GSA REPOSITORY 1

PALEOMAGNETISM AND GEOCHRONOLOGY OF THE ROHTAS SECTION

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PALEOMAGNETISM – Methods (Full version of summary provided in main text)

Rock samples for paleomagnetic analysis were collected from 360 sites with either a hand rasp (following the procedure outlined by Johnson et al. 1975) or a Pomeroy water-cooled gasoline drill. At least three samples were collected from each site with a vertical interval at each site ranging from 0.1 to 0.5 m, and lateral spacing of generally less than one meter. Sample locations were photographed and marked on the map and the section log, and many of the sites were recorded by GPS. A pick mattock was used to dig holes up to 0.7 m deep at the rasp sites in order to collect samples from unweathered siltstone or claystone. These samples were oriented on the outcrop using a hand rasp and a Brunton compass, and each sample was milled into a 2.5 cm^3 block using a cut-off saw and vertical platter grinder. Drilled samples were collected with a 2.5 cm diameter drill bit and oriented on the outcrop. Each core was drilled to a depth of seven to 10 cm in order to avoid the outer weathered surface, and the bottom 2.5 cm length was trimmed from this long core with a cut-off saw for study. Measurements were made on a 2G SCT superconducting magnetometer in a magnetically shielded room at the University of Texas.

Previous studies of Siwalik sediments have shown that both magnetite (Opdyke et al. 1979) and specular hematite (Tauxe et al. 1980) can serve as the carriers of the primary magnetic remanence. It is common to find varying contributions of pigmentary hematite in these rocks as well (Tauxe et al. 1980, Tauxe and Badgley 1984). Detailed studies by Stubblefield (1993) of the Rohtas rock samples further confirm these observations. Given this potential mix of magnetic minerals, thermal demagnetization is preferred over alternating-field (AF) demagnetization. A program of step-wise thermal demagnetization was used to remove secondary magnetic components acquired from either the present or past fields or oxidation reactions. Temperature stepping was carried out with a low-field Schonstedt Thermal Demagnetizer (TSD-1) in a shielded room. Calculations were made using PaleoMagCalc©, a paleomagnetics analysis program for Windows (Crow et al., 1993).

Paleomagnetic results

Each sample was measured for its natural remanence magnetism (NRM). Step-wise thermal demagnetization included seven and sometimes ten temperature steps with measurements taken after each step. The results for two typical samples are shown in Figure 1. Sample D12C (180.3 m) is of normal polarity (fig. 1a). It shows a low temperature normal overprint that is removed by 400°C, followed by a linear decay toward origin. Sample D48E (427.5 m) is of reversed polarity (Fig. 1b). It demonstrates a weak normal overprint that after removal by 200° C shows a nearly linear decay toward origin. Other reversed samples sometimes had a normal overprint that was not removed until 400°C. Neither of these two samples fully reaches the origin even though each was temperature stepped to 675°C but the directions of the vectors are clear.

Some samples collected from sandstones had a stubborn normal overprint that was not successfully removed by thermal demagnetization. This overprint was recognized by the fact that upon correction with bedding, the inclination shifted to a negative value while retaining a northern hemisphere declination. In most cases this overprint was easy to recognize because the bedding dips in this section are steep and range from 31°-56°. Shallower dips might have prevented the recognition of this overprint.

Repository 1, Figure 1

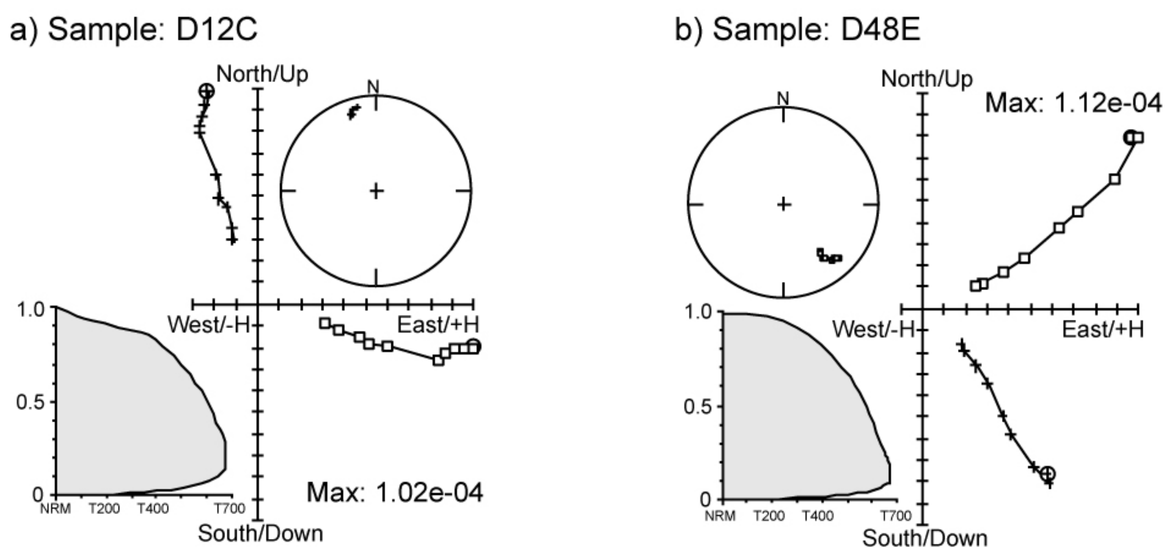

Figure 1. Results from thermal demagnetization treatments of representative samples shown by vector endpoint diagrams, stereoplots, and normalized intensity and temperature plots. (a) Sample D12C (180.3 m) demonstrates a normal overprint at NRM that is removed by 400°C, with the isolation of a stable normal vector with a decay toward origin. (b) Sample D48E (427.5 m) shows a normal overprint that is removed by 200° C and a stable reversed vector to 675°C. The plot of normalized intensity versus temperature suggests the presence of a combination of magnetite or maghemite and hematite. Symbols for VED plots: cross equals declination, hollow square equals inclination; for stereonets: crosses are lower hemisphere, hollow squares are upper hemisphere.

The magnetic vector for each sample was analyzed by calculating a best-fit line using the principal component analysis (PCA) routine (Kirschvink 1980) in PaleoMagCalc© (Crow et al, 1993). In many cases it was clear that the low temperature steps isolated a normal overprint, probably of recent origin, and these steps were not included in the analysis. Values were accepted as statistically significant if the maximum angular deviation (MAD) value was less than 15°. In those cases where the MAD value exceeded 15° but the polarity of the sample was not in question, a mean vector was calculated using the various temperature steps with Fisher statistics (1953), and statistical significance was evaluated with Watson's (1956) test for randomness. Site means and virtual geomagnetic pole latitudes were next calculated using Fisher statistics for those sites with three or more statistically significant samples. Statistical significance was again tested with the Watson criteria (1956).

Of the 360 sites that were sampled in this study, 314 provided samples having a stable magnetic direction. The remaining 36 sites demonstrated a stubborn present-day field overprint that was not unambiguously removed on thermal demagnetization (discussed above), and these samples were excluded from further study. The mean sample site density for the lower portion of the section is 8.7 m (±10.98 m 1 standard deviation, range of 0.1 - 91.2 m), while that of the upper portion of the section is 15.0 m (±22.0 m, 1 standard deviation, range of 0.1 - 159.3 m), for a section mean of 10.8 m (±15.8 m, 1 standard deviation). Site spacing was seriously constrained by the presence of thick sandstone bodies but in some cases well-cemented regions within the sandstones were sampled by drilling and produced good results.

A total of 209 sites contained three (195 sites: mean r statistic of 2.904 ± 0.099) or more (14 sites) samples that satisfied the statistical criteria noted above. The remaining 104 sites contained one and sometimes two samples of unambiguous polarity but because of small sample size did not satisfy the site criteria. In some cases samples from closely spaced sites were combined to produce a composite site that met statistical significance (32 sites for 15 composite sites). A stereoplot of the NRM measurement for one sample from each of the 209 sites with bedding correction is shown in Figure 2a, and it is interesting to note that a large number of samples are of reversed polarity at NRM. The effect of the normal overprint discussed above is also apparent. A stereoplot of the statistically significant site means after thermal demagnetization with the removal of 11 normal and 10 reversed sites with an angular standard deviation greater than 1.5 is given in figure 2b. The normal and reversed populations are roughly antipodal to one another and demonstrate the counter-clockwise rotation that has been previously noted for the Siwaliks (Opdyke et al. 1982). The Rohtas section is relatively uniform in its direction of dip and so a fold test could not be carried out with these data. A reversal test was conducted with the statistically significant site means plotted in figure 2b. An F-test shows that although the site means approach overlap at the $\alpha 95\%$ level, the two populations differ at $p < 0.05$. This result suggests that the thermal demagnetization treatments may not have been completely successful in removing the stubborn normal overprint. These data do, however, show that stable magnetic vectors of both normal and reversed polarity are preserved in the sediments of the Rohtas section. It is very likely that these directions reflect the primary detrital remanence.

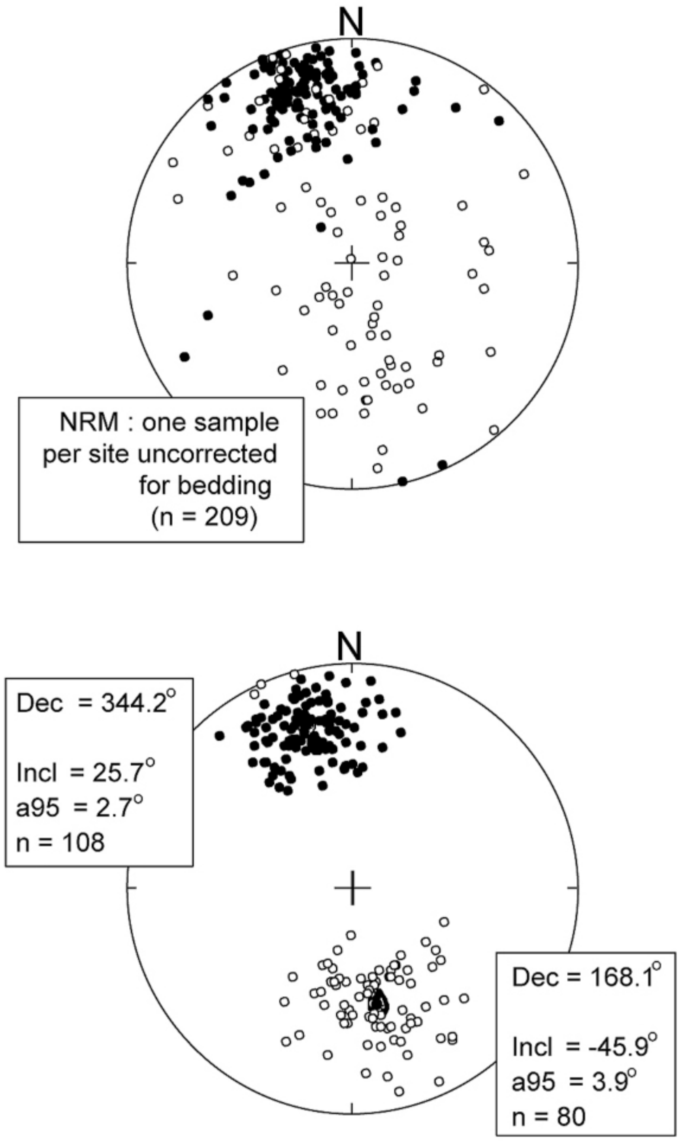

Figure 2. Plots of Schmidt equal area projections for samples and site means. (a) Plot of one sample from each of the statistically significant sites at NRM with bedding correction shows that many samples are of reversed polarity in spite of the effect of a present-day field overprint. (b) Plot of statistically significant site means after thermal demagnetization with the removal of 11 normal and 10 reversed sites having an ASD greater than 1.5. These sites demonstrate a separation into normal and reversed populations that are largely antipodal to one another. Population means (Xs) and α95 ellipses are also shown. The mean and α95 ellipse for the entire sample with reversed sites inverted is given by the black X and the lightly shaded ellipse in the northern hemisphere, and this approaches the mean and α95 ellipse for the normal population. Symbols: solid circles are lower hemisphere, hollow circles are upper hemisphere.

