 43)	4.50E+06	( 30)	10	243 88	59.2	36.3	97.7
39	5.63E+06	( 60)	4.13E+06	( 44)	16	222 67	56.3	37.6	85.2
40	1.13E+07	( 45)	5.01E+06	( 20)	6	270 120	92.4	53.8	165.2
41	6.13E+06	( 49)	4.75E+06	( 38)	12	256 83	53.3	34.2	83.7
42	8.79E+06	( 41)	8.58E+06	( 40)	7	462 146	42.4	26.8	67.3
43	3.32E+06	( 31)	4.83E+06	( 45)	14	260 78	28.6	17.5	46.1
44	3.65E+06	( 34)	5.47E+06	( 51)	14	295 83	27.7	17.3	43.5
45	9.26E+06	( 37)	9.51E+06	( 38)	6	512 166	40.3	24.9	65.1
46	4.67E+06	( 28)	3.34E+06	( 20)	9	180 80	57.8	31.5	108.1
47	5.58E+06	( 26)	6.44E+06	( 30)	7	347 126	35.9	20.4	62.8
48	3.88E+06	( 31)	6.76E+06	( 54)	12	364 100	23.9	14.8	37.7

49 5.88E+06 ( 47) 6.76E+06 ( 54) 12 364 100 36.1 23.8 54.3  
 50 3.94E+06 ( 42) 3.75E+06 ( 40) 16 202 64 43.5 27.5 68.8

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-03ab, U35Z-47,48

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2)	Sum age (Ma)
					Age --95% CI--	(%)	Age --95% CI--
8	2.50E+06	( 15)	5.51E+06	( 33)	19.1 9.6 35.9	100.0	19.1 9.6 35.9
17	5.51E+06	( 44)	1.08E+07	( 86)	21.4 14.5 31.1	74.4	20.7 14.8 28.5
20	2.63E+06	( 14)	4.69E+06	( 25)	23.5 11.2 46.6	89.8	21.2 15.9 28.2
48	3.88E+06	( 31)	6.76E+06	( 54)	23.9 14.8 37.7	93.8	21.9 17.2 27.9
37	5.86E+06	( 39)	1.01E+07	( 67)	24.2 15.8 36.4	96.5	22.5 18.2 27.7
19	5.79E+06	( 54)	9.87E+06	( 92)	24.5 17.1 34.7	97.9	23.0 19.2 27.5
7	4.70E+06	( 47)	7.71E+06	( 77)	25.5 17.3 37.1	98.5	23.4 19.9 27.6
33	2.75E+06	( 22)	4.25E+06	( 34)	26.9 14.9 47.2	99.0	23.7 20.2 27.7
44	3.65E+06	( 34)	5.47E+06	( 51)	27.7 17.3 43.5	98.9	24.1 20.7 28.0
5	3.86E+06	( 36)	5.79E+06	( 54)	27.8 17.7 43.2	99.0	24.4 21.1 28.2
43	3.32E+06	( 31)	4.83E+06	( 45)	28.6 17.5 46.1	99.1	24.7 21.5 28.4
32	4.80E+06	( 48)	6.91E+06	( 69)	28.9 19.5 42.3	98.9	25.1 22.0 28.7
29	5.26E+06	( 42)	7.01E+06	( 56)	31.1 20.3 47.2	98.2	25.6 22.5 29.0
12	3.57E+06	( 19)	4.69E+06	( 25)	31.7 16.5 59.8	98.4	25.8 22.7 29.2
9	2.44E+06	( 13)	3.19E+06	( 17)	32.0 14.2 69.5	98.7	25.9 22.9 29.3
6	4.93E+06	( 46)	6.33E+06	( 59)	32.5 21.6 48.6	97.8	26.4 23.4 29.7
10	3.30E+06	( 22)	4.20E+06	( 28)	32.8 17.8 59.3	98.0	26.6 23.6 29.9
24	4.41E+06	( 47)	5.35E+06	( 57)	34.4 22.8 51.5	96.2	27.0 24.1 30.3
47	5.58E+06	( 26)	6.44E+06	( 30)	35.9 20.4 62.8	95.3	27.3 24.4 30.6
49	5.88E+06	( 47)	6.76E+06	( 54)	36.1 23.8 54.3	92.1	27.8 24.9 31.0
34	4.25E+06	( 34)	4.88E+06	( 39)	36.1 22.1 58.7	90.6	28.1 25.2 31.3
26	2.68E+06	( 25)	3.00E+06	( 28)	37.0 20.7 65.7	90.0	28.3 25.5 31.5
23	6.38E+06	( 34)	6.94E+06	( 37)	38.3 23.3 62.7	87.2	28.7 25.8 31.8
21	5.26E+06	( 21)	5.51E+06	( 22)	39.8 20.8 75.7	86.0	28.9 26.0 32.0
13	5.63E+06	( 45)	5.88E+06	( 47)	39.9 25.9 61.3	79.5	29.3 26.5 32.4
22	7.51E+06	( 25)	7.81E+06	( 26)	40.0 22.2 72.1	77.9	29.5 26.7 32.7
45	9.26E+06	( 37)	9.51E+06	( 38)	40.3 24.9 65.1	73.6	29.9 27.0 33.0
28	4.75E+06	( 38)	4.75E+06	( 38)	41.4 25.7 66.7	68.2	30.2 27.4 33.3
15	1.16E+07	( 62)	1.16E+07	( 62)	41.6 28.8 60.2	57.0	30.7 27.9 33.8
16	6.57E+06	( 35)	6.57E+06	( 35)	41.6 25.3 68.5	53.9	31.0 28.2 34.1
42	8.79E+06	( 41)	8.58E+06	( 40)	42.4 26.8 67.3	49.0	31.3 28.5 34.4
50	3.94E+06	( 42)	3.75E+06	( 40)	43.5 27.5 68.8	43.4	31.7 28.8 34.7
14	3.34E+06	( 20)	3.17E+06	( 19)	43.8 22.2 86.6	43.5	31.8 29.0 34.9
30	8.11E+06	( 54)	7.51E+06	( 50)	44.7 29.8 67.1	35.0	32.2 29.4 35.3
1	3.28E+06	( 35)	3.00E+06	( 32)	45.5 27.4 75.9	31.3	32.5 29.7 35.6
18	3.13E+06	( 25)	2.63E+06	( 21)	49.5 26.6 92.9	27.7	32.7 29.9 35.8
36	7.88E+06	( 42)	6.57E+06	( 35)	49.6 30.9 80.1	20.5	33.1 30.3 36.2
4	5.51E+06	( 22)	4.50E+06	( 18)	50.8 26.0 100.3	18.4	33.3 30.5 36.4
3	5.56E+06	( 37)	4.50E+06	( 30)	51.3 30.8 85.9	13.7	33.6 30.8 36.7
25	3.75E+06	( 25)	3.00E+06	( 20)	51.9 27.7 98.5	11.8	33.8 31.0 36.9
11	8.45E+06	( 45)	6.76E+06	( 36)	51.9 32.8 82.9	7.8	34.2 31.4 37.3
41	6.13E+06	( 49)	4.75E+06	( 38)	53.3 34.2 83.7	4.6	34.6 31.8 37.7
39	5.63E+06	( 60)	4.13E+06	( 44)	56.3 37.6 85.2	1.8	35.2 32.3 38.3
35	3.25E+06	( 26)	2.38E+06	( 19)	56.5 30.2 107.9	1.4	35.4 32.5 38.5
46	4.67E+06	( 28)	3.34E+06	( 20)	57.8 31.5 108.1	1.0	35.6 32.7 38.7
38	6.46E+06	( 43)	4.50E+06	( 30)	59.2 36.3 97.7	0.5	36.0 33.1 39.1
31	9.51E+06	( 38)	5.26E+06	( 21)	74.5 42.8 133.6	0.1	36.4 33.5 39.6
40	1.13E+07	( 45)	5.01E+06	( 20)	92.4 53.8 165.2	0.0	37.0 34.1 40.2
2	8.26E+06	( 33)	3.25E+06	( 13)	104.4 54.0 216.1	0.0	37.5 34.5 40.7
27	6.86E+06	( 64)	2.57E+06	( 24)	109.4 67.8 182.9	0.0	38.4 35.4 41.6
POOL	5.12E+06	( 1807)	5.55E+06	( 1960)		0.0	38.4 35.4 41.6

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 297.6, 17.6



POOLED AGE WITH 68% CONF. INTERVAL (Ma): 38.4, 36.8 -- 40.0 ( -1.6 +1.6)  
 95% CONF. INTERVAL (Ma): 35.4 -- 41.6 ( -3.0 +3.3)  
 REDUCED CHI<sup>2</sup>, DEGREES OF FREEDOM: 2.5813, 49  
 CHI<sup>2</sup> PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 39.4, 37.1 -- 41.7 ( -2.2 +2.4)  
 95% CONF. INTERVAL (Ma): 35.1 -- 44.1 ( -4.3 +4.8)  
 AGE DISPERSION (%): 28.5

CHI<sup>2</sup> AGE WITH 68% CONF. INTERVAL (Ma): 35.4, 33.9 -- 36.9 ( -1.5 +1.6)  
 95% CONF. INTERVAL (Ma): 32.5 -- 38.5 ( -2.9 +3.1)  
 NUMBER AND PERCENTAGE OF GRAINS: 44, 88%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 19.29 to 108.43 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
41.14	5.479	34.24
98.64	0.703	4.39

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
24.94	3.128	19.55
41.64	5.472	34.20
54.84	3.359	20.99
105.02	0.673	4.21

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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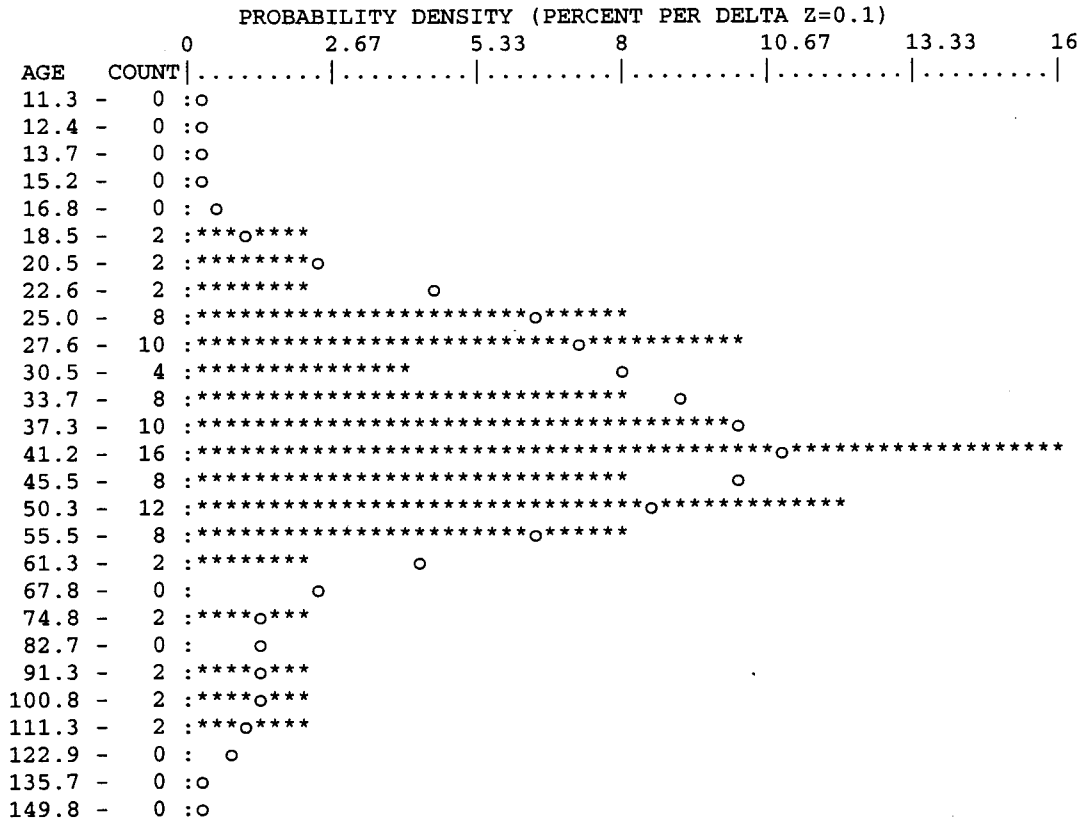
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05-03ab, U35Z-47,48

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-04 - Kulthieth Formation, North of Donald Ridge**

=====**ZetaAge Program v. 4.8 (Brandon 8/13/02)**=====

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05-04ab, U35Z-49,50

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.271E+05  
 RELATIVE ERROR (%): 1.96  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	Age	--95% CI--
1	6.76E+06	( 45)	9.01E+06	( 60)	10	488 127	30.9	20.5	46.3
2	3.00E+06	( 28)	5.58E+06	( 52)	14	302 84	22.3	13.5	35.9
3	8.26E+06	( 33)	6.76E+06	( 27)	6	366 140	50.3	29.3	86.9
4	3.60E+06	( 48)	5.33E+06	( 71)	20	289 69	27.9	18.9	40.8
5	6.76E+06	( 36)	7.70E+06	( 41)	8	417 130	36.2	22.5	58.0
6	6.91E+06	( 46)	6.46E+06	( 43)	10	350 107	44.0	28.4	68.4
7	4.88E+06	( 26)	7.51E+06	( 40)	8	407 129	26.9	15.7	45.0
8	5.26E+06	( 28)	3.38E+06	( 18)	8	183 85	63.8	34.2	122.4
9	7.21E+06	( 48)	1.08E+07	( 72)	10	586 139	27.5	18.6	40.2
10	5.82E+06	( 31)	5.44E+06	( 29)	8	295 109	44.0	25.7	75.6
11	7.88E+06	( 21)	8.63E+06	( 23)	4	468 194	37.6	19.8	71.0
12	1.26E+07	( 42)	1.50E+07	( 50)	5	813 231	34.6	22.4	53.3
13	6.22E+06	( 58)	5.58E+06	( 52)	14	302 84	45.9	31.0	68.1
14	4.25E+06	( 34)	4.50E+06	( 36)	12	244 81	38.9	23.6	64.0
15	5.88E+06	( 47)	4.88E+06	( 39)	12	264 85	49.6	31.7	77.9
16	6.38E+06	( 34)	4.32E+06	( 23)	8	234 97	60.7	34.8	107.9
17	3.75E+06	( 30)	6.01E+06	( 48)	12	325 94	25.8	15.8	41.5
18	4.50E+06	( 30)	3.45E+06	( 23)	10	187 78	53.6	30.2	96.6
19	6.38E+06	( 34)	4.50E+06	( 24)	8	244 99	58.2	33.6	102.5
20	3.75E+06	( 20)	4.50E+06	( 24)	8	244 99	34.4	18.0	64.8
21	6.76E+06	( 45)	7.21E+06	( 48)	10	390 113	38.6	25.1	59.3
22	2.50E+06	( 15)	4.84E+06	( 29)	9	262 97	21.5	10.6	41.1
23	4.50E+06	( 18)	6.76E+06	( 27)	6	366 140	27.6	14.3	51.8
24	7.13E+06	( 57)	7.88E+06	( 63)	12	427 108	37.3	25.6	54.3
25	4.63E+06	( 37)	7.26E+06	( 58)	12	393 104	26.3	16.9	40.5
26	5.76E+06	( 23)	5.26E+06	( 21)	6	286 124	44.8	23.7	85.1
27	4.50E+06	( 30)	3.00E+06	( 20)	10	164 73	61.2	33.7	113.7
28	5.56E+06	( 37)	5.71E+06	( 38)	10	311 101	39.9	24.7	64.5
29	3.38E+06	( 27)	3.13E+06	( 25)	12	170 68	44.2	24.7	79.4
30	3.90E+06	( 26)	4.20E+06	( 28)	10	229 86	38.1	21.4	67.3
31	7.51E+06	( 30)	7.51E+06	( 30)	6	409 149	41.0	23.9	70.3
32	8.01E+06	( 64)	8.01E+06	( 64)	12	436 110	41.0	28.5	58.9
33	4.13E+06	( 22)	8.07E+06	( 43)	8	439 134	21.1	12.0	35.9
34	6.51E+06	( 39)	6.34E+06	( 38)	9	345 112	42.0	26.2	67.5
35	6.51E+06	( 52)	3.75E+06	( 30)	12	204 74	70.7	44.4	114.9
36	4.13E+06	( 33)	5.88E+06	( 47)	12	320 94	28.8	17.9	45.9
37	4.25E+06	( 34)	3.38E+06	( 27)	12	184 71	51.5	30.2	88.7
38	5.07E+06	( 27)	6.01E+06	( 32)	8	327 115	34.6	19.9	59.6
39	6.61E+06	( 44)	8.26E+06	( 55)	10	450 122	32.8	21.5	49.7
40	7.96E+06	( 53)	7.36E+06	( 49)	10	401 115	44.3	29.4	66.8
41	3.13E+06	( 25)	4.38E+06	( 35)	12	238 81	29.4	16.8	50.4
42	5.86E+06	( 39)	4.50E+06	( 30)	10	245 89	53.2	32.2	88.6
43	4.88E+06	( 65)	3.08E+06	( 41)	20	168 52	64.7	43.2	98.3
44	3.75E+06	( 50)	5.41E+06	( 72)	20	294 70	28.5	19.4	41.5
45	3.94E+06	( 21)	5.26E+06	( 28)	8	286 108	30.8	16.6	56.1
46	6.65E+06	( 62)	6.44E+06	( 60)	14	350 91	42.3	29.2	61.5
47	3.25E+06	( 26)	5.13E+06	( 41)	12	279 87	26.1	15.3	43.6
48	6.94E+06	( 37)	6.94E+06	( 37)	8	378 124	41.0	25.3	66.4

49	7.51E+06 ( 50)	8.56E+06 ( 57)	10	466 124	36.0	24.1	53.6
50	5.07E+06 ( 27)	4.88E+06 ( 26)	8	266 104	42.5	23.9	75.8

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-04ab, U35Z-49,50

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
33	4.13E+06	( 22)	8.07E+06	( 43)	21.1	12.0	35.9	100.0	21.2	12.0	36.1
22	2.50E+06	( 15)	4.84E+06	( 29)	21.5	10.6	41.1	96.9	21.2	13.8	32.0
2	3.00E+06	( 28)	5.58E+06	( 52)	22.3	13.5	35.9	98.6	21.7	15.7	29.5
17	3.75E+06	( 30)	6.01E+06	( 48)	25.8	15.8	41.5	93.3	22.8	17.7	29.4
47	3.25E+06	( 26)	5.13E+06	( 41)	26.1	15.3	43.6	95.6	23.4	18.6	29.4
25	4.63E+06	( 37)	7.26E+06	( 58)	26.3	16.9	40.5	97.0	24.0	19.6	29.4
7	4.88E+06	( 26)	7.51E+06	( 40)	26.9	15.7	45.0	98.3	24.4	20.2	29.5
9	7.21E+06	( 48)	1.08E+07	( 72)	27.5	18.6	40.2	98.6	25.0	21.1	29.6
23	4.50E+06	( 18)	6.76E+06	( 27)	27.6	14.3	51.8	99.3	25.1	21.3	29.6
4	3.60E+06	( 48)	5.33E+06	( 71)	27.9	18.9	40.8	99.5	25.5	21.9	29.8
44	3.75E+06	( 50)	5.41E+06	( 72)	28.5	19.4	41.5	99.6	25.9	22.5	29.9
36	4.13E+06	( 33)	5.88E+06	( 47)	28.8	17.9	45.9	99.7	26.1	22.8	30.0
41	3.13E+06	( 25)	4.38E+06	( 35)	29.4	16.8	50.4	99.8	26.3	23.0	30.1
45	3.94E+06	( 21)	5.26E+06	( 28)	30.8	16.6	56.1	99.9	26.5	23.2	30.2
1	6.76E+06	( 45)	9.01E+06	( 60)	30.9	20.5	46.3	99.9	26.9	23.7	30.5
39	6.61E+06	( 44)	8.26E+06	( 55)	32.8	21.5	49.7	99.7	27.3	24.1	30.8
20	3.75E+06	( 20)	4.50E+06	( 24)	34.4	18.0	64.8	99.7	27.5	24.4	31.0
38	5.07E+06	( 27)	6.01E+06	( 32)	34.6	19.9	59.6	99.6	27.8	24.7	31.3
12	1.26E+07	( 42)	1.50E+07	( 50)	34.6	22.4	53.3	99.4	28.2	25.1	31.6
49	7.51E+06	( 50)	8.56E+06	( 57)	36.0	24.1	53.6	98.7	28.6	25.6	32.0
5	6.76E+06	( 36)	7.70E+06	( 41)	36.2	22.5	58.0	98.4	28.9	25.9	32.3
24	7.13E+06	( 57)	7.88E+06	( 63)	37.3	25.6	54.3	96.8	29.4	26.5	32.8
11	7.88E+06	( 21)	8.63E+06	( 23)	37.6	19.8	71.0	97.0	29.6	26.6	32.9
30	3.90E+06	( 26)	4.20E+06	( 28)	38.1	21.4	67.3	96.8	29.8	26.9	33.1
21	6.76E+06	( 45)	7.21E+06	( 48)	38.6	25.1	59.3	95.5	30.2	27.3	33.5
14	4.25E+06	( 34)	4.50E+06	( 36)	38.9	23.6	64.0	94.8	30.5	27.5	33.7
28	5.56E+06	( 37)	5.71E+06	( 38)	39.9	24.7	64.5	93.6	30.8	27.8	34.0
32	8.01E+06	( 64)	8.01E+06	( 64)	41.0	28.5	58.9	88.8	31.3	28.4	34.5
31	7.51E+06	( 30)	7.51E+06	( 30)	41.0	23.9	70.3	88.1	31.5	28.6	34.7
48	6.94E+06	( 37)	6.94E+06	( 37)	41.0	25.3	66.4	86.7	31.8	28.9	35.0
34	6.51E+06	( 39)	6.34E+06	( 38)	42.0	26.2	67.5	84.5	32.0	29.2	35.2
46	6.65E+06	( 62)	6.44E+06	( 60)	42.3	29.2	61.5	79.0	32.5	29.6	35.6
50	5.07E+06	( 27)	4.88E+06	( 26)	42.5	23.9	75.8	78.8	32.7	29.8	35.8
10	5.82E+06	( 31)	5.44E+06	( 29)	44.0	25.7	75.6	77.1	32.9	30.0	36.0
6	6.91E+06	( 46)	6.46E+06	( 43)	44.0	28.4	68.4	73.1	33.2	30.3	36.3
29	3.38E+06	( 27)	3.13E+06	( 25)	44.2	24.7	79.4	72.5	33.4	30.5	36.5
40	7.96E+06	( 53)	7.36E+06	( 49)	44.3	29.4	66.8	67.8	33.7	30.8	36.8
26	5.76E+06	( 23)	5.26E+06	( 21)	44.8	23.7	85.1	68.1	33.8	31.0	37.0
13	6.22E+06	( 58)	5.58E+06	( 52)	45.9	31.0	68.1	61.1	34.2	31.3	37.3
15	5.88E+06	( 47)	4.88E+06	( 39)	49.6	31.7	77.9	52.3	34.5	31.7	37.7
3	8.26E+06	( 33)	6.76E+06	( 27)	50.3	29.3	86.9	47.4	34.8	31.9	37.9
37	4.25E+06	( 34)	3.38E+06	( 27)	51.5	30.2	88.7	41.8	35.0	32.2	38.2
42	5.86E+06	( 39)	4.50E+06	( 30)	53.2	32.2	88.6	34.1	35.3	32.5	38.5
18	4.50E+06	( 30)	3.45E+06	( 23)	53.6	30.2	96.6	29.7	35.6	32.7	38.7
19	6.38E+06	( 34)	4.50E+06	( 24)	58.2	33.6	102.5	22.2	35.9	33.0	39.0
16	6.38E+06	( 34)	4.32E+06	( 23)	60.7	34.8	107.9	15.3	36.2	33.3	39.3
27	4.50E+06	( 30)	3.00E+06	( 20)	61.2	33.7	113.7	10.9	36.4	33.5	39.6
8	5.26E+06	( 28)	3.38E+06	( 18)	63.8	34.2	122.4	7.5	36.7	33.8	39.9
43	4.88E+06	( 65)	3.08E+06	( 41)	64.7	43.2	98.3	2.2	37.3	34.3	40.5
35	6.51E+06	( 52)	3.75E+06	( 30)	70.7	44.4	114.9	0.6	37.8	34.8	41.0
POOL	5.37E+06	( 1834)	5.85E+06	( 1999)				0.6	37.8	34.8	41.0

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 316.9, 18.8

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 37.8, 36.2 -- 39.4 ( -1.5 +1.6)  
                   95% CONF. INTERVAL (Ma):          34.8 -- 41.0 ( -3.0 +3.2)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 1.5866, 49  
                   CHI^2 PROBABILITY: 0.6%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 38.0, 36.2 -- 39.9 ( -1.8 +1.9)  
                   95% CONF. INTERVAL (Ma):          34.5 -- 41.8 ( -3.5 +3.8)  
                   AGE DISPERSION (%): 17.3

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 37.3, 35.8 -- 38.9 ( -1.5 +1.6)  
                   95% CONF. INTERVAL (Ma):          34.3 -- 40.5 ( -2.9 +3.2)  
 NUMBER AND PERCENTAGE OF GRAINS: 49, 98%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 21.22 to 70.36 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
40.59	6.215	37.65

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
27.57	4.086	24.75
41.36	6.191	37.51
65.64	1.839	11.14

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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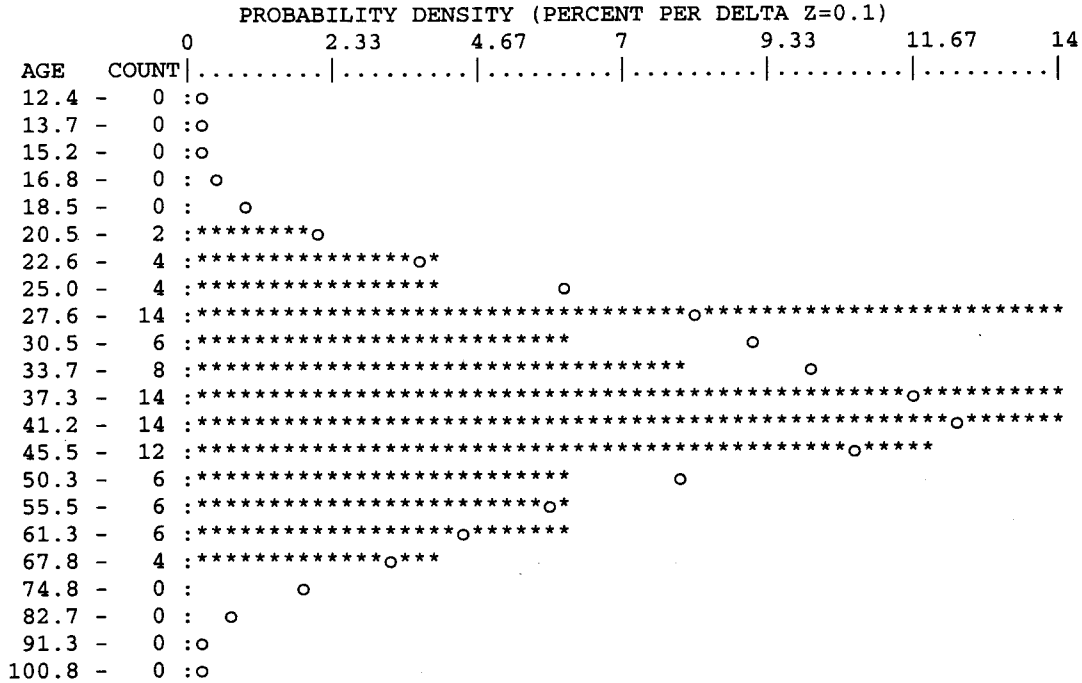
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05-04ab, U35Z-49,50

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-06 - Kulthieth Formation, Northern Robinson Mountains**