The paleomagnetic reversal stratigraphy of the Rohtas section is given in repository figure 3. Virtual geomagnetic pole (VGP) latitudes are plotted for each sample from the 314 sites (hollow circles) along with the statistically significant site means (solid circles). The reversal stratigraphy reveals mixture of normal and reversed polarities, with a distinctive predominantly long normal zone of nearly 600 m (N12-N14) in the upper portion of the section, and a long predominantly reversed zone of over 800 m (R6-R12) in the lower half of the section that includes many shorter intervals of normal polarity of varying thickness (N6-N11). In most cases the transitions from one polarity zone to another are tightly constrained by closely spaced sites of statistical significance (note the nearly horizontal lines connecting the statistically significant site means at polarity transitions seen in fig. 3) but the transitions from N14-R15-N15 are poorly defined because of wide site spacings. The majority of the polarity intervals are defined by multiple sites of statistical significance. Five intervals (R0, R1; N0, N2, N15) are defined by a single statistically significant site but these are generally constrained by closely spaced sites of opposite polarity which suggests that these intervals are well defined. It is possible that future resampling could better define the levels of these transitions, as well as test the existence of the five polarity zones that are presently defined by single sites. The lower and upper sections are separately from one another along strike by approximately one km. Both sections were sampled for overlap (seen in the middle of figure 3) and the results show that polarity zones R11-N11-R12 are present in both sections. This correlation between the two sections is further supported by the stratigraphic level of the Rohtas Shahi Road, built by the Afghan ruler Sher Shah Suri in the 1540s. The road is shown by the two-headed arrow and dashed line at 1052 m and

Repository 1, Figure 3

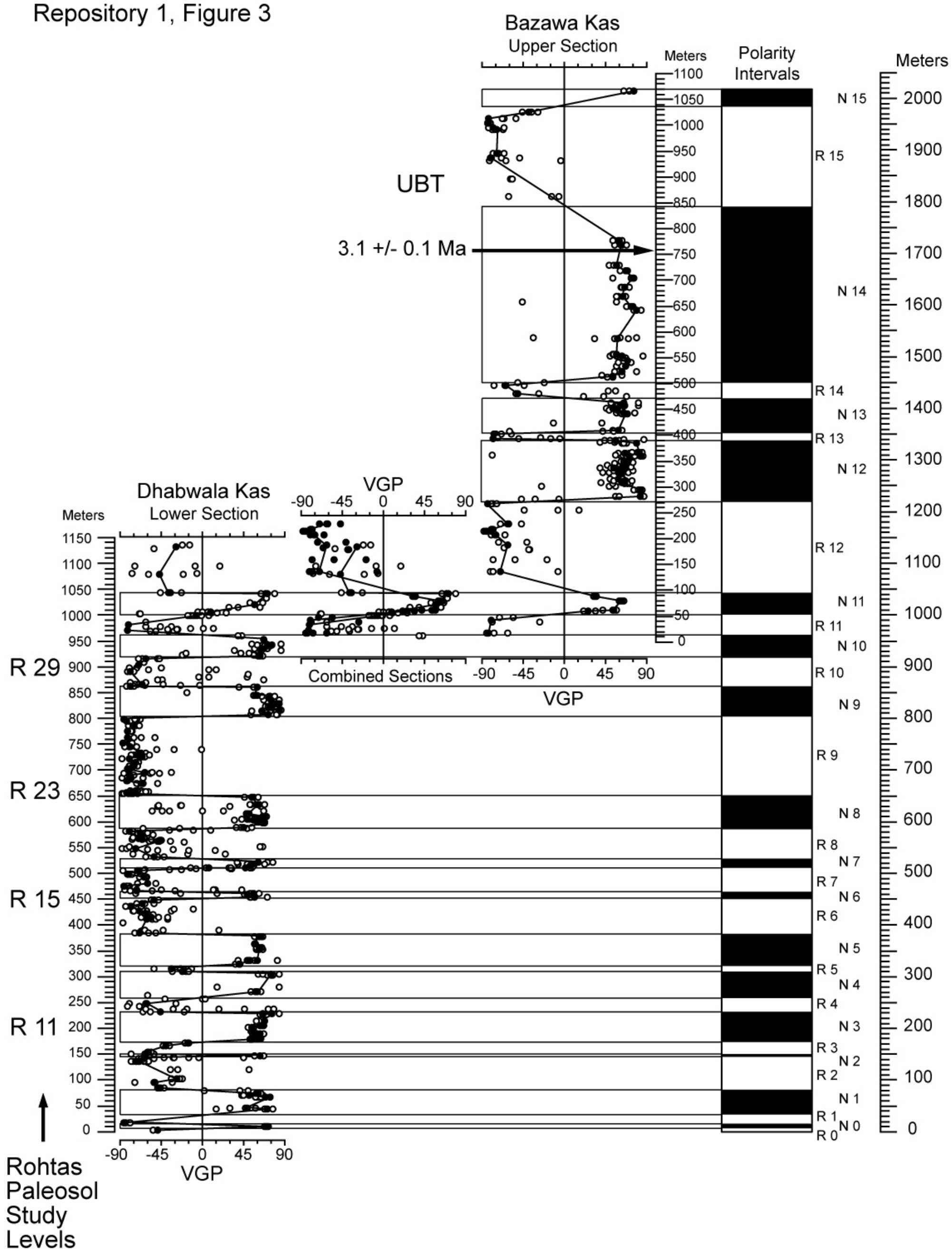

Figure 3. Reversal stratigraphy of the compsite Rohtas section. The link between the upper and lower sections is indicated by the overlapping data plotted as "Combined Sections" from the lower and upper sections. All statistically significant samples are plotted in stratigraphic superposition as hollow circles by their virtual geomagnetic pole latitude based on either a PCA calculation or a Fisher fit, with statistically significant site means based on three or more samples shown by solid circles. The interpretation of the paleomagnetic reversal stratigraphy is given by the boundaries of the hollow rectangles, with the transition between polarity zones plotted as the midpoint between statistically significant site means of opposite polarity. This interpretation is repeated at right, with black intervals representing normal polarity, and white intervals representing reversed polarity. The majority of the polarity intervals are defined by multiple sites, and many of the single site intervals are tightly constrained by closely sampled sites (Data in Repository 1).

107 m in the lower and upper sections, respectively, and largely follows the strike of the sandstone beds. The composite thickness of the lower and upper sections equals 2,020 m. Numerous volcanic tuffs are present in the upper part of the section and dates for some of these are given in Johnson et al. (1982), Opdyke et al. (1979), and Johnson et al. (1979). We have redated one of the tuffs at the 755 m level in the upper section as 3.1 ± 0.1 Ma (figure 4) and this date can be used to correlate the upper part of the section to the

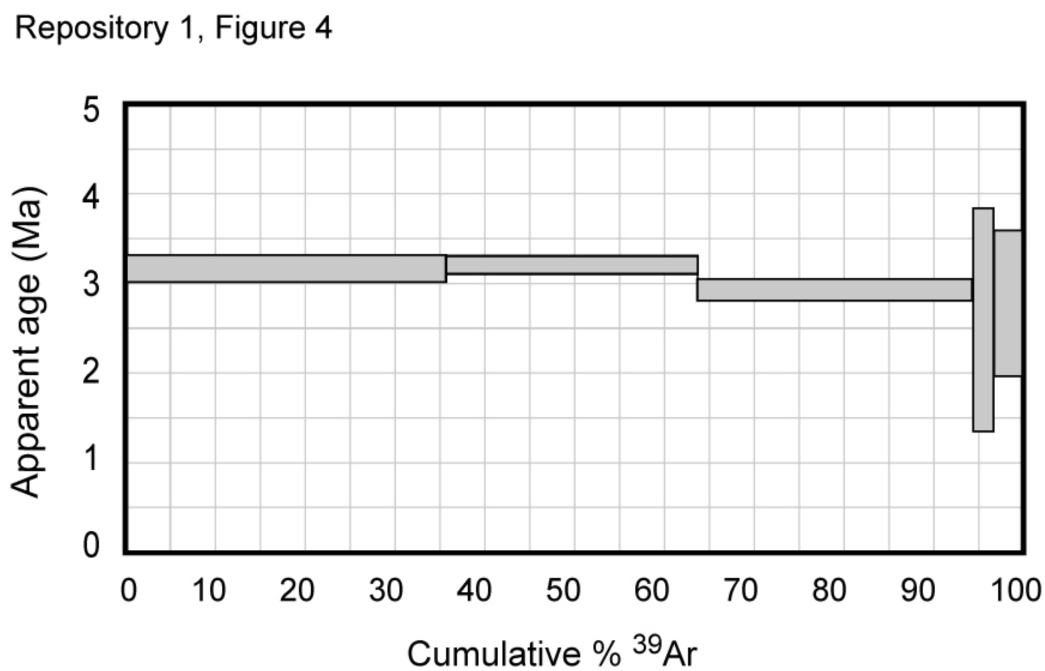

Figure 4. $^{40}Ar/^{39}Ar$ age spectrum for biotite from a tuff from the 1700 m stratigraphic level. Weighted average of all five steps analyzed is 3.1 ± 0.1 Ma. See also Repository Item 1.

geomagnetic reversal time scale (GRTS). An additional biostratigraphic correlation is also available. *Hipparion* is a distinctive three-toed perissodactyl that entered the Old World during the late Miocene but the exact dating of this event and the question of its utility as a datum has been plagued with uncertainty (Sen 1989). More recent work that addresses the question of the age of the *Hipparion* datum in the Miocene Sinap Formation of Turkey (Kappelman *et al*., 1996; Bernor et al., 2003), and a recalibration of the first occurrence of this taxon in the Siwaliks (Pilbeam *et al*., 1996), suggests that the *Hipparion* dispersal event was largely synchronous and occurred near the beginning of the long normal of Chron 5 although other workers such as Garcés *et al*. (1997) note that it might be somewhat earlier. The recently published time scale of Cande and Kent (1995) can be used to place this event in Sinap and the Siwaliks at about 10.7 Ma. Isolated specimens of *Hipparion* occur near the base of the Rohtas section and these fossils can be used as support for the argument that this level postdates this age. The absence of a distinctive long normal zone at the base of the section further suggests that the Rohtas section postdates Chron 5.

Repository 1, Figure 5

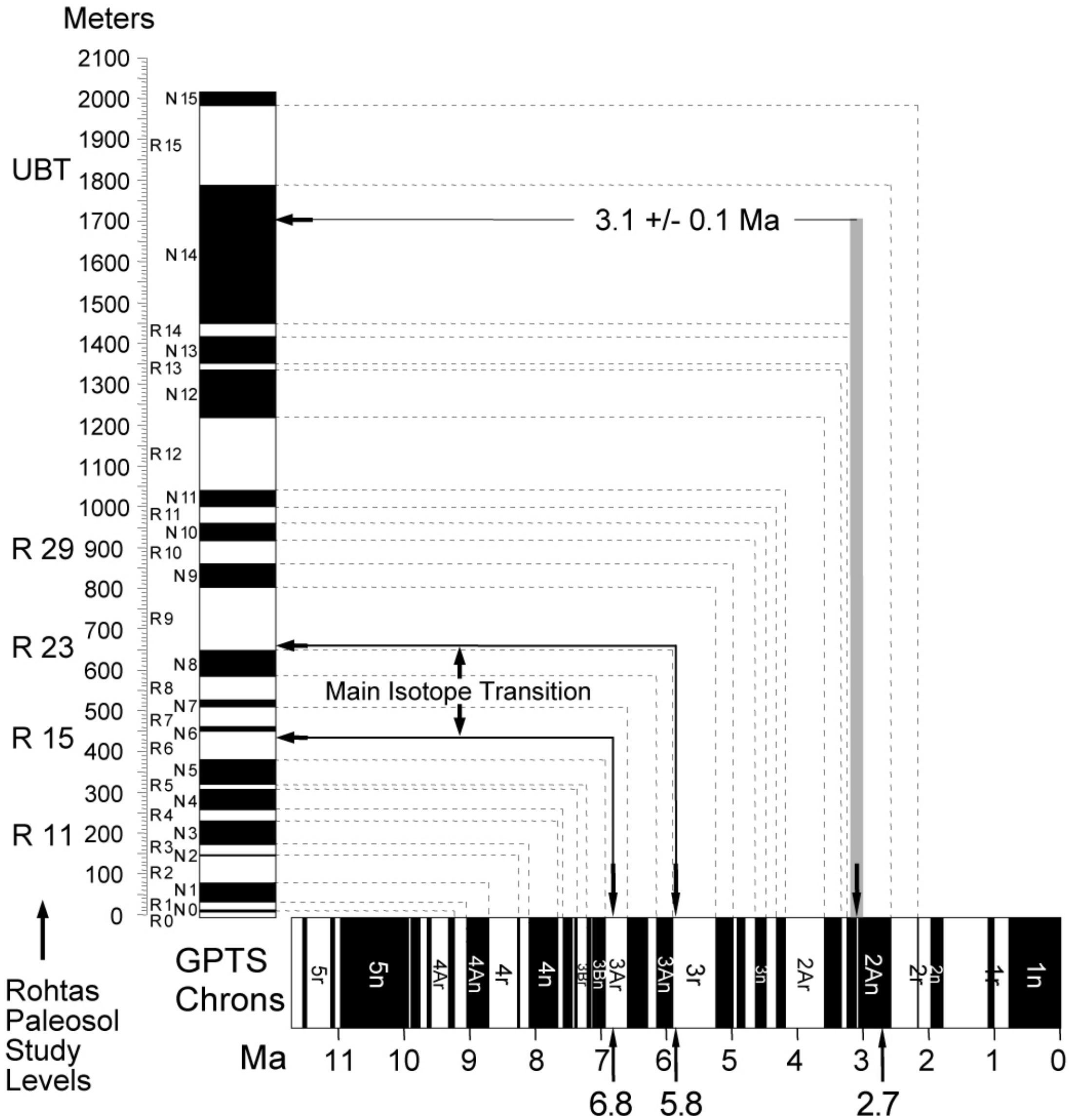

Figure 5. The correlation between the Rohtas section and the GRTS (Cande and Kent 1995) ties the long predominantly normal zone in the upper portion of the section to Chron 2An, the middle predominantly reversed zone to Chrons 2Ar to 3r, and the lower predominantly normal zone to Chrons 3Bn to 4An. The calculation of compacted sediment accumulation rates suggests an increase in rates through time with possible break points at around 400 m and 1,200 m. The biotite date at the 1,700 m level has an interpolated age of 2.71 Ma which falls about 3 s.d. from its mean calculated age of 3.1 ± 0.1 Ma (see repository figure 4) (gray bar on repository figure 5 indicates measured error range). The Siwalik stable isotope transition is first recorded at the 450 m level and this event has an interpolated age of 6.75 Ma. The main part of the isotope transition is complete by the 660 m level and this event has an interpolated age of 5.78 Ma. The mean compacted sediment accumulation rate is 0.28 mm/yr, with possible break points at the 380 m and 1,220 m levels. Compacted sediment accumulation rates calculated for these three intervals are 0.16 mm/yr (15 m to 380 m) for 9.23 Ma to 6.935 Ma, 0.25 mm/yr (380 m to 1,220 m) for 6.935 Ma to 3.58 Ma, and 0.53 mm/yr (1,220 m to 1980 m) for 3.58 Ma to 2.15 Ma.

The correlation with the GRTS of Cande and Kent (1995) is presented in figure 5. This correlation ties the upper predominantly normal polarity intervals of N12-N14 to Chron 2An. The correlation is supported by the date of 3.1 ± 0.1 Ma for the volcanic tuff at 1,700 m. The correlation predicts an age of 2.71 Ma for the tuff as based as its stratigraphic position, and this value is nearly three s.d. removed from the mean age determination. There is, however, no question about the fact that this volcanic tuff occurs in the upper portion of the long normal interval of N14. The top of this zone is poorly defined because of a low sampling density; in fact the top could be up to nearly 150 m higher in the section, making the predicted date somewhat older The predominantly reversed zone (R9-R12) that contains the three brief normal intervals (N9-N11) is correlated with Chrons 2Ar-3r. It should be noted that while the intervening Chron 3n is known to consist of four normal subchrons, only three normal intervals are identified in the Rohtas section. There is some support for the existence of a fourth short duration normal interval at what would be the predicted level of C3n.3n at about 875 m (see fig. 3), but the normal sites at this level are not statistically significant. Similarly, samples at 1120 m in Dhabwala Kas and 170 m and 230 m in Bazawa Kas are of normal polarity but are not statistically significant. Resampling could test this idea. The next two lower normal intervals, N7 and N8, are correlated with Chron 3An in figure 5. Although N8 is of the appropriate thickness to match C3An.1n, N7 is of much shorter duration than would be predicted for C3An.2n. It is, however, the case that the stratigraphic interval at about 500 m in in Dhabwala Kas contains some of the thickest multistoried sandstones seen in the Rohtas section, and it seems likely that these large sandstones either eroded away the sediments that originally preserved this polarity interval or were deposted at such a rapid rate that they did not completely record the full duration of this subchron. The next predominantly normal zone that contains intervals N3-N5 is about 200 m thick and is correlated with Chrons 3Bn and 4n. Additional sampling could be carried out in intervals N4 and N5 to test for the presence of the short reversed subchrons of C3Br.1r and C3Br.2r that occur in Chron 3Br. The next predominantly reversed zone of R2-R3 is correlated with Chron 4r and appears to preserve the short normal of C4r.1n in polarity interval N2. Although this short normal interval is documented by a single site only, it is closely constrained by nearby higher and lower sites of opposite polarity. The lowest polarity zones of R0-N1 are correlated with Chrons 4An and 4r. It should, however, be noted that intervals R0, N0, and R1 that are correlated with C4r.2r, C4r.1n, and C4r.1r, respectively, are based on single sites. Although each of these three sites is statistically significant, additional sampling could be carried out to confirm and perhaps better define the presence and duration of these three intervals. Only one normal interval, N6, in the Rohtas section does not find a match with the GRTS. If this polarity interval is confirmed with data from other sections, it would be designated as C3Ar.1n. It is unfortunate that the base of the Rohtas is marked by a fault; otherwise, sampling could be carried down the section in order to test for the presence of the long normal of Chron 5.

The correlation in figure 5 differs from the correlation of Opdyke *et al*. (1979) primarily because this earlier study relied on a much coarser sampling site density that apparently missed many of the short normal and reversed intervals identified in the present study. In addition, the Opdyke *et al*. (1979) study relied on AF demagnetization and this laboratory protocol was probably not sufficient to remove the stubborn normal overprint discussed above. Stubblefield’s (1993) work focused on the lower part of the

Rohtas section, and this portion of the section was resampled in the present study in order to increase sample site density. The samples included in the study by Stubblefield (1993) are included in this study.

Figure 5 also provides some idea of compacted sediment accumulation rates with the mean rate for the Rohtas section equaling 0.28 mm/yr. The plot in figure 5 is interesting in that it suggests that the general increase in accumulation rates through the nearly seven million years sampled in this study is marked by possible break points at around the 400 m and 1,200 m levels. Compacted sediment accumulation rates can be calculated for these three intervals and equal 0.16 mm/yr (15 m to 380 m) for the time period from 9.23 Ma to 6.935 Ma, 0.25 mm/yr (380 m to 1,220 m) for the time period from 6.935 Ma to 3.58 Ma, and 0.53 mm/yr (1,220 m to 1980 m) for the time period from 3.58 Ma to 2.15 Ma. These rates are within the range of rates for the Siwaliks published by other studies (Raynolds and Johnson, 1985; Badgley *et al*., 1986; Johnson *et al*. 1982; Kappelman *et al*., 1991; Meigs *et al*., 1995; Khan *et al*., 1997). It is interesting to note that the first increase in rates occurs across the interval that documents the beginning of the C_3-C_4 isotope transition (Quade *et al*. 1989), which begins at the 450 m level and is complete by the 660 m level. The interpolated dates for the beginning and end of the main part of the isotope transition are 6.8 Ma and 5.8 Ma, respectively.

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	A	B	C	D	E	F	G	H	I	J	K
1	**Table DR1-Bottom: Paleomagnetic Determinations for lower part of Rohtas section.**										
2	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
3	1	-48.7	-52.9	-50.5	-41.2				2.94	3	3.2
4	2	70.9	71.1	72.6	68.5				2.99	3	10.7
5	3	-85.4	-78.4	-79.9	-84				2.97	3	17.3
6	106	71.4	77	68.2	15.6	70.3			2.99	4	44.5
7	4	49.5	58.8	30.5	47.2				2.76	3	46
8	5	74	64	66.2	65.6				2.9	3	67.9
9	25	69	58.8	61.5	60				3	3	67.9
10	23	51.4	45.1	66.4	43.8				2.88	3	70.8
11	108	61.7	64.7	59.3	60.1				2.96	3	75
12	26		41.1	50.4	2.7					3	79.4
13	24	-45.8	-47	-48.7	-42				2.98	3	85.3
14	6	-51.7	-52.6	-32.3	-73.9				2.76	3	95.3
15	27	-27.4	-33.5	-25	-22				2.89	3	102
16	29		51.8	-34.4	-26.7				1.99	3	121
17	7	-72.1	-77.4	-75.6	-59				2.95	3	136
18	8	-68.5	-69.9	-71.5	-63.6				2.99	3	137.1
19	9	-63.3	-66.2	-69.3	-52.1				2.93	3	141
20	30		45.8	-3.4	-31.1				2.08	3	143.1
21	31		-41.8	-14.2	-30.7					3	143.2
22	109	63.3	57.1	67.8	63.8				2.98	3	147
23	32	-63	-61.7	-77.3	-52.3				2.9	3	150.4
24	10	-58.5	-59.7	-55.2	-59.9				2.99	3	153.7
25	110	62.98	56.23	66.19	54.11						161
26	33	-39.9	-42.1	-35.4	-42.1				2.96	3	166.5
27	34	-15.9	-14.3	-18.4	-15				3	3	172
28	11	53.5	52.7	54.8	52.8				2.99	3	179.7
29	12	62.2	64.7	60.2	60.7				2.98	3	180.3
30	13	57.9	59.7	55.3	58.2				3	3	187
31	14	63.6	63.2	60.3	67				2.98	3	190.4
32	15	55.5	56.9	53.6	54.4				2.97	3	194.3
33	16	54.8	56.6	50.5	56.2				2.98	3	201.6
34	35	65.3	64.3	67.4	63.1				2.98	3	206.3
35	36	68.8	59.1	62.6	61.3				2.66	3	213.6
36	37	66.3	63.8	70.8	64.6				2.99	3	226.6
37	111	76.9	84.1	66.3	72.4				2.93	3	229
38	112	-45.4	-19.2	-56.7	-64.1				2.87	3	233
39	17		72.8	18.9	78.4	-16.8			2.62	4	237.7
40	38		-61.8	-31.6	46.2					3	237.7
41	114		-68.2	-82						2	242
42	39	-61.4	-60.8	-28.2	-79.5				2.75	3	247.8
43	18		-40.2	3.6	0.8				1.97	3	256.3
44	117				-59.6					1	265

	A	B	C	D	E	F	G	H	I	J	K
127	**Table DR1-Bottom: Paleomagnetic Determinations for lower part of Rohtas section.**										
128	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
129	222	59.3	68.6	52.2	53.4				2.9	3	633
130	72	62.4	61.7	61.8	62.8				2.99	3	633.8
131	73	54.8	46.9	61	56.4				2.91	3	647.3
132	74	-80.9	-75.3	-77.6	-87.2				2.97	3	654
133	223			-85.5	-70.4					2	655
134	224	-82.5	-71.7	-68.6	-76.3				2.93	3	656
135	225	-75.3	-66.8	-75.5	-79.2				2.97	3	657
136	226	-76.5	-61.6	-58.4	-64				2.86	3	658
137	75	-73	-71	-66.7	-78.6				2.99	3	660.5
138	76	-66.5	-64.8	-72	-48.2				2.83	3	673.5
139	227	-83	-81.1	-82.3	-82.1				2.99	3	680
140	228	-77.9	-77.2	-87.3	-64.5				2.97	3	685
141	229	-79.3	-74.8	-79	-83.5				2.99	3	690
142	230	-63.6	-85.6	-56.1	-46.9				2.86	3	694
143	77		-54.4	-62.4	-33.1				2.54	3	695.7
144	78	-81.9	-81.9	-80.8	-78.1				2.99	3	702
145	79	-75.8	-74.4	-70.5	-79.3				2.98	3	708.5
146	80	-72.7	-73.4	-74.8	-69.6				2.99	3	714.1
147	81	-79.9	-73.2	-75.6	-87.5				2.97	3	721.2
148	82	-66	-62.6	-66.7	-68.9				2.99	3	725.5
149	83	-70.8	-58	-77.9	-74.9				2.96	3	729.5
150	84	-66.6	-69.9	-62	-67.3				2.97	3	732.5
151	85		-0.6	-30.9	-49.9					3	740.5
152	86	-78.7	-84.2	-79.9	-71.4				2.98	3	744.5
153	87	-86.5	-76.2	-78.9	-79.8				2.96	3	753
154	88	-81.4	-74.3	-66.2	-51.5				2.76	3	763
155	89	-81.6	-77.5	-76.7	-78				2.96	3	776
156	90	-75.6	-68.7	-72.6	-80.3				2.93	3	785.1
157	91	-82.4	-82.2	-78.9	-80.7				2.99	3	794
158	92	-85.4	-73.8	-71.6	-67.6				2.89	3	799
159	93	72.3	81.3	53	82.2				2.76	3	808
160	94	65.4	69	54.5	74.4				2.94	3	813.5
161	95	84.7	86.8	84.4	80.5				2.99	3	816
162	96	74.4	72.1	81.5	69				2.98	3	822.3
163	97	82.6	80.2	84.4	81.4				3	3	828
164	98	75.8	75.1	67	84				2.96	3	835.5
165	99	73.1	79.8	65	74.4				2.96	3	842
166	100	58.1	60.4	56.5	56.3				2.98	3	843.7
167	136		-16.9							1	849

	A	B	C	D	E	F	G	H	I	J	K
86	**Table DR1-Bottom: Paleomagnetic Determinations for lower part of Rohtas section.**										
87	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
88	135		-6.7	32.2	31.1				2.46	3	509
89	189	7	4	-12.4	29.6				2.75	3	511
90	190	47.3	31.9	52.7	54.5				2.8	3	511
91	191	52.5	49.6	51.2	56.8				2.99	3	514
92	104			49						1	516
93	192	55.5	49.4	68.9	39.6				2.81	3	518
94	193	61.5	77.4	38	71.3				2.8	3	521
95	60	-52.4	-41.1	-61.1	-48.5				2.89	3	532.5
96	197		-75.3	25	-15.6					3	537
97	199		-14.1	-48.3	14.6					3	545
98	200		-31.2	-75.1	-59.2					3	547
99	200.5	-72.8							4.71	5	547.5
100	201		-82.1	-87.2						2	548
101	61		-79.8	63	66.9					3	551
102	62		-19.1							1	560.5
103	206	-46.8	-34.5	-48.3	-57.4				2.97	3	563
104	63	-46	-44.4	-44.9	-47				2.97	3	564.5
105	207	-65.8	-76.5	-55.6	-65.4				2.98	3	565
106	208		-63.7	-62.9						2	567
107	208.5	-69.1							2.95	3	568
108	209		-75.6							1	569
109	64	-66.5	-53.6	-67.2	-73.6				2.97	3	574.5
110	210	-67.4	-67.9	-70.9	-59.7				2.97	3	579
111	65	-79.6	-75.4	-83.5	-77.1				2.99	3	582.2
112	211		-35.9	9.9	-9.3					3	584
113	212		-64.6	-24.3	49.8					3	588
114	66	45.3	54.7	37.6	42.2				2.93	3	589.7
115	67	67.6	66.3	68.5	66.9				2.98	3	597.5
116	213	64.5	62	66.3	63.9				2.99	3	599
117	214	63.2	61.3	68.5	60.1				2.99	3	600
118	215	56.2	65.3	60.5	35				2.85	3	603
119	68	49.9	54.6	51.1	43.9				2.99	3	604.5
120	216	57.5	54.6	54.6	59.2				2.94	3	607
121	217	68.5	66.1	70.7	68.6				3	3	610
122	69	50.3	48.5	50.4	51.5				2.97	3	615.7
123	221		67.6	0.2	-43.3					3	620
124	70		-35.1	-54.9	23.1					3	621.5
125	71		-48.5	30.8	64.3					3	629.8
126	220		-47.8	-22.8	-23.2				2.48	3	631

	A	B	C	D	E	F	G	H	I	J	K
168	**Table DR1-Bottom: Paleomagnetic Determinations for lower part of Rohtas section.**										
169	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
170	138	60.4	56.5	40.2	57.9				2.96	3	859.6
171	101	-78.5	-75	-77.9	-83				2.99	3	861.5
172	139		-3	-23.6	-62.8				2.18	3	864.7
173	140	-65.8	-42.5	-73.4	-70.3				2.79	3	866.2
174	141		-78.8	-61.4						2	869.2
175	142		-48.5	67.2	-43.8					3	875.3
176	143		-4	7.9	49.5					3	880.7
177	144		50.3							1	886
178	145	-78.3	-78.3	-74.4	-81.1				3	3	890.9
179	146		15.5	-58.1	7.2					3	894.8
180	147		-44.1	-79.9	-71.3						896.9
181	147.5	-69.1							3.37	4	903
182	148			-63.7							909.1
183	149	-61.5	-70	-65.1	-46.3	-48.6			3.81	4	914.8
184	152	63.5	62.2	61.5	66.4				2.99	3	920.6
185	153		-21.5	56.1	58.8					3	923
186	154		-17.4	51.6	42.2					3	926.6
187	157	64.5	86.1	64.6	35.3				2.67	3	931
188	158	65.9	57.8	67.9	71.9				2.92	3	935.6
189	155	72.1	68.9	74.9	68.7				2.97	3	940.5
190	159	73.3	71.2	70	74.2				2.98	3	940.6
191	156	76.2	60.8	71.9		66			2.86	3	942.2
192	160		86.8	54.1						2	944.3
193	160.5	67.1							3.23	4	951.9
194	161		39.3	43.7						2	959.5
195	162		-50.8	-56.7	-36.6					3	968.5
196	162.5	-82							4.43	6	970.1
197	163		-37.6	-27.7	-26.3					3	971.6
198	164		12.3	-12.7	1.9					3	974.8
199	165		-45.4	-33.5	-61.3					3	977.4
200	165.5	-80.8							3.18	4	981
201	166		-61.3							1	985.9
202	167		-5.8	-15.5	-12.7					3	998.5
203	168		-0.5	7.2	-1.2					3	998.5
204	169		-6.4	-9.5	-5.2					3	998.5
205	168.5	-5.5							8.9	0	998.5
206	171		-67.4	-69	7.3					3	1003
207	172		10.1	16.4	26.8					3	1005
208	172.5	9.5							5.84	6	1005.5