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05-06a, U35Z-51

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.247E+05  
 RELATIVE ERROR (%): 2.00  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	4.40E+06	( 41)	3.65E+06	( 34)	14	200 68	49.1	30.4	79.7
2	3.00E+06	( 32)	4.32E+06	( 46)	16	236 70	28.4	17.5	45.6
3	4.75E+06	( 38)	5.38E+06	( 43)	12	295 90	36.0	22.6	57.1
4	3.25E+06	( 26)	5.76E+06	( 46)	12	315 93	23.1	13.7	38.1
5	8.26E+06	( 44)	7.32E+06	( 39)	8	401 129	45.9	29.2	72.6
6	5.26E+06	( 28)	6.19E+06	( 33)	8	339 118	34.6	20.1	59.0
7	5.01E+06	( 40)	8.51E+06	( 68)	12	466 114	24.0	15.8	36.0
8	4.13E+06	( 55)	7.81E+06	( 104)	20	427 85	21.6	15.2	30.3
9	4.50E+06	( 24)	4.50E+06	( 24)	8	247 100	40.8	22.2	74.9
10	5.01E+06	( 60)	5.59E+06	( 67)	18	306 75	36.5	25.3	52.6
11	8.01E+06	( 64)	1.04E+07	( 83)	12	568 126	31.5	22.3	44.2
12	8.71E+06	( 58)	7.96E+06	( 53)	10	436 120	44.6	30.2	66.0
13	4.50E+06	( 48)	5.35E+06	( 57)	16	293 78	34.4	22.9	51.4
14	6.57E+06	( 35)	6.57E+06	( 35)	8	360 122	40.8	24.8	67.0
15	4.72E+06	( 44)	3.75E+06	( 35)	14	205 69	51.1	32.1	82.2
16	6.76E+06	( 45)	8.71E+06	( 58)	10	477 126	31.7	20.9	47.6
17	2.00E+06	( 24)	5.92E+06	( 71)	18	324 78	13.9	8.3	22.2
18	5.71E+06	( 38)	9.31E+06	( 62)	10	510 131	25.1	16.2	38.1
19	4.50E+06	( 60)	4.28E+06	( 57)	20	234 62	42.9	29.3	62.8
20	8.38E+06	( 67)	1.08E+07	( 86)	12	589 129	31.8	22.7	44.3
21	7.38E+06	( 59)	7.76E+06	( 62)	12	425 109	38.8	26.7	56.4
22	8.56E+06	( 57)	8.71E+06	( 58)	10	477 126	40.1	27.3	58.8
23	8.82E+06	( 47)	9.38E+06	( 50)	8	514 146	38.3	25.1	58.3
24	4.34E+06	( 26)	7.84E+06	( 47)	9	429 126	22.6	13.4	37.2
25	3.38E+06	( 27)	4.63E+06	( 37)	12	253 83	29.8	17.4	50.2
26	4.35E+06	( 29)	5.11E+06	( 34)	10	279 96	34.8	20.4	58.8
27	7.51E+06	( 50)	7.81E+06	( 52)	10	427 119	39.2	26.0	59.0
28	9.01E+06	( 60)	9.61E+06	( 64)	10	526 133	38.2	26.4	55.3
29	3.75E+06	( 20)	4.13E+06	( 22)	8	226 96	37.1	19.2	71.1
30	8.82E+06	( 47)	9.01E+06	( 48)	8	493 143	39.9	26.1	61.0
31	8.11E+06	( 54)	8.86E+06	( 59)	10	485 127	37.3	25.3	55.0
32	5.26E+06	( 35)	6.01E+06	( 40)	10	329 104	35.7	22.0	57.6
33	5.16E+06	( 55)	3.19E+06	( 34)	16	175 60	65.7	42.1	104.0
34	5.38E+06	( 43)	5.38E+06	( 43)	12	295 90	40.8	26.1	63.7
35	5.01E+06	( 20)	8.01E+06	( 32)	6	438 155	25.6	13.8	46.0
36	4.29E+06	( 40)	2.04E+06	( 19)	14	112 51	85.1	48.4	155.7
37	4.58E+06	( 61)	3.53E+06	( 47)	20	193 57	52.8	35.5	79.0
38	9.91E+06	( 66)	4.35E+06	( 29)	10	238 88	92.1	58.9	147.9
39	6.88E+06	( 55)	6.01E+06	( 48)	12	329 95	46.7	31.1	70.3
40	7.51E+06	( 30)	7.26E+06	( 29)	6	397 147	42.2	24.4	72.7
41	3.15E+06	( 42)	2.48E+06	( 33)	20	136 47	51.8	32.1	84.3
42	7.66E+06	( 51)	7.66E+06	( 51)	10	419 118	40.8	27.1	61.3
43	2.25E+06	( 15)	3.75E+06	( 25)	10	205 82	24.6	12.0	48.3
44	8.17E+06	( 49)	6.34E+06	( 38)	9	347 113	52.5	33.7	82.4
45	3.65E+06	( 34)	6.11E+06	( 57)	14	335 89	24.4	15.4	37.9
46	7.01E+06	( 42)	9.01E+06	( 54)	9	493 135	31.8	20.7	48.4
47	6.76E+06	( 72)	7.60E+06	( 81)	16	416 94	36.3	26.0	50.5
48	2.63E+06	( 35)	3.83E+06	( 51)	20	210 59	28.0	17.7	43.9



49	3.50E+06 ( 28)	3.75E+06 ( 30)	12	205	75	38.1	21.9	65.9
50	4.35E+06 ( 29)	5.86E+06 ( 39)	10	321	103	30.4	18.1	50.3

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-06a, U35Z-51

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
17	2.00E+06	( 24)	5.92E+06	( 71)	13.9	8.3	22.2	100.0	13.9	8.3	22.2
8	4.13E+06	( 55)	7.81E+06	( 104)	21.6	15.2	30.3	12.0	18.5	14.1	24.2
24	4.34E+06	( 26)	7.84E+06	( 47)	22.6	13.4	37.2	23.4	19.4	15.3	24.5
4	3.25E+06	( 26)	5.76E+06	( 46)	23.1	13.7	38.1	34.8	20.0	16.1	24.8
7	5.01E+06	( 40)	8.51E+06	( 68)	24.0	15.8	36.0	41.6	20.8	17.2	25.2
45	3.65E+06	( 34)	6.11E+06	( 57)	24.4	15.4	37.9	50.0	21.3	17.9	25.4
43	2.25E+06	( 15)	3.75E+06	( 25)	24.6	12.0	48.3	60.8	21.5	18.1	25.5
18	5.71E+06	( 38)	9.31E+06	( 62)	25.1	16.2	38.1	66.6	22.0	18.7	25.8
35	5.01E+06	( 20)	8.01E+06	( 32)	25.6	13.8	46.0	73.6	22.2	19.0	25.9
48	2.63E+06	( 35)	3.83E+06	( 51)	28.0	17.7	43.9	72.1	22.7	19.6	26.3
2	3.00E+06	( 32)	4.32E+06	( 46)	28.4	17.5	45.6	72.3	23.1	20.1	26.7
25	3.38E+06	( 27)	4.63E+06	( 37)	29.8	17.4	50.2	72.0	23.5	20.5	27.0
50	4.35E+06	( 29)	5.86E+06	( 39)	30.4	18.1	50.3	71.0	23.9	20.9	27.3
11	8.01E+06	( 64)	1.04E+07	( 83)	31.5	22.3	44.2	59.0	24.7	21.8	28.0
16	6.76E+06	( 45)	8.71E+06	( 58)	31.7	20.9	47.6	55.5	25.2	22.3	28.5
46	7.01E+06	( 42)	9.01E+06	( 54)	31.8	20.7	48.4	54.3	25.6	22.7	28.8
20	8.38E+06	( 67)	1.08E+07	( 86)	31.8	22.7	44.3	50.3	26.1	23.3	29.3
13	4.50E+06	( 48)	5.35E+06	( 57)	34.4	22.9	51.4	45.0	26.6	23.8	29.7
6	5.26E+06	( 28)	6.19E+06	( 33)	34.6	20.1	59.0	45.2	26.9	24.1	29.9
26	4.35E+06	( 29)	5.11E+06	( 34)	34.8	20.4	58.8	45.4	27.1	24.3	30.2
32	5.26E+06	( 35)	6.01E+06	( 40)	35.7	22.0	57.6	43.5	27.4	24.7	30.5
3	4.75E+06	( 38)	5.38E+06	( 43)	36.0	22.6	57.1	41.2	27.7	25.0	30.8
47	6.76E+06	( 72)	7.60E+06	( 81)	36.3	26.0	50.5	33.4	28.3	25.6	31.3
10	5.01E+06	( 60)	5.59E+06	( 67)	36.5	25.3	52.6	29.3	28.7	26.0	31.7
29	3.75E+06	( 20)	4.13E+06	( 22)	37.1	19.2	71.1	31.3	28.8	26.1	31.8
31	8.11E+06	( 54)	8.86E+06	( 59)	37.3	25.3	55.0	28.2	29.2	26.5	32.1
49	3.50E+06	( 28)	3.75E+06	( 30)	38.1	21.9	65.9	28.7	29.4	26.7	32.3
28	9.01E+06	( 60)	9.61E+06	( 64)	38.2	26.4	55.3	24.9	29.7	27.1	32.7
23	8.82E+06	( 47)	9.38E+06	( 50)	38.3	25.1	58.3	23.5	30.0	27.4	32.9
21	7.38E+06	( 59)	7.76E+06	( 62)	38.8	26.7	56.4	20.9	30.4	27.7	33.3
27	7.51E+06	( 50)	7.81E+06	( 52)	39.2	26.0	59.0	19.4	30.6	28.0	33.5
30	8.82E+06	( 47)	9.01E+06	( 48)	39.9	26.1	61.0	18.0	30.9	28.3	33.8
22	8.56E+06	( 57)	8.71E+06	( 58)	40.1	27.3	58.8	16.0	31.2	28.6	34.1
14	6.57E+06	( 35)	6.57E+06	( 35)	40.8	24.8	67.0	15.8	31.4	28.8	34.2
42	7.66E+06	( 51)	7.66E+06	( 51)	40.8	27.1	61.3	14.5	31.6	29.0	34.5
9	4.50E+06	( 24)	4.50E+06	( 24)	40.8	22.2	74.9	15.4	31.8	29.1	34.6
34	5.38E+06	( 43)	5.38E+06	( 43)	40.8	26.1	63.7	15.0	32.0	29.3	34.8
40	7.51E+06	( 30)	7.26E+06	( 29)	42.2	24.4	72.7	15.1	32.1	29.5	35.0
19	4.50E+06	( 60)	4.28E+06	( 57)	42.9	29.3	62.8	12.4	32.4	29.8	35.3
12	8.71E+06	( 58)	7.96E+06	( 53)	44.6	30.2	66.0	9.6	32.7	30.1	35.6
5	8.26E+06	( 44)	7.32E+06	( 39)	45.9	29.2	72.6	7.9	33.0	30.4	35.8
39	6.88E+06	( 55)	6.01E+06	( 48)	46.7	31.1	70.3	5.7	33.3	30.7	36.1
1	4.40E+06	( 41)	3.65E+06	( 34)	49.1	30.4	79.7	4.3	33.5	30.9	36.4
15	4.72E+06	( 44)	3.75E+06	( 35)	51.1	32.1	82.2	2.8	33.8	31.2	36.7
41	3.15E+06	( 42)	2.48E+06	( 33)	51.8	32.1	84.3	1.8	34.1	31.4	36.9
44	8.17E+06	( 49)	6.34E+06	( 38)	52.5	33.7	82.4	1.0	34.4	31.7	37.2
37	4.58E+06	( 61)	3.53E+06	( 47)	52.8	35.5	79.0	0.5	34.8	32.1	37.6
33	5.16E+06	( 55)	3.19E+06	( 34)	65.7	42.1	104.0	0.1	35.2	32.5	38.1
36	4.29E+06	( 40)	2.04E+06	( 19)	85.1	48.4	155.7	0.0	35.6	32.9	38.5
38	9.91E+06	( 66)	4.35E+06	( 29)	92.1	58.9	147.9	0.0	36.3	33.6	39.2
POOL	5.37E+06	( 2149)	6.03E+06	( 2414)				0.0	36.3	33.6	39.2

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 330.1, 18.8

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 36.3, 34.9 -- 37.8 ( -1.4 +1.5)  
                   95% CONF. INTERVAL (Ma):          33.6 -- 39.2 ( -2.7 +2.9)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.3122, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 36.5, 34.6 -- 38.5 ( -1.9 +2.0)  
                   95% CONF. INTERVAL (Ma):          32.9 -- 40.4 ( -3.6 +3.9)  
                   AGE DISPERSION (%): 23.8

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 34.4, 33.0 -- 35.8 ( -1.4 +1.4)  
                   95% CONF. INTERVAL (Ma):          31.7 -- 37.2 ( -2.6 +2.9)  
                   NUMBER AND PERCENTAGE OF GRAINS: 46, 92%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 13.99 to 91.50 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
14.10	0.289	1.61
37.93	7.232	40.28
87.41	0.544	3.03

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
13.84	0.287	1.60
22.78	2.352	13.10
38.26	7.223	40.23
52.66	2.574	14.34
91.10	0.528	2.94

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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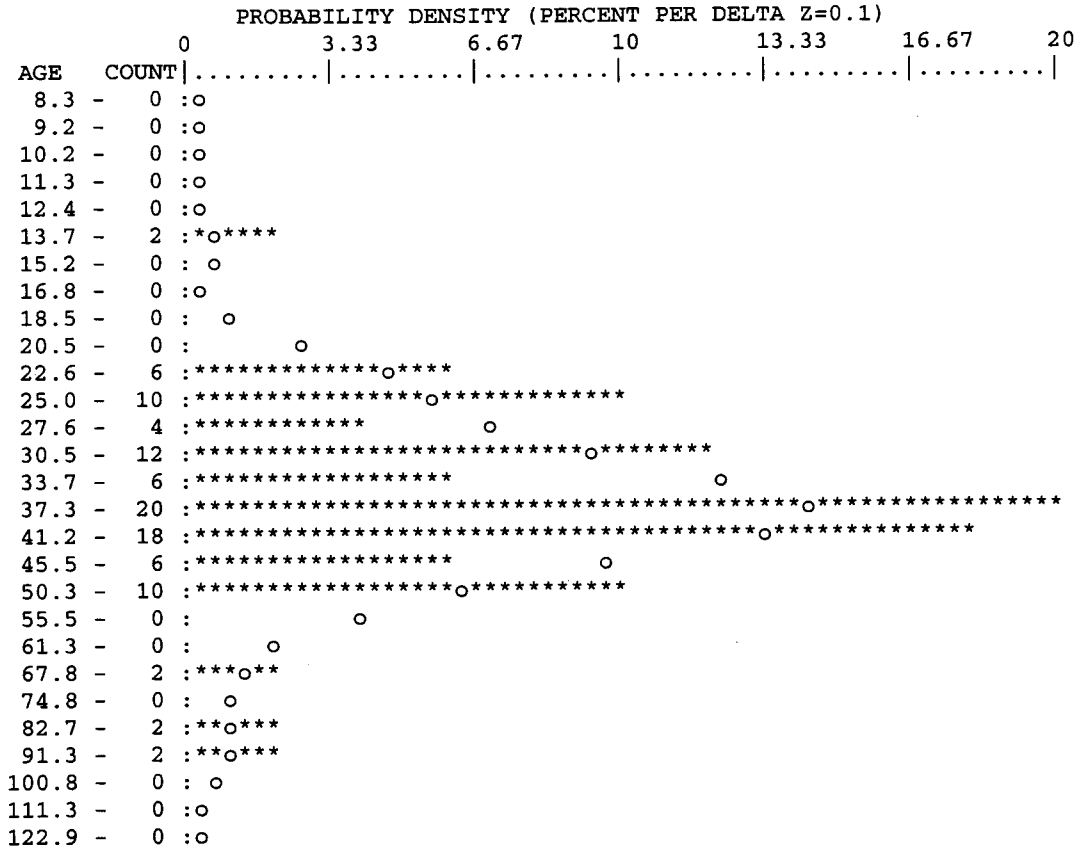
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05-06a, U35Z-51

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-07 - Poul Creek Formation, Northern Robinson Mountains**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-07ab, U35Z-52,53

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.235E+05  
 RELATIVE ERROR (%): 2.03  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	4.40E+06	( 44)	3.00E+06	( 30)	15	165 60	59.3	36.5	97.7
2	6.65E+06	( 62)	7.29E+06	( 68)	14	401 98	37.0	25.7	53.0
3	5.76E+06	( 23)	7.76E+06	( 31)	6	427 153	30.2	16.8	53.3
4	6.01E+06	( 48)	8.88E+06	( 71)	12	489 117	27.5	18.6	40.2
5	5.13E+06	( 41)	5.26E+06	( 42)	12	289 90	39.6	25.1	62.4
6	5.68E+06	( 53)	3.75E+06	( 35)	14	207 70	61.2	39.2	96.7
7	7.08E+06	( 66)	4.08E+06	( 38)	14	224 73	70.1	46.4	107.6
8	5.82E+06	( 31)	7.88E+06	( 42)	8	434 134	30.0	18.2	48.8
9	7.17E+06	( 43)	1.05E+07	( 63)	9	578 147	27.7	18.3	41.5
10	3.00E+06	( 30)	2.10E+06	( 21)	15	116 50	57.7	32.0	106.1
11	4.73E+06	( 63)	3.45E+06	( 46)	20	190 56	55.4	37.3	83.0
12	5.21E+06	( 52)	2.40E+06	( 24)	15	132 54	87.2	53.0	148.0
13	3.75E+06	( 15)	5.51E+06	( 22)	6	303 128	27.8	13.4	55.8
14	4.84E+06	( 29)	5.34E+06	( 32)	9	294 104	36.8	21.4	62.7
15	4.25E+06	( 17)	7.01E+06	( 28)	6	386 145	24.7	12.7	46.6
16	3.00E+06	( 36)	6.01E+06	( 72)	18	331 79	20.4	13.2	30.7
17	7.94E+06	( 37)	1.03E+07	( 48)	7	567 164	31.3	19.8	49.1
18	5.38E+06	( 43)	8.38E+06	( 67)	12	461 114	26.1	17.3	38.8
19	6.10E+06	( 65)	5.35E+06	( 57)	16	294 79	46.2	31.8	67.2
20	6.17E+06	( 74)	5.84E+06	( 70)	18	321 78	42.9	30.4	60.4
21	5.63E+06	( 45)	5.51E+06	( 44)	12	303 92	41.5	26.7	64.3
22	4.35E+06	( 29)	6.16E+06	( 41)	10	339 106	28.8	17.2	47.3
23	3.25E+06	( 26)	6.76E+06	( 54)	12	372 102	19.6	11.7	31.8
24	2.82E+06	( 30)	3.85E+06	( 41)	16	212 66	29.7	17.9	48.7
25	4.40E+06	( 44)	5.41E+06	( 54)	15	297 81	33.1	21.7	50.2
26	4.50E+06	( 27)	6.17E+06	( 37)	9	342 112	29.5	17.2	49.7
27	3.86E+06	( 18)	6.01E+06	( 28)	7	332 125	26.0	13.5	48.6
28	4.17E+06	( 50)	4.59E+06	( 55)	18	254 69	36.7	24.5	54.8
29	3.63E+06	( 29)	5.51E+06	( 44)	12	305 92	26.7	16.0	43.5
30	6.92E+06	( 83)	5.67E+06	( 68)	18	314 77	49.2	35.2	68.9
31	4.29E+06	( 40)	6.01E+06	( 56)	14	332 89	28.9	18.7	44.1
32	2.75E+06	( 11)	2.50E+06	( 10)	6	138 86	44.3	17.1	115.9
33	6.54E+06	( 61)	6.44E+06	( 60)	14	356 93	41.0	28.2	59.6
34	3.94E+06	( 21)	4.88E+06	( 26)	8	270 105	32.6	17.4	60.2
35	8.26E+06	( 44)	7.32E+06	( 39)	8	405 130	45.4	28.8	71.8
36	5.01E+06	( 50)	6.21E+06	( 62)	15	343 88	32.6	21.9	48.0
37	5.17E+06	( 62)	2.59E+06	( 31)	18	143 51	80.2	51.4	127.8
38	4.00E+06	( 32)	3.63E+06	( 29)	12	201 74	44.4	26.0	76.1
39	7.17E+06	( 43)	7.34E+06	( 44)	9	406 123	39.4	25.2	61.4
40	4.43E+06	( 59)	3.38E+06	( 45)	20	187 56	52.8	35.2	79.7
41	3.25E+06	( 26)	6.13E+06	( 49)	12	339 97	21.5	12.8	35.2
42	2.75E+06	( 11)	1.50E+06	( 6)	6	83 65	72.8	25.1	239.8
43	3.32E+06	( 31)	3.22E+06	( 30)	14	178 65	41.6	24.4	71.2
44	3.75E+06	( 50)	4.05E+06	( 54)	20	224 61	37.3	24.9	55.9
45	2.63E+06	( 35)	2.40E+06	( 32)	20	133 47	44.1	26.5	73.5
46	2.67E+06	( 32)	2.42E+06	( 29)	18	134 50	44.4	26.0	76.1
47	4.38E+06	( 35)	5.26E+06	( 42)	12	291 90	33.6	20.8	54.0
48	2.30E+06	( 23)	3.00E+06	( 30)	15	166 61	31.0	17.1	55.1

49	4.75E+06 ( 38)	3.13E+06 ( 25)	12	173	69	61.0	36.0	105.6
50	4.35E+06 ( 29)	3.45E+06 ( 23)	10	191	79	50.7	28.4	91.8

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 =====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-07ab, U35Z-52,53

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
23	3.25E+06	( 26)	6.76E+06	( 54)	19.6	11.7	31.8	100.0	19.6	11.7	31.8
16	3.00E+06	( 36)	6.01E+06	( 72)	20.4	13.2	30.7	90.4	20.0	14.5	27.4
41	3.25E+06	( 26)	6.13E+06	( 49)	21.5	12.8	35.2	96.4	20.4	15.8	26.5
15	4.25E+06	( 17)	7.01E+06	( 28)	24.7	12.7	46.6	94.1	21.0	16.5	26.7
27	3.86E+06	( 18)	6.01E+06	( 28)	26.0	13.5	48.6	93.5	21.6	17.3	27.0
18	5.38E+06	( 43)	8.38E+06	( 67)	26.1	17.3	38.8	91.1	22.6	18.6	27.5
29	3.63E+06	( 29)	5.51E+06	( 44)	26.7	16.0	43.5	92.7	23.1	19.3	27.8
4	6.01E+06	( 48)	8.88E+06	( 71)	27.5	18.6	40.2	92.0	23.9	20.2	28.2
9	7.17E+06	( 43)	1.05E+07	( 63)	27.7	18.3	41.5	93.0	24.4	20.9	28.5
13	3.75E+06	( 15)	5.51E+06	( 22)	27.8	13.4	55.8	95.6	24.5	21.1	28.5
22	4.35E+06	( 29)	6.16E+06	( 41)	28.8	17.2	47.3	96.4	24.8	21.4	28.7
31	4.29E+06	( 40)	6.01E+06	( 56)	28.9	18.7	44.1	96.9	25.2	21.9	29.0
26	4.50E+06	( 27)	6.17E+06	( 37)	29.5	17.2	49.7	97.5	25.5	22.2	29.2
24	2.82E+06	( 30)	3.85E+06	( 41)	29.7	17.9	48.7	98.0	25.7	22.5	29.3
8	5.82E+06	( 31)	7.88E+06	( 42)	30.0	18.2	48.8	98.4	26.0	22.8	29.5
3	5.76E+06	( 23)	7.76E+06	( 31)	30.2	16.8	53.3	98.8	26.1	23.0	29.6
48	2.30E+06	( 23)	3.00E+06	( 30)	31.0	17.1	55.1	99.0	26.3	23.3	29.8
17	7.94E+06	( 37)	1.03E+07	( 48)	31.3	19.8	49.1	99.1	26.6	23.6	30.0
36	5.01E+06	( 50)	6.21E+06	( 62)	32.6	21.9	48.0	98.7	27.0	24.1	30.4
34	3.94E+06	( 21)	4.88E+06	( 26)	32.6	17.4	60.2	98.9	27.2	24.2	30.5
25	4.40E+06	( 44)	5.41E+06	( 54)	33.1	21.7	50.2	98.7	27.5	24.6	30.8
47	4.38E+06	( 35)	5.26E+06	( 42)	33.6	20.8	54.0	98.6	27.8	24.9	31.0
28	4.17E+06	( 50)	4.59E+06	( 55)	36.7	24.5	54.8	97.1	28.2	25.4	31.4
14	4.84E+06	( 29)	5.34E+06	( 32)	36.8	21.4	62.7	96.6	28.5	25.6	31.7
2	6.65E+06	( 62)	7.29E+06	( 68)	37.0	25.7	53.0	93.9	29.0	26.1	32.1
44	3.75E+06	( 50)	4.05E+06	( 54)	37.3	24.9	55.9	91.8	29.3	26.5	32.5
39	7.17E+06	( 43)	7.34E+06	( 44)	39.4	25.2	61.4	88.6	29.7	26.9	32.8
5	5.13E+06	( 41)	5.26E+06	( 42)	39.6	25.1	62.4	85.7	30.0	27.2	33.1
33	6.54E+06	( 61)	6.44E+06	( 60)	41.0	28.2	59.6	77.6	30.5	27.7	33.6
21	5.63E+06	( 45)	5.51E+06	( 44)	41.5	26.7	64.3	72.2	30.8	28.0	33.9
43	3.32E+06	( 31)	3.22E+06	( 30)	41.6	24.4	71.2	70.2	31.1	28.3	34.1
20	6.17E+06	( 74)	5.84E+06	( 70)	42.9	30.4	60.4	57.0	31.6	28.8	34.7
45	2.63E+06	( 35)	2.40E+06	( 32)	44.1	26.5	73.5	52.8	31.9	29.1	34.9
32	2.75E+06	( 11)	2.50E+06	( 10)	44.3	17.1	115.9	54.9	32.0	29.2	35.0
46	2.67E+06	( 32)	2.42E+06	( 29)	44.4	26.0	76.1	51.7	32.2	29.4	35.2
38	4.00E+06	( 32)	3.63E+06	( 29)	44.4	26.0	76.1	49.0	32.4	29.6	35.5
35	8.26E+06	( 44)	7.32E+06	( 39)	45.4	28.8	71.8	42.9	32.7	29.9	35.8
19	6.10E+06	( 65)	5.35E+06	( 57)	46.2	31.8	67.2	32.5	33.2	30.4	36.2
30	6.92E+06	( 83)	5.67E+06	( 68)	49.2	35.2	68.9	17.7	33.8	31.0	36.8
50	4.35E+06	( 29)	3.45E+06	( 23)	50.7	28.4	91.8	15.2	34.0	31.2	37.1
40	4.43E+06	( 59)	3.38E+06	( 45)	52.8	35.2	79.7	8.3	34.5	31.6	37.5
11	4.73E+06	( 63)	3.45E+06	( 46)	55.4	37.3	83.0	3.5	35.0	32.1	38.1
10	3.00E+06	( 30)	2.10E+06	( 21)	57.7	32.0	106.1	2.4	35.2	32.4	38.3
1	4.40E+06	( 44)	3.00E+06	( 30)	59.3	36.5	97.7	1.2	35.6	32.7	38.7
49	4.75E+06	( 38)	3.13E+06	( 25)	61.0	36.0	105.6	0.6	35.9	33.1	39.0
6	5.68E+06	( 53)	3.75E+06	( 35)	61.2	39.2	96.7	0.2	36.4	33.5	39.5
7	7.08E+06	( 66)	4.08E+06	( 38)	70.1	46.4	107.6	0.0	37.0	34.1	40.2
42	2.75E+06	( 11)	1.50E+06	( 6)	72.8	25.1	239.8	0.0	37.1	34.2	40.3
37	5.17E+06	( 62)	2.59E+06	( 31)	80.2	51.4	127.8	0.0	37.8	34.8	41.0
12	5.21E+06	( 52)	2.40E+06	( 24)	87.2	53.0	148.0	0.0	38.3	35.4	41.6
POOL	4.67E+06	( 1986)	4.94E+06	( 2100)				0.0	38.3	35.4	41.6

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 272.0, 16.2

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 38.3, 36.8 -- 39.9 ( -1.5 +1.6)  
                   95% CONF. INTERVAL (Ma):           35.4 -- 41.6 ( -3.0 +3.2)  
       REDUCED CHI^2, DEGREES OF FREEDOM: 2.3388, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 38.2, 36.1 -- 40.4 ( -2.1 +2.2)  
                   95% CONF. INTERVAL (Ma):           34.3 -- 42.6 ( -3.9 +4.4)  
                   AGE DISPERSION (%): 25.4

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 35.6, 34.1 -- 37.2 ( -1.5 +1.6)  
                   95% CONF. INTERVAL (Ma):           32.7 -- 38.7 ( -2.9 +3.1)  
       NUMBER AND PERCENTAGE OF GRAINS: 44, 88%

Kernel factor = .6 (Ratio of kernel window size to standard error)  
 Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives  
 of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 19.74 to 86.55 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
37.21	5.119	31.42

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
19.49	1.060	6.51
28.32	4.674	28.69
41.24	4.955	30.42
60.70	2.201	13.51
84.09	0.842	5.17



====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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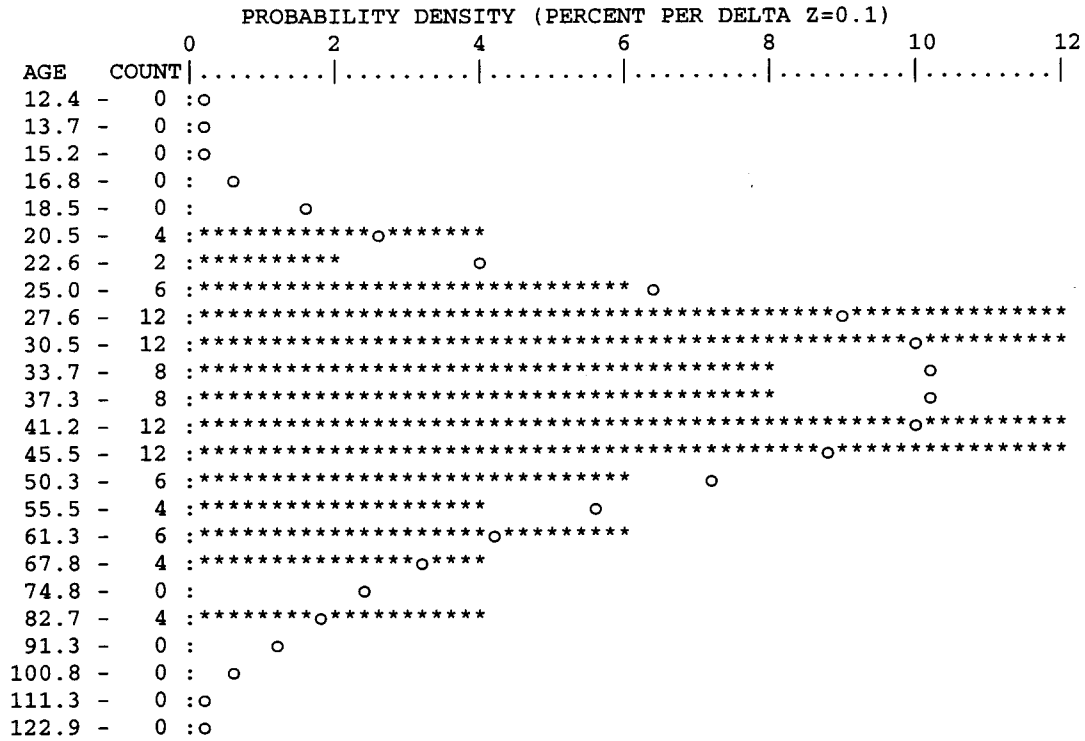
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05-07ab, U35Z-52,53