	A	B	C	D	E	F	G	H	I	J	K
209	**Table DR1-Bottom: Paleomagnetic Determinations for lower part of Rohtas section.**										
210	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
211	173		0.6	6.9	-4.8					3	1006
212	174		63.1	39.4	29.5					3	1015.5
213	174.5	57.64							4.3	5	1019.3
214	175			52.1	66.3					2	1023
215	180		70			70.1				2	1031.9
216	177	71.7	79.1	64.5	69.1				2.93	3	1041
217	178		-22.4							1	1043
218	178.5	-36.9							2.59	3	1043.5
219	179		-45.5		-34.7					2	1044
220	181		-20.1	-58.2						2	1078
221	181.5	-46.1							2.55	4	1079
222	182		-5.9		-76.6					2	1080
223	184		-73.8	-7.2	19.5					3	1094
224	187		-52.1							1	1128
225	187.5	-28.1							2.67	3	1132
226	188		-21.2	-13.9						2	1136

	A	B	C	D	E	F	G	H	I	J	K
1	**Table DR2-Top: Paleomagnetic Determinations for upper part of Rohtas section.**										
2	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
3	231	-83.1	-62	-85	-77.6				2.92	3	17.65
4	232		-27.5		-79.6					2	37.8
5	232.5	-80.7							2.86	3	42.45
6	233		-71.7	-56						2	47.1
7	234	25.5	21.23	20.97	34.03				2.97	3	59.75
8	235	53	42.12	53.56	57.06				2.89	3	61.65
9	236	62.3	61.3	65	59.56				2.98	3	78.3
10	237	33.6	31.8	34.58	33.13				2.89	3	88.35
11	238	-70.6	-7.4	-78.5	-80.9				2.66	3	134.95
12	240		20.55	73.75	48.32				2.44	3	155.4
13	241		-54	-78.6	-18.9				2.44	3	158.7
14	244			-38.8	-37.9					2	178.9
15	245		-66.6							1	181.9
16	245.5	-62.6							2.78	3	186.9
17	246		-72.1	-41.4						2	191.9
18	247	-75.2	-76.2	-64.8	-80.6				2.98	3	206.7
19	248	-85.4	-86.3	-88.2	-80.5				3	3	214.4
20	249	-79.7	-80.3	-79.8	-78.5				3	3	216.8
21	250	-62.2	-61.6	-47	-69.8				2.83	3	227.6
22	252			54.48	57.83				2	2	251.4
23	253		-7.7	-44.3	15.83					3	254.9
24	254	-84.5	-80.2	-73.9	-78.4				2.96	3	267.6
25	255		-32.5	-47.5	-6.15					3	275.1
26	256	83.1	59.42	86.43	56.17				2.71	3	280.9
27	257	82.6	85.2	80.66	75.78				2.97	3	294.25
28	258		-25.1	56.13	48.93					3	300.9
29	259	66.1	52.56	68.78	71.33				2.94	3	306.35
30	260	64.2	63.13	39.98	56.99				2.65	3	307.85
31	261	65.8	53.65	73.42	67				2.89	3	310.95
32	262	59	63.52	49.9	59.77				2.94	3	314.65
33	264	63.5	48.92	60.61	69.3				2.82	3	326.8
34	265	58.5	41.74	63.95	61.78				2.87	3	326.9
35	266	60	53.99	74.49	50.56				2.79	3	330.95
36	267	61.5	61.47	56.25	65.98				2.97	3	334.05
37	268	53.6	50.45	64.25	38.91				2.81	3	337.05
38	269	65.7	57.92	73.15	61.15				2.81	3	338.85
39	270	63.3	60.33	47.23	55.4				2.66	3	341.75
40	271		54.88	65.33							344.45
41	272	68.8	74.77	67.08	64.29				2.98	3	346.25
42	273	64.5	61.8	63.55	67.75				2.98	3	348.95
43	274	70.1	66.92	71.41	71.77				2.99	3	350.85

	A	B	C	D	E	F	G	H	I	J	K
44	**Table DR2-Top: Paleomagnetic Determinations for upper part of Rohtas section.**										
45	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
46	275		67.88								353.45
47	276	71.2	67.79	68.51	62.12				2.91	3	358.7
48	277	82.8	83.74	77.15	85.42				2.99	3	360.15
49	278		55.97	-79.1	63.41					3	361.65
50	279	66.6	65.4	70.79	58.64				2.95	3	364.65
51	280	81.8	73.85	80.23	84.4				2.98	3	366.65
52	281	78.7	64.94	62.66	67.98				2.82	3	384.45
53	282			54.86	38.49					2	386.1
54	283	56	49.46	43.6	59.28				2.65	3	390.2
55	284		87.2	64.4						2	391.4
56	285		-5.53	-49.8	-15					3	393
57	285.5	-78.7							3.24	4	393.75
58	286		-72.9	-73.6	-26.5					3	394.5
59	287	-77.5		-58.1	-68.8	-75			2.82	3	402.7
60	288		-60	54.11	42.11					3	407.1
61	289	59.1	63.07	59.76	53.17				2.94	3	409.85
62	291		40.33		-11.8					2	422.4
63	293	67	62.66	69.17	68.72				2.99	3	441.15
64	294	65	76.46	60.81	56.64				2.88	3	442.7
65	295	57.9	48.62	60.91	62.74				2.88	3	448.8
66	296	52.3	54.34	55.27	45.36				2.96	3	452.1
67	297	65.6	60.94	57.45	80.85				2.88	3	456.5
68	298	63.1	61.73	63.22	63.57				2.99	3	458.7
69	299	64.3	80.6	64.44	50.68				2.84	3	461.7
70	301		20.86	68.14	43.15					3	474.3
71	302	-51.4	-52.8	-28.1	-52.8				2.76	3	479.5
72	303			55.6	47.54					2	485
73	304	-64.7	-44	-65.4	-77.6				2.67	3	496.7
74	305			-22.5	-51.6					2	501.2
75	306		53.01	46.73						2	511.7
76	306.5	52.7							3.85	4	513.6
77	307		62.9		40.88					2	515.5
78	308	63.1	54.58	78.83	58.6				2.9	3	523.5
79	309	66.3	56.58	67.14	62.52				2.89	3	533.6
80	310		58.75		73.12					2	540.8
81	310.5	68.4							3.88	4	544.625
82	311			63.6	66.43					2	548.45
83	312	62.7	56.93	85.85	50				2.81	3	552.95

	A	B	C	D	E	F	G	H	I	J	K
84	**Table DR2-Top: Paleomagnetic Determinations for upper part of Rohtas section.**										
85	**Site No**	**Mean**	**A**	**B**	**C**	**D**	**E**	**F**	**R**	**n**	**meters from local base**
86	313	56.7	54.14	54.38	53.18				2.87	3	555.95
87	314	58.2	69.34	54.59	32.98				2.7	3	585.75
88	315		-34.2	60.43	78.77					3	588.85
89	316	78.7	83.29		75.89	76			2.99	3	641.6
90	317	72.7	74	68.16	74.7				2.98	3	649.4
91	318		56.91	56.98	-46.7					3	657.3
92	319	63.3	56.43	58.8	66.44				2.97	3	668.95
93	325	65.5	62.74	61.62	71.09				2.97	3	685.7
94	331	74.8	72.37	52.91	75.66				2.9	3	704.4
95	332	66.4	68.55	60.68	68.44				2.98	3	718.1
96	333	56.5	60.13	53.35	49.22				2.89	3	729.2
97	336	61.7	67.62	62.49	54.96				2.97	3	766.7
98	338	59.9	52.88	58.44	62.66				2.92	3	777.3
99	344		-14.2	-5.98	-61.7					3	861
100	346		-56.9	-59.3						2	896
101	350		-64.5	-4	-82.6					3	930
102	348	-80.2	-69.6	-49.7	-81.6				2.85	3	937
103	349	-74.2	-66.6	-78.5	-72.1				2.98	3	945
104	353	-74.1	-78.9	-77.2	-67				2.98	3	992
105	354	-78.3	-83.7	-66.2	-79				2.97	3	995
106	355	-83.4	-84.5	-81.6	-82				2.99	3	1003
107	356	-83.5	-67.8	-53.6	-66.5				2.7	3	1013
108	357	-38.8	-36.2	-46.6	-29.1				2.9	3	1024
109	359	76	70.63	65.14	70.37				2.86	3	1066

	A	B	C	D	F	G	H	I	J	K
1	**Table DR3: Laboratory measurements for 40Ar/39Ar dating of Upper Boundary Tuff, Basawa Kas**									
2	temp (°C)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar	%39Ar	% 40Ar*	40Ar*/39ArK	age (Ma)	±	1 s.d.
3	1100	2.1758	0.00600	0.00378	0.356	45.6	0.0991	3.19	±	0.15
4	1150	2.0195	0.00022	0.00314	0.636	50.7	1.0234	3.20	±	0.10
5	1200	1.3299	0.00179	0.00111	0.942	70.1	0.9326	2.92	±	0.12
6	1250	2.5037	0.12179	0.00535	0.965	34.5	0.8634	2.69	±	1.24
7	1350	2.2688	0.03761	0.00440	1.000	39.8	0.9829	2.82	±	0.81

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Table DR4 Stable Isotope Data**													
2	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**	
3	**R11 level, soil carbonate**													
4	ROT 75	R11		soil nodule		198.8	-10.1	-9.8	7.85	7.89	75.4			
5	ROT 76	R11		soil nodule		197.4	-10.2	-9.5	7.86	7.90	69.5			
6	ROT 78J	R11		soil nodule		198.4	-10.4	-9.1	7.85	7.89	54.9			
7	ROT 78K	R11		soil nodule		198.0	-9.9	-9.4	7.85	7.89	41.4			
8	ROT 78K	R11		soil nodule		198.0	-10.4	-9.5	7.85	7.89	77.5			
9	ROT 78L	R11		soil nodule		197.6	-10.0	-9.9	7.86	7.90	56.0			
10	ROT 94-71	R11-4S1	1.0	soil nodule	-0.70	187.1	-12.0	-8.6	7.92	7.97	73.0			
11	ROT 152	R11-5	1.0	soil nodule	-0.60	187.4	-11.3	-7.0	7.92	7.97	49.5			
12	ROT 94-74	R11-5A	1.0	soil nodule	-1.20	186.8	-11.2	-8.6	7.92	7.97	75.3			
13	ROT 94-27	R11-4A	1.0	soil nodule	-0.50	186.1	-11.1	-9.1	7.92	7.98	71.3			
14	ROT 94-73	R11-5A	1.0	soil nodule	-1.80	186.2	-10.4	-8.9	7.92	7.98	70.1			
15	ROT 94-9	R11-3	1.0	soil nodule	-0.70	186.5	-10.2	-9.0	7.92	7.98	77.7			
16	ROT 94-75	R11-5A	1.0	soil nodule	-0.40	187.6	-10.2	-8.6	7.92	7.97	74.6			
17	ROT 147	R11-4	1.0	soil nodule	-0.70	186.3	-10.0	-9.4	7.92	7.98	70.2			
18	ROT 94-7	R11-3	1.0	soil nodule	-0.40	186.8	-9.9	-9.3	7.92	7.97	72.2			
19	ROT 94-8	R11-3	1.0	soil nodule	-2.30	184.9	-9.9	-8.9	7.92	7.99	64.9			
20	KB96-026	R11-2N1	1.0	soil nodule	-0.20	185.7	-9.9	-8.9	7.92	7.98	74.0			
21	ROT94-4	R11-1N	1.0	soil nodule	-2.00	185.1	-9.8	-9.5	7.92	7.99	76.3			
22	ROT-235-1	R11-2	1.0	nodule/rhizolith	-0.60	187.0	-9.8	-9.2	7.92	7.97	50.8			
23	ROT 94-72	R11-4S1	1.0	soil nodule	0.00	187.8	-9.7	-8.8	7.92	7.97	70.1			
24	ROT 94-1	R11-1	1.0	soil nodule	-2.20	184.8	-9.6	-8.5	7.92	7.99	60.2			
25	ROT94-3	R11-1	1.0	soil nodule	-1.20	185.8	-9.6	-10.3	7.92	7.98	68.2			
26	ROT 94-6	R11-1N	1.0	soil nodule	-1.10	186.0	-9.4	-8.8	7.92	7.98	80.4			
27	ROT 94-2	R11-1	1.0	soil nodule	-1.80	185.2	-9.3	-9.0	7.92	7.98	83.0			
28	ROT 94-26	R11-4A	1.0	soil nodule	-2.00	184.6	-9.1	-9.6	7.92	7.99	51.1			
29	ROT 121	R11-1	1.0	soil nodule	-1.50	185.5	-8.6	-8.9	7.92	7.98	53.9			
30	ROT-235-1	R11-2	1.0	nodule/rhizolith		187.0	-9.9	-9.3	7.92	7.97	41.5	R11-Psol 1		
31	ROT-235-2	R11-2	1.0	nodule/rhizolith		187.0	-9.8	-9.1	7.92	7.97	46.7	-10.007	0.769	**$\delta^{13}C$ (PDB)**
32	ROT-235-3	R11-2	1.0	nodule/rhizolith		187.0	-9.6	-9.1	7.92	7.97	64.2	-8.976	0.579	**$\delta^{18}O$ (PDB)**
33	ROT-123n	R11-1	2.0	soil nodule		191.3	-9.5	-9.4	7.89	7.94	40.4			
34	ROT-125.n	R11-1	2.0	soil nodule		193.7	-10.1	-8.2	7.89	7.92	65.6			
35	ROT 124	R11-1	2.0	soil nodule		192.8	-7.4	-7.5	7.89	7.93	47.9			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
36	**Table DR4 Stable Isotope Data**													
37	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**	
38	**R11 level, soil carbonate**													
39	ROT-149.n	R11-4	2.0	soil nodule		192.4	-10.7	-7.5	7.89	7.93	73.6			
40	ROT-153.n	R11-5	2.0	soil nodule		194.6	-10.5	-9.0	7.89	7.92	67.1			
41	ROT 141	R11-3	3.0	soil nodule		203.3	-9.0	-8.9	7.83	7.86	58.7			
42	ROT-142	R11-3	4.0	soil nodule		206.8	-9.7	-8.6	7.82	7.86	69.9			
43	ROT 136	R11-3	4.5	soil nodule		210.8	-11.3	-7.3	7.81	7.80	61.0			
44	ROT-234	R11-1	5.0	soil nodule		222.9	-9.7	-9.0	7.70	7.72	63.0			
45	ROT-237.n	R11-5	5.0	soil nodule		221.2	-10.6	-8.5	7.70	7.80	71.2			
46	ROT 94-5	R11-1N	1.1	soil nodule		187.3	-10.6	-11.1	7.91	7.97	53.7			
47														
48	**R12 level, soil carbonate**													
49	ROT 163	R12		soil nodule		289.0	-10.2	-8.8	7.46	7.43	67.4			
50	ROT 164	R12		soil nodule		327.0	-7.8	-8.0	7.37	7.07	42.2			
51	ROT 165	R12		soil nodule		326.8	-6.8	-8.4	7.37	7.07	52.1			
52														
53	**R13 level, soil carbonate**													
54	ROT-160.n	R13		soil nodule		356.0	-6.4	-12.6	7.25	7.00	68.6			
55	ROT 161	R13		soil nodule		354.0	-7.5	-7.6	7.25	7.01	54.7			
56														
57	**R15 level, soil carbonate**													
58	ROT-36n	R15-3	1.0	soil nodule		437.8	-7.8	-9.4	7.08	6.77	49.9			
59	KB96-003	R15-5A	2.0	soil nodule	-0.60	435.0	-5.9	-8.2	7.09	6.78	60.0			
60	KB96-033	R15-D	2.0	soil nodule	-1.00	435.0	-4.9	-8.2	7.09	6.78	72.0			
61	KB96-032	R15-C	2.0	soil nodule	-0.80	435.0	-3.6	-8.0	7.09	6.78	67.0			
62	KB96-004	R15-5A	2.0	soil nodule	-0.80	435.2	-4.2	-8.2	7.09	6.78	63.6			
63	KB96-029	R15-A	2.0	soil nodule	-0.80	435.2	-3.4	-7.9	7.09	6.78	56.5			
64	KB96-005	R15-5A	2.0	soil nodule	-1.00	435.4	-4.6	-8.9	7.09	6.78	66.1			
65	KB96-028	R15-5	2.0	soil nodule	-0.50	435.5	-5.1	-8.3	7.09	6.78	65.1			
66	KB96-030	R15-B	2.0	soil nodule	-0.50	435.5	-4.5	-8.0	7.09	6.78	69.0			
67	ROT 16	R15-1	2.0	soil nodule	-0.70	437.1	-3.3	-8.2	7.08	6.77	62.9			
68	ROT 17	R15-1	2.0	soil nodule	-0.50	437.3	-3.7	-8.5	7.08	6.77	66.0			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
101	**Table DR4 Stable Isotope Data**													
102	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**	
103	**R15 level, soil carbonate**													
104	ROT 94-35	CF 15-3S1	6.0	soil nodule	-0.40	447.6	-5.3	-7.6	7.05	6.74	77.8			
105	ROT 94-58	CF 15-4A	6.0	soil nodule	-2.40	444.1	-7.0	-8.1	7.06	6.75	60.1			
106	ROT 94-69	CF 15-4A	6.0	soil nodule	-1.60	444.9	-8.0	-8.2	7.06	6.75	71.1			
107	ROT 94-70	CF 15-4A	6.0	soil nodule	-0.80	445.7	-8.9	-8.2	7.05	6.75	64.3			
108	ROT 94-37	CF 15-5A	6.0	soil nodule	-1.80	446.4	-7.8	-8.2	7.05	6.74	67.4			
109	ROT 94-38	CF 15-5A	6.0	soil nodule	-1.50	446.7	-8.6	-9.6	7.05	6.74	63.7			
110	ROT 94-40	CF R15-5A	6.0	soil nodule	-1.40	446.8	-8.2	-8.6	7.05	6.74	62.5			
111	ROT 94-41	CF R15-5A	6.0	soil nodule	-1.20	447.0	-9.7	-9.8	7.05	6.74	57.4			
112	ROT 94-43	CF R15-5A	6.0	soil nodule	-0.80	447.3	-8.4	-9.5	7.05	6.74	59.2	R15-Psol 6 Channel Fill		
113	ROT 94-44	CF R15-5A	6.0	soil nodule	-0.60	447.5	-9.1	-10.0	7.05	6.74	60.9	-7.870	1.435	**$\delta^{13}C$ (PDB)**
114	KB96-035	CF R15-5S	6.0	soil nodule	-1.00	446.0	-9.7	-8.6	7.05	6.75	51.7	-8.640	0.763	**$\delta^{18}O$ (PDB)**
115	ROT 94-56	CF R15-6A	6.0	soil nodule	-2.30	445.8	-5.2	-8.2	7.06	6.75	65.8	R15-Psol 6 All		
116	ROT 94-57	CF R15-6A	6.0	soil nodule	-0.10	448.0	-8.0	-8.5	7.05	6.74	51.5	-6.850	2.503	**$\delta^{13}C$ (PDB)**
117	ROT-73n	CF R15-7	6.0	soil nodule	-1.60	446.5	-6.4	-7.9	7.05	6.74	47.1	-8.184	0.934	**$\delta^{18}O$ (PDB)**
118	KB96-37	CF R15-3N2	6.0	soil nodule	-1.00	446.0	-4.7	-7.9	7.06	6.74				
119	ROT 66	R15-6	9.0	soil nodule		453.4	-7.9	-8.3	7.03	6.72	52.6			
120	ROT 32	R15-2	9.5	soil nodule		452.9	-2.5	-7.5	7.03	6.73	67.6			
121	ROT 59	R15-4	11.0	soil nodule		455.8	-2.6	-6.4	7.03	6.72	68.8			
122	ROT 68	R15-6	11.0	soil nodule		456.2	-8.8	-9.8	7.02	6.72	49.1			
123	RJF-H	R15-E	6?	soil nodule	-0.80	450.2	-9.8	-8.7	7.04	6.73				
124	RJF-J	R15-E	6?	soil nodule	-0.60	450.4	-9.8	-8.3	7.04	6.73				
125	RJF-C	R15-E	6?	soil nodule	-0.20	450.6	-9.2	-9.3	7.04	6.73				
126	RJF-I	R15-E	6?	soil nodule	-0.70	450.2	-8.9	-9.3	7.04	6.73				
127	RJF-P	R15-E	6?	soil nodule	-1.30	449.8	-8.8	-9.5	7.04	6.73	47.6			
128	RJF-M	R15-E	6?	soil nodule	-0.90	450.1	-8.7	-10.3	7.04	6.73	56.0			
129	RJF-E	R15-E	6?	soil nodule	-0.20	450.6	-8.5	-9.1	7.04	6.73				
130	RJF-B	R15-E	6?	soil nodule	-0.10	450.8	-8.5	-9.5	7.04	6.73				
131	RJF-N	R15-E	6?	soil nodule	-1.50	449.5	-8.5	-6.3	7.04	6.73	49.0			
132	RJF-D	R15-E	6?	soil nodule	-0.10	450.8	-8.3	-9.1	7.04	6.73				