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-08 - Poul Creek Formation, Northern Robinson Mountains**

=====**ZetaAge Program v. 4.8 (Brandon 8/13/02)**=====

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05-08ab, U35Z-67,68

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.057E+05  
 RELATIVE ERROR (%): 2.62  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	Age	--95% CI--
1	5.44E+06	( 58)	5.54E+06	( 59)	16	331 88	36.7	25.0	53.8
2	4.50E+06	( 21)	4.93E+06	( 23)	7	295 123	34.1	17.9	64.4
3	3.36E+06	( 56)	3.06E+06	( 51)	25	183 52	41.0	27.5	61.2
4	3.15E+06	( 42)	2.55E+06	( 34)	20	153 53	46.0	28.6	74.8
5	5.26E+06	( 35)	3.60E+06	( 24)	10	215 88	54.3	31.4	95.5
6	6.76E+06	( 45)	7.66E+06	( 51)	10	458 130	33.0	21.5	50.3
7	4.05E+06	( 27)	4.65E+06	( 31)	10	278 100	32.6	18.6	56.4
8	3.13E+06	( 25)	3.75E+06	( 30)	12	224 82	31.2	17.5	54.8
9	1.32E+07	( 44)	1.53E+07	( 51)	5	916 260	32.2	21.0	49.3
10	4.72E+06	( 44)	3.65E+06	( 34)	14	218 75	48.2	30.1	77.9
11	4.95E+06	( 33)	6.76E+06	( 45)	10	404 122	27.4	16.9	44.0
12	2.75E+06	( 22)	3.25E+06	( 26)	12	195 76	31.6	17.0	58.0
13	8.58E+06	( 40)	6.22E+06	( 29)	7	372 138	51.4	31.1	86.0
14	9.01E+06	( 30)	7.21E+06	( 24)	5	431 176	46.6	26.3	83.3
15	4.75E+06	( 38)	6.26E+06	( 50)	12	374 107	28.4	18.1	44.3
16	5.04E+06	( 47)	2.68E+06	( 25)	14	160 64	69.8	42.2	118.6
17	6.91E+06	( 46)	3.15E+06	( 21)	10	189 82	81.1	47.6	143.4
18	5.63E+06	( 45)	3.88E+06	( 31)	12	232 84	54.0	33.4	88.5
19	2.70E+06	( 36)	3.15E+06	( 42)	20	189 59	32.0	19.9	51.3
20	5.79E+06	( 27)	7.29E+06	( 34)	7	436 150	29.7	17.2	50.7
21	7.51E+06	( 35)	7.29E+06	( 34)	7	436 150	38.4	23.2	63.6
22	5.26E+06	( 28)	5.07E+06	( 27)	8	303 117	38.7	22.0	68.3
23	5.16E+06	( 55)	3.57E+06	( 38)	16	213 70	53.9	35.0	84.0
24	3.90E+06	( 26)	4.80E+06	( 32)	10	287 102	30.4	17.3	52.6
25	2.10E+06	( 28)	2.03E+06	( 27)	20	121 47	38.7	22.0	68.3
26	3.23E+06	( 43)	3.68E+06	( 49)	20	221 64	32.6	21.1	50.2
27	2.34E+06	( 28)	3.42E+06	( 41)	18	206 65	25.4	15.1	42.1
28	3.45E+06	( 23)	3.30E+06	( 22)	10	199 84	38.8	20.7	73.0
29	6.31E+06	( 42)	4.80E+06	( 32)	10	289 103	48.6	30.0	79.8
30	4.29E+06	( 20)	4.72E+06	( 22)	7	284 121	33.8	17.5	64.9
31	7.26E+06	( 29)	6.01E+06	( 24)	6	361 147	44.8	25.2	80.5
32	6.91E+06	( 23)	6.91E+06	( 23)	5	415 173	37.1	19.9	69.3
33	5.76E+06	( 23)	6.76E+06	( 27)	6	406 156	31.7	17.3	57.4
34	4.50E+06	( 15)	4.20E+06	( 14)	5	253 133	39.7	17.9	88.8
35	6.01E+06	( 32)	5.44E+06	( 29)	8	327 122	40.9	24.0	70.2
36	6.38E+06	( 34)	6.76E+06	( 36)	8	406 136	35.1	21.2	57.8
37	7.51E+06	( 40)	8.07E+06	( 43)	8	485 149	34.6	21.8	54.5
38	7.26E+06	( 29)	6.51E+06	( 26)	6	391 153	41.4	23.5	73.2
39	5.11E+06	( 17)	7.51E+06	( 25)	5	451 180	25.4	12.8	48.7
40	8.01E+06	( 32)	8.51E+06	( 34)	6	512 176	35.0	20.8	58.5
41	8.11E+06	( 27)	7.21E+06	( 24)	5	433 177	41.7	23.2	75.6
42	2.48E+06	( 33)	2.18E+06	( 29)	20	131 49	42.2	24.8	72.2
43	2.63E+06	( 21)	4.00E+06	( 32)	12	241 85	24.5	13.3	43.7
44	9.91E+06	( 33)	6.31E+06	( 21)	5	379 165	58.1	32.7	105.8
45	7.72E+06	( 36)	7.51E+06	( 35)	7	451 153	38.2	23.3	62.7
46	6.16E+06	( 41)	6.76E+06	( 45)	10	406 122	33.9	21.6	53.0
47	1.43E+06	( 19)	1.88E+06	( 25)	20	113 45	28.3	14.7	53.4
48	5.26E+06	( 21)	6.76E+06	( 27)	6	406 156	29.0	15.5	53.1

49	4.32E+06 ( 23)	3.94E+06 ( 21)	8	237 103	40.6	21.5	77.2
50	3.19E+06 ( 51)	2.63E+06 ( 42)	24	158 49	45.0	29.3	69.6

=====**ZetaAge Program v. 4.8 (Brandon 8/13/02)**=====

DATE/TIME: 01-05-2006/12:12:55 FILENAME:

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05-08ab, U35Z-67,68

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
43	2.63E+06	( 21)	4.00E+06	( 32)	24.5	13.3	43.7	100.0	24.6	13.4	43.9
39	5.11E+06	( 17)	7.51E+06	( 25)	25.4	12.8	48.7	93.3	24.9	16.0	38.3
27	2.34E+06	( 28)	3.42E+06	( 41)	25.4	15.1	42.1	99.4	24.9	17.9	34.5
11	4.95E+06	( 33)	6.76E+06	( 45)	27.4	16.9	44.0	99.0	25.8	19.8	33.5
47	1.43E+06	( 19)	1.88E+06	( 25)	28.3	14.7	53.4	99.6	26.2	20.5	33.3
15	4.75E+06	( 38)	6.26E+06	( 50)	28.4	18.1	44.3	99.8	26.7	21.5	33.0
48	5.26E+06	( 21)	6.76E+06	( 27)	29.0	15.5	53.1	99.9	26.9	22.0	32.9
20	5.79E+06	( 27)	7.29E+06	( 34)	29.7	17.2	50.7	99.9	27.2	22.5	33.0
24	3.90E+06	( 26)	4.80E+06	( 32)	30.4	17.3	52.6	100.0	27.6	23.0	33.0
8	3.13E+06	( 25)	3.75E+06	( 30)	31.2	17.5	54.8	100.0	27.9	23.4	33.1
12	2.75E+06	( 22)	3.25E+06	( 26)	31.6	17.0	58.0	100.0	28.1	23.8	33.3
33	5.76E+06	( 23)	6.76E+06	( 27)	31.7	17.3	57.4	100.0	28.4	24.1	33.4
19	2.70E+06	( 36)	3.15E+06	( 42)	32.0	19.9	51.3	100.0	28.7	24.6	33.5
9	1.32E+07	( 44)	1.53E+07	( 51)	32.2	21.0	49.3	100.0	29.1	25.1	33.7
7	4.05E+06	( 27)	4.65E+06	( 31)	32.6	18.6	56.4	100.0	29.3	25.4	33.8
26	3.23E+06	( 43)	3.68E+06	( 49)	32.6	21.1	50.2	100.0	29.6	25.8	34.0
6	6.76E+06	( 45)	7.66E+06	( 51)	33.0	21.5	50.3	100.0	29.9	26.1	34.1
30	4.29E+06	( 20)	4.72E+06	( 22)	33.8	17.5	64.9	100.0	30.0	26.3	34.2
46	6.16E+06	( 41)	6.76E+06	( 45)	33.9	21.6	53.0	100.0	30.2	26.6	34.4
2	4.50E+06	( 21)	4.93E+06	( 23)	34.1	17.9	64.4	100.0	30.4	26.8	34.4
37	7.51E+06	( 40)	8.07E+06	( 43)	34.6	21.8	54.5	100.0	30.6	27.1	34.6
40	8.01E+06	( 32)	8.51E+06	( 34)	35.0	20.8	58.5	100.0	30.8	27.3	34.7
36	6.38E+06	( 34)	6.76E+06	( 36)	35.1	21.2	57.8	100.0	31.0	27.5	34.9
1	5.44E+06	( 58)	5.54E+06	( 59)	36.7	25.0	53.8	100.0	31.4	27.9	35.2
32	6.91E+06	( 23)	6.91E+06	( 23)	37.1	19.9	69.3	100.0	31.5	28.1	35.3
45	7.72E+06	( 36)	7.51E+06	( 35)	38.2	23.3	62.7	100.0	31.8	28.4	35.5
21	7.51E+06	( 35)	7.29E+06	( 34)	38.4	23.2	63.6	100.0	32.0	28.6	35.7
25	2.10E+06	( 28)	2.03E+06	( 27)	38.7	22.0	68.3	100.0	32.2	28.8	35.9
22	5.26E+06	( 28)	5.07E+06	( 27)	38.7	22.0	68.3	100.0	32.3	29.0	36.1
28	3.45E+06	( 23)	3.30E+06	( 22)	38.8	20.7	73.0	100.0	32.5	29.2	36.2
34	4.50E+06	( 15)	4.20E+06	( 14)	39.7	17.9	88.8	100.0	32.6	29.3	36.3
49	4.32E+06	( 23)	3.94E+06	( 21)	40.6	21.5	77.2	100.0	32.7	29.4	36.4
35	6.01E+06	( 32)	5.44E+06	( 29)	40.9	24.0	70.2	100.0	32.9	29.6	36.6
3	3.36E+06	( 56)	3.06E+06	( 51)	41.0	27.5	61.2	100.0	33.3	30.0	36.9
38	7.26E+06	( 29)	6.51E+06	( 26)	41.4	23.5	73.2	100.0	33.5	30.2	37.1
41	8.11E+06	( 27)	7.21E+06	( 24)	41.7	23.2	75.6	100.0	33.6	30.4	37.3
42	2.48E+06	( 33)	2.18E+06	( 29)	42.2	24.8	72.2	100.0	33.8	30.6	37.4
31	7.26E+06	( 29)	6.01E+06	( 24)	44.8	25.2	80.5	100.0	34.0	30.8	37.7
50	3.19E+06	( 51)	2.63E+06	( 42)	45.0	29.3	69.6	100.0	34.4	31.1	38.0
4	3.15E+06	( 42)	2.55E+06	( 34)	46.0	28.6	74.8	99.9	34.7	31.4	38.3
14	9.01E+06	( 30)	7.21E+06	( 24)	46.6	26.3	83.3	99.9	34.9	31.6	38.5
10	4.72E+06	( 44)	3.65E+06	( 34)	48.2	30.1	77.9	99.8	35.2	32.0	38.8
29	6.31E+06	( 42)	4.80E+06	( 32)	48.6	30.0	79.8	99.6	35.5	32.3	39.1
13	8.58E+06	( 40)	6.22E+06	( 29)	51.4	31.1	86.0	99.2	35.8	32.6	39.4
23	5.16E+06	( 55)	3.57E+06	( 38)	53.9	35.0	84.0	97.5	36.3	33.0	39.9
18	5.63E+06	( 45)	3.88E+06	( 31)	54.0	33.4	88.5	95.1	36.7	33.4	40.3
5	5.26E+06	( 35)	3.60E+06	( 24)	54.3	31.4	95.5	93.0	36.9	33.6	40.6
44	9.91E+06	( 33)	6.31E+06	( 21)	58.1	32.7	105.8	89.2	37.2	33.9	40.9
16	5.04E+06	( 47)	2.68E+06	( 25)	69.8	42.2	118.6	71.4	37.7	34.4	41.4
17	6.91E+06	( 46)	3.15E+06	( 21)	81.1	47.6	143.4	39.8	38.3	34.9	42.0
POOL	4.60E+06	( 1668)	4.49E+06	( 1625)				39.8	38.3	34.9	42.0

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 268.2, 19.4

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 38.3, 36.5 -- 40.1 ( -1.8 +1.8)  
                   95% CONF. INTERVAL (Ma):           34.9 -- 42.0 ( -3.4 +3.7)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 1.0391, 49  
                   CHI^2 PROBABILITY: 39.8%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 38.3, 36.5 -- 40.2 ( -1.8 +1.9)  
                   95% CONF. INTERVAL (Ma):           34.8 -- 42.1 ( -3.4 +3.8)  
                   AGE DISPERSION (%): 7.1

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 38.3, 36.5 -- 40.1 ( -1.8 +1.8)  
                   95% CONF. INTERVAL (Ma):           34.9 -- 42.0 ( -3.4 +3.7)  
                   NUMBER AND PERCENTAGE OF GRAINS: 50, 100%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 24.58 to 80.43 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
35.18	7.169	46.07

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
33.66	7.050	45.31
47.67	4.497	28.90
81.36	0.448	2.88

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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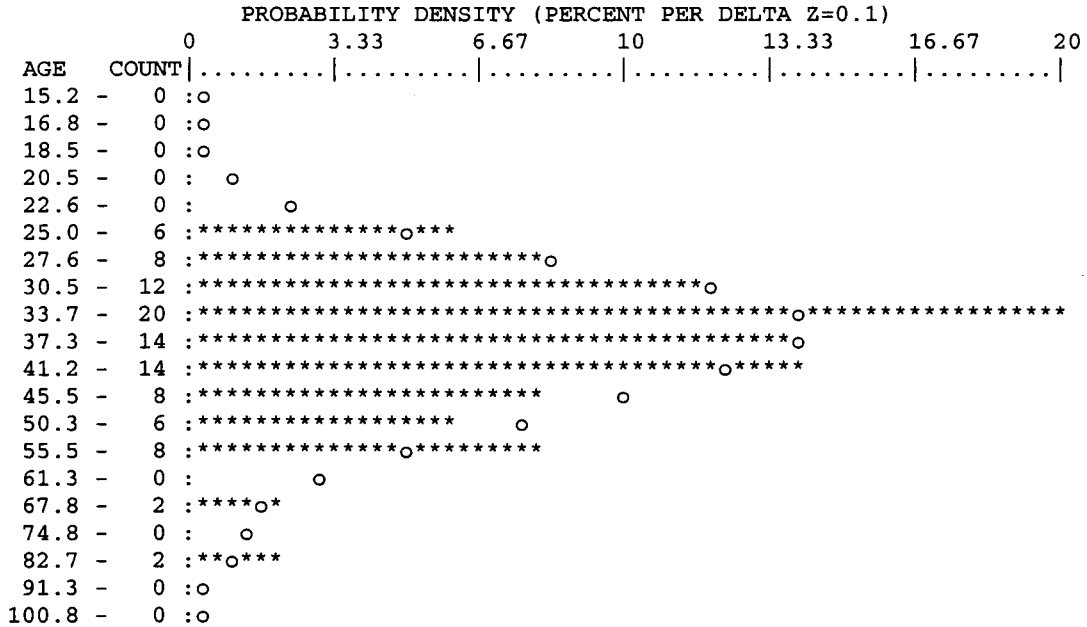
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05-08ab, U35Z-67,68

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-09 - Yakataga Formation, Kulthieth Mountain**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-09a, U35Z-54

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.212E+05  
 RELATIVE ERROR (%): 2.09  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age	--95% CI--	
1	4.97E+06	( 53)	6.19E+06	( 66)	16	344 86	32.3	22.0	47.1
2	2.35E+07	( 94)	9.51E+06	( 38)	6	529 172	98.5	67.1	147.8
3	1.17E+07	( 78)	1.17E+07	( 78)	10	651 150	40.1	28.9	55.7
4	6.01E+06	( 80)	3.38E+06	( 45)	20	188 56	71.0	48.7	104.9
5	5.92E+06	( 71)	1.57E+07	( 188)	18	872 132	15.2	11.6	20.1
6	6.01E+06	( 64)	4.13E+06	( 44)	16	230 70	58.2	39.0	87.6
7	2.50E+06	( 20)	8.51E+06	( 68)	12	473 116	11.9	6.8	19.7
8	5.11E+06	( 34)	7.21E+06	( 48)	10	401 116	28.5	17.8	45.1
9	5.03E+06	( 67)	1.01E+07	( 135)	20	564 100	20.0	14.6	27.0
10	4.60E+06	( 49)	3.19E+06	( 34)	16	177 61	57.7	36.5	92.2
11	5.82E+06	( 62)	1.16E+07	( 124)	16	647 119	20.1	14.5	27.5
12	5.68E+06	( 53)	5.79E+06	( 54)	14	322 88	39.4	26.4	58.7
13	7.92E+06	( 95)	3.84E+06	( 46)	18	213 63	82.4	57.4	120.1
14	9.95E+06	( 53)	1.20E+07	( 64)	8	668 169	33.3	22.6	48.7
15	6.94E+06	( 74)	1.08E+07	( 115)	16	600 114	25.9	19.0	35.0
16	1.46E+07	( 68)	7.94E+06	( 37)	7	441 145	73.4	48.6	112.8
17	5.13E+06	( 41)	1.00E+07	( 80)	12	557 126	20.6	13.8	30.4
18	7.13E+06	( 57)	5.13E+06	( 41)	12	285 89	55.6	36.6	85.4
19	6.68E+06	( 89)	9.01E+06	( 120)	20	501 94	29.8	22.6	39.4
20	1.50E+06	( 20)	6.08E+06	( 81)	20	338 76	10.0	5.8	16.4
21	4.69E+06	( 50)	1.07E+07	( 114)	16	595 114	17.7	12.4	24.8
22	2.60E+06	( 26)	7.81E+06	( 78)	15	434 100	13.5	8.2	21.2
23	3.75E+06	( 45)	6.76E+06	( 81)	18	376 85	22.4	15.1	32.6
24	3.88E+06	( 31)	1.03E+07	( 82)	12	571 128	15.2	9.7	23.3
25	1.75E+06	( 21)	3.34E+06	( 40)	18	186 59	21.2	11.8	36.7
26	7.66E+06	( 51)	3.60E+06	( 24)	10	200 81	84.6	51.4	143.9
27	3.92E+06	( 47)	1.01E+07	( 121)	18	561 105	15.6	10.9	22.1
28	7.88E+06	( 42)	1.39E+07	( 74)	8	772 182	22.8	15.2	33.8
29	4.97E+06	( 53)	1.05E+07	( 112)	16	584 113	19.0	13.4	26.7
30	7.96E+06	( 53)	6.01E+06	( 40)	10	334 106	53.1	34.5	82.2
31	8.26E+06	( 55)	2.85E+06	( 19)	10	159 72	114.8	67.6	204.9
32	5.56E+06	( 37)	9.61E+06	( 64)	10	534 135	23.3	15.0	35.4
33	4.17E+06	( 50)	3.00E+06	( 36)	18	167 56	55.6	35.5	87.9
34	9.57E+06	( 51)	6.94E+06	( 37)	8	386 127	55.2	35.4	86.7
35	6.38E+06	( 68)	1.33E+07	( 142)	16	741 128	19.3	14.4	25.9
36	3.75E+06	( 40)	3.94E+06	( 42)	16	219 68	38.2	24.1	60.4
37	3.38E+06	( 36)	6.01E+06	( 64)	16	334 84	22.6	14.6	34.6
38	2.55E+06	( 17)	2.25E+06	( 15)	10	125 64	45.4	21.4	97.5
39	5.86E+06	( 39)	3.75E+06	( 25)	10	209 83	62.3	36.9	107.5
40	3.94E+06	( 21)	3.57E+06	( 19)	8	198 90	44.3	22.7	87.0
41	3.90E+06	( 26)	6.31E+06	( 42)	10	351 109	24.9	14.6	41.5
42	8.56E+06	( 57)	9.01E+06	( 60)	10	501 131	38.1	26.0	55.8
43	3.75E+06	( 25)	6.01E+06	( 40)	10	334 106	25.2	14.6	42.4
44	8.26E+06	( 33)	8.76E+06	( 35)	6	487 165	37.8	22.8	62.7
45	1.80E+06	( 12)	1.23E+07	( 82)	10	685 153	6.0	2.9	10.9
46	2.85E+06	( 38)	7.96E+06	( 106)	20	443 88	14.5	9.7	21.1
47	3.09E+06	( 37)	9.51E+06	( 114)	18	529 101	13.1	8.7	19.1
48	3.38E+06	( 18)	3.00E+06	( 16)	8	167 83	45.1	21.7	94.3

49	2.38E+06	( 19)	2.50E+06	( 20)	12	139	62	38.1	19.2	75.1
50	3.75E+06	( 35)	2.25E+06	( 21)	14	125	54	66.5	37.8	120.3



====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-09a, U35Z-54

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
45	1.80E+06	( 12)	1.23E+07	( 82)	6.0	2.9	10.9	100.0	6.0	2.9	10.9
20	1.50E+06	( 20)	6.08E+06	( 81)	10.0	5.8	16.4	18.5	7.9	5.2	11.6
7	2.50E+06	( 20)	8.51E+06	( 68)	11.9	6.8	19.7	20.0	9.1	6.6	12.3
47	3.09E+06	( 37)	9.51E+06	( 114)	13.1	8.7	19.1	15.6	10.4	8.2	13.2
22	2.60E+06	( 26)	7.81E+06	( 78)	13.5	8.2	21.2	19.3	11.0	8.9	13.6
46	2.85E+06	( 38)	7.96E+06	( 106)	14.5	9.7	21.1	18.5	11.7	9.7	14.1
5	5.92E+06	( 71)	1.57E+07	( 188)	15.2	11.6	20.1	13.4	12.6	10.7	14.7
24	3.88E+06	( 31)	1.03E+07	( 82)	15.2	9.7	23.3	16.7	12.8	11.1	14.9
27	3.92E+06	( 47)	1.01E+07	( 121)	15.6	10.9	22.1	18.2	13.2	11.5	15.2
21	4.69E+06	( 50)	1.07E+07	( 114)	17.7	12.4	24.8	13.3	13.7	12.0	15.6
29	4.97E+06	( 53)	1.05E+07	( 112)	19.0	13.4	26.7	7.6	14.2	12.5	16.1
35	6.38E+06	( 68)	1.33E+07	( 142)	19.3	14.4	25.9	4.1	14.8	13.1	16.6
9	5.03E+06	( 67)	1.01E+07	( 135)	20.0	14.6	27.0	2.3	15.3	13.6	17.1
11	5.82E+06	( 62)	1.16E+07	( 124)	20.1	14.5	27.5	1.6	15.6	14.0	17.4
17	5.13E+06	( 41)	1.00E+07	( 80)	20.6	13.8	30.4	1.4	15.9	14.3	17.7
25	1.75E+06	( 21)	3.34E+06	( 40)	21.2	11.8	36.7	1.6	16.0	14.4	17.8
23	3.75E+06	( 45)	6.76E+06	( 81)	22.4	15.1	32.6	1.1	16.3	14.7	18.1
37	3.38E+06	( 36)	6.01E+06	( 64)	22.6	14.6	34.6	0.8	16.5	14.9	18.3
28	7.88E+06	( 42)	1.39E+07	( 74)	22.8	15.2	33.8	0.6	16.8	15.2	18.5
32	5.56E+06	( 37)	9.61E+06	( 64)	23.3	15.0	35.4	0.5	17.0	15.4	18.7
41	3.90E+06	( 26)	6.31E+06	( 42)	24.9	14.6	41.5	0.4	17.2	15.6	18.9
43	3.75E+06	( 25)	6.01E+06	( 40)	25.2	14.6	42.4	0.3	17.3	15.7	19.0
15	6.94E+06	( 74)	1.08E+07	( 115)	25.9	19.0	35.0	0.1	17.8	16.2	19.5
8	5.11E+06	( 34)	7.21E+06	( 48)	28.5	17.8	45.1	0.0	18.0	16.4	19.7
19	6.68E+06	( 89)	9.01E+06	( 120)	29.8	22.6	39.4	0.0	18.6	17.0	20.4
1	4.97E+06	( 53)	6.19E+06	( 66)	32.3	22.0	47.1	0.0	19.0	17.4	20.8
14	9.95E+06	( 53)	1.20E+07	( 64)	33.3	22.6	48.7	0.0	19.4	17.7	21.1
44	8.26E+06	( 33)	8.76E+06	( 35)	37.8	22.8	62.7	0.0	19.6	18.0	21.4
42	8.56E+06	( 57)	9.01E+06	( 60)	38.1	26.0	55.8	0.0	20.1	18.4	21.9
49	2.38E+06	( 19)	2.50E+06	( 20)	38.1	19.2	75.1	0.0	20.2	18.5	22.0
36	3.75E+06	( 40)	3.94E+06	( 42)	38.2	24.1	60.4	0.0	20.5	18.8	22.3
12	5.68E+06	( 53)	5.79E+06	( 54)	39.4	26.4	58.7	0.0	20.9	19.2	22.7
3	1.17E+07	( 78)	1.17E+07	( 78)	40.1	28.9	55.7	0.0	21.4	19.7	23.3
40	3.94E+06	( 21)	3.57E+06	( 19)	44.3	22.7	87.0	0.0	21.6	19.9	23.4
48	3.38E+06	( 18)	3.00E+06	( 16)	45.1	21.7	94.3	0.0	21.7	20.0	23.6
38	2.55E+06	( 17)	2.25E+06	( 15)	45.4	21.4	97.5	0.0	21.9	20.1	23.7
30	7.96E+06	( 53)	6.01E+06	( 40)	53.1	34.5	82.2	0.0	22.3	20.5	24.2
34	9.57E+06	( 51)	6.94E+06	( 37)	55.2	35.4	86.7	0.0	22.7	21.0	24.6
33	4.17E+06	( 50)	3.00E+06	( 36)	55.6	35.5	87.9	0.0	23.1	21.3	25.1
18	7.13E+06	( 57)	5.13E+06	( 41)	55.6	36.6	85.4	0.0	23.6	21.8	25.6
10	4.60E+06	( 49)	3.19E+06	( 34)	57.7	36.5	92.2	0.0	24.0	22.1	26.0
6	6.01E+06	( 64)	4.13E+06	( 44)	58.2	39.0	87.6	0.0	24.5	22.6	26.5
39	5.86E+06	( 39)	3.75E+06	( 25)	62.3	36.9	107.5	0.0	24.8	22.9	26.8
50	3.75E+06	( 35)	2.25E+06	( 21)	66.5	37.8	120.3	0.0	25.1	23.2	27.1
4	6.01E+06	( 80)	3.38E+06	( 45)	71.0	48.7	104.9	0.0	25.8	23.8	27.8
16	1.46E+07	( 68)	7.94E+06	( 37)	73.4	48.6	112.8	0.0	26.3	24.4	28.4
13	7.92E+06	( 95)	3.84E+06	( 46)	82.4	57.4	120.1	0.0	27.1	25.1	29.3
26	7.66E+06	( 51)	3.60E+06	( 24)	84.6	51.4	143.9	0.0	27.6	25.5	29.7
2	2.35E+07	( 94)	9.51E+06	( 38)	98.5	67.1	147.8	0.0	28.4	26.3	30.6
31	8.26E+06	( 55)	2.85E+06	( 19)	114.8	67.6	204.9	0.0	28.9	26.8	31.2
POOL	5.29E+06	( 2355)	7.35E+06	( 3271)				0.0	28.9	26.8	31.2

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 408.8, 22.3

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 28.9, 27.8 -- 30.0 ( -1.1 +1.1)  
 95% CONF. INTERVAL (Ma): 26.8 -- 31.2 ( -2.1 +2.3)  
 REDUCED CHI<sup>2</sup>, DEGREES OF FREEDOM: 9.9627, 49  
 CHI<sup>2</sup> PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 31.6, 28.8 -- 34.5 ( -2.7 +3.0)  
 95% CONF. INTERVAL (Ma): 26.5 -- 37.6 ( -5.1 +6.1)  
 AGE DISPERSION (%): 57.0