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
133	**Table DR4 Stable Isotope Data**													
134	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**	
135	**R15 level, soil carbonate**													
136	RJF-A	R15-E	6?	soil nodule	-0.10	450.8	-8.2	-9.8	7.04	6.73				
137	RJF-F	R15-E	6?	soil nodule	-0.20	450.6	-8.1	-8.9	7.04	6.73				
138	RJF-L	R15-E	6?	soil nodule	-0.90	450.1	-8.0	-9.7	7.04	6.73	40.0	R15 Psol =6 Grid		
139	RJF-G	R15-E	6?	soil nodule	-0.20	450.6	-7.9	-9.4	7.04	6.73	50.7	-8.593	0.623	**$\delta^{13}C$ (PDB)**
140	RJF-O	R15-E	6?	soil nodule	-1.40	449.5	-7.7	-7.2	7.04	6.73	57.5	-8.957	1.034	**$\delta^{18}O$ (PDB)**
141	KB96-019	R15	CFS-2C	soil nodule		500.0	-4.5	-8.3		not used	65.5			
142	KB96-020	R15	CFS-2D	soil nodule		500.0	-8.5	-8.9		not used	47.4			
143	KB96-016	R15	CFS-2A	soil nodule		500.0	-5.2	-8.5		not used	22.9			
144	KB96-039	R15-3N2	6.0	soil nodule		446.0	-8.5	-9.4	7.06	not used	36.2			
145	RJF-K	R15-E`	6?	soil nodule		450.1	-7.4	-8.6	7.04	not used	31.1			
146	ROT-36 n2	R15-3	1.0	soil nodule		437.8	-6.7	-8.2	7.08	not used	37.4			
147	ROT 61	R15-5	7.0	soil nodule		452.6	-5.3	-3.1	7.04	not used	39.0			
148														
149	**R17 level, soil carbonate**													
150	ROT 114	R17-3	4.0	soil nodule		569.1	-5.8	-5.4	6.65	6.23	43.9			
151														
152	**R23 level, soil carbonate**													
153	R-4	R23?	4?	soil nodule			0.6	-5.0						
154	ROT-82n	R23-1	4.0	soil nodule		681.5	-6.5	-6.5	5.55	5.75				
155	ROT 94-64	R23-4A	2.0	soil nodule	-0.62	675.4	-9.6	-9.8	5.58	5.78	64.4			
156	ROT 94-65	R23-4S1	2.0	soil nodule	-0.55	675.4	-8.7	-8.8	5.58	5.78	61.5			
157	ROT 94-64r	R23-4A	2.0	soil nodule	-0.62	675.4	-7.1	-7.5	5.58	5.78	59.8			
158	ROT 94-60	R23-4A	2.0	soil nodule	-0.40	675.5	-9.8	-9.7	5.58	5.78	47.4			
159	ROT 92	R23-4	2.0	soil nodule	-0.40	675.6	-10.5	-9.4	5.58	5.78	63.0			
160	ROT 94-66	R23-4	2.0	soil nodule	-0.38	675.6	-9.4	-9.2	5.58	5.78	66.4			
161	ROT 94-66	R23-4S2	2.0	soil nodule	-0.38	675.6	-8.1	-8.7	5.58	5.78	41.2			
162	ROT 94-61r	R23-4A	2.0	soil nodule	-0.10	675.9	-8.4	-9.4	5.57	5.78	40.0			
163	ROT 94-61	R23-4A	2.0	soil nodule	-0.10	675.9	-8.3	-8.7	5.57	5.78	57.6			
164	ROT 94-67	R23-4N1	2.0	soil nodule	-0.08	675.9	-8.1	-9.0	5.57	5.78	50.5			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
165	**Table DR4 Stable Isotope Data**													
166	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**	
167	**R23 level, soil carbonate**													
168	KB96-060	R23-4S3	2+	soil nodule	0.30	676.3	-6.7	-11.0	5.56	5.78	63.4	R23-Psol 2		
169	KB96-057	R23-4S3	2.0	soil nodule	-0.78	675.2	-5.1	-8.2	5.57	5.78	57.7	-7.673	2.744	**$\delta^{13}C$ (PDB)**
170	KB96-059	R23-4S3	2.0	soil nodule	-0.10	675.9	0.1	-6.6	5.57	5.78	76.4	-8.849	1.100	**$\delta^{18}O$ (PDB)**
171	KB96-058	R23-4S3	2.0	soil nodule		675.5	-3.5	-9.1	5.56	5.78	39.7	Not used		
172	ROT 92	R23-4	2.0	soil nodule		675.6	-11.2	-9.6	5.58	5.78	34.4	Not used		
173														
174	**R29 level, soil carbonate**													
175	KB96-047	R29-1	1.0	soil nodule	-0.30	885.3	1.5	-6.6	4.80	4.86	69.2			
176	KB96-046	R29-2	1.0	soil nodule	-0.30	885.7	0.9	-6.8	4.80	4.86	63.7			
177	KB96-045	R29-3	1.0	soil nodule	-0.30	885.2	-1.1	-8.0	4.80	4.86	57.8			
178	KB96-075	G R29-1G	2.0	soil nodule	-1.95	885.9	0.4	-7.1	4.80	4.85	67.7			
179	KB96-067	G R29-1G	2.0	soil nodule	-1.95	885.9	0.4	-7.1	4.80	4.85	64.4			
180	KB96-077	G R29-1G	2.0	soil nodule	-1.95	885.9	0.6	-6.8	4.80	4.85	70.0			
181	KB96-074	G R29-1G	2.0	soil nodule	-1.55	886.3	-0.5	-6.4	4.80	4.85	67.6			
182	KB96-065	G R29-1G	2.0	soil nodule	-1.55	886.3	-0.3	-6.6	4.80	4.85	59.0			
183	KB96-071	G R29-1G	2.0	soil nodule	-1.55	886.3	-0.2	-6.3	4.80	4.85	64.0			
184	KB96-070	G R29-1G	2.0	soil nodule	-1.15	886.7	-2.2	-6.7	4.80	4.85	65.3			
185	KB96-076	G R29-1G	2.0	soil nodule	-1.15	886.7	-2.1	-6.7	4.80	4.85	64.0			
186	KB96-064	G R29-1G	2.0	soil nodule	-1.15	886.7	-2.1	-6.6	4.80	4.85	60.1			
187	KB96-073	G R29-1G	2.0	soil nodule	-0.75	887.1	-1.7	-6.2	4.80	4.85	67.9			
188	KB96-069	G R29-1G	2.0	soil nodule	-0.75	887.1	-1.6	-6.4	4.80	4.85	65.7			
189	KB96-063	G R29-1G	2.0	soil nodule	-0.75	887.1	-1.0	-6.1	4.80	4.85	66.1			
190	KB96-068	G R29-1G	2.0	soil nodule	-0.35	887.5	-6.4	-7.4	4.80	4.85	51.7	R29-Psol 2 Grid Only:		
191	KB96-072	G R29-1G	2.0	soil nodule	-0.35	887.5	-3.9	-6.8	4.80	4.85	55.9	-1.552	1.856	**$\delta^{13}C$ (PDB)**
192	KB96-062	G R29-1G	2.0	soil nodule	-0.35	887.5	-2.7	-6.6	4.80	4.85	57.5	-6.653	0.360	**$\delta^{18}O$ (PDB)**
193	KB96-061	R29-1	2.0	soil nodule	-2.25	885.6	0.6	-7.5	4.80	4.86	63.5	Panel Only		
194	ROT 216	R29-1	2.0	soil nodule	-0.40	887.5	-4.6	-9.4	4.80	4.85	51.5	-1.230	2.245	**$\delta^{13}C$ (PDB)**
195	ROT 212	R29-2	2.0	soil nodule	-1.95	886.0	-0.1	-6.2	4.80	4.85	62.0	-7.039	1.252	**$\delta^{18}O$ (PDB)**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
196	**Table DR4 Stable Isotope Data**													
197	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**	
198	**R29 level, soil carbonate**													
199	KB96-048	R29-3	2.0	soil nodule	-1.30	886.8	-0.2	-6.1	4.80	4.85	69.8			
200	ROT 206	R29-4	2.0	soil nodule	-1.90	886.1	0.4	-6.7	4.80	4.85	64.8	All		
201	ROT 207	R29-4	2.0	soil nodule	-0.90	887.0	-3.6	-6.3	4.80	4.85	46.8	-1.460	1.922	**$\delta^{13}C$ (PDB)**
202	KB96-050	R29-2	3.0	soil nodule		889.8	-8.5	-6.6	4.79	4.84	65.4	-6.763	0.717	**$\delta^{18}O$ (PDB)**
203	ROT 209	R29-4	4.0	soil nodule		896.3	0.7	-6.2	4.85	4.80	53.3			
204	KB96-051	R29-2	5.0	soil nodule		899.9	-2.3	-8.1	4.77	4.79	45.3			
205	KB96-052	R29-3	5.0	soil nodule		901.0	-2.9	-7.6	4.77	4.78	47.7	R29-Psol 5		
206	KB96-008	R29-3S1	5.0	soil nodule		900.2	-3.5	-8.8	4.77	4.78	58.1	-2.921	0.615	**$\delta^{13}C$ (PDB)**
207	KB96-056	R29-1S	6.0	soil nodule		910.0	-2.6	-6.6	4.75	4.74	67.9	-8.172	0.613	**$\delta^{18}O$ (PDB)**
208	KB96-043	R29-4N1		soil nodule		874.8	-0.2	-7.7	4.83	4.91	67.5			
209	KB96-044	R29-4N2		soil nodule		876.2	1.1	-6.9	4.82	4.90	65.6			
210	KB96-008 m	R29-3S2	5.0	matrix		900.2	-1.8	-11.3	4.77	Not used	15.5			
211	KB96-053	R29-4	5.0	soil nodule		900.2	-3.4	-8.5	4.77	Not used	39.1			
212	KB96-054	R29-1	5.0	soil nodule		901.4	-3.7	-8.1	4.77	Not used	38.9			
213	KB96-055	R29-3	6.0	soil nodule		907.8	-4.0	-7.5	4.75	Not used	20.4			
214														
215	**UBT level, soil carbonate**													
216	ROT 171	UBT-1	1.0	soil nodule	-0.40	1850.0	1.6	-6.2	2.4?	2.42	56.6			
217	ROT 172	UBT-1	1.0	soil nodule	-0.70	1850.0	1.4	-6.3	2.4?	2.42	46.0			
218	ROT 187	UBT-3	1.0	soil nodule	-0.50	1850.0	1.4	-3.9	2.4?	2.42	72.5			
219	ROT-182n	UBT-2	2.0	soil nodule	-0.65	1850.0	2.7	-5.8	2.4?	2.42	73.3	UBT Psol 3		
220	ROT 183	UBT-2	3.0	soil nodule	-1.15	1850.0	2.3	-6.8	2.4?	2.42	88.2	2.860	0.659	**$\delta^{13}C$ (PDB)**
221	ROT 184	UBT-2	3.0	soil nodule	-1.15	1850.0	3.4	-6.6	2.4?	2.42	74.4	-6.633	0.130	**$\delta^{18}O$ (PDB)**
222	ROT 184	UBT-2	3.0	soil nodule	-1.15	1850.0	2.3	-6.5	2.4?	2.42	81.5	UBT All		
223	ROT 188	UBT-3	3.0	soil nodule	-2.90	1850.0	3.4	-6.7	2.4?	2.42	76.1	2.212	0.830	**$\delta^{13}C$ (PDB)**
224	ROT 175	UBT-1	4.0	soil nodule	-1.90	1850.0	1.4	-5.9	2.4?	2.42	56.5	-6.064	0.892	**$\delta^{18}O$ (PDB)**
225														
226	R-8	LBT?		soil nodule		1745.0	0.5	-7.4	2.41?	2.42				

	A	B	C	D	E	F	G	H	I	J	K	L	M
227	**Table DR4 Stable Isotope Data**												
228	**sample no.**	**Level**	**Paleosol**	**material**	**sample depth (cm)**	**stratigraphic thickness (m)**	**$\delta^{13}C$ (PDB)**	**$\delta^{18}O$ (PDB)**	**age (Ma)**	**Revised age (Ma)**	**% $CaCO_3$**	**Average**	**StDev**
229													
230	**matrix, various levels**												
231	ROT 104B			matrix			0.3	-6.7			2.7		
232	ROT 104I			matrix			-2.5	-9.3			3.6		
233	ROT 110			matrix			-2.8	-9.8			9.2		
234	ROT 122			matrix			-7.6	-11.2			4.8		
235	ROT 132			matrix			-6.5	-6.9			12.6		
236	ROT 144			matrix			-3.5	-11.4			13.9		
237	ROT 145			matrix			-8.1	-9.8			34.1		
238	ROT 168			matrix			-0.2	-7.8			29.0		
239	ROT 173			matrix			3.7	1.0			5.7		
240	ROT 185			matrix			-3.2	-9.2			38.5		
241	ROT 194A			matrix			-2.6	-8.5			17.7		
242	ROT 194B			matrix			-4.4	-10.1			9.8		
243	ROT 194C			matrix			-2.0	-7.3			3.9		
244	ROT 194N			matrix			-1.4	-9.2			15.0		
245	ROT 194P			matrix			-2.4	-9.4			4.6		
246	ROT 223			matrix			-2.2	-10.2			11.7		
247	ROT 94-59	R23-4A	2.0	matrix		675.1	-2.8	-8.6	5.60		24.3		
248	ROT 94-62	R23-4A	2.0	matrix		676.0	-2.2	-8.6	5.57		21.1		
249	ROT 94-68	R23-4N1	2.0	matrix		675.6	-2.5	-9.4	5.58		14.0		
250	KB96-008 m	R29-3S2	5.0	matrix		900.2	-1.8	-11.3	4.77		15.5		
251													
252	**modern river silt**												
253	INDUS 1.b			Indus silt			-0.4	-6.6			28.9		
254	Indus.1.b			Indus silt			-0.4	-6.6			27.2		
255	ROT 245			Jhelum silt			-2.8	-10.1			10.7		
256	ROT 246			Jhelum silt			-2.9	-9.8			13.6		
257	ROT 247			Jhelum silt			-2.9	-10.6			9.9		
258													
259													

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Table DR5 Sample Ages - Summary**											
2	**sample**	**Kaymeters**	**d13C**	**d18O**	**Revised Age**			**sample**	**Kaymeters**	**d13C**	**d18O**	**Revised Age**
3	ROT 94-26	184.6	-9.12	-9.60	-7.99			ROT-237.n	221.2	-10.55	-8.55	-7.73
4	ROT 94-1	184.8	-9.59	-8.50	-7.99			ROT-234	222.9	-9.74	-9.00	-7.72
5	ROT 94-8	184.9	-9.93	-8.90	-7.99			ROT 163	289	-10.19	-8.83	-7.43
6	ROT94-4	185.1	-9.79	-9.50	-7.99			ROT 165	326.8	-6.79	-8.35	-7.07
7	ROT 94-2	185.2	-9.27	-9.00	-7.98			ROT 164	327	-7.79	-7.97	-7.07
8	ROT 121	185.5	-8.62	-8.91	-7.98			ROT 161	354	-7.45	-7.58	-7.01
9	KB96-026	185.7	-9.92	-8.92	-7.98			ROT-160.n	356	-6.42	-12.58	-7.00
10	ROT94-3	185.8	-9.55	-10.30	-7.98			KB96-003	435	-5.86	-8.24	-6.78
11	ROT 94-6	186	-9.39	-8.80	-7.98			KB96-032	435	-3.59	-8.04	-6.78
12	ROT 94-27	186.1	-11.06	-9.10	-7.98			KB96-033	435	-4.88	-8.19	-6.78
13	ROT 94-73	186.2	-10.42	-8.90	-7.98			KB96-029	435.2	-3.41	-7.94	-6.78
14	ROT 147	186.3	-9.95	-9.40	-7.98			KB96-004	435.2	-4.21	-8.17	-6.78
15	ROT 94-9	186.5	-10.20	-9.00	-7.98			KB96-005	435.4	-4.60	-8.85	-6.78
16	ROT 94-7	186.8	-9.94	-9.30	-7.97			KB96-028	435.5	-5.06	-8.29	-6.78
17	ROT 94-74	186.8	-11.20	-8.60	-7.97			KB96-030	435.5	-4.48	-7.97	-6.78
18	ROT-235-1	187	-9.90	-9.30	-7.97			KB96-034	436.7	-7.66	-8.92	-6.77
19	ROT-235-2	187	-9.80	-9.10	-7.97			ROT 16	437.1	-3.27	-8.24	-6.77
20	ROT-235-3	187	-9.60	-9.10	-7.97			ROT 17	437.3	-3.74	-8.50	-6.77
21	ROT 94-71	187.1	-12.03	-8.60	-7.97			ROT-36n	437.8	-7.83	-9.43	-6.77
22	ROT 94-5	187.3	-10.61	-11.10	-7.97			ROT 71	438	-3.90	-7.27	-6.77
23	ROT 152	187.4	-11.30	-7.04	-7.97			ROT-225	438.4	-2.68	-7.36	-6.77
24	ROT 94-75	187.6	-10.16	-8.60	-7.97			9795	438.5	-2.50	-7.60	-6.77
25	ROT 94-72	187.8	-9.66	-8.80	-7.97			ROT-37	439.8	-2.34	-7.52	-6.76
26	ROT-123n	191.3	-9.51	-9.42	-7.94			ROT 27	440.4	-5.85	-9.16	-6.76
27	9005	191.9	-10.10	-7.90	-7.94			ROT 26	440.8	-7.33	-9.73	-6.76
28	ROT-149.n	192.4	-10.72	-7.55	-7.93			ROT-227	441.5	-3.29	-7.40	-6.76
29	ROT 124	192.8	-7.40	-7.48	-7.93			ROT 28	442.3	-2.53	-8.06	-6.76
30	ROT-125.n	193.7	-10.13	-8.20	-7.92			ROT 53	442.6	-8.96	-8.71	-6.76
31	ROT-153.n	194.6	-10.49	-8.98	-7.92			ROT 94-58	444.1	-7.04	-8.10	-6.75
32	ROT 76	197.4	-10.22	-9.54	-7.90			ROT 29	444.2	-7.49	-7.22	-6.75
33	ROT 78L	197.6	-10.03	-9.86	-7.90			ROT 29	444.2	-5.99	-7.14	-6.75
34	ROT 78K	198	-9.89	-9.41	-7.89			ROT 51	444.9	-4.26	-7.10	-6.75
35	ROT 78K	198	-10.36	-9.50	-7.89			ROT-51.n	444.9	-7.19	-8.10	-6.75
36	ROT 78J	198.4	-10.41	-9.13	-7.89			ROT 94-69	444.9	-8.02	-8.20	-6.75
37	ROT 75	198.8	-10.05	-9.78	-7.89			ROT 94-70	445.7	-8.90	-8.20	-6.75
38	ROT 141	203.3	-9.01	-8.88	-7.86			ROT 94-56	445.8	-5.18	-8.20	-6.75
39	ROT-142	206.8	-9.67	-8.64	-7.83			KB96-038	446	-8.60	-8.50	-6.75
40	ROT 136	210.8	-11.28	-7.32	-7.80			KB96-035	446	-9.66	-8.56	-6.75