CHI<sup>2</sup> AGE WITH 68% CONF. INTERVAL (Ma): 16.3, 15.5 -- 17.2 ( -0.8 +0.9)  
 95% CONF. INTERVAL (Ma): 14.7 -- 18.1 ( -1.6 +1.8)  
 NUMBER AND PERCENTAGE OF GRAINS: 17, 34%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 6.09 to 113.53 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
6.12	0.220	1.21
15.26	2.154	11.87
20.54	3.421	18.85
38.58	2.640	14.55
56.27	2.634	14.52

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
6.03	0.219	1.21
9.57	0.362	1.99
14.90	2.133	11.76
19.97	3.372	18.58
24.67	2.615	14.41
30.42	2.151	11.86
39.04	2.633	14.51
55.87	2.633	14.51
78.23	1.452	8.00
102.21	0.699	3.85

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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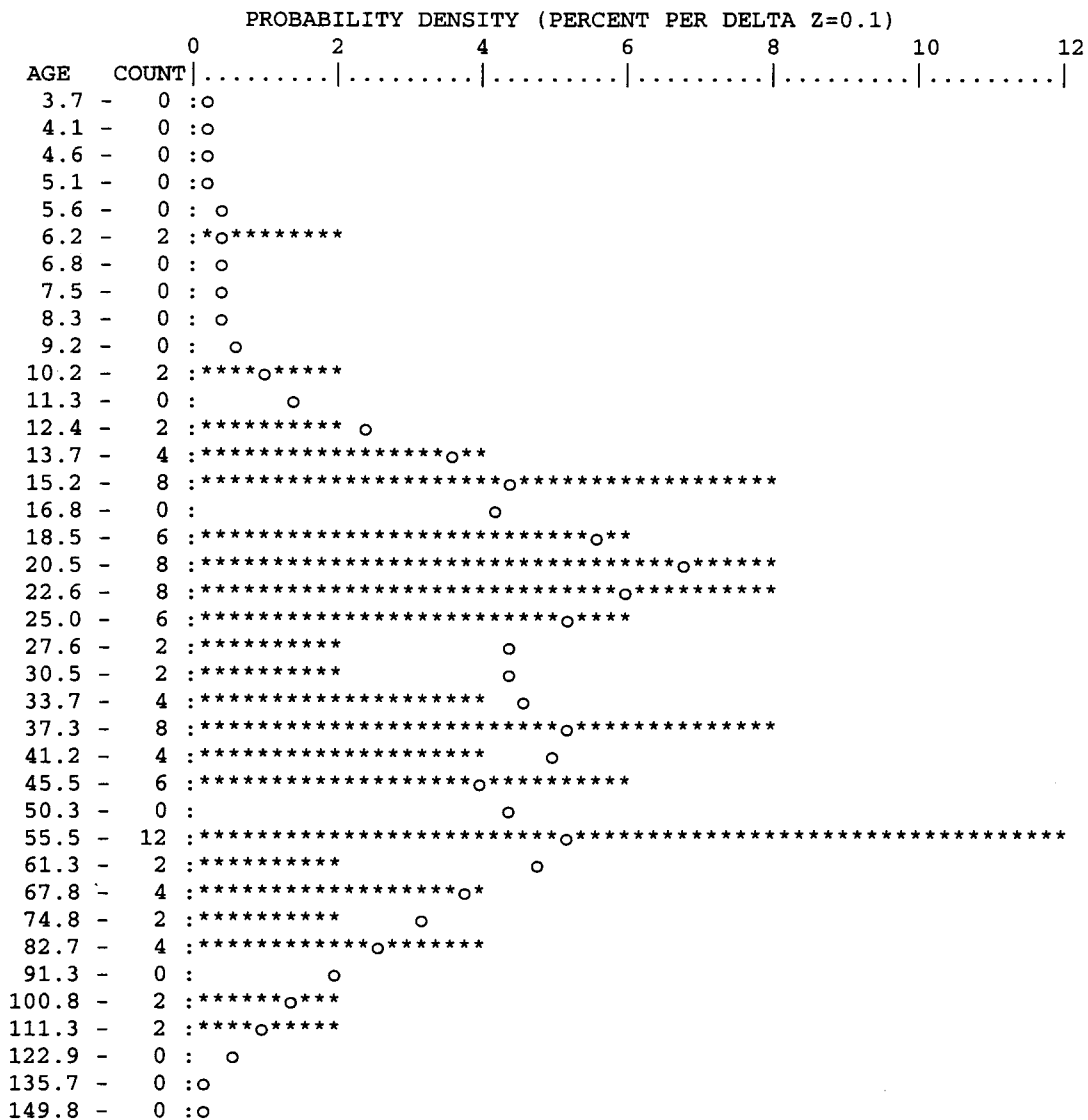
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05-09a, U35Z-54

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-10 - Yakataga Formation, Kulthieth Formation**

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05-10ab, U35Z-55,56

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.188E+05  
 RELATIVE ERROR (%): 2.15  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	7.41E+06	( 79)	4.22E+06	( 45)	16	237 71	69.4	47.6	102.6
2	2.78E+06	( 37)	7.06E+06	( 94)	20	397 83	15.7	10.4	23.2
3	4.35E+06	( 29)	8.41E+06	( 56)	10	473 127	20.6	12.7	32.8
4	5.26E+06	( 35)	7.96E+06	( 53)	10	447 124	26.3	16.6	41.0
5	5.26E+06	( 42)	1.03E+07	( 82)	12	577 129	20.4	13.7	29.9
6	3.25E+06	( 26)	1.14E+07	( 91)	12	640 137	11.4	7.0	17.8
7	1.20E+07	( 72)	1.10E+07	( 66)	9	619 154	43.3	30.5	61.5
8	2.70E+06	( 36)	4.80E+06	( 64)	20	270 68	22.4	14.4	34.2
9	4.75E+06	( 38)	9.76E+06	( 78)	12	549 126	19.4	12.8	28.9
10	3.67E+06	( 44)	9.01E+06	( 108)	18	506 100	16.2	11.1	23.3
11	5.34E+06	( 64)	2.59E+06	( 31)	18	145 52	81.4	52.4	129.6
12	6.46E+06	( 86)	8.33E+06	( 111)	20	468 91	30.8	23.2	41.0
13	2.44E+06	( 26)	2.53E+06	( 27)	16	142 55	38.2	21.4	68.0
14	6.54E+06	( 61)	6.54E+06	( 61)	14	368 95	39.7	27.3	57.6
15	4.35E+06	( 29)	5.56E+06	( 37)	10	312 103	31.2	18.4	52.0
16	6.46E+06	( 43)	6.46E+06	( 43)	10	363 111	39.7	25.4	62.1
17	6.01E+06	( 40)	5.56E+06	( 37)	10	312 103	42.9	26.7	69.0
18	3.38E+06	( 45)	1.41E+07	( 188)	20	793 121	9.5	6.7	13.3
19	1.25E+06	( 15)	2.84E+06	( 34)	18	159 55	17.6	8.9	33.1
20	3.75E+06	( 35)	4.93E+06	( 46)	14	277 82	30.3	18.9	48.0
21	1.02E+07	( 68)	5.86E+06	( 39)	10	329 106	68.9	45.9	105.1
22	9.31E+06	( 62)	5.26E+06	( 35)	10	295 100	70.0	45.6	109.3
23	2.25E+06	( 21)	1.10E+07	( 103)	14	621 125	8.2	4.8	13.1
24	3.53E+06	( 47)	6.53E+06	( 87)	20	367 80	21.5	14.7	31.0
25	6.63E+06	( 53)	1.01E+07	( 81)	12	570 129	26.0	18.0	37.3
26	4.50E+06	( 48)	8.26E+06	( 88)	16	464 101	21.7	14.9	31.2
27	3.32E+06	( 31)	1.06E+07	( 99)	14	597 122	12.5	8.0	18.8
28	7.40E+06	( 69)	9.97E+06	( 93)	14	561 118	29.5	21.2	40.8
29	7.70E+06	( 41)	7.88E+06	( 42)	8	443 137	38.7	24.5	61.1
30	3.50E+06	( 42)	6.17E+06	( 74)	18	347 82	22.6	15.0	33.4
31	3.65E+06	( 34)	4.61E+06	( 43)	14	259 79	31.4	19.4	50.4
32	3.72E+06	( 62)	5.17E+06	( 86)	25	290 64	28.7	20.3	40.2
33	2.30E+06	( 23)	6.61E+06	( 66)	15	371 92	13.9	8.2	22.6
34	2.84E+06	( 34)	6.26E+06	( 75)	18	352 82	18.1	11.6	27.4
35	1.28E+07	( 51)	1.03E+07	( 41)	6	577 181	49.3	32.0	76.3
36	3.45E+06	( 23)	3.45E+06	( 23)	10	194 81	39.7	21.3	73.9
37	3.50E+06	( 28)	1.09E+07	( 87)	12	612 133	12.9	8.0	19.8
38	2.63E+06	( 35)	7.21E+06	( 96)	20	405 84	14.5	9.5	21.6
39	4.35E+06	( 58)	5.33E+06	( 71)	20	300 72	32.5	22.5	46.6
40	3.83E+06	( 51)	1.04E+07	( 139)	20	587 102	14.6	10.3	20.3
41	4.58E+06	( 61)	1.04E+07	( 138)	20	582 102	17.6	12.7	24.0
42	1.02E+07	( 68)	5.26E+06	( 35)	10	295 100	76.7	50.4	119.0
43	3.00E+06	( 28)	6.86E+06	( 64)	14	386 98	17.5	10.7	27.6
44	3.75E+06	( 25)	5.41E+06	( 36)	10	304 101	27.6	15.9	47.3
45	2.25E+06	( 30)	4.43E+06	( 59)	20	249 65	20.3	12.6	31.9
46	1.23E+07	( 82)	1.16E+07	( 77)	10	650 150	42.2	30.5	58.5
47	6.22E+06	( 58)	3.22E+06	( 30)	14	181 66	76.3	48.4	123.0
48	3.47E+06	( 37)	7.98E+06	( 85)	16	448 99	17.3	11.4	25.8

49	3.75E+06 ( 35)	1.61E+06 ( 15)	14	90	46	91.6	49.2	180.8
50	5.44E+06 ( 58)	2.91E+06 ( 31)	16	164	59	73.9	47.1	118.3

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-10ab, U35Z-55,56

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2)	Sum age (Ma)
					Age --95% CI--	(%)	Age --95% CI--
23	2.25E+06	( 21)	1.10E+07	( 103)	8.2	4.8 13.1	100.0 8.2 4.8 13.1
18	3.38E+06	( 45)	1.41E+07	( 188)	9.5	6.7 13.3	58.2 9.1 6.9 11.9
6	3.25E+06	( 26)	1.14E+07	( 91)	11.4	7.0 17.8	58.3 9.6 7.6 12.1
27	3.32E+06	( 31)	1.06E+07	( 99)	12.5	8.0 18.8	51.7 10.2 8.3 12.5
37	3.50E+06	( 28)	1.09E+07	( 87)	12.9	8.0 19.8	53.3 10.6 8.8 12.8
33	2.30E+06	( 23)	6.61E+06	( 66)	13.9	8.2 22.6	52.2 10.9 9.2 13.0
38	2.63E+06	( 35)	7.21E+06	( 96)	14.5	9.5 21.6	44.1 11.4 9.7 13.4
40	3.83E+06	( 51)	1.04E+07	( 139)	14.6	10.3 20.3	37.1 11.9 10.3 13.8
2	2.78E+06	( 37)	7.06E+06	( 94)	15.7	10.4 23.2	32.3 12.3 10.7 14.1
10	3.67E+06	( 44)	9.01E+06	( 108)	16.2	11.1 23.3	26.1 12.7 11.1 14.5
48	3.47E+06	( 37)	7.98E+06	( 85)	17.3	11.4 25.8	20.4 13.0 11.4 14.8
43	3.00E+06	( 28)	6.86E+06	( 64)	17.5	10.7 27.6	19.1 13.2 11.7 15.0
41	4.58E+06	( 61)	1.04E+07	( 138)	17.6	12.7 24.0	12.9 13.7 12.2 15.4
19	1.25E+06	( 15)	2.84E+06	( 34)	17.6	8.9 33.1	15.2 13.8 12.3 15.5
34	2.84E+06	( 34)	6.26E+06	( 75)	18.1	11.6 27.4	14.3 14.0 12.5 15.7
9	4.75E+06	( 38)	9.76E+06	( 78)	19.4	12.8 28.9	10.8 14.3 12.8 15.9
45	2.25E+06	( 30)	4.43E+06	( 59)	20.3	12.6 31.9	8.6 14.5 13.0 16.2
5	5.26E+06	( 42)	1.03E+07	( 82)	20.4	13.7 29.9	5.8 14.8 13.3 16.4
3	4.35E+06	( 29)	8.41E+06	( 56)	20.6	12.7 32.8	4.9 15.0 13.5 16.6
24	3.53E+06	( 47)	6.53E+06	( 87)	21.5	14.7 31.0	2.8 15.3 13.8 16.9
26	4.50E+06	( 48)	8.26E+06	( 88)	21.7	14.9 31.2	1.6 15.6 14.1 17.2
8	2.70E+06	( 36)	4.80E+06	( 64)	22.4	14.4 34.2	1.1 15.8 14.3 17.4
30	3.50E+06	( 42)	6.17E+06	( 74)	22.6	15.0 33.4	0.7 16.0 14.5 17.7
25	6.63E+06	( 53)	1.01E+07	( 81)	26.0	18.0 37.3	0.1 16.4 14.9 18.0
4	5.26E+06	( 35)	7.96E+06	( 53)	26.3	16.6 41.0	0.1 16.6 15.1 18.3
44	3.75E+06	( 25)	5.41E+06	( 36)	27.6	15.9 47.3	0.0 16.8 15.3 18.5
32	3.72E+06	( 62)	5.17E+06	( 86)	28.7	20.3 40.2	0.0 17.3 15.7 18.9
28	7.40E+06	( 69)	9.97E+06	( 93)	29.5	21.2 40.8	0.0 17.7 16.2 19.4
20	3.75E+06	( 35)	4.93E+06	( 46)	30.3	18.9 48.0	0.0 18.0 16.4 19.6
12	6.46E+06	( 86)	8.33E+06	( 111)	30.8	23.2 41.0	0.0 18.5 17.0 20.2
15	4.35E+06	( 29)	5.56E+06	( 37)	31.2	18.4 52.0	0.0 18.7 17.1 20.4
31	3.65E+06	( 34)	4.61E+06	( 43)	31.4	19.4 50.4	0.0 18.9 17.3 20.6
39	4.35E+06	( 58)	5.33E+06	( 71)	32.5	22.5 46.6	0.0 19.3 17.7 21.0
13	2.44E+06	( 26)	2.53E+06	( 27)	38.2	21.4 68.0	0.0 19.4 17.9 21.2
29	7.70E+06	( 41)	7.88E+06	( 42)	38.7	24.5 61.1	0.0 19.7 18.1 21.5
14	6.54E+06	( 61)	6.54E+06	( 61)	39.7	27.3 57.6	0.0 20.2 18.6 21.9
36	3.45E+06	( 23)	3.45E+06	( 23)	39.7	21.3 73.9	0.0 20.3 18.7 22.1
16	6.46E+06	( 43)	6.46E+06	( 43)	39.7	25.4 62.1	0.0 20.6 19.0 22.4
46	1.23E+07	( 82)	1.16E+07	( 77)	42.2	30.5 58.5	0.0 21.2 19.5 23.0
17	6.01E+06	( 40)	5.56E+06	( 37)	42.9	26.7 69.0	0.0 21.4 19.8 23.3
7	1.20E+07	( 72)	1.10E+07	( 66)	43.3	30.5 61.5	0.0 21.9 20.2 23.7
35	1.28E+07	( 51)	1.03E+07	( 41)	49.3	32.0 76.3	0.0 22.3 20.6 24.1
21	1.02E+07	( 68)	5.86E+06	( 39)	68.9	45.9 105.1	0.0 22.8 21.1 24.7
1	7.41E+06	( 79)	4.22E+06	( 45)	69.4	47.6 102.6	0.0 23.5 21.7 25.4
22	9.31E+06	( 62)	5.26E+06	( 35)	70.0	45.6 109.3	0.0 24.0 22.2 26.0
50	5.44E+06	( 58)	2.91E+06	( 31)	73.9	47.1 118.3	0.0 24.5 22.6 26.5
47	6.22E+06	( 58)	3.22E+06	( 30)	76.3	48.4 123.0	0.0 25.0 23.1 27.0
42	1.02E+07	( 68)	5.26E+06	( 35)	76.7	50.4 119.0	0.0 25.5 23.6 27.5
11	5.34E+06	( 64)	2.59E+06	( 31)	81.4	52.4 129.6	0.0 26.0 24.1 28.1
49	3.75E+06	( 35)	1.61E+06	( 15)	91.6	49.2 180.8	0.0 26.3 24.4 28.4
POOL	4.62E+06	( 2245)	6.98E+06	( 3390)			0.0 26.3 24.4 28.4

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 392.5, 21.6

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 26.3, 25.3 -- 27.4 ( -1.0 +1.0)  
                   95% CONF. INTERVAL (Ma):           24.4 -- 28.4 ( -1.9 +2.1)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 9.0272, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 28.1, 25.8 -- 30.6 ( -2.3 +2.5)  
                   95% CONF. INTERVAL (Ma):           23.8 -- 33.3 ( -4.3 +5.1)  
                   AGE DISPERSION (%): 53.9

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 15.8, 15.0 -- 16.6 ( -0.8 +0.8)  
                   95% CONF. INTERVAL (Ma):           14.3 -- 17.4 ( -1.5 +1.6)  
                   NUMBER AND PERCENTAGE OF GRAINS: 22, 44%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 8.26 to 90.53 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
19.62	3.373	17.83
30.07	3.208	16.96
40.64	2.675	14.15
73.13	2.125	11.24

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
7.30	0.202	1.07
9.41	0.713	3.77
14.90	2.551	13.49
17.38	3.233	17.10
21.23	3.266	17.27
30.13	3.208	16.96
42.06	2.610	13.80
72.25	2.118	11.20

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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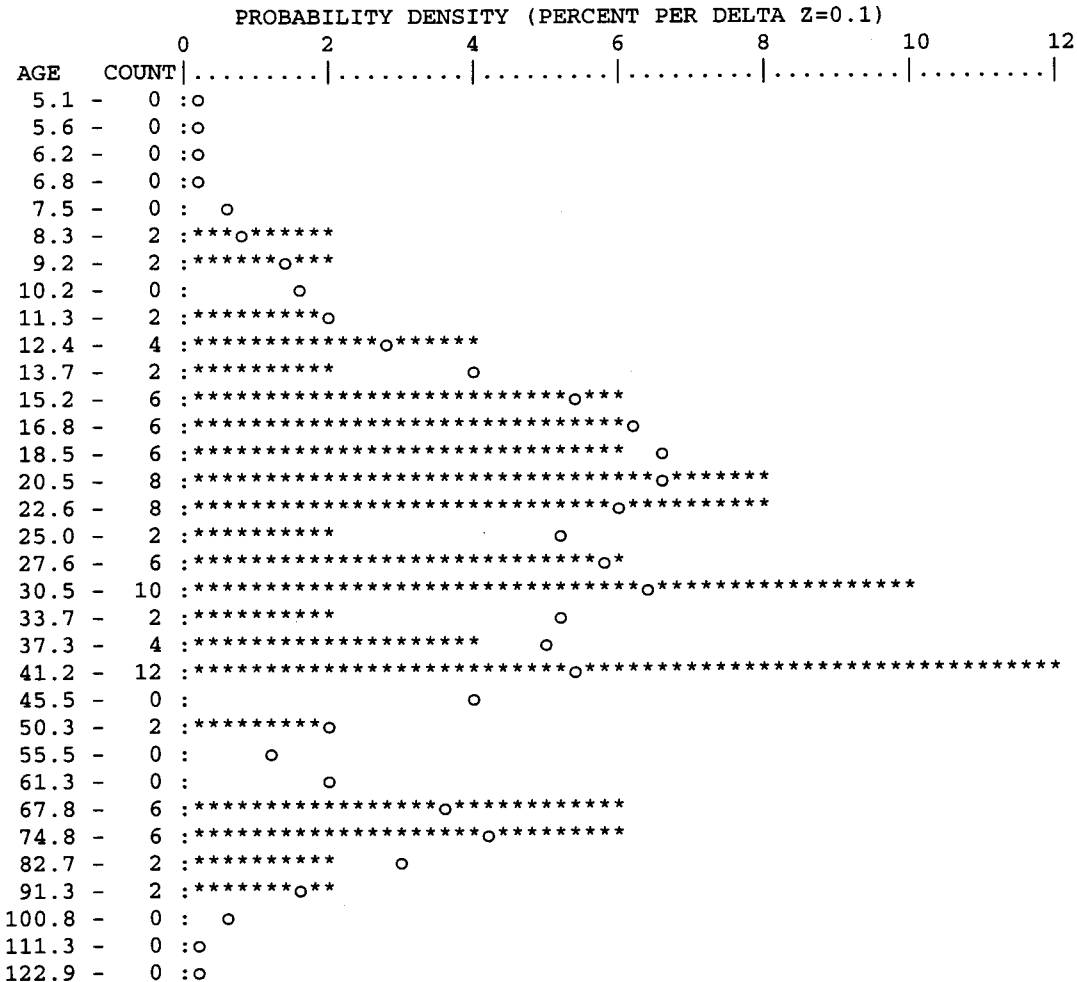
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05-10ab, U35Z-55,56

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.





**05-11 - Yakataga Formation, Kulthieth Mountain**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-11ab, U35Z-57,58

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.176E+05  
 RELATIVE ERROR (%): 2.18  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age	Age	--95% CI--
1	4.75E+06	( 38)	8.01E+06	( 64)	12	453 114	23.5	15.3	35.7
2	5.26E+06	( 42)	9.38E+06	( 75)	12	530 124	22.2	14.8	32.8
3	9.01E+06	( 90)	1.02E+07	( 102)	15	577 117	34.9	26.2	46.5
4	5.26E+06	( 42)	1.25E+07	( 100)	12	707 144	16.6	11.3	24.1
5	5.54E+06	( 59)	1.88E+06	( 20)	16	106 47	115.1	68.8	202.0
6	6.19E+06	( 33)	8.07E+06	( 43)	8	456 140	30.3	18.6	48.9
7	5.86E+06	( 39)	7.51E+06	( 50)	10	424 121	30.8	19.7	47.8
8	5.13E+06	( 41)	1.20E+07	( 96)	12	679 141	16.9	11.4	24.6
9	2.90E+06	( 27)	8.79E+06	( 82)	14	497 112	13.1	8.1	20.4
10	5.63E+06	( 30)	1.14E+07	( 61)	8	647 167	19.5	12.1	30.6
11	7.81E+06	( 52)	1.22E+07	( 81)	10	687 155	25.4	17.5	36.5
12	5.15E+06	( 24)	1.39E+07	( 65)	7	788 198	14.7	8.7	23.7
13	4.05E+06	( 54)	1.06E+07	( 141)	20	598 104	15.2	10.8	20.9
14	3.23E+06	( 43)	9.46E+06	( 126)	20	535 98	13.5	9.3	19.3
15	8.41E+06	( 56)	1.35E+07	( 90)	10	764 164	24.6	17.3	34.8
16	9.97E+06	( 93)	4.72E+06	( 44)	14	267 81	83.0	57.4	121.8
17	4.13E+06	( 33)	6.38E+06	( 51)	12	361 102	25.6	16.0	40.4
18	5.76E+06	( 46)	1.29E+07	( 103)	12	728 147	17.7	12.2	25.3
19	8.11E+06	( 54)	9.16E+06	( 61)	10	518 134	35.0	23.7	51.3
20	6.01E+06	( 48)	1.18E+07	( 94)	12	665 140	20.2	13.9	28.9
21	1.18E+07	( 47)	1.63E+07	( 65)	6	919 231	28.6	19.2	42.3
22	1.00E+07	( 80)	1.10E+07	( 88)	12	622 135	35.9	26.1	49.3
23	7.83E+06	( 73)	1.13E+07	( 105)	14	637 127	27.5	20.0	37.5
24	9.13E+06	( 73)	7.01E+06	( 56)	12	396 107	51.4	35.7	74.2
25	2.60E+06	( 26)	1.05E+07	( 105)	15	594 119	9.8	6.1	15.2
26	6.94E+06	( 37)	5.82E+06	( 31)	8	331 119	46.8	28.2	78.0
27	6.88E+06	( 55)	6.88E+06	( 55)	12	391 106	39.3	26.5	58.2
28	2.75E+06	( 22)	3.88E+06	( 31)	12	220 79	27.9	15.4	49.8
29	1.29E+06	( 12)	1.23E+07	( 115)	14	701 134	4.2	2.1	7.5
30	8.26E+06	( 77)	3.86E+06	( 36)	14	219 73	83.5	55.6	127.9
31	4.18E+06	( 39)	1.04E+07	( 97)	14	591 123	15.9	10.6	23.2
32	6.33E+06	( 59)	1.47E+07	( 137)	14	835 147	17.0	12.2	23.2
33	7.23E+06	( 77)	1.11E+07	( 118)	16	629 119	25.7	19.2	34.4
34	5.86E+06	( 82)	6.44E+06	( 90)	21	366 79	35.8	26.1	48.9
35	5.63E+06	( 75)	9.31E+06	( 124)	20	529 98	23.8	17.8	31.9
36	4.50E+06	( 48)	4.22E+06	( 45)	16	240 72	41.9	27.3	64.4
37	5.26E+06	( 35)	3.90E+06	( 26)	10	222 87	52.7	30.9	91.2
38	7.61E+06	( 71)	1.79E+07	( 167)	14	1018 164	16.8	12.7	22.3
39	5.26E+06	( 42)	3.00E+06	( 24)	12	171 69	68.3	40.6	118.1
40	7.42E+06	( 89)	4.17E+06	( 50)	18	237 68	69.6	48.7	100.7
41	6.38E+06	( 51)	9.51E+06	( 76)	12	541 126	26.4	18.1	38.2
42	4.35E+06	( 58)	1.07E+07	( 143)	20	610 105	16.0	11.5	21.9
43	5.01E+06	( 50)	5.31E+06	( 53)	15	302 84	37.0	24.6	55.6
44	2.88E+06	( 23)	1.13E+07	( 90)	12	640 138	10.1	6.1	16.1
45	3.75E+06	( 35)	7.19E+06	( 67)	14	408 101	20.6	13.2	31.4
46	4.69E+06	( 50)	1.20E+07	( 128)	16	683 124	15.4	10.8	21.5
47	2.70E+06	( 27)	4.50E+06	( 45)	15	256 77	23.6	14.1	38.9
48	2.55E+06	( 34)	5.93E+06	( 79)	20	337 77	17.0	11.0	25.7

49 5.76E+06 ( 46) 5.38E+06 ( 43) 12 306 94 42.0 27.1 65.2  
 50 3.60E+06 ( 48) 5.11E+06 ( 68) 20 290 71 27.8 18.7 40.8

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-11lab, U35Z-57,58

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2)	Sum age (Ma)	Age	--95% CI--
29	1.29E+06	( 12)	1.23E+07	( 115)	4.2	2.1 7.5	100.0	4.1	2.1 7.4
25	2.60E+06	( 26)	1.05E+07	( 105)	9.8	6.1 15.2	1.8	6.8	4.7 9.7
44	2.88E+06	( 23)	1.13E+07	( 90)	10.1	6.1 16.1	3.1	7.8	5.9 10.3
9	2.90E+06	( 27)	8.79E+06	( 82)	13.1	8.1 20.4	1.6	8.9	7.0 11.3
14	3.23E+06	( 43)	9.46E+06	( 126)	13.5	9.3 19.3	0.9	10.0	8.2 12.2
12	5.15E+06	( 24)	1.39E+07	( 65)	14.7	8.7 23.7	0.9	10.5	8.7 12.7
13	4.05E+06	( 54)	1.06E+07	( 141)	15.2	10.8 20.9	0.5	11.4	9.7 13.4
46	4.69E+06	( 50)	1.20E+07	( 128)	15.4	10.8 21.5	0.4	12.0	10.3 13.9
31	4.18E+06	( 39)	1.04E+07	( 97)	15.9	10.6 23.2	0.4	12.4	10.8 14.3
42	4.35E+06	( 58)	1.07E+07	( 143)	16.0	11.5 21.9	0.4	12.9	11.3 14.7
4	5.26E+06	( 42)	1.25E+07	( 100)	16.6	11.3 24.1	0.4	13.2	11.6 14.9
38	7.61E+06	( 71)	1.79E+07	( 167)	16.8	12.7 22.3	0.4	13.6	12.1 15.3
8	5.13E+06	( 41)	1.20E+07	( 96)	16.9	11.4 24.6	0.4	13.8	12.3 15.5
32	6.33E+06	( 59)	1.47E+07	( 137)	17.0	12.2 23.2	0.5	14.1	12.6 15.7
48	2.55E+06	( 34)	5.93E+06	( 79)	17.0	11.0 25.7	0.6	14.2	12.8 15.9
18	5.76E+06	( 46)	1.29E+07	( 103)	17.7	12.2 25.3	0.7	14.4	13.0 16.0
10	5.63E+06	( 30)	1.14E+07	( 61)	19.5	12.1 30.6	0.7	14.6	13.2 16.2
20	6.01E+06	( 48)	1.18E+07	( 94)	20.2	13.9 28.9	0.4	14.9	13.4 16.5
45	3.75E+06	( 35)	7.19E+06	( 67)	20.6	13.2 31.4	0.3	15.1	13.6 16.6
2	5.26E+06	( 42)	9.38E+06	( 75)	22.2	14.8 32.8	0.2	15.3	13.9 16.9
1	4.75E+06	( 38)	8.01E+06	( 64)	23.5	15.3 35.7	0.1	15.6	14.1 17.1
47	2.70E+06	( 27)	4.50E+06	( 45)	23.6	14.1 38.9	0.1	15.7	14.3 17.3
35	5.63E+06	( 75)	9.31E+06	( 124)	23.8	17.8 31.9	0.0	16.2	14.7 17.7
15	8.41E+06	( 56)	1.35E+07	( 90)	24.6	17.3 34.8	0.0	16.5	15.0 18.1
11	7.81E+06	( 52)	1.22E+07	( 81)	25.4	17.5 36.5	0.0	16.8	15.3 18.4
17	4.13E+06	( 33)	6.38E+06	( 51)	25.6	16.0 40.4	0.0	16.9	15.5 18.5
33	7.23E+06	( 77)	1.11E+07	( 118)	25.7	19.2 34.4	0.0	17.3	15.9 18.9
41	6.38E+06	( 51)	9.51E+06	( 76)	26.4	18.1 38.2	0.0	17.6	16.1 19.2
23	7.83E+06	( 73)	1.13E+07	( 105)	27.5	20.0 37.5	0.0	18.0	16.5 19.6
50	3.60E+06	( 48)	5.11E+06	( 68)	27.8	18.7 40.8	0.0	18.2	16.7 19.8
28	2.75E+06	( 22)	3.88E+06	( 31)	27.9	15.4 49.8	0.0	18.3	16.8 19.9
21	1.18E+07	( 47)	1.63E+07	( 65)	28.6	19.2 42.3	0.0	18.5	17.0 20.1
6	6.19E+06	( 33)	8.07E+06	( 43)	30.3	18.6 48.9	0.0	18.7	17.2 20.3
7	5.86E+06	( 39)	7.51E+06	( 50)	30.8	19.7 47.8	0.0	18.9	17.4 20.5
3	9.01E+06	( 90)	1.02E+07	( 102)	34.9	26.2 46.5	0.0	19.4	17.9 21.0
19	8.11E+06	( 54)	9.16E+06	( 61)	35.0	23.7 51.3	0.0	19.7	18.1 21.3
34	5.86E+06	( 82)	6.44E+06	( 90)	35.8	26.1 48.9	0.0	20.1	18.6 21.8
22	1.00E+07	( 80)	1.10E+07	( 88)	35.9	26.1 49.3	0.0	20.5	19.0 22.2
43	5.01E+06	( 50)	5.31E+06	( 53)	37.0	24.6 55.6	0.0	20.8	19.2 22.5
27	6.88E+06	( 55)	6.88E+06	( 55)	39.3	26.5 58.2	0.0	21.1	19.5 22.8
36	4.50E+06	( 48)	4.22E+06	( 45)	41.9	27.3 64.4	0.0	21.3	19.7 23.0
49	5.76E+06	( 46)	5.38E+06	( 43)	42.0	27.1 65.2	0.0	21.6	20.0 23.3
26	6.94E+06	( 37)	5.82E+06	( 31)	46.8	28.2 78.0	0.0	21.8	20.2 23.5
24	9.13E+06	( 73)	7.01E+06	( 56)	51.4	35.7 74.2	0.0	22.2	20.6 24.0
37	5.26E+06	( 35)	3.90E+06	( 26)	52.7	30.9 91.2	0.0	22.4	20.8 24.2
39	5.26E+06	( 42)	3.00E+06	( 24)	68.3	40.6 118.1	0.0	22.7	21.1 24.5
40	7.42E+06	( 89)	4.17E+06	( 50)	69.6	48.7 100.7	0.0	23.4	21.7 25.2
16	9.97E+06	( 93)	4.72E+06	( 44)	83.0	57.4 121.8	0.0	24.0	22.3 25.9
30	8.26E+06	( 77)	3.86E+06	( 36)	83.5	55.6 127.9	0.0	24.6	22.8 26.5
5	5.54E+06	( 59)	1.88E+06	( 20)	115.1	68.8 202.0	0.0	25.1	23.3 27.0
POOL	5.52E+06	( 2485)	8.70E+06	( 3917)			0.0	25.1	23.3 27.0

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 491.8, 26.6

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 25.1, 24.1 -- 26.0 ( -0.9 +1.0)  
95% CONF. INTERVAL (Ma): 23.3 -- 27.0 ( -1.8 +1.9)  
REDUCED CHI^2, DEGREES OF FREEDOM: 9.0500, 49  
CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 26.4, 24.3 -- 28.7 ( -2.1 +2.3)  
95% CONF. INTERVAL (Ma): 22.5 -- 31.1 ( -4.0 +4.7)  
AGE DISPERSION (%): 52.4

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 8.9, 7.9 -- 10.0 ( -1.0 +1.1)  
95% CONF. INTERVAL (Ma): 7.0 -- 11.3 ( -1.9 +2.4)  
NUMBER AND PERCENTAGE OF GRAINS: 4, 8%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

#### PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 4.26 to 113.89 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
4.26	0.223	1.12
16.51	4.171	20.86
25.68	4.247	21.24
35.51	3.094	15.47
77.02	1.006	5.03

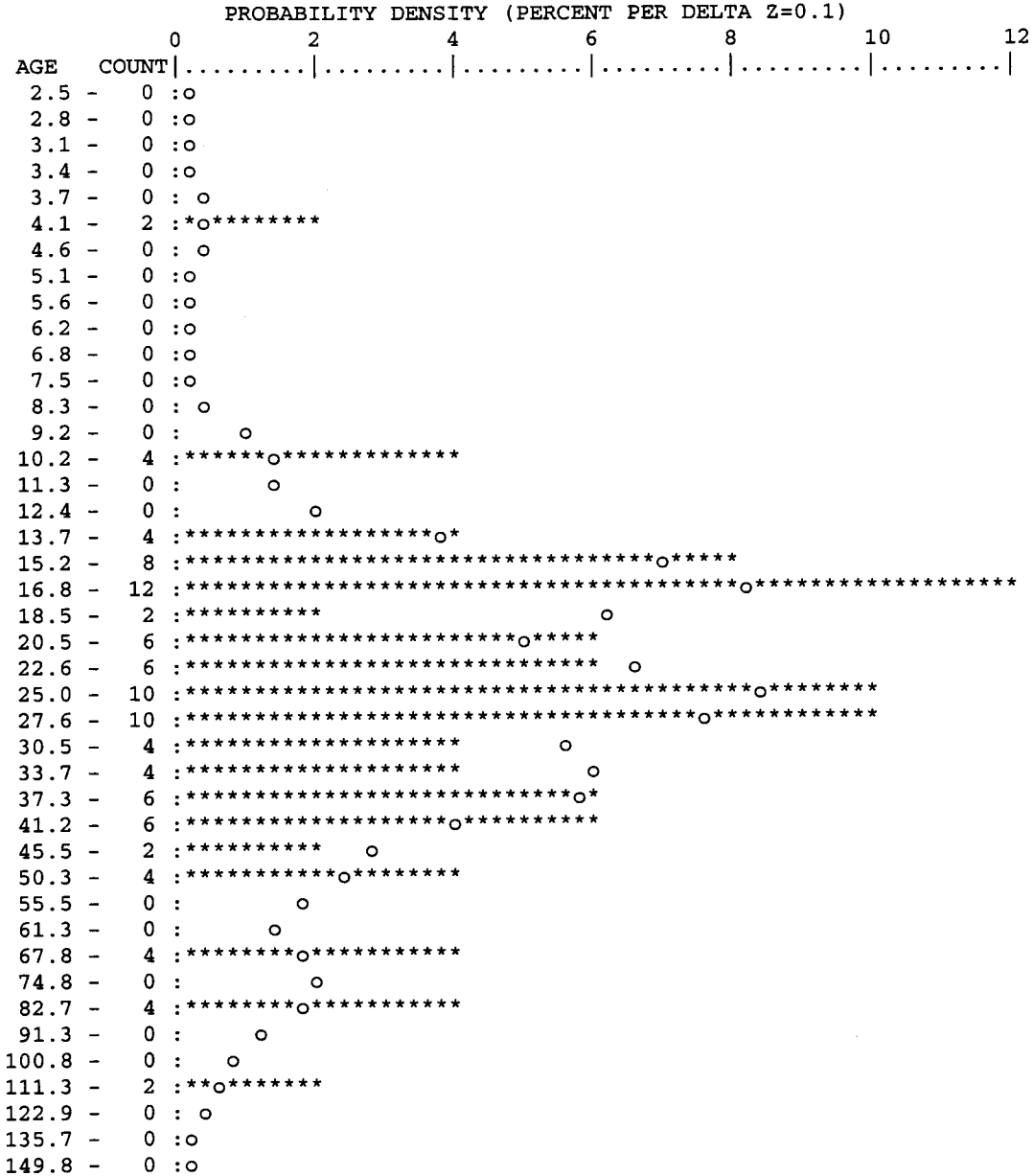
Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
4.25	0.223	1.12
6.17	0.027	0.13
9.80	0.611	3.05
16.38	4.166	20.83
25.61	4.248	21.24
35.87	3.084	15.42
51.13	1.119	5.59
81.66	0.958	4.79
119.50	0.252	1.26

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-11ab, U35Z-57,58

Kernel factor = .6 (Ratio of kernel window size to standard error)  
Number of grains = 50 Barwidth (Z units) = .1  
Histogram shown by asterisks and probability distribution by circles.



**05-12 - Yakataga Formation, Suckling Hills**

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-12ab, U35Z-59,60

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.152E+05  
 RELATIVE ERROR (%): 2.26  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	8.13E+06	( 65)	1.00E+07	( 80)	12	572 130	31.8	22.5	44.7
2	3.00E+06	( 30)	3.20E+06	( 32)	15	183 65	36.6	21.5	62.2
3	1.95E+06	( 26)	4.58E+06	( 61)	20	262 68	16.7	10.1	26.8
4	7.66E+06	( 51)	6.61E+06	( 44)	10	378 114	45.2	29.6	69.4
5	5.01E+06	( 50)	8.41E+06	( 84)	15	481 107	23.3	16.0	33.5
6	2.78E+06	( 37)	5.48E+06	( 73)	20	313 74	19.9	12.9	29.9
7	4.00E+06	( 32)	9.38E+06	( 75)	12	536 126	16.7	10.7	25.6
8	3.60E+06	( 48)	4.05E+06	( 54)	20	232 64	34.7	23.0	52.3
9	1.42E+06	( 17)	2.67E+06	( 32)	18	153 54	20.9	10.8	38.6
10	6.26E+06	( 75)	1.03E+07	( 123)	18	586 109	23.9	17.9	32.0
11	4.60E+06	( 49)	9.20E+06	( 98)	16	526 109	19.6	13.6	27.9
12	4.08E+06	( 38)	5.15E+06	( 48)	14	294 86	31.0	19.6	48.4
13	2.15E+06	( 20)	6.86E+06	( 64)	14	392 99	12.3	7.0	20.5
14	2.85E+06	( 38)	6.83E+06	( 91)	20	390 84	16.4	10.9	24.2
15	3.75E+06	( 35)	9.01E+06	( 84)	14	515 114	16.3	10.6	24.5
16	6.88E+06	( 55)	8.76E+06	( 70)	12	501 121	30.7	21.1	44.4
17	6.38E+06	( 51)	8.26E+06	( 66)	12	472 118	30.2	20.5	44.3
18	3.92E+06	( 47)	4.75E+06	( 57)	18	272 73	32.2	21.4	48.3
19	2.82E+06	( 30)	1.22E+06	( 13)	16	70 38	89.1	45.5	186.3
20	5.26E+06	( 35)	4.95E+06	( 33)	10	283 99	41.4	25.0	68.7
21	6.48E+06	( 69)	7.79E+06	( 83)	16	445 99	32.5	23.2	45.3
22	7.63E+06	( 61)	8.63E+06	( 69)	12	493 120	34.5	24.0	49.5
23	2.13E+06	( 17)	4.00E+06	( 32)	12	229 81	20.9	10.8	38.6
24	4.95E+06	( 66)	6.91E+06	( 92)	20	395 84	28.1	20.1	39.0
25	4.05E+06	( 54)	5.48E+06	( 73)	20	313 74	28.9	19.9	41.7
26	3.90E+06	( 39)	9.41E+06	( 94)	15	541 114	16.2	10.8	23.7
27	6.53E+06	( 87)	1.01E+07	( 135)	20	583 104	25.1	19.1	33.0
28	8.51E+06	( 68)	1.13E+07	( 90)	12	647 139	29.4	21.0	40.8
29	3.30E+06	( 33)	5.21E+06	( 52)	15	299 84	24.7	15.4	38.9
30	9.88E+06	( 79)	8.26E+06	( 66)	12	475 118	46.4	33.0	65.5
31	6.98E+06	( 93)	1.31E+07	( 175)	20	755 119	20.7	16.0	26.8
32	4.90E+06	( 49)	3.70E+06	( 37)	15	213 70	51.3	32.8	81.0
33	4.60E+06	( 49)	4.69E+06	( 50)	16	270 77	38.0	25.1	57.7
34	6.01E+06	( 32)	8.07E+06	( 43)	8	464 142	28.9	17.7	46.8
35	7.94E+06	( 74)	6.01E+06	( 56)	14	345 93	51.2	35.7	74.0
36	7.06E+06	( 47)	7.81E+06	( 52)	10	449 126	35.1	23.1	53.2
37	3.30E+06	( 22)	3.30E+06	( 22)	10	190 81	38.8	20.5	73.4
38	4.61E+06	( 43)	5.90E+06	( 55)	14	339 92	30.4	19.9	46.2
39	8.26E+06	( 44)	5.63E+06	( 30)	8	324 118	56.8	34.9	93.6
40	1.53E+07	( 102)	6.76E+06	( 45)	10	388 117	87.5	61.1	127.4
41	6.63E+06	( 53)	9.88E+06	( 79)	12	568 130	26.1	18.0	37.5
42	4.75E+06	( 57)	1.58E+06	( 19)	18	91 41	115.1	67.9	205.0
43	6.65E+06	( 62)	1.04E+07	( 97)	14	598 124	24.9	17.7	34.6
44	6.76E+06	( 54)	1.09E+07	( 87)	12	626 137	24.2	16.8	34.3
45	1.45E+07	( 77)	7.51E+06	( 40)	8	432 137	74.4	50.2	112.1
46	2.79E+06	( 26)	5.15E+06	( 48)	14	296 86	21.1	12.5	34.7
47	6.51E+06	( 65)	5.71E+06	( 57)	15	328 88	44.2	30.5	64.4
48	7.36E+06	( 98)	4.20E+06	( 56)	20	242 65	67.7	48.2	96.0

49	9.43E+06 ( 113)	9.09E+06 ( 109)	18	523 103	40.2	30.8	52.6
50	5.07E+06 ( 54)	6.66E+06 ( 71)	16	383 92	29.6	20.3	42.8

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-12ab, U35Z-59,60

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2) (%)	Sum age (Ma)
					Age --95% CI--		Age --95% CI--
13	2.15E+06	( 20)	6.86E+06	( 64)	12.3 7.0 20.5	100.0	12.3 7.0 20.5
26	3.90E+06	( 39)	9.41E+06	( 94)	16.2 10.8 23.7	38.3	14.5 10.5 19.8
15	3.75E+06	( 35)	9.01E+06	( 84)	16.3 10.6 24.5	62.3	15.2 11.9 19.4
14	2.85E+06	( 38)	6.83E+06	( 91)	16.4 10.9 24.2	79.0	15.5 12.6 19.1
3	1.95E+06	( 26)	4.58E+06	( 61)	16.7 10.1 26.8	89.1	15.7 12.9 19.0
7	4.00E+06	( 32)	9.38E+06	( 75)	16.7 10.7 25.6	94.5	15.8 13.3 18.9
11	4.60E+06	( 49)	9.20E+06	( 98)	19.6 13.6 27.9	88.4	16.5 14.0 19.4
6	2.78E+06	( 37)	5.48E+06	( 73)	19.9 12.9 29.9	87.8	16.9 14.5 19.6
31	6.98E+06	( 93)	1.31E+07	( 175)	20.7 16.0 26.8	76.4	17.7 15.4 20.2
23	2.13E+06	( 17)	4.00E+06	( 32)	20.9 10.8 38.6	81.6	17.8 15.6 20.3
9	1.42E+06	( 17)	2.67E+06	( 32)	20.9 10.8 38.6	85.9	17.9 15.7 20.4
46	2.79E+06	( 26)	5.15E+06	( 48)	21.1 12.5 34.7	88.3	18.1 15.9 20.5
5	5.01E+06	( 50)	8.41E+06	( 84)	23.3 16.0 33.5	81.3	18.5 16.4 20.9
10	6.26E+06	( 75)	1.03E+07	( 123)	23.9 17.9 32.0	67.8	19.1 17.0 21.4
44	6.76E+06	( 54)	1.09E+07	( 87)	24.2 16.8 34.3	61.9	19.4 17.4 21.7
29	3.30E+06	( 33)	5.21E+06	( 52)	24.7 15.4 38.9	61.0	19.7 17.6 21.9
43	6.65E+06	( 62)	1.04E+07	( 97)	24.9 17.7 34.6	54.3	20.0 18.0 22.3
27	6.53E+06	( 87)	1.01E+07	( 135)	25.1 19.1 33.0	45.1	20.5 18.5 22.7
41	6.63E+06	( 53)	9.88E+06	( 79)	26.1 18.0 37.5	40.8	20.8 18.8 22.9
24	4.95E+06	( 66)	6.91E+06	( 92)	28.1 20.1 39.0	28.8	21.1 19.2 23.3
25	4.05E+06	( 54)	5.48E+06	( 73)	28.9 19.9 41.7	21.2	21.5 19.5 23.6
34	6.01E+06	( 32)	8.07E+06	( 43)	28.9 17.7 46.8	19.6	21.7 19.7 23.8
28	8.51E+06	( 68)	1.13E+07	( 90)	29.4 21.0 40.8	12.9	22.0 20.0 24.2
50	5.07E+06	( 54)	6.66E+06	( 71)	29.6 20.3 42.8	9.9	22.3 20.3 24.5
17	6.38E+06	( 51)	8.26E+06	( 66)	30.2 20.5 44.3	7.6	22.6 20.6 24.7
38	4.61E+06	( 43)	5.90E+06	( 55)	30.4 19.9 46.2	6.4	22.8 20.8 24.9
16	6.88E+06	( 55)	8.76E+06	( 70)	30.7 21.1 44.4	4.8	23.0 21.1 25.2
12	4.08E+06	( 38)	5.15E+06	( 48)	31.0 19.6 48.4	4.3	23.2 21.2 25.3
1	8.13E+06	( 65)	1.00E+07	( 80)	31.8 22.5 44.7	2.7	23.5 21.5 25.6
18	3.92E+06	( 47)	4.75E+06	( 57)	32.2 21.4 48.3	2.1	23.7 21.7 25.8
21	6.48E+06	( 69)	7.79E+06	( 83)	32.5 23.2 45.3	1.2	24.0 22.0 26.1
22	7.63E+06	( 61)	8.63E+06	( 69)	34.5 24.0 49.5	0.6	24.3 22.3 26.4
8	3.60E+06	( 48)	4.05E+06	( 54)	34.7 23.0 52.3	0.4	24.5 22.5 26.7
36	7.06E+06	( 47)	7.81E+06	( 52)	35.1 23.1 53.2	0.3	24.7 22.8 26.9
2	3.00E+06	( 30)	3.20E+06	( 32)	36.6 21.5 62.2	0.2	24.9 22.9 27.0
33	4.60E+06	( 49)	4.69E+06	( 50)	38.0 25.1 57.7	0.1	25.1 23.1 27.3
37	3.30E+06	( 22)	3.30E+06	( 22)	38.8 20.5 73.4	0.1	25.2 23.2 27.4
49	9.43E+06	( 113)	9.09E+06	( 109)	40.2 30.8 52.6	0.0	25.8 23.8 28.0
20	5.26E+06	( 35)	4.95E+06	( 33)	41.4 25.0 68.7	0.0	26.0 24.0 28.2
47	6.51E+06	( 65)	5.71E+06	( 57)	44.2 30.5 64.4	0.0	26.4 24.3 28.6
4	7.66E+06	( 51)	6.61E+06	( 44)	45.2 29.6 69.4	0.0	26.6 24.6 28.9
30	9.88E+06	( 79)	8.26E+06	( 66)	46.4 33.0 65.5	0.0	27.1 25.0 29.3
35	7.94E+06	( 74)	6.01E+06	( 56)	51.2 35.7 74.0	0.0	27.5 25.4 29.8
32	4.90E+06	( 49)	3.70E+06	( 37)	51.3 32.8 81.0	0.0	27.8 25.7 30.1
39	8.26E+06	( 44)	5.63E+06	( 30)	56.8 34.9 93.6	0.0	28.1 26.0 30.4
48	7.36E+06	( 98)	4.20E+06	( 56)	67.7 48.2 96.0	0.0	28.8 26.7 31.1
45	1.45E+07	( 77)	7.51E+06	( 40)	74.4 50.2 112.1	0.0	29.4 27.2 31.7
40	1.53E+07	( 102)	6.76E+06	( 45)	87.5 61.1 127.4	0.0	30.2 28.0 32.6
19	2.82E+06	( 30)	1.22E+06	( 13)	89.1 45.5 186.3	0.0	30.4 28.2 32.8
42	4.75E+06	( 57)	1.58E+06	( 19)	115.1 67.9 205.0	0.0	30.9 28.6 33.4
POOL	5.37E+06	( 2616)	6.78E+06	( 3305)		0.0	30.9 28.6 33.4

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 387.5, 22.1

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 30.9, 29.7 -- 32.1 ( -1.2 +1.2)  
                   95% CONF. INTERVAL (Ma):          28.6 -- 33.4 ( -2.3 +2.4)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 5.5880, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 31.5, 29.4 -- 33.8 ( -2.1 +2.3)  
                   95% CONF. INTERVAL (Ma):          27.5 -- 36.1 ( -4.0 +4.6)  
                   AGE DISPERSION (%): 40.4

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 24.0, 23.0 -- 25.1 ( -1.0 +1.1)  
                   95% CONF. INTERVAL (Ma):          22.0 -- 26.1 ( -2.0 +2.1)  
 NUMBER AND PERCENTAGE OF GRAINS: 31, 62%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 12.43 to 113.79 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILTY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
30.53	5.249	27.01
70.14	0.939	4.83

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILTY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
11.05	0.203	1.04
16.32	2.048	10.54
20.26	2.821	14.52
24.68	4.185	21.53
31.17	5.211	26.81
41.99	2.724	14.01
48.49	2.057	10.58
69.35	0.938	4.83
87.67	0.772	3.97
119.47	0.304	1.57



====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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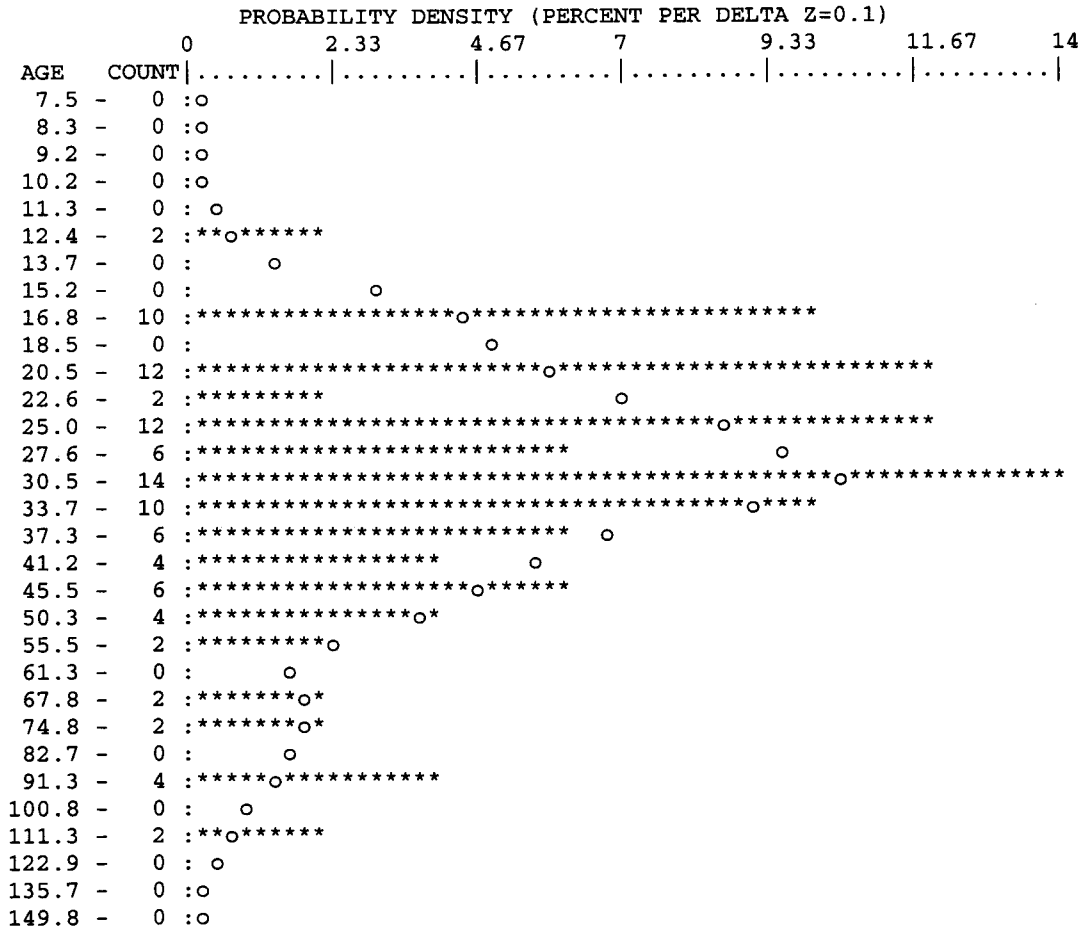
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05-12ab, U35Z-59,60

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-13 - Poul Creek Formation, Grindle Hills**

=====**ZetaAge Program v. 4.8 (Brandon 8/13/02)**=====

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05-13b, U35Z-62

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.117E+05  
 RELATIVE ERROR (%): 2.38  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	4.69E+06	( 25)	2.82E+06	( 15)	8	164 83	63.6	32.4	129.9
2	5.71E+06	( 38)	1.16E+07	( 77)	10	672 156	19.0	12.5	28.4
3	7.88E+06	( 42)	7.13E+06	( 38)	8	414 135	42.4	26.7	67.7
4	4.13E+06	( 33)	4.88E+06	( 39)	12	284 91	32.5	19.8	53.1
5	6.17E+06	( 37)	1.03E+07	( 62)	9	601 155	23.0	14.8	35.1
6	6.76E+06	( 27)	5.51E+06	( 22)	6	320 136	47.0	25.8	86.7
7	9.01E+06	( 36)	7.76E+06	( 31)	6	451 162	44.5	26.8	74.5
8	6.76E+06	( 45)	1.04E+07	( 69)	10	602 147	25.1	16.8	37.1
9	8.26E+06	( 44)	6.94E+06	( 37)	8	403 133	45.6	28.8	72.7
10	3.57E+06	( 19)	6.76E+06	( 36)	8	393 131	20.4	11.0	36.4
11	7.88E+06	( 42)	9.01E+06	( 48)	8	523 152	33.6	21.6	52.0
12	4.38E+06	( 35)	3.50E+06	( 28)	12	204 77	47.9	28.3	81.8
13	6.01E+06	( 48)	7.01E+06	( 56)	12	407 110	32.9	21.9	49.4
14	6.65E+06	( 31)	1.14E+07	( 53)	7	661 183	22.5	13.9	35.7
15	7.21E+06	( 48)	6.76E+06	( 45)	10	393 118	40.9	26.6	63.0
16	6.01E+06	( 32)	1.31E+07	( 70)	8	763 185	17.6	11.2	27.1
17	5.81E+06	( 58)	6.21E+06	( 62)	15	361 93	35.9	24.6	52.4
18	8.51E+06	( 34)	9.26E+06	( 37)	6	538 178	35.3	21.5	57.9
19	3.17E+06	( 38)	6.01E+06	( 72)	18	349 84	20.3	13.3	30.5
20	4.65E+06	( 31)	4.50E+06	( 30)	10	262 96	39.7	23.2	67.9
21	5.13E+06	( 41)	8.13E+06	( 65)	12	473 119	24.3	16.0	36.5
22	6.16E+06	( 41)	5.11E+06	( 34)	10	297 102	46.2	28.6	75.2
23	3.00E+06	( 24)	4.13E+06	( 33)	12	240 84	28.0	15.8	48.8
24	7.34E+06	( 44)	7.34E+06	( 44)	9	427 129	38.4	24.7	59.8
25	4.80E+06	( 32)	9.46E+06	( 63)	10	550 140	19.6	12.3	30.4
26	7.36E+06	( 49)	1.05E+07	( 70)	10	611 148	26.9	18.2	39.4
27	4.08E+06	( 57)	5.15E+06	( 72)	21	299 72	30.4	21.1	43.8
28	8.76E+06	( 35)	5.76E+06	( 23)	6	334 139	58.2	33.5	103.3
29	1.25E+07	( 50)	1.20E+07	( 48)	6	698 203	40.0	26.3	60.8
30	5.86E+06	( 39)	6.16E+06	( 41)	10	358 112	36.5	22.9	58.1
31	4.50E+06	( 54)	5.17E+06	( 62)	18	300 77	33.5	22.7	49.1
32	7.96E+06	( 53)	7.96E+06	( 53)	10	462 128	38.4	25.7	57.4
33	3.84E+06	( 46)	5.92E+06	( 71)	18	344 83	24.9	16.8	36.7
34	6.31E+06	( 42)	7.36E+06	( 49)	10	427 123	32.9	21.2	50.8
35	2.13E+06	( 17)	3.63E+06	( 29)	12	211 78	22.6	11.6	42.4
36	5.91E+06	( 59)	6.31E+06	( 63)	15	366 94	36.0	24.7	52.2
37	5.63E+06	( 45)	6.51E+06	( 52)	12	378 106	33.3	21.8	50.6
38	5.38E+06	( 43)	4.13E+06	( 33)	12	240 84	49.9	31.0	81.2
39	3.15E+06	( 21)	4.80E+06	( 32)	10	279 99	25.3	13.8	45.2
40	6.38E+06	( 34)	9.57E+06	( 51)	8	556 157	25.7	16.1	40.4
41	5.15E+06	( 48)	6.33E+06	( 59)	14	368 97	31.3	20.9	46.6
42	4.50E+06	( 30)	2.70E+06	( 18)	10	157 73	63.6	34.5	121.4
43	4.25E+06	( 34)	2.88E+06	( 23)	12	167 69	56.6	32.4	100.7
44	4.50E+06	( 18)	2.50E+06	( 10)	6	145 90	68.5	30.2	166.2
45	4.20E+06	( 42)	4.70E+06	( 47)	15	273 80	34.3	22.1	53.3
46	4.13E+06	( 33)	2.13E+06	( 17)	12	124 59	74.0	40.2	141.8
47	6.01E+06	( 24)	8.01E+06	( 32)	6	465 165	28.9	16.2	50.5
48	4.63E+06	( 37)	3.38E+06	( 27)	12	196 75	52.5	31.1	89.7