	A	B	C	D	E	F	G	H	I	J	K	L
41	**Table DR5 Sample Ages - Summary**											
42	**sample**	**Kaymeters**	**d13C**	**d18O**	**Revised Age**			**sample**	**Kaymeters**	**d13C**	**d18O**	**Revised Age**
43	ROT 94-14	446.2	-4.87	-7.70	-6.75			ROT 66	453.4	-7.87	-8.34	-6.72
44	ROT 94-37	446.4	-7.81	-8.20	-6.74			ROT 59	455.8	-2.61	-6.38	-6.72
45	ROT-73n	446.5	-6.39	-7.91	-6.74			ROT 68	456.2	-8.84	-9.80	-6.72
46	ROT-52	446.6	-4.03	-7.59	-6.74			ROT 114	569.1	-5.79	-5.36	-6.23
47	ROT 94-38	446.7	-8.57	-9.60	-6.74			KB96-057	675.2	-5.11	-8.24	-5.78
48	ROT 54	446.8	-4.00	-7.93	-6.74			ROT 94-64r	675.4	-7.12	-7.50	-5.78
49	ROT 94-16	446.8	-10.11	-7.90	-6.74			ROT 94-65	675.4	-8.65	-8.80	-5.78
50	ROT 94-40	446.8	-8.17	-8.60	-6.74			ROT 94-64	675.4	-9.63	-9.80	-5.78
51	ROT 94-41	447	-9.72	-9.80	-6.74			KB96-058	675.5	-3.54	-9.08	-5.78
52	ROT 94-13	447.2	-4.95	-7.90	-6.74			ROT 94-60	675.5	-9.78	-9.70	-5.78
53	ROT 94-23	447.2	-8.43	-7.40	-6.74			ROT 92	675.6	-10.54	-9.37	-5.78
54	ROT 49	447.3	-2.82	-7.28	-6.74			ROT 94-66	675.6	-8.07	-8.70	-5.78
55	ROT 94-43	447.3	-8.37	-9.50	-6.74			ROT 94-66	675.6	-9.40	-9.20	-5.78
56	ROT 94-18	447.3	-2.20	-6.00	-6.74			KB96-059	675.9	0.13	-6.60	-5.78
57	ROT 94-11	447.4	-4.44	-7.70	-6.74			ROT 94-61r	675.9	-8.39	-9.40	-5.78
58	ROT 94-44	447.5	-9.05	-10.00	-6.74			ROT 94-67	675.9	-8.14	-9.00	-5.78
59	ROT 94-29	447.6	-9.34	-9.30	-6.74			ROT 94-61	675.9	-8.30	-8.70	-5.78
60	ROT 94-24	447.6	-1.07	-6.10	-6.74			KB96-060	676.3	-6.75	-10.98	-5.78
61	ROT 94-35	447.6	-5.29	-7.60	-6.74			ROT-82n	681.5	-6.47	-6.47	-5.75
62	ROT 94-57	448	-8.01	-8.50	-6.74			KB96-043	874.8	-0.16	-7.68	-4.91
63	ROT 94-21	448.1	-8.52	-8.40	-6.74			KB96-044	876.2	1.10	-6.90	-4.90
64	ROT 94-30	448.4	-8.24	-8.50	-6.74			KB96-045	885.2	-1.09	-7.96	-4.86
65	RJF-N	449.5	-8.48	-6.28	-6.74			KB96-047	885.3	1.48	-6.64	-4.86
66	RJF-O	449.5	-7.72	-7.17	-6.74			KB96-061	885.6	0.64	-7.50	-4.86
67	RJF-P	449.8	-8.75	-9.50	-6.73			KB96-046	885.7	0.91	-6.82	-4.86
68	RJF-L	450.1	-8.04	-9.66	-6.73			KB96-067	885.9	0.41	-7.10	-4.85
69	RJF-M	450.1	-8.66	-10.30	-6.73			KB96-075	885.9	0.38	-7.14	-4.85
70	RJF-H	450.2	-9.81	-8.70	-6.73			KB96-077	885.9	0.61	-6.84	-4.85
71	RJF-I	450.2	-8.85	-9.30	-6.73			ROT 212	886	-0.12	-6.20	-4.85
72	RJF-J	450.4	-9.77	-8.30	-6.73			ROT 206	886.1	0.41	-6.69	-4.85
73	RJF-G	450.6	-7.90	-9.44	-6.73			KB96-065	886.3	-0.27	-6.63	-4.85
74	RJF-C	450.6	-9.24	-9.30	-6.73			KB96-071	886.3	-0.21	-6.25	-4.85
75	RJF-E	450.6	-8.54	-9.10	-6.73			KB96-074	886.3	-0.51	-6.45	-4.85
76	RJF-F	450.6	-8.13	-8.90	-6.73			KB96-064	886.7	-2.07	-6.62	-4.85
77	RJF-A	450.8	-8.16	-9.80	-6.73			KB96-076	886.7	-2.13	-6.73	-4.85
78	RJF-B	450.8	-8.53	-9.50	-6.73			KB96-070	886.7	-2.24	-6.71	-4.85
79	RJF-D	450.8	-8.31	-9.10	-6.73			KB96-048	886.8	-0.17	-6.13	-4.85
80	ROT 32	452.9	-2.47	-7.47	-6.73			ROT 207	887	-3.56	-6.34	-4.85

	A	B	C	D	E	F	G	H	I	J	K	L
81	**Table DR5 Sample Ages - Summary**											
82	**sample**	**Kaymeters**	**d13C**	**d18O**	**Revised Age**							
83	KB96-069	887.1	-1.61	-6.36	-4.85							
84	KB96-063	887.1	-1.00	-6.08	-4.85							
85	KB96-073	887.1	-1.68	-6.22	-4.85							
86	ROT 216	887.5	-4.58	-9.38	-4.85							
87	KB96-068	887.5	-6.37	-7.36	-4.85							
88	KB96-072	887.5	-3.91	-6.75	-4.85							
89	KB96-062	887.5	-2.68	-6.56	-4.85							
90	KB96-050	889.8	-8.53	-6.59	-4.84							
91	ROT 209	896.3	0.67	-6.19	-4.80							
92	KB96-051	899.9	-2.31	-8.11	-4.79							
93	KB96-008	900.2	-3.54	-8.81	-4.78							
94	KB96-052	901	-2.91	-7.59	-4.78							
95	KB96-056	910	-2.63	-6.56	-4.74							
96	9006	899.53	-11.00	-9.70	-4.79							
97	R-8	1745	0.50	-7.40	-2.63							
98	ROT 172	1850	1.42	-6.30	-2.42							
99	ROT 175	1850	1.42	-5.90	-2.42							
100	ROT 171	1850	1.62	-6.18	-2.42							
101	ROT 187	1850	1.36	-3.86	-2.42							
102	ROT-182n	1850	2.65	-5.80	-2.42							
103	ROT 184	1850	3.44	-6.61	-2.42							
104	ROT 188	1850	3.42	-6.70	-2.42							
105	ROT 184	1850	2.33	-6.46	-2.42							
106	ROT 183	1850	2.25	-6.76	-2.42							
107	ROT 104H	1900	1.77	-6.02	-2.28							
108	ROT-104En2	1900	1.18	-4.87	-2.28							
109	ROT 104F	1900	2.05	-2.78	-2.28							
110	ROT 104D	1900	0.99	-5.21	-2.28							

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Table DR5 Ages Worksheet: Interpolated Age Calculation for Samples**													
2	Based on Repository 1 paleomagnetic data and Cande and Kent 95													
3	Sample #	Chron	Chron Max Age	Chron	Chron Min Age	Time Span	Interv al Base	Interval Top	Thickness (m)	AKB meters (level)	X: Distance above base of stratigraphic interval	Y: Proportion of total stratigraphic interval at sample level	Increment: Proportion of time span of interval to sample level	Revised Age
4	ROT 94-26	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	184.6	11.6	0.20	0.083	7.99
5	ROT 94-1	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	184.8	11.8	0.20	0.084	7.99
6	ROT 94-8	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	184.9	11.9	0.20	0.085	7.99
7	ROT94-4	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	185.1	12.1	0.21	0.087	7.99
8	ROT 94-2	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	185.2	12.2	0.21	0.087	7.98
9	ROT 121	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	185.5	12.5	0.21	0.089	7.98
10	KB96-026	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	185.7	12.7	0.22	0.091	7.98
11	ROT94-3	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	185.8	12.8	0.22	0.092	7.98
12	ROT 94-6	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186	13	0.22	0.093	7.98
13	ROT 94-27	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186.1	13.1	0.22	0.094	7.98
14	ROT 94-73	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186.2	13.2	0.22	0.094	7.98
15	ROT 147	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186.3	13.3	0.23	0.095	7.98
16	ROT 94-9	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186.5	13.5	0.23	0.097	7.98
17	ROT 94-7	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186.8	13.8	0.23	0.099	7.97
18	ROT 94-74	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	186.8	13.8	0.23	0.099	7.97
19	ROT-235-1	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187	14	0.24	0.100	7.97
20	ROT-235-2	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187	14	0.24	0.100	7.97
21	ROT-235-3	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187	14	0.24	0.100	7.97
22	ROT 94-71	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187.1	14.1	0.24	0.101	7.97
23	ROT 94-5	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187.3	14.3	0.24	0.102	7.97
24	ROT 152	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187.4	14.4	0.24	0.103	7.97
25	ROT 94-75	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187.6	14.6	0.25	0.104	7.97
26	ROT 94-72	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	187.8	14.8	0.25	0.106	7.97
27	ROT-123n	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	191.3	18.3	0.31	0.131	7.94
28	9005	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	191.9	18.9	0.32	0.135	7.94
29	ROT-149.n	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	192.4	19.4	0.33	0.139	7.93
30	ROT 124	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	192.8	19.8	0.34	0.142	7.93
31	ROT-125.n	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	193.7	20.7	0.35	0.148	7.92
32	ROT-153.n	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	194.6	21.6	0.37	0.154	7.92
33	ROT 76	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	197.4	24.4	0.41	0.175	7.90
34	ROT 78L	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	197.6	24.6	0.42	0.176	7.90
35	ROT 78K	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	198	25	0.42	0.179	7.89
36	ROT 78K	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	198	25	0.42	0.179	7.89

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
37	**Table DR5 Ages Worksheet: Interpolated Age Calculation for Samples**													
38	Based on Repository 1 paleomagnetic data and Cande and Kent 95													
39	Sample #	Chron	Chron Max Age	Chron	Chron Min Age	Time Span	Interval Base	Interval Top	Thickness (m)	AKB meters (level)	X: Distance above base of stratigraphic interval	Y: Proportion of total stratigraphic interval at sample level	Increment: Proportion of time span of interval to sample level	Revised Age
40	ROT 78J	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	198.4	25.4	0.43	0.182	7.89
41	ROT 75	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	198.8	25.8	0.44	0.185	7.89
42	ROT 141	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	203.3	30.3	0.51	0.217	7.86
43	ROT-142	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	206.8	33.8	0.57	0.242	7.83
44	ROT 136	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	210.8	37.8	0.64	0.270	7.80
45	ROT-237.n	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	221.2	48.2	0.82	0.345	7.73
46	ROT-234	N3 = 4n.2n	8.07	N3 = 4n.2n	7.65	0.42	173	232.00	59.00	222.9	49.9	0.85	0.357	7.72
47	ROT 163	N4 = 4n.1n	7.56	N4 = 3Br.2n	7.34	0.22	260	309.00	49.00	289	29	0.59	0.130	7.43
48	ROT 165	N5 = 3Br.1n	7.09	N5 = 3Bn	6.94	0.15	320	381.00	61.00	326.8	6.8	0.11	0.017	7.07
49	ROT 164	N5 = 3Br.1n	7.09	N5 = 3Bn	6.94	0.15	320	381.00	61.00	327	7	0.11	0.017	7.07
50	ROT 161	N5 = 3Br.1n	7.09	N5 = 3Bn	6.94	0.15	320	381.00	61.00	354	34	0.56	0.084	7.01
51	ROT-160.n	N5 = 3Br.1n	7.09	N5 = 3Bn	6.94	0.15	320	381.00	61.00	356	36	0.59	0.089	7.00
52	KB96-003	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435	54	0.44	0.161	6.78
53	KB96-032	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435	54	0.44	0.161	6.78
54	KB96-033	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435	54	0.44	0.161	6.78
55	KB96-029	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435.2	54.2	0.44	0.162	6.78
56	KB96-004	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435.2	54.2	0.44	0.162	6.78
57	KB96-005	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435.4	54.4	0.44	0.162	6.78
58	KB96-028	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435.5	54.5	0.44	0.163	6.78
59	KB96-030	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	435.5	54.5	0.44	0.163	6.78
60	KB96-034	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	436.7	55.7	0.45	0.166	6.77
61	ROT 16	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	437.1	56.1	0.45	0.167	6.77
62	ROT 17	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	437.3	56.3	0.45	0.168	6.77
63	ROT-36n	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	437.8	56.8	0.46	0.169	6.77
64	ROT 71	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	438	57	0.46	0.170	6.77
65	ROT-225	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	438.4	57.4	0.46	0.171	6.77
66	9795	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	438.5	57.5	0.46	0.172	6.77
67	ROT-37	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	439.8	58.8	0.47	0.175	6.76
68	ROT 27	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	440.4	59.4	0.48	0.177	6.76
69	ROT 26	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	440.8	59.8	0.48	0.178	6.76
70	ROT-227	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	441.5	60.5	0.49	0.181	6.76
71	ROT 28	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	442.3	61.3	0.49	0.183	6.76
72	ROT 53	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	442.6	61.6	0.50	0.184	6.76