49	6.01E+06 ( 36)	1.08E+07 ( 65)	9	630 159	21.3	13.7	32.6
50	8.82E+06 ( 47)	1.16E+07 ( 62)	8	676 174	29.2	19.5	43.3

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-13b, U35Z-62

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2) (%)	Sum age (Ma)
					Age --95% CI--		Age --95% CI--
16	6.01E+06	( 32)	1.31E+07	( 70)	17.6	11.2 27.1	17.6 11.2 27.1
2	5.71E+06	( 38)	1.16E+07	( 77)	19.0	12.5 28.4	18.4 13.8 24.5
25	4.80E+06	( 32)	9.46E+06	( 63)	19.6	12.3 30.4	18.7 14.7 23.9
19	3.17E+06	( 38)	6.01E+06	( 72)	20.3	13.3 30.5	19.1 15.5 23.6
10	3.57E+06	( 19)	6.76E+06	( 36)	20.4	11.0 36.4	19.3 15.8 23.5
49	6.01E+06	( 36)	1.08E+07	( 65)	21.3	13.7 32.6	19.6 16.3 23.5
14	6.65E+06	( 31)	1.14E+07	( 53)	22.5	13.9 35.7	20.0 16.8 23.7
35	2.13E+06	( 17)	3.63E+06	( 29)	22.6	11.6 42.4	20.1 17.0 23.7
5	6.17E+06	( 37)	1.03E+07	( 62)	23.0	14.8 35.1	20.4 17.5 23.9
21	5.13E+06	( 41)	8.13E+06	( 65)	24.3	16.0 36.5	20.9 18.0 24.2
33	3.84E+06	( 46)	5.92E+06	( 71)	24.9	16.8 36.7	21.3 18.5 24.5
8	6.76E+06	( 45)	1.04E+07	( 69)	25.1	16.8 37.1	21.7 18.9 24.7
39	3.15E+06	( 21)	4.80E+06	( 32)	25.3	13.8 45.2	21.8 19.1 24.9
40	6.38E+06	( 34)	9.57E+06	( 51)	25.7	16.1 40.4	22.0 19.4 25.0
26	7.36E+06	( 49)	1.05E+07	( 70)	26.9	18.2 39.4	22.4 19.8 25.4
23	3.00E+06	( 24)	4.13E+06	( 33)	28.0	15.8 48.8	22.6 20.0 25.5
47	6.01E+06	( 24)	8.01E+06	( 32)	28.9	16.2 50.5	22.8 20.3 25.7
50	8.82E+06	( 47)	1.16E+07	( 62)	29.2	19.5 43.3	23.2 20.7 26.1
27	4.08E+06	( 57)	5.15E+06	( 72)	30.4	21.1 43.8	23.7 21.2 26.5
41	5.15E+06	( 48)	6.33E+06	( 59)	31.3	20.9 46.6	24.1 21.6 26.9
4	4.13E+06	( 33)	4.88E+06	( 39)	32.5	19.8 53.1	24.4 21.9 27.1
13	6.01E+06	( 48)	7.01E+06	( 56)	32.9	21.9 49.4	24.8 22.3 27.5
34	6.31E+06	( 42)	7.36E+06	( 49)	32.9	21.2 50.8	25.1 22.6 27.8
37	5.63E+06	( 45)	6.51E+06	( 52)	33.3	21.8 50.6	25.4 22.9 28.1
31	4.50E+06	( 54)	5.17E+06	( 62)	33.5	22.7 49.1	25.7 23.3 28.5
11	7.88E+06	( 42)	9.01E+06	( 48)	33.6	21.6 52.0	26.0 23.5 28.7
45	4.20E+06	( 42)	4.70E+06	( 47)	34.3	22.1 53.3	26.3 23.8 29.0
18	8.51E+06	( 34)	9.26E+06	( 37)	35.3	21.5 57.9	26.5 24.0 29.2
17	5.81E+06	( 58)	6.21E+06	( 62)	35.9	24.6 52.4	26.8 24.4 29.5
36	5.91E+06	( 59)	6.31E+06	( 63)	36.0	24.7 52.2	27.2 24.7 29.9
30	5.86E+06	( 39)	6.16E+06	( 41)	36.5	22.9 58.1	27.4 25.0 30.1
24	7.34E+06	( 44)	7.34E+06	( 44)	38.4	24.7 59.8	27.7 25.2 30.4
32	7.96E+06	( 53)	7.96E+06	( 53)	38.4	25.7 57.4	28.0 25.6 30.7
20	4.65E+06	( 31)	4.50E+06	( 30)	39.7	23.2 67.9	28.2 25.7 30.9
29	1.25E+07	( 50)	1.20E+07	( 48)	40.0	26.3 60.8	28.5 26.0 31.2
15	7.21E+06	( 48)	6.76E+06	( 45)	40.9	26.6 63.0	28.8 26.3 31.5
3	7.88E+06	( 42)	7.13E+06	( 38)	42.4	26.7 67.7	29.1 26.6 31.8
7	9.01E+06	( 36)	7.76E+06	( 31)	44.5	26.8 74.5	29.3 26.8 32.0
9	8.26E+06	( 44)	6.94E+06	( 37)	45.6	28.8 72.7	29.6 27.1 32.3
22	6.16E+06	( 41)	5.11E+06	( 34)	46.2	28.6 75.2	29.9 27.4 32.6
6	6.76E+06	( 27)	5.51E+06	( 22)	47.0	25.8 86.7	30.1 27.6 32.8
12	4.38E+06	( 35)	3.50E+06	( 28)	47.9	28.3 81.8	30.3 27.8 33.0
38	5.38E+06	( 43)	4.13E+06	( 33)	49.9	31.0 81.2	30.6 28.1 33.4
48	4.63E+06	( 37)	3.38E+06	( 27)	52.5	31.1 89.7	30.9 28.3 33.6
43	4.25E+06	( 34)	2.88E+06	( 23)	56.6	32.4 100.7	31.1 28.6 33.9
28	8.76E+06	( 35)	5.76E+06	( 23)	58.2	33.5 103.3	31.4 28.9 34.2
1	4.69E+06	( 25)	2.82E+06	( 15)	63.6	32.4 129.9	31.6 29.1 34.4
42	4.50E+06	( 30)	2.70E+06	( 18)	63.6	34.5 121.4	31.9 29.3 34.7
44	4.50E+06	( 18)	2.50E+06	( 10)	68.5	30.2 166.2	32.1 29.5 34.9
46	4.13E+06	( 33)	2.13E+06	( 17)	74.0	40.2 141.8	32.4 29.8 35.2
POOL	5.48E+06	( 1918)	6.49E+06	( 2275)		0.0	32.4 29.8 35.2

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 377.3, 23.9

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 32.4, 31.0 -- 33.8 ( -1.4 +1.4)  
                   95% CONF. INTERVAL (Ma): 29.8 -- 35.2 ( -2.6 +2.8)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.1917, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 33.2, 31.5 -- 35.1 ( -1.8 +1.9)  
                   95% CONF. INTERVAL (Ma): 29.9 -- 37.0 ( -3.4 +3.7)  
                   AGE DISPERSION (%): 23.6

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 30.3, 29.0 -- 31.7 ( -1.3 +1.4)  
                   95% CONF. INTERVAL (Ma): 27.8 -- 33.0 ( -2.5 +2.7)  
                   NUMBER AND PERCENTAGE OF GRAINS: 42, 84%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 17.73 to 73.31 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
34.72	5.537	32.47

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
19.85	2.494	14.63
23.69	3.575	20.96
34.62	5.536	32.47
51.49	2.621	15.37
70.28	1.046	6.14

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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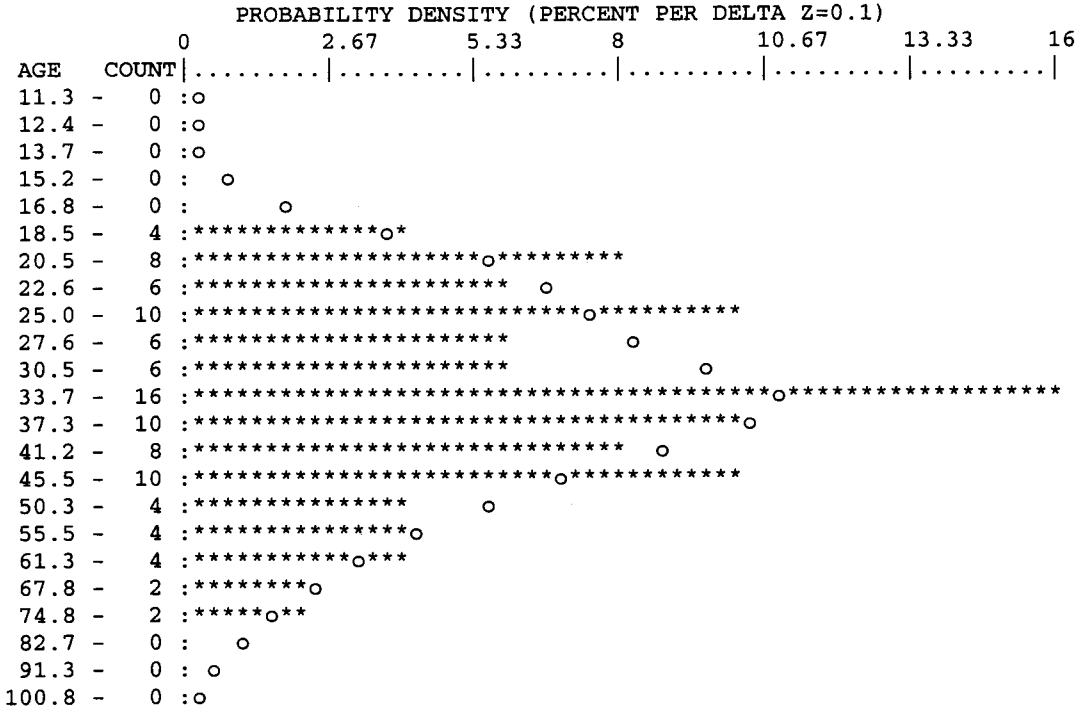
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05-13b, U35Z-62

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-16 - Poul Creek Formation, Grindle Hills**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-16ab, U35Z-63,64

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.105E+05  
 RELATIVE ERROR (%): 2.43  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	1.00E+07	( 40)	8.01E+06	( 32)	6	468 166	47.7	29.2	78.5
2	7.32E+06	( 39)	4.13E+06	( 22)	8	241 102	67.3	39.1	119.4
3	8.11E+06	( 54)	8.41E+06	( 56)	10	491 133	36.8	24.8	54.6
4	3.00E+06	( 24)	2.25E+06	( 18)	12	132 62	50.8	26.5	99.3
5	1.33E+07	( 53)	7.01E+06	( 28)	6	409 155	71.9	44.8	118.3
6	2.92E+06	( 35)	3.67E+06	( 44)	18	214 65	30.4	18.9	48.6
7	5.63E+06	( 45)	5.88E+06	( 47)	12	344 101	36.6	23.7	56.3
8	5.81E+06	( 58)	7.81E+06	( 78)	15	456 105	28.5	19.8	40.6
9	7.51E+06	( 40)	5.44E+06	( 29)	8	318 118	52.6	31.8	88.0
10	2.44E+06	( 26)	2.82E+06	( 30)	16	165 60	33.2	18.8	58.0
11	5.67E+06	( 34)	3.84E+06	( 23)	9	224 93	56.3	32.2	100.2
12	4.00E+06	( 24)	2.67E+06	( 16)	9	156 77	57.0	29.2	115.0
13	6.26E+06	( 25)	4.25E+06	( 17)	6	249 119	55.9	29.1	110.5
14	3.00E+06	( 16)	5.07E+06	( 27)	8	296 114	22.8	11.4	43.6
15	2.25E+06	( 9)	3.25E+06	( 13)	6	190 104	26.6	10.0	66.8
16	3.11E+06	( 29)	2.36E+06	( 22)	14	138 59	50.2	27.9	91.8
17	3.75E+06	( 30)	3.75E+06	( 30)	12	219 80	38.2	22.2	65.6
18	5.38E+06	( 43)	2.63E+06	( 21)	12	154 67	77.7	45.3	138.0
19	9.26E+06	( 37)	8.26E+06	( 33)	6	483 168	42.8	26.0	70.7
20	5.51E+06	( 44)	5.76E+06	( 46)	12	336 100	36.6	23.6	56.6
21	6.01E+06	( 36)	5.51E+06	( 33)	9	322 112	41.6	25.2	69.0
22	5.44E+06	( 29)	6.19E+06	( 33)	8	362 126	33.6	19.6	57.1
23	6.46E+06	( 43)	5.11E+06	( 34)	10	298 103	48.2	30.0	78.1
24	6.16E+06	( 41)	7.06E+06	( 47)	10	412 121	33.4	21.3	51.9
25	6.01E+06	( 32)	9.20E+06	( 49)	8	537 155	25.0	15.5	39.9
26	6.16E+06	( 41)	6.46E+06	( 43)	10	379 117	36.2	23.0	57.0
27	4.88E+06	( 52)	6.57E+06	( 70)	16	386 94	28.3	19.3	41.1
28	3.60E+06	( 24)	6.01E+06	( 40)	10	353 112	22.9	13.1	38.8
29	7.21E+06	( 48)	6.46E+06	( 43)	10	379 117	42.4	27.4	65.6
30	5.58E+06	( 52)	3.86E+06	( 36)	14	227 76	54.7	35.1	86.3
31	7.67E+06	( 46)	6.51E+06	( 39)	9	382 123	44.7	28.5	70.5
32	4.65E+06	( 31)	6.76E+06	( 45)	10	397 119	26.2	16.0	42.4
33	6.94E+06	( 37)	5.63E+06	( 30)	8	331 121	46.8	28.1	78.5
34	4.63E+06	( 37)	1.88E+06	( 15)	12	110 56	92.7	50.0	182.0
35	6.38E+06	( 34)	9.01E+06	( 48)	8	529 154	27.0	16.8	42.7
36	5.38E+06	( 43)	3.50E+06	( 28)	12	206 78	58.1	35.3	97.3
37	4.13E+06	( 55)	2.48E+06	( 33)	20	146 51	63.0	40.2	100.4
38	5.44E+06	( 29)	6.38E+06	( 34)	8	375 129	32.4	19.0	54.8
39	8.63E+06	( 46)	3.94E+06	( 21)	8	232 101	82.5	48.5	145.8
40	6.19E+06	( 33)	5.26E+06	( 28)	8	309 117	44.7	26.2	76.8
41	5.63E+06	( 45)	9.01E+06	( 72)	12	529 127	23.8	16.0	35.1
42	5.26E+06	( 35)	5.71E+06	( 38)	10	335 109	35.0	21.4	56.9
43	7.13E+06	( 38)	5.44E+06	( 29)	8	320 119	49.6	29.8	83.6
44	6.26E+06	( 25)	8.01E+06	( 32)	6	471 167	29.7	16.8	51.7
45	4.18E+06	( 39)	7.19E+06	( 67)	14	422 105	22.2	14.5	33.4
46	4.32E+06	( 23)	2.82E+06	( 15)	8	165 84	57.9	29.1	119.5
47	5.13E+06	( 41)	5.26E+06	( 42)	12	309 96	37.1	23.5	58.5
48	3.67E+06	( 22)	4.67E+06	( 28)	9	275 104	29.9	16.3	54.1

49	7.51E+06	( 35)	7.94E+06	( 37)	7	466	154	35.9	21.9	58.7
50	3.63E+06	( 29)	2.75E+06	( 22)	12	162	69	49.9	27.7	91.3



=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-16ab, U35Z-63,64

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2)	Sum age (Ma)
					Age --95% CI--	(%)	Age --95% CI--
45	4.18E+06	( 39)	7.19E+06	( 67)	22.2	14.5 33.4	100.0
14	3.00E+06	( 16)	5.07E+06	( 27)	22.8	11.4 43.6	95.0
28	3.60E+06	( 24)	6.01E+06	( 40)	22.9	13.1 38.8	99.5
41	5.63E+06	( 45)	9.01E+06	( 72)	23.8	16.0 35.1	99.5
25	6.01E+06	( 32)	9.20E+06	( 49)	25.0	15.5 39.9	99.6
32	4.65E+06	( 31)	6.76E+06	( 45)	26.2	16.0 42.4	99.5
15	2.25E+06	( 9)	3.25E+06	( 13)	26.6	10.0 66.8	99.8
35	6.38E+06	( 34)	9.01E+06	( 48)	27.0	16.8 42.7	99.8
27	4.88E+06	( 52)	6.57E+06	( 70)	28.3	19.3 41.1	99.6
8	5.81E+06	( 58)	7.81E+06	( 78)	28.5	19.8 40.6	99.5
44	6.26E+06	( 25)	8.01E+06	( 32)	29.7	16.8 51.7	99.6
48	3.67E+06	( 22)	4.67E+06	( 28)	29.9	16.3 54.1	99.7
6	2.92E+06	( 35)	3.67E+06	( 44)	30.4	18.9 48.6	99.7
38	5.44E+06	( 29)	6.38E+06	( 34)	32.4	19.0 54.8	99.6
10	2.44E+06	( 26)	2.82E+06	( 30)	33.2	18.8 58.0	99.5
24	6.16E+06	( 41)	7.06E+06	( 47)	33.4	21.3 51.9	99.2
22	5.44E+06	( 29)	6.19E+06	( 33)	33.6	19.6 57.1	99.1
42	5.26E+06	( 35)	5.71E+06	( 38)	35.0	21.4 56.9	98.7
49	7.51E+06	( 35)	7.94E+06	( 37)	35.9	21.9 58.7	98.2
26	6.16E+06	( 41)	6.46E+06	( 43)	36.2	23.0 57.0	97.4
20	5.51E+06	( 44)	5.76E+06	( 46)	36.6	23.6 56.6	96.3
7	5.63E+06	( 45)	5.88E+06	( 47)	36.6	23.7 56.3	95.4
3	8.11E+06	( 54)	8.41E+06	( 56)	36.8	24.8 54.6	94.1
47	5.13E+06	( 41)	5.26E+06	( 42)	37.1	23.5 58.5	93.7
17	3.75E+06	( 30)	3.75E+06	( 30)	38.2	22.2 65.6	93.5
21	6.01E+06	( 36)	5.51E+06	( 33)	41.6	25.2 69.0	91.0
29	7.21E+06	( 48)	6.46E+06	( 43)	42.4	27.4 65.6	85.9
19	9.26E+06	( 37)	8.26E+06	( 33)	42.8	26.0 70.7	82.3
40	6.19E+06	( 33)	5.26E+06	( 28)	44.7	26.2 76.8	77.9
31	7.67E+06	( 46)	6.51E+06	( 39)	44.7	28.5 70.5	70.4
33	6.94E+06	( 37)	5.63E+06	( 30)	46.8	28.1 78.5	63.3
1	1.00E+07	( 40)	8.01E+06	( 32)	47.7	29.2 78.5	54.9
23	6.46E+06	( 43)	5.11E+06	( 34)	48.2	30.0 78.1	45.9
43	7.13E+06	( 38)	5.44E+06	( 29)	49.6	29.8 83.6	38.1
50	3.63E+06	( 29)	2.75E+06	( 22)	49.9	27.7 91.3	34.0
16	3.11E+06	( 29)	2.36E+06	( 22)	50.2	27.9 91.8	30.3
4	3.00E+06	( 24)	2.25E+06	( 18)	50.8	26.5 99.3	28.1
9	7.51E+06	( 40)	5.44E+06	( 29)	52.6	31.8 88.0	21.4
30	5.58E+06	( 52)	3.86E+06	( 36)	54.7	35.1 86.3	12.9
13	6.26E+06	( 25)	4.25E+06	( 17)	55.9	29.1 110.5	10.8
11	5.67E+06	( 34)	3.84E+06	( 23)	56.3	32.2 100.2	7.9
12	4.00E+06	( 24)	2.67E+06	( 16)	57.0	29.2 115.0	6.7
46	4.32E+06	( 23)	2.82E+06	( 15)	57.9	29.1 119.5	5.6
36	5.38E+06	( 43)	3.50E+06	( 28)	58.1	35.3 97.3	3.4
37	4.13E+06	( 55)	2.48E+06	( 33)	63.0	40.2 100.4	1.2
2	7.32E+06	( 39)	4.13E+06	( 22)	67.3	39.1 119.4	0.5
5	1.33E+07	( 53)	7.01E+06	( 28)	71.9	44.8 118.3	0.1
18	5.38E+06	( 43)	2.63E+06	( 21)	77.7	45.3 138.0	0.0
39	8.63E+06	( 46)	3.94E+06	( 21)	82.5	48.5 145.8	0.0
34	4.63E+06	( 37)	1.88E+06	( 15)	92.7	50.0 182.0	0.0
POOL	5.37E+06	( 1826)	5.20E+06	( 1768)			0.0

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 303.6, 20.6

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 39.4, 37.7 -- 41.2 ( -1.7 +1.8)  
                   95% CONF. INTERVAL (Ma): 36.1 -- 43.0 ( -3.3 +3.6)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.1653, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 40.2, 38.0 -- 42.6 ( -2.2 +2.4)  
                   95% CONF. INTERVAL (Ma): 35.9 -- 45.0 ( -4.3 +4.8)  
                   AGE DISPERSION (%): 25.1

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 37.0, 35.3 -- 38.7 ( -1.7 +1.7)  
                   95% CONF. INTERVAL (Ma): 33.8 -- 40.5 ( -3.2 +3.5)  
 NUMBER AND PERCENTAGE OF GRAINS: 45, 90%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 22.24 to 91.47 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
37.49	4.902	30.87

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
23.71	2.422	15.26
27.59	3.574	22.51
36.49	4.883	30.75
51.02	4.170	26.27
82.28	1.118	7.04

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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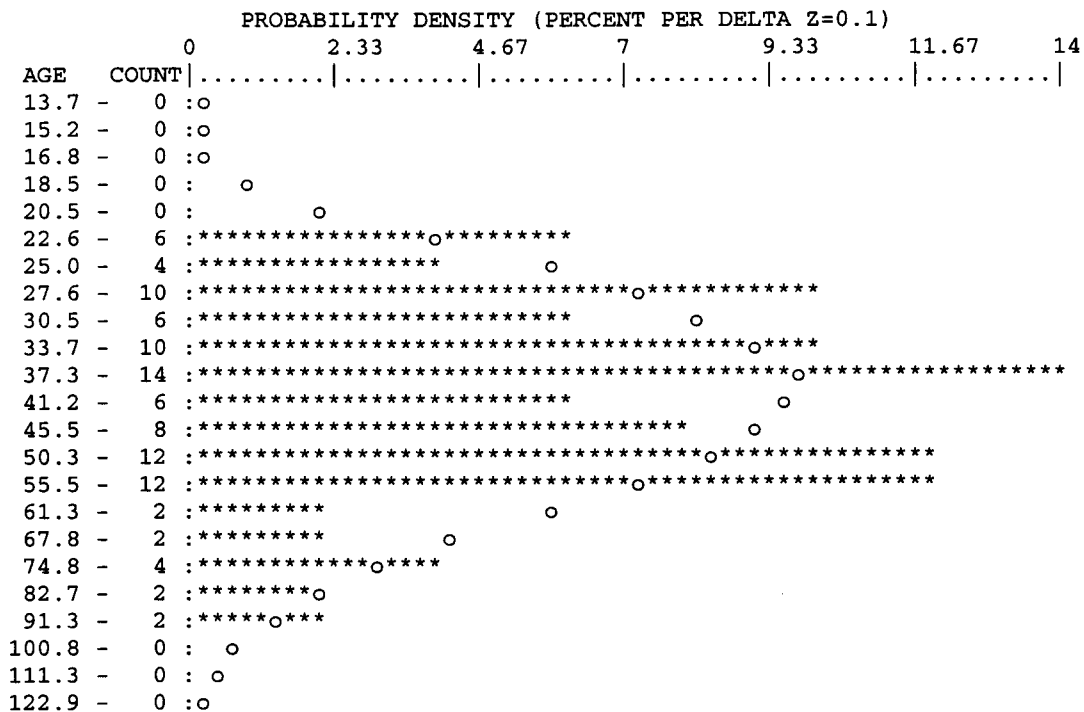
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05-16ab, U35Z-63,64

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**05-17 - Kulthieth Formation, Khitrov Hills**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-17ab, U35Z-65,66

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.081E+05  
 RELATIVE ERROR (%): 2.52  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	7.88E+06	( 21)	7.88E+06	( 21)	4	466 202	37.8	19.6	72.6
2	4.50E+06	( 18)	5.01E+06	( 20)	6	296 132	34.0	16.9	67.7
3	6.76E+06	( 27)	9.51E+06	( 38)	6	562 183	26.9	15.7	45.2
4	6.01E+06	( 32)	1.20E+07	( 64)	8	710 180	19.0	11.9	29.4
5	8.41E+06	( 28)	9.61E+06	( 32)	5	568 201	33.1	19.1	56.7
6	9.26E+06	( 37)	7.01E+06	( 28)	6	414 157	49.8	29.7	84.6
7	6.34E+06	( 38)	7.34E+06	( 44)	9	434 132	32.6	20.5	51.6
8	7.76E+06	( 31)	9.01E+06	( 36)	6	532 178	32.6	19.4	54.2
9	6.65E+06	( 31)	7.94E+06	( 37)	7	469 155	31.7	19.0	52.5
10	8.71E+06	( 29)	1.20E+07	( 40)	5	710 226	27.4	16.4	45.4
11	1.13E+07	( 90)	8.13E+06	( 65)	12	481 121	52.2	37.4	73.2
12	4.00E+06	( 16)	5.01E+06	( 20)	6	296 132	30.3	14.6	61.4
13	5.11E+06	( 17)	6.91E+06	( 23)	5	408 170	28.0	14.0	54.6
14	3.75E+06	( 25)	4.20E+06	( 28)	10	248 94	33.8	18.8	60.0
15	4.05E+06	( 27)	3.75E+06	( 25)	10	222 89	40.8	22.8	73.2
16	5.71E+06	( 38)	5.56E+06	( 37)	10	328 109	38.8	24.0	62.8
17	2.85E+06	( 19)	2.25E+06	( 15)	10	133 68	47.7	23.0	100.9
18	3.15E+06	( 21)	3.60E+06	( 24)	10	213 87	33.1	17.5	62.0
19	7.13E+06	( 76)	7.88E+06	( 84)	16	466 104	34.2	24.6	47.3
20	5.71E+06	( 38)	4.20E+06	( 28)	10	248 94	51.1	30.6	86.6
21	6.84E+06	( 41)	8.17E+06	( 49)	9	483 139	31.6	20.3	49.0
22	3.17E+06	( 19)	3.50E+06	( 21)	9	207 90	34.2	17.4	66.8
23	3.50E+06	( 28)	4.13E+06	( 33)	12	244 85	32.1	18.6	54.8
24	5.26E+06	( 42)	8.76E+06	( 70)	12	518 126	22.7	15.1	33.8
25	6.65E+06	( 31)	1.14E+07	( 53)	7	672 187	22.2	13.7	35.2
26	5.07E+06	( 27)	4.13E+06	( 22)	8	245 104	46.0	25.2	84.8
27	9.57E+06	( 51)	1.33E+07	( 71)	8	792 192	27.0	18.4	39.3
28	6.61E+06	( 44)	7.36E+06	( 49)	10	437 126	33.7	21.9	51.8
29	7.76E+06	( 31)	5.76E+06	( 23)	6	342 142	50.5	28.5	90.7
30	3.75E+06	( 15)	3.25E+06	( 13)	6	193 106	43.2	19.2	98.6
31	7.01E+06	( 28)	4.75E+06	( 19)	6	283 129	55.1	29.8	104.5
32	6.76E+06	( 45)	5.56E+06	( 37)	10	330 109	45.6	28.8	72.6
33	9.01E+06	( 60)	1.17E+07	( 78)	10	696 161	28.9	20.2	41.1
34	3.57E+06	( 19)	4.13E+06	( 22)	8	245 104	32.5	16.6	62.8
35	4.50E+06	( 18)	7.26E+06	( 29)	6	431 160	23.4	12.2	43.5
36	6.01E+06	( 32)	4.88E+06	( 26)	8	290 114	46.1	26.6	80.7
37	5.44E+06	( 29)	7.32E+06	( 39)	8	435 140	28.0	16.6	46.4
38	2.25E+06	( 15)	2.25E+06	( 15)	10	134 68	37.5	17.1	82.3
39	5.17E+06	( 31)	9.68E+06	( 58)	9	575 153	20.1	12.5	31.7
40	6.76E+06	( 27)	3.75E+06	( 15)	6	223 114	67.1	34.6	135.9
41	3.57E+06	( 19)	6.76E+06	( 36)	8	402 135	19.9	10.7	35.6
42	6.01E+06	( 48)	5.38E+06	( 43)	12	320 98	41.9	27.1	64.9
43	4.13E+06	( 22)	4.32E+06	( 23)	8	257 107	35.9	19.1	67.4
44	5.56E+06	( 37)	8.26E+06	( 55)	10	491 134	25.3	16.2	39.1
45	1.35E+07	( 54)	1.53E+07	( 61)	6	908 236	33.3	22.6	48.9
46	3.22E+06	( 30)	6.54E+06	( 61)	14	389 101	18.5	11.5	29.2
47	9.51E+06	( 38)	1.23E+07	( 49)	6	729 211	29.2	18.5	45.5
48	3.50E+06	( 14)	4.75E+06	( 19)	6	283 129	27.8	12.8	58.2

49	9.95E+06 ( 53)	1.31E+07 ( 70)	8	781 190	28.5	19.5	41.3
50	8.63E+06 ( 69)	1.00E+07 ( 80)	12	595 136	32.4	23.1	45.4

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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05-17ab, U35Z-65,66

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	P(X2)	Sum age (Ma)
					Age	--95% CI-- (%)	Age
							--95% CI--
46	3.22E+06	( 30)	6.54E+06	( 61)	18.5	11.5 29.2	100.0 18.7 11.6 29.3
4	6.01E+06	( 32)	1.20E+07	( 64)	19.0	11.9 29.4	94.3 18.8 13.6 25.7
41	3.57E+06	( 19)	6.76E+06	( 36)	19.9	10.7 35.6	98.1 19.0 14.5 25.0
39	5.17E+06	( 31)	9.68E+06	( 58)	20.1	12.5 31.7	99.3 19.3 15.3 24.4
25	6.65E+06	( 31)	1.14E+07	( 53)	22.2	13.7 35.2	98.4 19.8 16.1 24.5
24	5.26E+06	( 42)	8.76E+06	( 70)	22.7	15.1 33.8	98.0 20.4 16.9 24.6
35	4.50E+06	( 18)	7.26E+06	( 29)	23.4	12.2 43.5	98.8 20.6 17.2 24.7
44	5.56E+06	( 37)	8.26E+06	( 55)	25.3	16.2 39.1	97.4 21.2 17.9 25.2
3	6.76E+06	( 27)	9.51E+06	( 38)	26.9	15.7 45.2	96.1 21.7 18.5 25.5
27	9.57E+06	( 51)	1.33E+07	( 71)	27.0	18.4 39.3	93.0 22.4 19.3 26.1
10	8.71E+06	( 29)	1.20E+07	( 40)	27.4	16.4 45.4	93.2 22.7 19.7 26.3
48	3.50E+06	( 14)	4.75E+06	( 19)	27.8	12.8 58.2	94.8 22.9 19.8 26.4
37	5.44E+06	( 29)	7.32E+06	( 39)	28.0	16.6 46.4	95.0 23.2 20.2 26.7
13	5.11E+06	( 17)	6.91E+06	( 23)	28.0	14.0 54.6	96.1 23.4 20.4 26.8
49	9.95E+06	( 53)	1.31E+07	( 70)	28.5	19.5 41.3	95.1 23.9 20.9 27.2
33	9.01E+06	( 60)	1.17E+07	( 78)	28.9	20.2 41.1	93.7 24.4 21.5 27.6
47	9.51E+06	( 38)	1.23E+07	( 49)	29.2	18.5 45.5	94.0 24.6 21.8 27.8
12	4.00E+06	( 16)	5.01E+06	( 20)	30.3	14.6 61.4	95.1 24.8 21.9 27.9
21	6.84E+06	( 41)	8.17E+06	( 49)	31.6	20.3 49.0	93.6 25.1 22.3 28.3
9	6.65E+06	( 31)	7.94E+06	( 37)	31.7	19.0 52.5	93.3 25.4 22.6 28.5
23	3.50E+06	( 28)	4.13E+06	( 33)	32.1	18.6 54.8	93.2 25.6 22.8 28.7
50	8.63E+06	( 69)	1.00E+07	( 80)	32.4	23.1 45.4	89.6 26.1 23.4 29.2
34	3.57E+06	( 19)	4.13E+06	( 22)	32.5	16.6 62.8	90.8 26.2 23.5 29.3
8	7.76E+06	( 31)	9.01E+06	( 36)	32.6	19.4 54.2	91.0 26.4 23.7 29.5
7	6.34E+06	( 38)	7.34E+06	( 44)	32.6	20.5 51.6	90.8 26.7 23.9 29.7
5	8.41E+06	( 28)	9.61E+06	( 32)	33.1	19.1 56.7	91.3 26.8 24.1 29.8
18	3.15E+06	( 21)	3.60E+06	( 24)	33.1	17.5 62.0	92.3 26.9 24.3 29.9
45	1.35E+07	( 54)	1.53E+07	( 61)	33.3	22.6 48.9	91.2 27.2 24.6 30.2
28	6.61E+06	( 44)	7.36E+06	( 49)	33.7	21.9 51.8	90.7 27.5 24.8 30.4
14	3.75E+06	( 25)	4.20E+06	( 28)	33.8	18.8 60.0	91.5 27.6 25.0 30.5
2	4.50E+06	( 18)	5.01E+06	( 20)	34.0	16.9 67.7	92.6 27.7 25.1 30.6
19	7.13E+06	( 76)	7.88E+06	( 84)	34.2	24.6 47.3	90.5 28.1 25.4 31.0
22	3.17E+06	( 19)	3.50E+06	( 21)	34.2	17.4 66.8	91.7 28.2 25.5 31.1
43	4.13E+06	( 22)	4.32E+06	( 23)	35.9	19.1 67.4	92.2 28.3 25.6 31.2
38	2.25E+06	( 15)	2.25E+06	( 15)	37.5	17.1 82.3	92.7 28.4 25.7 31.3
1	7.88E+06	( 21)	7.88E+06	( 21)	37.8	19.6 72.6	92.6 28.5 25.9 31.4
16	5.71E+06	( 38)	5.56E+06	( 37)	38.8	24.0 62.8	90.6 28.7 26.1 31.6
15	4.05E+06	( 27)	3.75E+06	( 25)	40.8	22.8 73.2	88.7 28.9 26.3 31.8
42	6.01E+06	( 48)	5.38E+06	( 43)	41.9	27.1 64.9	81.9 29.3 26.6 32.1
30	3.75E+06	( 15)	3.25E+06	( 13)	43.2	19.2 98.6	81.3 29.4 26.7 32.3
32	6.76E+06	( 45)	5.56E+06	( 37)	45.6	28.8 72.6	69.6 29.7 27.1 32.6
26	5.07E+06	( 27)	4.13E+06	( 22)	46.0	25.2 84.8	63.7 29.9 27.3 32.8
36	6.01E+06	( 32)	4.88E+06	( 26)	46.1	26.6 80.7	56.1 30.2 27.5 33.1
17	2.85E+06	( 19)	2.25E+06	( 15)	47.7	23.0 100.9	52.6 30.3 27.6 33.2
6	9.26E+06	( 37)	7.01E+06	( 28)	49.8	29.7 84.6	40.4 30.6 27.9 33.6
29	7.76E+06	( 31)	5.76E+06	( 23)	50.5	28.5 90.7	31.7 30.9 28.2 33.8
20	5.71E+06	( 38)	4.20E+06	( 28)	51.1	30.6 86.6	22.0 31.2 28.5 34.1
11	1.13E+07	( 90)	8.13E+06	( 65)	52.2	37.4 73.2	6.1 31.9 29.2 34.9
31	7.01E+06	( 28)	4.75E+06	( 19)	55.1	29.8 104.5	4.1 32.1 29.4 35.1
40	6.76E+06	( 27)	3.75E+06	( 15)	67.1	34.6 135.9	1.9 32.4 29.6 35.4
POOL	6.01E+06	( 1676)	7.00E+06	( 1954)			1.9 32.4 29.6 35.4

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 413.8, 28.0

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 32.4, 31.0 -- 33.9 ( -1.4 +1.5)  
                   95% CONF. INTERVAL (Ma):           29.6 -- 35.4 ( -2.7 +3.0)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 1.4644, 49  
                   CHI^2 PROBABILITY: 1.9%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 32.6, 31.0 -- 34.4 ( -1.6 +1.7)  
                   95% CONF. INTERVAL (Ma):           29.5 -- 36.1 ( -3.1 +3.5)  
                   AGE DISPERSION (%): 16.6

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 32.4, 31.0 -- 33.9 ( -1.4 +1.5)  
                   95% CONF. INTERVAL (Ma):           29.6 -- 35.4 ( -2.7 +3.0)  
 NUMBER AND PERCENTAGE OF GRAINS: 50, 100%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 18.64 to 66.44 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
32.02	6.879	44.75

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
19.21	1.675	10.89
32.29	6.869	44.68
51.21	2.833	18.43

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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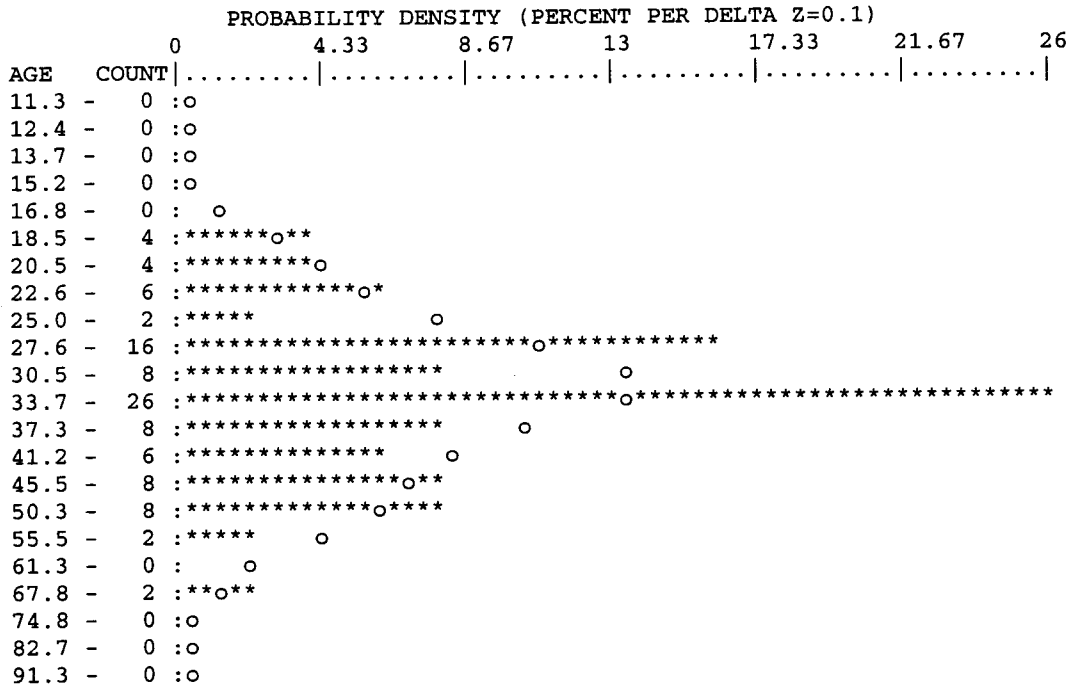
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05-17ab, U35Z-65,66

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.





**KA 1 - Kaliakh River**

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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KA-1ab, U35Z-36,37

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.425E+05  
 RELATIVE ERROR (%): 1.82  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	Age	--95% CI--
1	5.58E+06	( 52)	8.04E+06	( 75)	14	408 95	30.6	21.0	44.1
2	6.11E+06	( 57)	1.04E+07	( 97)	14	528 109	25.9	18.3	36.3
3	3.67E+06	( 44)	3.42E+06	( 41)	18	173 54	47.2	30.1	74.0
4	7.51E+06	( 60)	6.26E+06	( 50)	12	317 90	52.7	35.6	78.3
5	6.61E+06	( 88)	4.50E+06	( 60)	20	228 59	64.3	45.8	91.0
6	5.71E+06	( 38)	1.02E+07	( 68)	10	518 127	24.7	16.1	37.2
7	4.50E+06	( 42)	6.22E+06	( 58)	14	316 83	31.9	20.9	48.3
8	6.46E+06	( 43)	1.13E+07	( 75)	10	571 133	25.3	16.9	37.3
9	5.11E+06	( 34)	4.20E+06	( 28)	10	213 80	53.3	31.4	91.2
10	6.97E+06	( 65)	7.29E+06	( 68)	14	370 90	42.0	29.4	60.0
11	4.05E+06	( 27)	4.05E+06	( 27)	10	206 79	44.0	24.8	77.8
12	9.18E+06	( 55)	1.00E+07	( 60)	9	508 132	40.3	27.4	59.2
13	9.95E+06	( 53)	6.94E+06	( 37)	8	352 116	62.8	40.6	98.3
14	5.56E+06	( 37)	5.41E+06	( 36)	10	274 91	45.2	27.8	73.5
15	3.92E+06	( 47)	5.17E+06	( 62)	18	262 67	33.4	22.3	49.6
16	4.32E+06	( 23)	7.13E+06	( 38)	8	362 117	26.7	15.2	45.9
17	7.81E+06	( 52)	1.04E+07	( 69)	10	525 128	33.2	22.7	48.3
18	3.38E+06	( 45)	5.71E+06	( 76)	20	289 67	26.1	17.6	38.2
19	4.50E+06	( 36)	8.76E+06	( 70)	12	444 107	22.7	14.7	34.4
20	7.32E+06	( 39)	8.82E+06	( 47)	8	447 131	36.5	23.2	57.0
21	5.38E+06	( 43)	4.00E+06	( 32)	12	203 72	58.9	36.5	96.2
22	2.90E+06	( 27)	4.61E+06	( 43)	14	234 71	27.7	16.4	45.8
23	3.90E+06	( 26)	3.30E+06	( 22)	10	168 71	51.9	28.3	95.9
24	5.26E+06	( 35)	5.56E+06	( 37)	10	282 93	41.6	25.4	67.9
25	4.95E+06	( 33)	6.31E+06	( 42)	10	320 99	34.6	21.2	55.9
26	3.23E+06	( 43)	2.10E+06	( 28)	20	107 40	66.9	40.7	111.9
27	4.18E+06	( 39)	4.18E+06	( 39)	14	213 68	43.8	27.3	70.0
28	4.08E+06	( 38)	2.57E+06	( 24)	14	131 53	69.0	40.4	120.2
29	5.17E+06	( 62)	3.59E+06	( 43)	18	183 56	62.9	42.0	95.2
30	6.01E+06	( 32)	5.07E+06	( 27)	8	258 99	51.8	30.1	89.8
31	9.76E+06	( 65)	9.16E+06	( 61)	10	467 120	46.6	32.3	67.3
32	4.75E+06	( 38)	4.63E+06	( 37)	12	236 78	44.9	27.8	72.6
33	7.06E+06	( 47)	8.11E+06	( 54)	10	413 113	38.1	25.2	57.4
34	3.67E+06	( 44)	3.09E+06	( 37)	18	157 52	52.0	32.8	82.7
35	6.76E+06	( 36)	5.26E+06	( 28)	8	268 101	56.1	33.4	95.5
36	5.01E+06	( 40)	5.01E+06	( 40)	12	255 81	43.8	27.5	69.6
37	3.63E+06	( 29)	5.76E+06	( 46)	12	293 87	27.7	16.7	44.9
38	5.56E+06	( 37)	9.46E+06	( 63)	10	482 122	25.8	16.7	39.3
39	3.30E+06	( 44)	3.98E+06	( 53)	20	203 56	36.4	23.8	55.3
40	2.68E+06	( 25)	3.32E+06	( 31)	14	169 61	35.4	20.0	61.8
41	7.81E+06	( 52)	9.01E+06	( 60)	10	459 119	38.0	25.6	56.0
42	5.35E+06	( 57)	3.47E+06	( 37)	16	177 58	67.2	43.7	104.6
43	7.21E+06	( 48)	3.90E+06	( 26)	10	199 78	80.3	49.0	134.9
44	9.95E+06	( 53)	6.94E+06	( 37)	8	354 116	62.5	40.4	97.9
45	6.46E+06	( 43)	1.08E+07	( 72)	10	551 131	26.2	17.5	38.7
46	2.25E+06	( 21)	2.15E+06	( 20)	14	109 48	45.9	23.7	89.1
47	2.57E+06	( 24)	2.68E+06	( 25)	14	137 54	42.0	23.0	76.6
48	3.90E+06	( 52)	4.88E+06	( 65)	20	249 62	35.1	23.8	51.3

49	5.72E+06	( 61)	1.15E+07	( 123)	16	588 108	21.8	15.7	29.8
50	8.58E+06	( 80)	1.08E+07	( 101)	14	552 111	34.7	25.5	47.0

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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KA-lab, U35Z-36,37

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
49	5.72E+06	( 61)	1.15E+07	( 123)	21.8	15.7	29.8	100.0	21.7	15.7	29.7
19	4.50E+06	( 36)	8.76E+06	( 70)	22.7	14.7	34.4	87.3	22.1	17.3	28.3
6	5.71E+06	( 38)	1.02E+07	( 68)	24.7	16.1	37.2	88.8	22.8	18.4	28.2
8	6.46E+06	( 43)	1.13E+07	( 75)	25.3	16.9	37.3	92.6	23.3	19.3	28.1
38	5.56E+06	( 37)	9.46E+06	( 63)	25.8	16.7	39.3	95.6	23.7	19.9	28.2
2	6.11E+06	( 57)	1.04E+07	( 97)	25.9	18.3	36.3	97.2	24.1	20.6	28.2
18	3.38E+06	( 45)	5.71E+06	( 76)	26.1	17.6	38.2	98.4	24.4	21.1	28.2
45	6.46E+06	( 43)	1.08E+07	( 72)	26.2	17.5	38.7	99.2	24.6	21.4	28.2
16	4.32E+06	( 23)	7.13E+06	( 38)	26.7	15.2	45.9	99.6	24.7	21.6	28.2
37	3.63E+06	( 29)	5.76E+06	( 46)	27.7	16.7	44.9	99.8	24.9	21.8	28.3
22	2.90E+06	( 27)	4.61E+06	( 43)	27.7	16.4	45.8	99.9	25.0	22.0	28.4
1	5.58E+06	( 52)	8.04E+06	( 75)	30.6	21.0	44.1	99.4	25.5	22.6	28.8
7	4.50E+06	( 42)	6.22E+06	( 58)	31.9	20.9	48.3	98.6	25.9	23.0	29.2
17	7.81E+06	( 52)	1.04E+07	( 69)	33.2	22.7	48.3	96.3	26.4	23.6	29.6
15	3.92E+06	( 47)	5.17E+06	( 62)	33.4	22.3	49.6	94.2	26.9	24.0	30.0
25	4.95E+06	( 33)	6.31E+06	( 42)	34.6	21.2	55.9	92.6	27.2	24.4	30.3
50	8.58E+06	( 80)	1.08E+07	( 101)	34.7	25.5	47.0	84.9	27.8	25.1	30.9
48	3.90E+06	( 52)	4.88E+06	( 65)	35.1	23.8	51.3	81.4	28.2	25.5	31.2
40	2.68E+06	( 25)	3.32E+06	( 31)	35.4	20.0	61.8	82.3	28.4	25.6	31.4
39	3.30E+06	( 44)	3.98E+06	( 53)	36.4	23.8	55.3	79.2	28.7	26.0	31.7
20	7.32E+06	( 39)	8.82E+06	( 47)	36.5	23.2	57.0	77.5	28.9	26.3	31.9
41	7.81E+06	( 52)	9.01E+06	( 60)	38.0	25.6	56.0	71.3	29.3	26.6	32.3
33	7.06E+06	( 47)	8.11E+06	( 54)	38.1	25.2	57.4	67.0	29.6	27.0	32.6
12	9.18E+06	( 55)	1.00E+07	( 60)	40.3	27.4	59.2	57.0	30.1	27.4	33.0
24	5.26E+06	( 35)	5.56E+06	( 37)	41.6	25.4	67.9	51.9	30.3	27.7	33.2
47	2.57E+06	( 24)	2.68E+06	( 25)	42.0	23.0	76.6	50.3	30.5	27.9	33.4
10	6.97E+06	( 65)	7.29E+06	( 68)	42.0	29.4	60.0	38.2	31.0	28.3	33.9
27	4.18E+06	( 39)	4.18E+06	( 39)	43.8	27.3	70.0	32.4	31.3	28.6	34.1
36	5.01E+06	( 40)	5.01E+06	( 40)	43.8	27.5	69.6	27.5	31.5	28.9	34.4
11	4.05E+06	( 27)	4.05E+06	( 27)	44.0	24.8	77.8	26.1	31.7	29.1	34.6
32	4.75E+06	( 38)	4.63E+06	( 37)	44.9	27.8	72.6	22.0	32.0	29.4	34.9
14	5.56E+06	( 37)	5.41E+06	( 36)	45.2	27.8	73.5	18.8	32.3	29.6	35.1
46	2.25E+06	( 21)	2.15E+06	( 20)	45.9	23.7	89.1	18.4	32.4	29.8	35.3
31	9.76E+06	( 65)	9.16E+06	( 61)	46.6	32.3	67.3	11.4	32.9	30.2	35.7
3	3.67E+06	( 44)	3.42E+06	( 41)	47.2	30.1	74.0	8.7	33.1	30.5	36.0
30	6.01E+06	( 32)	5.07E+06	( 27)	51.8	30.1	89.8	6.3	33.4	30.7	36.3
23	3.90E+06	( 26)	3.30E+06	( 22)	51.9	28.3	95.9	5.1	33.6	30.9	36.5
34	3.67E+06	( 44)	3.09E+06	( 37)	52.0	32.8	82.7	3.1	33.9	31.3	36.8
4	7.51E+06	( 60)	6.26E+06	( 50)	52.7	35.6	78.3	1.3	34.4	31.7	37.3
9	5.11E+06	( 34)	4.20E+06	( 28)	53.3	31.4	91.2	0.9	34.6	31.9	37.5
35	6.76E+06	( 36)	5.26E+06	( 28)	56.1	33.4	95.5	0.5	34.9	32.2	37.8
21	5.38E+06	( 43)	4.00E+06	( 32)	58.9	36.5	96.2	0.2	35.3	32.6	38.2
44	9.95E+06	( 53)	6.94E+06	( 37)	62.5	40.4	97.9	0.1	35.7	33.0	38.6
13	9.95E+06	( 53)	6.94E+06	( 37)	62.8	40.6	98.3	0.0	36.1	33.4	39.1
29	5.17E+06	( 62)	3.59E+06	( 43)	62.9	42.0	95.2	0.0	36.6	33.9	39.6
5	6.61E+06	( 88)	4.50E+06	( 60)	64.3	45.8	91.0	0.0	37.3	34.6	40.3
26	3.23E+06	( 43)	2.10E+06	( 28)	66.9	40.7	111.9	0.0	37.7	34.9	40.7
42	5.35E+06	( 57)	3.47E+06	( 37)	67.2	43.7	104.6	0.0	38.1	35.3	41.2
28	4.08E+06	( 38)	2.57E+06	( 24)	69.0	40.4	120.2	0.0	38.4	35.6	41.5
43	7.21E+06	( 48)	3.90E+06	( 26)	80.3	49.0	134.9	0.0	38.9	36.1	41.9
POOL	5.21E+06	( 2211)	5.89E+06	( 2501)				0.0	38.9	36.1	41.9

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 299.0, 16.2

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 38.9, 37.4 -- 40.4 ( -1.5 +1.5)  
                   95% CONF. INTERVAL (Ma):           36.1 -- 41.9 ( -2.8 +3.1)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.7107, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 40.0, 37.9 -- 42.2 ( -2.1 +2.2)  
                   95% CONF. INTERVAL (Ma):           36.0 -- 44.4 ( -4.0 +4.4)  
                   AGE DISPERSION (%): 26.3

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 34.4, 33.0 -- 35.8 ( -1.4 +1.5)  
                   95% CONF. INTERVAL (Ma):           31.7 -- 37.3 ( -2.7 +2.9)  
                   NUMBER AND PERCENTAGE OF GRAINS: 39, 78%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 21.82 to 79.85 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
39.24	5.068	27.87

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
25.41	3.332	18.32
35.20	4.835	26.59
43.86	4.905	26.98
63.96	3.267	17.96

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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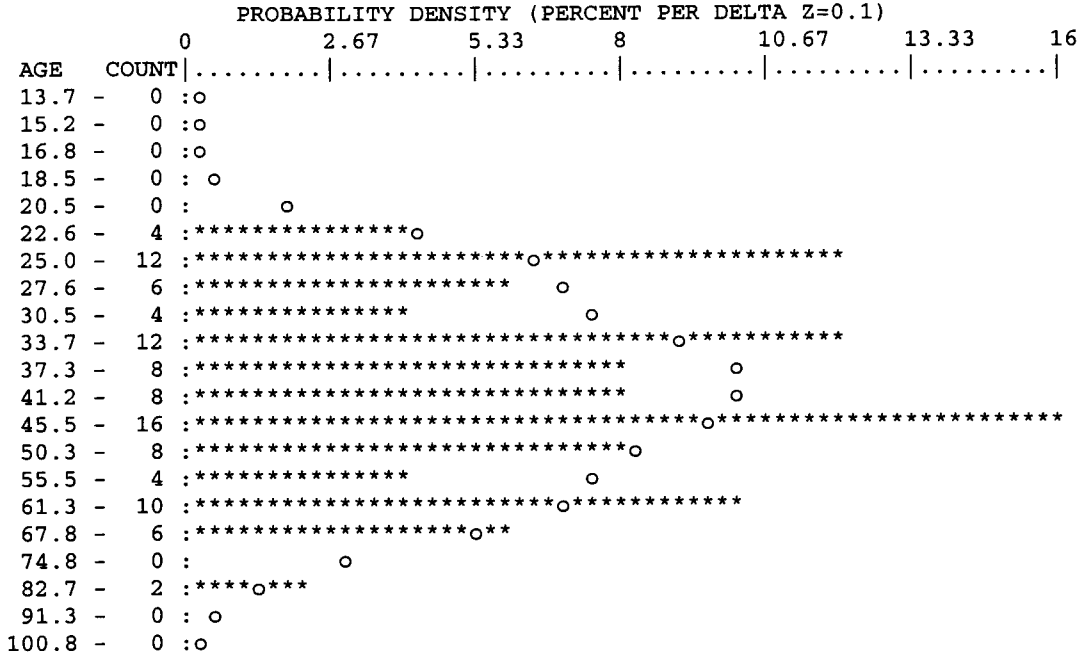
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KA-lab, U35Z-36,37

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.



**KL 2 - Kulthieth River**

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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KL-2ab, U35Z-38,39

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.401E+05  
 RELATIVE ERROR (%): 1.83  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	--95% CI--	
1	6.26E+06	( 50)	7.26E+06	( 58)	12	372 98	37.6	25.2	55.8
2	5.63E+06	( 45)	8.76E+06	( 70)	12	449 108	28.1	18.8	41.4
3	3.25E+06	( 26)	4.25E+06	( 34)	12	218 75	33.4	19.2	57.2
4	5.51E+06	( 44)	6.38E+06	( 51)	12	327 92	37.6	24.5	57.4
5	1.20E+07	( 48)	1.20E+07	( 48)	6	615 178	43.5	28.6	66.4
6	5.82E+06	( 31)	3.94E+06	( 21)	8	202 87	64.0	35.7	117.2
7	5.34E+06	( 32)	3.67E+06	( 22)	9	188 80	63.1	35.6	113.9
8	4.80E+06	( 32)	5.11E+06	( 34)	10	262 90	41.0	24.5	68.4
9	4.79E+06	( 51)	3.66E+06	( 39)	16	187 60	56.8	36.7	88.6
10	3.75E+06	( 45)	5.59E+06	( 67)	18	286 70	29.3	19.6	43.4
11	4.88E+06	( 39)	4.50E+06	( 36)	12	231 77	47.1	29.2	76.3
12	7.96E+06	( 53)	9.61E+06	( 64)	10	492 124	36.1	24.6	52.8
13	4.50E+06	( 30)	9.01E+06	( 60)	10	462 120	21.9	13.6	34.4
14	3.60E+06	( 24)	4.80E+06	( 32)	10	246 87	32.7	18.4	57.2
15	5.07E+06	( 54)	8.63E+06	( 92)	16	442 93	25.6	17.9	36.2
16	6.26E+06	( 50)	4.38E+06	( 35)	12	224 76	62.0	39.5	98.4
17	9.76E+06	( 65)	1.49E+07	( 99)	10	762 155	28.6	20.6	39.6
18	8.56E+06	( 57)	1.37E+07	( 91)	10	700 149	27.3	19.2	38.5
19	1.07E+07	( 57)	1.50E+07	( 80)	8	769 174	31.1	21.7	44.2
20	4.88E+06	( 26)	4.32E+06	( 23)	8	221 92	49.2	27.0	90.1
21	4.92E+06	( 59)	9.34E+06	( 112)	18	479 92	23.0	16.4	31.8
22	5.26E+06	( 28)	6.01E+06	( 32)	8	308 109	38.1	22.1	65.3
23	2.38E+06	( 19)	2.75E+06	( 22)	12	141 60	37.7	19.3	72.7
24	3.38E+06	( 36)	4.88E+06	( 52)	16	250 70	30.2	19.1	47.1
25	8.86E+06	( 59)	1.25E+07	( 83)	10	638 142	31.0	21.8	43.8
26	7.13E+06	( 95)	1.02E+07	( 136)	20	526 92	30.3	23.3	39.6
27	2.90E+06	( 27)	2.79E+06	( 26)	14	144 56	45.0	25.3	80.1
28	9.65E+06	( 90)	1.71E+07	( 159)	14	878 143	24.6	18.9	32.0
29	3.19E+06	( 34)	1.78E+06	( 19)	16	92 42	77.0	42.9	142.9
30	4.50E+06	( 54)	4.50E+06	( 54)	18	232 63	43.3	29.1	64.4
31	7.32E+06	( 39)	4.32E+06	( 23)	8	222 92	73.1	42.7	128.2
32	1.16E+07	( 62)	1.46E+07	( 78)	8	754 172	34.5	24.3	48.8
33	8.56E+06	( 57)	6.46E+06	( 43)	10	332 102	57.3	37.9	87.3
34	3.88E+06	( 31)	6.01E+06	( 48)	12	309 90	28.1	17.2	44.9
35	6.08E+06	( 81)	7.21E+06	( 96)	20	371 77	36.6	26.8	49.7
36	1.18E+07	( 47)	1.15E+07	( 46)	6	593 175	44.3	28.8	68.0
37	7.01E+06	( 28)	5.76E+06	( 23)	6	296 123	52.6	29.3	95.6
38	2.82E+06	( 30)	2.82E+06	( 30)	16	145 53	43.3	25.2	74.3
39	5.44E+06	( 29)	3.00E+06	( 16)	8	155 76	78.0	41.2	153.6
40	4.58E+06	( 61)	6.91E+06	( 92)	20	356 75	28.8	20.4	40.2
41	8.71E+06	( 58)	7.96E+06	( 53)	10	410 113	47.4	32.1	70.1
42	4.25E+06	( 34)	4.63E+06	( 37)	12	238 78	39.8	24.2	65.2
43	1.35E+07	( 108)	1.80E+07	( 144)	12	928 158	32.6	25.3	41.9
44	1.09E+07	( 58)	8.07E+06	( 43)	8	416 127	58.3	38.7	88.6
45	9.22E+06	( 86)	5.47E+06	( 51)	14	282 79	72.8	50.9	105.1
46	8.38E+06	( 67)	5.38E+06	( 43)	12	277 85	67.3	45.3	101.2
47	7.81E+06	( 52)	1.02E+07	( 68)	10	526 128	33.2	22.6	48.3
48	6.01E+06	( 40)	5.56E+06	( 37)	10	286 94	46.8	29.2	75.2

49	5.17E+06	( 31)	6.01E+06	( 36)	9	309	103	37.4	22.3	62.0
50	7.98E+06	( 85)	8.73E+06	( 93)	16	449	94	39.6	29.1	53.8

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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KL-2ab, U35Z-38,39

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
13	4.50E+06	( 30)	9.01E+06	( 60)	21.9	13.6	34.4	100.0	21.9	13.6	34.4
21	4.92E+06	( 59)	9.34E+06	( 112)	23.0	16.4	31.8	85.0	22.6	17.4	29.3
28	9.65E+06	( 90)	1.71E+07	( 159)	24.6	18.9	32.0	88.5	23.6	19.5	28.4
15	5.07E+06	( 54)	8.63E+06	( 92)	25.6	17.9	36.2	93.4	24.0	20.3	28.4
18	8.56E+06	( 57)	1.37E+07	( 91)	27.3	19.2	38.5	92.3	24.6	21.1	28.6
2	5.63E+06	( 45)	8.76E+06	( 70)	28.1	18.8	41.4	93.3	25.0	21.7	28.8
34	3.88E+06	( 31)	6.01E+06	( 48)	28.1	17.2	44.9	95.6	25.2	22.0	28.9
17	9.76E+06	( 65)	1.49E+07	( 99)	28.6	20.6	39.6	95.5	25.7	22.6	29.2
40	4.58E+06	( 61)	6.91E+06	( 92)	28.8	20.4	40.2	96.2	26.0	23.0	29.4
10	3.75E+06	( 45)	5.59E+06	( 67)	29.3	19.6	43.4	97.0	26.3	23.3	29.6
24	3.38E+06	( 36)	4.88E+06	( 52)	30.2	19.1	47.1	97.6	26.5	23.6	29.7
26	7.13E+06	( 95)	1.02E+07	( 136)	30.3	23.3	39.6	96.7	27.0	24.2	30.1
25	8.86E+06	( 59)	1.25E+07	( 83)	31.0	21.8	43.8	96.7	27.2	24.5	30.3
19	1.07E+07	( 57)	1.50E+07	( 80)	31.1	21.7	44.2	97.0	27.5	24.8	30.5
43	1.35E+07	( 108)	1.80E+07	( 144)	32.6	25.3	41.9	94.4	28.0	25.4	30.9
14	3.60E+06	( 24)	4.80E+06	( 32)	32.7	18.4	57.2	95.6	28.1	25.5	31.0
47	7.81E+06	( 52)	1.02E+07	( 68)	33.2	22.6	48.3	95.4	28.4	25.8	31.2
3	3.25E+06	( 26)	4.25E+06	( 34)	33.4	19.2	57.2	96.2	28.5	25.9	31.3
32	1.16E+07	( 62)	1.46E+07	( 78)	34.5	24.3	48.8	95.0	28.8	26.2	31.5
12	7.96E+06	( 53)	9.61E+06	( 64)	36.1	24.6	52.8	93.0	29.0	26.5	31.8
35	6.08E+06	( 81)	7.21E+06	( 96)	36.6	26.8	49.7	87.8	29.5	27.0	32.2
49	5.17E+06	( 31)	6.01E+06	( 36)	37.4	22.3	62.0	87.4	29.6	27.1	32.3
1	6.26E+06	( 50)	7.26E+06	( 58)	37.6	25.2	55.8	84.7	29.9	27.4	32.6
4	5.51E+06	( 44)	6.38E+06	( 51)	37.6	24.5	57.4	83.1	30.1	27.6	32.8
23	2.38E+06	( 19)	2.75E+06	( 22)	37.7	19.3	72.7	84.6	30.2	27.7	32.8
22	5.26E+06	( 28)	6.01E+06	( 32)	38.1	22.1	65.3	84.9	30.3	27.8	33.0
50	7.98E+06	( 85)	8.73E+06	( 93)	39.6	29.1	53.8	74.8	30.7	28.2	33.4
42	4.25E+06	( 34)	4.63E+06	( 37)	39.8	24.2	65.2	73.5	30.9	28.4	33.5
8	4.80E+06	( 32)	5.11E+06	( 34)	41.0	24.5	68.4	71.5	31.0	28.6	33.7
30	4.50E+06	( 54)	4.50E+06	( 54)	43.3	29.1	64.4	61.1	31.3	28.9	34.0
38	2.82E+06	( 30)	2.82E+06	( 30)	43.3	25.2	74.3	58.0	31.5	29.0	34.2
5	1.20E+07	( 48)	1.20E+07	( 48)	43.5	28.6	66.4	50.3	31.8	29.3	34.4
36	1.18E+07	( 47)	1.15E+07	( 46)	44.3	28.8	68.0	42.8	32.0	29.5	34.7
27	2.90E+06	( 27)	2.79E+06	( 26)	45.0	25.3	80.1	40.5	32.2	29.7	34.8
48	6.01E+06	( 40)	5.56E+06	( 37)	46.8	29.2	75.2	33.3	32.4	29.9	35.1
11	4.88E+06	( 39)	4.50E+06	( 36)	47.1	29.2	76.3	27.3	32.6	30.1	35.3
41	8.71E+06	( 58)	7.96E+06	( 53)	47.4	32.1	70.1	18.6	32.9	30.5	35.6
20	4.88E+06	( 26)	4.32E+06	( 23)	49.2	27.0	90.1	16.4	33.1	30.6	35.8
37	7.01E+06	( 28)	5.76E+06	( 23)	52.6	29.3	95.6	12.7	33.3	30.8	35.9
9	4.79E+06	( 51)	3.66E+06	( 39)	56.8	36.7	88.6	5.1	33.6	31.1	36.3
33	8.56E+06	( 57)	6.46E+06	( 43)	57.3	37.9	87.3	1.6	34.0	31.5	36.7
44	1.09E+07	( 58)	8.07E+06	( 43)	58.3	38.7	88.6	0.4	34.4	31.9	37.1
16	6.26E+06	( 50)	4.38E+06	( 35)	62.0	39.5	98.4	0.1	34.8	32.3	37.5
7	5.34E+06	( 32)	3.67E+06	( 22)	63.1	35.6	113.9	0.0	35.0	32.5	37.8
6	5.82E+06	( 31)	3.94E+06	( 21)	64.0	35.7	117.2	0.0	35.2	32.7	38.0
46	8.38E+06	( 67)	5.38E+06	( 43)	67.3	45.3	101.2	0.0	35.7	33.2	38.5
45	9.22E+06	( 86)	5.47E+06	( 51)	72.8	50.9	105.1	0.0	36.4	33.8	39.2
31	7.32E+06	( 39)	4.32E+06	( 23)	73.1	42.7	128.2	0.0	36.7	34.1	39.5
29	3.19E+06	( 34)	1.78E+06	( 19)	77.0	42.9	142.9	0.0	37.0	34.4	39.8
39	5.44E+06	( 29)	3.00E+06	( 16)	78.0	41.2	153.6	0.0	37.2	34.6	40.1
POOL	6.18E+06	( 2444)	7.23E+06	( 2859)				0.0	37.2	34.6	40.1

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 370.2, 19.4



POOLED AGE WITH 68% CONF. INTERVAL (Ma): 37.2, 35.9 -- 38.7 ( -1.4 +1.4)  
                   95% CONF. INTERVAL (Ma):           34.6 -- 40.1 ( -2.6 +2.8)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.7160, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 39.1, 37.1 -- 41.2 ( -2.0 +2.1)  
                   95% CONF. INTERVAL (Ma):           35.3 -- 43.4 ( -3.8 +4.2)  
                   AGE DISPERSION (%): 25.3

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 34.0, 32.7 -- 35.4 ( -1.3 +1.4)  
                   95% CONF. INTERVAL (Ma):           31.5 -- 36.7 ( -2.5 +2.7)  
                   NUMBER AND PERCENTAGE OF GRAINS: 41, 82%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 21.98 to 77.24 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
32.30	5.659	30.80

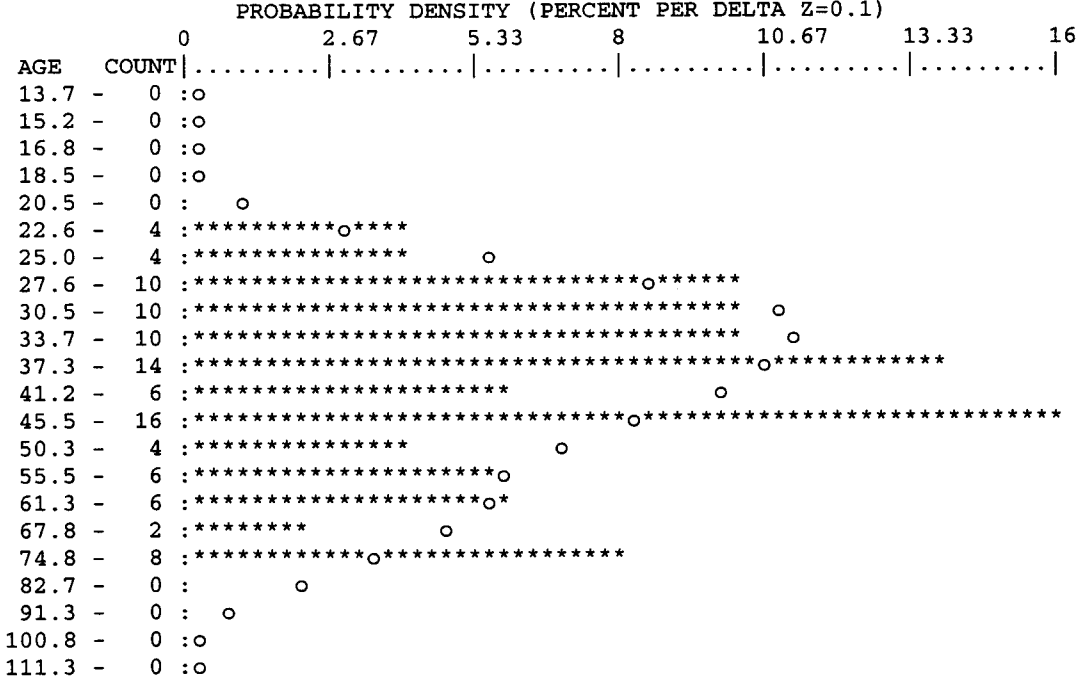
Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
24.31	2.431	13.23
30.71	5.506	29.97
39.73	5.182	28.20
69.69	2.289	12.46

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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 KL-2ab, U35Z-38,39

Kernel factor = .6 (Ratio of kernel window size to standard error)  
 Number of grains = 50 Barwidth (Z units) = .1  
 Histogram shown by asterisks and probability distribution by circles.



**DK 3 - Duktoth River**

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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DK-3a, U35Z-40

>>NEW PARAMETERS--ZETA METHOD<<

EFFECTIVE TRACK DENSITY FOR FLUENCE MONITOR (tracks/cm<sup>2</sup>): 2.378E+05  
 RELATIVE ERROR (%): 1.84  
 EFFECTIVE URANIUM CONTENT OF MONITOR (ppm): 12.30  
 ZETA FACTOR AND STANDARD ERROR (yr cm<sup>2</sup>): 363.85 6.46  
 SIZE OF COUNTER SQUARE (cm<sup>2</sup>): 6.660E-07

----- GRAIN AGES IN ORIGINAL ORDER -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Squares	U+/-2s	Grain Age (Ma)	Age	--95% CI--
1	7.01E+06	( 56)	6.38E+06	( 51)	12	330 93	47.3	31.8	70.6
2	7.04E+06	( 75)	9.20E+06	( 98)	16	476 97	33.1	24.1	45.1
3	8.11E+06	( 54)	9.61E+06	( 64)	10	497 125	36.4	24.8	53.2
4	4.42E+06	( 53)	3.25E+06	( 39)	18	168 54	58.5	38.0	90.8
5	9.61E+06	( 64)	8.26E+06	( 55)	10	427 116	50.1	34.4	73.3
6	9.46E+06	( 63)	1.11E+07	( 74)	10	575 135	36.8	25.8	52.2
7	2.44E+06	( 26)	2.25E+06	( 24)	16	116 47	46.7	25.8	84.8
8	4.40E+06	( 41)	5.15E+06	( 48)	14	266 77	36.9	23.7	57.1
9	2.63E+06	( 35)	2.25E+06	( 30)	20	116 42	50.2	30.0	84.7
10	1.04E+07	( 69)	9.91E+06	( 66)	10	513 127	45.1	31.7	64.2
11	7.21E+06	( 48)	9.31E+06	( 62)	10	482 123	33.4	22.4	49.5
12	9.31E+06	( 62)	9.16E+06	( 61)	10	474 122	43.8	30.3	63.5
13	1.04E+07	( 69)	9.16E+06	( 61)	10	474 122	48.7	34.0	70.0
14	1.00E+07	( 40)	1.13E+07	( 45)	6	582 174	38.4	24.4	60.1
15	4.20E+06	( 56)	5.26E+06	( 70)	20	272 66	34.5	23.8	49.8
16	5.56E+06	( 37)	4.80E+06	( 32)	10	249 88	49.8	30.2	82.6
17	3.68E+06	( 49)	3.30E+06	( 44)	20	171 52	48.0	31.3	73.8
18	5.03E+06	( 67)	6.83E+06	( 91)	20	353 75	31.8	22.8	44.1
19	6.91E+06	( 46)	1.16E+07	( 77)	10	598 138	25.8	17.5	37.7
20	4.35E+06	( 29)	4.95E+06	( 33)	10	256 89	37.9	22.2	64.4
21	6.01E+06	( 36)	5.17E+06	( 31)	9	268 96	50.0	30.1	83.6
22	4.38E+06	( 35)	4.88E+06	( 39)	12	252 81	38.7	23.8	62.7
23	1.38E+06	( 11)	2.13E+06	( 17)	12	110 53	28.1	11.8	63.1
24	6.23E+06	( 83)	8.41E+06	( 112)	20	435 84	32.0	24.0	42.7
25	7.32E+06	( 78)	7.41E+06	( 79)	16	383 87	42.6	30.7	59.0
26	7.88E+06	( 63)	5.63E+06	( 45)	12	291 87	60.2	40.5	90.4
27	4.63E+06	( 37)	4.75E+06	( 38)	12	246 80	42.0	26.0	67.8
28	8.76E+06	( 70)	7.76E+06	( 62)	12	401 103	48.7	34.1	69.7
29	1.10E+07	( 44)	8.76E+06	( 35)	6	453 153	54.1	34.0	86.9
30	5.82E+06	( 62)	7.32E+06	( 78)	16	379 87	34.3	24.1	48.6
31	2.70E+06	( 36)	3.98E+06	( 53)	20	206 57	29.4	18.6	45.7
32	3.38E+06	( 45)	4.73E+06	( 63)	20	245 62	30.9	20.5	46.0
33	3.75E+06	( 50)	3.83E+06	( 51)	20	198 56	42.3	28.0	63.7
34	4.50E+06	( 48)	9.85E+06	( 105)	16	510 101	19.8	13.7	28.1
35	7.13E+06	( 38)	9.38E+06	( 50)	8	485 138	32.8	20.9	51.0
36	7.01E+06	( 42)	8.51E+06	( 51)	9	440 124	35.6	23.0	54.6
37	8.58E+06	( 80)	4.72E+06	( 44)	14	244 74	78.1	53.5	115.6
38	2.70E+06	( 36)	3.15E+06	( 42)	20	163 50	37.0	23.0	59.1
39	3.00E+06	( 20)	8.41E+06	( 56)	10	435 117	15.5	8.8	26.1
40	7.51E+06	( 60)	6.51E+06	( 52)	12	337 94	49.7	33.7	73.5
41	5.67E+06	( 68)	5.42E+06	( 65)	18	280 70	45.1	31.6	64.4
42	4.00E+06	( 32)	9.38E+06	( 75)	12	485 113	18.5	11.8	28.3
43	4.88E+06	( 39)	4.25E+06	( 34)	12	220 75	49.4	30.4	80.7
44	3.00E+06	( 28)	6.76E+06	( 63)	14	349 89	19.3	11.8	30.4
45	3.75E+06	( 35)	3.54E+06	( 33)	14	183 64	45.7	27.6	75.9
46	1.07E+07	( 57)	9.01E+06	( 48)	8	466 135	51.2	34.2	76.8
47	6.38E+06	( 51)	4.00E+06	( 32)	12	207 73	68.5	43.3	110.1
48	4.50E+06	( 54)	5.09E+06	( 61)	18	263 68	38.2	26.0	56.0

49	1.00E+07 ( 80)	9.38E+06 ( 75)	12	485 113	46.0	33.1	63.9
50	4.79E+06 ( 51)	7.79E+06 ( 83)	16	403 89	26.6	18.3	38.1

=====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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DK-3a, U35Z-40

Number of grains = 50

----- GRAIN AGES ORDERED WITH INCREASING AGE -----

Grain no.	RhoS (cm <sup>-2</sup> )	(Ns)	RhoI (cm <sup>-2</sup> )	(Ni)	Grain age (Ma)	Age	--95% CI--	P(X2) (%)	Sum age (Ma)	Age	--95% CI--
39	3.00E+06	( 20)	8.41E+06	( 56)	15.5	8.8	26.1	100.0	15.5	8.8	26.1
42	4.00E+06	( 32)	9.38E+06	( 75)	18.5	11.8	28.3	59.6	17.2	12.2	23.9
44	3.00E+06	( 28)	6.76E+06	( 63)	19.3	11.8	30.4	80.2	17.9	13.7	23.3
34	4.50E+06	( 48)	9.85E+06	( 105)	19.8	13.7	28.1	88.4	18.5	15.0	22.9
19	6.91E+06	( 46)	1.16E+07	( 77)	25.8	17.5	37.7	54.7	20.0	16.6	24.1
50	4.79E+06	( 51)	7.79E+06	( 83)	26.6	18.3	38.1	41.4	21.2	17.9	25.0
23	1.38E+06	( 11)	2.13E+06	( 17)	28.1	11.8	63.1	48.2	21.4	18.2	25.2
31	2.70E+06	( 36)	3.98E+06	( 53)	29.4	18.6	45.7	39.7	22.2	19.0	25.9
32	3.38E+06	( 45)	4.73E+06	( 63)	30.9	20.5	46.0	28.6	23.1	20.0	26.8
18	5.03E+06	( 67)	6.83E+06	( 91)	31.8	22.8	44.1	16.8	24.3	21.2	27.8
24	6.23E+06	( 83)	8.41E+06	( 112)	32.0	24.0	42.7	10.6	25.4	22.4	28.7
35	7.13E+06	( 38)	9.38E+06	( 50)	32.8	20.9	51.0	10.6	25.8	22.9	29.1
2	7.04E+06	( 75)	9.20E+06	( 98)	33.1	24.1	45.1	8.3	26.6	23.7	29.8
11	7.21E+06	( 48)	9.31E+06	( 62)	33.4	22.4	49.5	8.3	27.0	24.1	30.2
30	5.82E+06	( 62)	7.32E+06	( 78)	34.3	24.1	48.6	7.3	27.5	24.7	30.6
15	4.20E+06	( 56)	5.26E+06	( 70)	34.5	23.8	49.8	7.0	27.9	25.2	31.0
36	7.01E+06	( 42)	8.51E+06	( 51)	35.6	23.0	54.6	7.1	28.3	25.5	31.3
3	8.11E+06	( 54)	9.61E+06	( 64)	36.4	24.8	53.2	6.4	28.7	25.9	31.7
6	9.46E+06	( 63)	1.11E+07	( 74)	36.8	25.8	52.2	5.4	29.1	26.4	32.1
8	4.40E+06	( 41)	5.15E+06	( 48)	36.9	23.7	57.1	5.6	29.4	26.7	32.4
38	2.70E+06	( 36)	3.15E+06	( 42)	37.0	23.0	59.1	6.0	29.6	26.9	32.6
20	4.35E+06	( 29)	4.95E+06	( 33)	37.9	22.2	64.4	6.5	29.8	27.1	32.7
48	4.50E+06	( 54)	5.09E+06	( 61)	38.2	26.0	56.0	6.0	30.1	27.5	33.1
14	1.00E+07	( 40)	1.13E+07	( 45)	38.4	24.4	60.1	6.1	30.4	27.7	33.3
22	4.38E+06	( 35)	4.88E+06	( 39)	38.7	23.8	62.7	6.3	30.6	27.9	33.5
27	4.63E+06	( 37)	4.75E+06	( 38)	42.0	26.0	67.8	5.6	30.8	28.2	33.7
33	3.75E+06	( 50)	3.83E+06	( 51)	42.3	28.0	63.7	4.3	31.2	28.5	34.1
25	7.32E+06	( 78)	7.41E+06	( 79)	42.6	30.7	59.0	2.5	31.7	29.0	34.6
12	9.31E+06	( 62)	9.16E+06	( 61)	43.8	30.3	63.5	1.7	32.1	29.4	35.0
10	1.04E+07	( 69)	9.91E+06	( 66)	45.1	31.7	64.2	0.9	32.5	29.9	35.4
41	5.67E+06	( 68)	5.42E+06	( 65)	45.1	31.6	64.4	0.6	32.9	30.3	35.8
45	3.75E+06	( 35)	3.54E+06	( 33)	45.7	27.6	75.9	0.5	33.2	30.5	36.0
49	1.00E+07	( 80)	9.38E+06	( 75)	46.0	33.1	63.9	0.3	33.6	31.0	36.5
7	2.44E+06	( 26)	2.25E+06	( 24)	46.7	25.8	84.8	0.3	33.8	31.1	36.6
1	7.01E+06	( 56)	6.38E+06	( 51)	47.3	31.8	70.6	0.2	34.1	31.4	37.0
17	3.68E+06	( 49)	3.30E+06	( 44)	48.0	31.3	73.8	0.1	34.4	31.7	37.2
28	8.76E+06	( 70)	7.76E+06	( 62)	48.7	34.1	69.7	0.1	34.8	32.1	37.6
13	1.04E+07	( 69)	9.16E+06	( 61)	48.7	34.0	70.0	0.0	35.1	32.5	38.0
43	4.88E+06	( 39)	4.25E+06	( 34)	49.4	30.4	80.7	0.0	35.3	32.7	38.2
40	7.51E+06	( 60)	6.51E+06	( 52)	49.7	33.7	73.5	0.0	35.6	33.0	38.5
16	5.56E+06	( 37)	4.80E+06	( 32)	49.8	30.2	82.6	0.0	35.8	33.2	38.7
21	6.01E+06	( 36)	5.17E+06	( 31)	50.0	30.1	83.6	0.0	36.0	33.4	38.9
5	9.61E+06	( 64)	8.26E+06	( 55)	50.1	34.4	73.3	0.0	36.3	33.7	39.2
9	2.63E+06	( 35)	2.25E+06	( 30)	50.2	30.0	84.7	0.0	36.5	33.8	39.4
46	1.07E+07	( 57)	9.01E+06	( 48)	51.2	34.2	76.8	0.0	36.8	34.1	39.6
29	1.10E+07	( 44)	8.76E+06	( 35)	54.1	34.0	86.9	0.0	37.0	34.3	39.9
4	4.42E+06	( 53)	3.25E+06	( 39)	58.5	38.0	90.8	0.0	37.3	34.6	40.2
26	7.88E+06	( 63)	5.63E+06	( 45)	60.2	40.5	90.4	0.0	37.7	35.0	40.6
47	6.38E+06	( 51)	4.00E+06	( 32)	68.5	43.3	110.1	0.0	38.0	35.3	41.0
37	8.58E+06	( 80)	4.72E+06	( 44)	78.1	53.5	115.6	0.0	38.7	35.9	41.6
POOL	5.59E+06	( 2508)	6.23E+06	( 2797)				0.0	38.7	35.9	41.6

MEAN URANIUM CONCENTRATION +/-2SE (ppm): 322.3, 17.0

POOLED AGE WITH 68% CONF. INTERVAL (Ma): 38.7, 37.3 -- 40.2 ( -1.4 +1.5)  
                   95% CONF. INTERVAL (Ma):           35.9 -- 41.6 ( -2.7 +2.9)  
 REDUCED CHI^2, DEGREES OF FREEDOM: 2.5647, 49  
                   CHI^2 PROBABILITY: 0.0%

CENTRAL AGE WITH 68% CONF. INTERVAL (Ma): 39.0, 37.1 -- 41.0 ( -1.9 +2.0)  
                   95% CONF. INTERVAL (Ma):           35.3 -- 43.1 ( -3.7 +4.1)  
                   AGE DISPERSION (%): 24.1

CHI^2 AGE WITH 68% CONF. INTERVAL (Ma): 32.1, 30.7 -- 33.5 ( -1.4 +1.4)  
                   95% CONF. INTERVAL (Ma):           29.4 -- 35.0 ( -2.6 +2.9)  
                   NUMBER AND PERCENTAGE OF GRAINS: 29, 58%

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50

PEAKS IN PROBABILITY DISTRIBUTION

The modes in the distribution are found by inspecting the derivatives of the probability density as a function of Z.

Probability distribution uses grain-only standard errors.

Total probability mass integrates to N (= number of grains).

Probability density is given as grains per delta Z=0.1.

At 50 Ma, delta Z=0.1 is equivalent to a time interval of 5 m.y.

Total range for grain ages = 15.68 to 77.79 Ma

First Search: peaks with zero first derivatives.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
19.37	1.130	5.89
36.58	5.797	30.24
45.67	6.843	35.70

Second search: find minima in the second derivative of the Gaussian probability density function.

AGE (Ma)	PROBABILITY DENSITY AT PEAK (grains/DZ=0.1)	EST. N (grains)
19.19	1.128	5.88
25.13	1.248	6.51
33.29	5.415	28.25
47.08	6.744	35.19
79.10	0.563	2.94

====ZetaAge Program v. 4.8 (Brandon 8/13/02)=====

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DK-3a, U35Z-40

Kernel factor = .6 (Ratio of kernel window size to standard error)

Number of grains = 50 Barwidth (Z units) = .1

Histogram shown by asterisks and probability distribution by circles.