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
73	**Table DR5 Ages Worksheet: Interpolated Age Calculation for Samples**													
74	Based on Repository 1 paleomagnetic data and Cande and Kent 95													
75	Sample #	Chron	Chron Max Age	Chron	Chron Min Age	Time Span	Interval Base	Interval Top	Thickness (m)	AKB meters (level)	X: Distance above base of stratigraphic interval	Y: Proportion of total stratigraphic interval at sample level	Increment: Proportion of time span of interval to sample level	Revised Age
76	ROT 94-58	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	444.1	63.1	0.51	0.188	6.75
77	ROT 29	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	444.2	63.2	0.51	0.189	6.75
78	ROT 29	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	444.2	63.2	0.51	0.189	6.75
79	ROT 51	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	444.9	63.9	0.52	0.191	6.75
80	ROT-51.n	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	444.9	63.9	0.52	0.191	6.75
81	ROT 94-69	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	444.9	63.9	0.52	0.191	6.75
82	ROT 94-70	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	445.7	64.7	0.52	0.193	6.75
83	ROT 94-56	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	445.8	64.8	0.52	0.193	6.75
84	KB96-038	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446	65	0.52	0.194	6.75
85	KB96-035	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446	65	0.52	0.194	6.75
86	ROT 94-14	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.2	65.2	0.53	0.195	6.75
87	ROT 94-37	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.4	65.4	0.53	0.195	6.74
88	ROT-73n	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.5	65.5	0.53	0.195	6.74
89	ROT-52	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.6	65.6	0.53	0.196	6.74
90	ROT 94-38	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.7	65.7	0.53	0.196	6.74
91	ROT 54	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.8	65.8	0.53	0.196	6.74
92	ROT 94-16	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.8	65.8	0.53	0.196	6.74
93	ROT 94-40	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	446.8	65.8	0.53	0.196	6.74
94	ROT 94-41	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447	66	0.53	0.197	6.74
95	ROT 94-13	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.2	66.2	0.53	0.198	6.74
96	ROT 94-23	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.2	66.2	0.53	0.198	6.74
97	ROT 49	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.3	66.3	0.53	0.198	6.74
98	ROT 94-43	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.3	66.3	0.53	0.198	6.74
99	ROT 94-18	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.3	66.3	0.53	0.198	6.74
100	ROT 94-11	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.4	66.4	0.54	0.198	6.74
101	ROT 94-44	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.5	66.5	0.54	0.198	6.74
102	ROT 94-29	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.6	66.6	0.54	0.199	6.74
103	ROT 94-24	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.6	66.6	0.54	0.199	6.74
104	ROT 94-35	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	447.6	66.6	0.54	0.199	6.74
105	ROT 94-57	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	448	67	0.54	0.200	6.74
106	ROT 94-21	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	448.1	67.1	0.54	0.200	6.74
107	ROT 94-30	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	448.4	67.4	0.54	0.201	6.74
108	RJF-N	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	449.5	68.5	0.55	0.204	6.74

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
109	**Table DR5 Ages Worksheet: Interpolated Age Calculation for Samples**													
110	Based on Repository 1 paleomagnetic data and Cande and Kent 95													
111	Sample #	Chron	Chron Max Age	Chron	Chron Min Age	Time Span	Interv al Base	Interval Top	Thickness (m)	AKB meters (level)	X: Distance above base of stratigraphic interval	Y: Proportion of total stratigraphic interval at sample level	Increment: Proportion of time span of interval to sample level	Revised Age
112	RJF-O	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	449.5	68.5	0.55	0.204	6.74
113	RJF-P	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	449.8	68.8	0.55	0.205	6.73
114	RJF-L	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.1	69.1	0.56	0.206	6.73
115	RJF-M	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.1	69.1	0.56	0.206	6.73
116	RJF-H	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.2	69.2	0.56	0.206	6.73
117	RJF-I	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.2	69.2	0.56	0.206	6.73
118	RJF-J	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.4	69.4	0.56	0.207	6.73
119	RJF-G	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.6	69.6	0.56	0.208	6.73
120	RJF-C	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.6	69.6	0.56	0.208	6.73
121	RJF-E	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.6	69.6	0.56	0.208	6.73
122	RJF-F	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.6	69.6	0.56	0.208	6.73
123	RJF-A	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.8	69.8	0.56	0.208	6.73
124	RJF-B	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.8	69.8	0.56	0.208	6.73
125	RJF-D	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	450.8	69.8	0.56	0.208	6.73
126	ROT 32	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	452.9	71.9	0.58	0.215	6.73
127	ROT 66	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	453.4	72.4	0.58	0.216	6.72
128	ROT 59	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	455.8	74.8	0.60	0.223	6.72
129	ROT 68	N5 = 3Br.1n	6.94	N5 = 3Bn	6.57	0.37	381	505.00	124.00	456.2	75.2	0.61	0.224	6.72
130	ROT 114	N7 = 3An.2n	6.57	N7 = 3An.2n (b	6.14	0.43	505	585.00	80.00	569.1	64.1	0.80	0.345	6.23
131	KB96-057	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.2	25.2	0.16	0.109	5.78
132	ROT 94-64r	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.4	25.4	0.17	0.110	5.78
133	ROT 94-65	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.4	25.4	0.17	0.110	5.78
134	ROT 94-64	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.4	25.4	0.17	0.110	5.78
135	KB96-058	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.5	25.5	0.17	0.110	5.78
136	ROT 94-60	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.5	25.5	0.17	0.110	5.78
137	ROT 92	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.6	25.6	0.17	0.110	5.78
138	ROT 94-66	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.6	25.6	0.17	0.110	5.78
139	ROT 94-66	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.6	25.6	0.17	0.110	5.78
140	KB96-059	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.9	25.9	0.17	0.112	5.78
141	ROT 94-61r	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.9	25.9	0.17	0.112	5.78
142	ROT 94-67	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.9	25.9	0.17	0.112	5.78
143	ROT 94-61	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	675.9	25.9	0.17	0.112	5.78
144	KB96-060	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	676.3	26.3	0.17	0.113	5.78

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
145	**Table DR5 Ages Worksheet: Interpolated Age Calculation for Samples**													
146	Based on Repository 1 paleomagnetic data and Cande and Kent 95													
147	Sample #	Chron	Chron Max Age	Chron	Chron Min Age	Time Span	Interval Base	Interval Top	Thickness (m)	AKB meters (level)	X: Distance above base of stratigraphic interval	Y: Proportion of total stratigraphic interval at sample level	Increment: Proportion of time span of interval to sample level	Revised Age
148	ROT-82n	N8 =3An.1n (to	5.89	N8 = 3n.1n (bas	5.23	0.66	650	803.00	153.00	681.5	31.5	0.21	0.136	5.75
149	KB96-043	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	874.8	14.8	0.14	0.072	4.91
150	KB96-044	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	876.2	16.2	0.16	0.079	4.90
151	KB96-045	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.2	25.2	0.24	0.122	4.86
152	KB96-047	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.3	25.3	0.25	0.123	4.86
153	KB96-061	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.6	25.6	0.25	0.124	4.86
154	KB96-046	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.7	25.7	0.25	0.125	4.86
155	KB96-067	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.9	25.9	0.25	0.126	4.85
156	KB96-075	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.9	25.9	0.25	0.126	4.85
157	KB96-077	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	885.9	25.9	0.25	0.126	4.85
158	ROT 212	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886	26	0.25	0.126	4.85
159	ROT 206	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.1	26.1	0.25	0.127	4.85
160	KB96-065	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.3	26.3	0.26	0.128	4.85
161	KB96-071	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.3	26.3	0.26	0.128	4.85
162	KB96-074	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.3	26.3	0.26	0.128	4.85
163	KB96-064	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.7	26.7	0.26	0.130	4.85
164	KB96-076	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.7	26.7	0.26	0.130	4.85
165	KB96-070	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.7	26.7	0.26	0.130	4.85
166	KB96-048	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	886.8	26.8	0.26	0.130	4.85
167	ROT 207	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887	27	0.26	0.131	4.85
168	KB96-069	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.1	27.1	0.26	0.132	4.85
169	KB96-063	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.1	27.1	0.26	0.132	4.85
170	KB96-073	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.1	27.1	0.26	0.132	4.85
171	ROT 216	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.5	27.5	0.27	0.133	4.85
172	KB96-068	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.5	27.5	0.27	0.133	4.85
173	KB96-072	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.5	27.5	0.27	0.133	4.85
174	KB96-062	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	887.5	27.5	0.27	0.133	4.85
175	KB96-050	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	889.8	29.8	0.29	0.145	4.84
176	ROT 209	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	896.3	36.3	0.35	0.176	4.80
177	KB96-051	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	899.9	39.9	0.39	0.194	4.79
178	KB96-008	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	900.2	40.2	0.39	0.195	4.78
179	KB96-052	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	901	41	0.40	0.199	4.78
180	KB96-056	N9 = 3n.4n (bas	4.98	N10 = 3n.2n (to	4.48	0.50	860	963.00	103.00	910	50	0.49	0.243	4.74

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
181	**Table DR5 Ages Worksheet: Interpolated Age Calculation for Samples**													
182	Based on Repository 1 paleomagnetic data and Cande and Kent 95													
183	Sample #	Chron	Chron Max Age	Chron	Chron Min Age	Time Span	Interv al Base	Interval Top	Thickness (m)	AKB meters (level)	X: Distance above base of stratigraphic interval	Y: Proportion of total stratigraphic interval at sample level	Increment: Proportion of time span of interval to sample level	Revised Age
184	9006	N9 = 3n.4n (base	4.98	N10 = 3n.2n (top	4.48	0.50	860	963.00	103.00	899.53	39.53	0.38	0.192	4.79
185	R-8	N14 = 2An.1n	3.04	N14 = 2An.1n	2.58	0.46	1405	1790.00	385.00	1745	340	0.88	0.405	2.63
186	ROT 172	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
187	ROT 175	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
188	ROT 171	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
189	ROT 187	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
190	ROT-182n	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
191	ROT 184	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
192	ROT 188	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
193	ROT 184	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
194	ROT 183	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1850	60	0.26	0.165	2.42
195	ROT 104H	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1900	110	0.48	0.302	2.28
196	ROT-104En2	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1900	110	0.48	0.302	2.28
197	ROT 104F	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1900	110	0.48	0.302	2.28
198	ROT 104D	N14 = 2An.1n	2.58	N15 = 2n (base)	1.95	0.63	1790	2020.00	230.00	1900	110	0.48	0.302	2.28

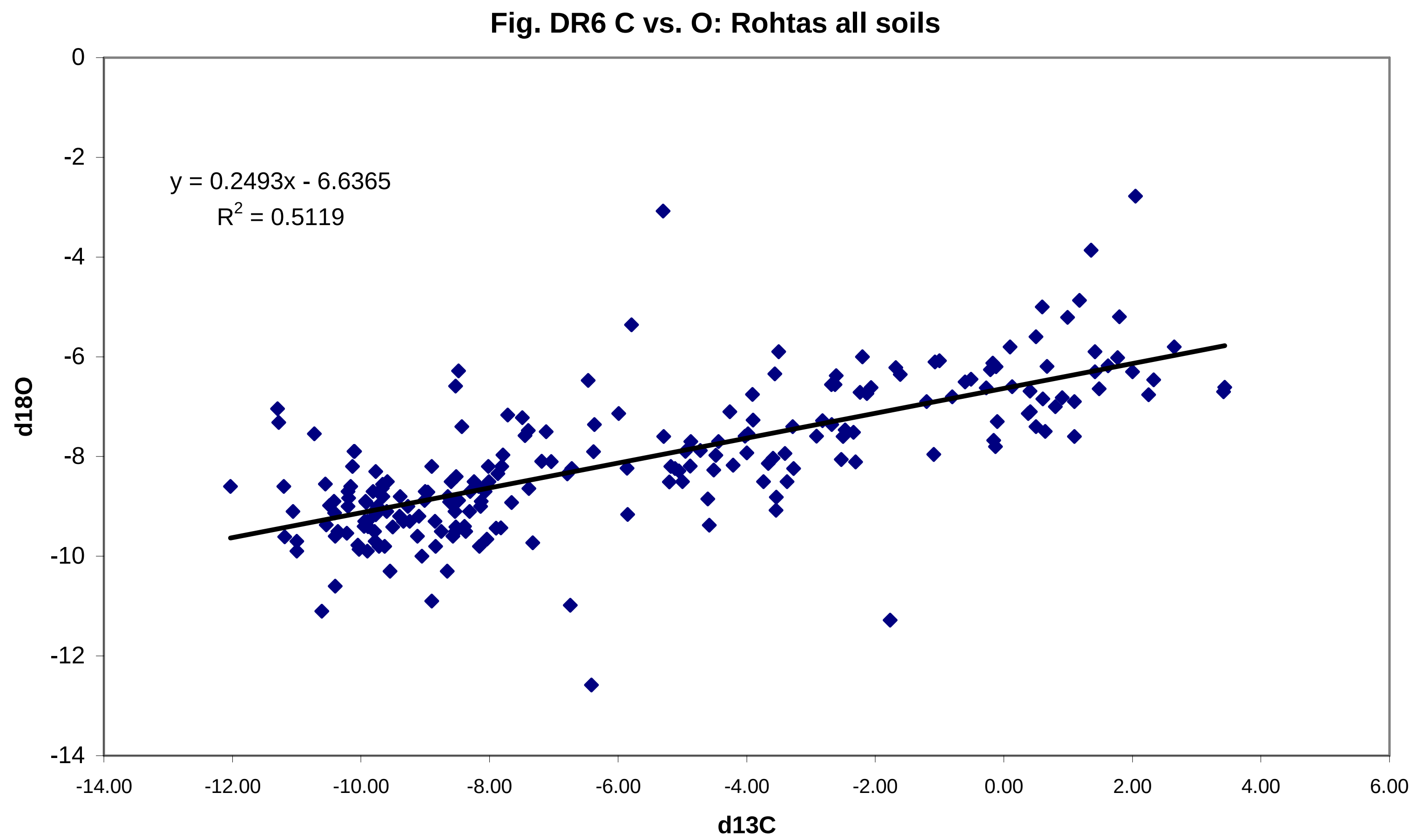


Fig. DR6 C vs. O: Rohtas all soils
y = 0.2493x - 6.6365
R2 = 0.5119
d18O
d13C
0
-2
-4
-6
-8
-10
-12
-14
-14.00
-12.00
-10.00
-8.00
-6.00
-4.00
-2.00
0.00
2.00
4.00
6.00

	A	B
1	**Table DR6**	
2	**r2 summary results 13C versus 18O regressions for carbonates**	
3	**level**	**r2**
4	R11	0.0129
5	R15 all soils	0.3993
6	R23Psol 2	0.4475
7	R15Psol 6	0.5784
8	R15Psol 2	0.2993
9	R29Psol2	0.1231
10	UBT	0.2831
11	all Rohtas soils	0.3993

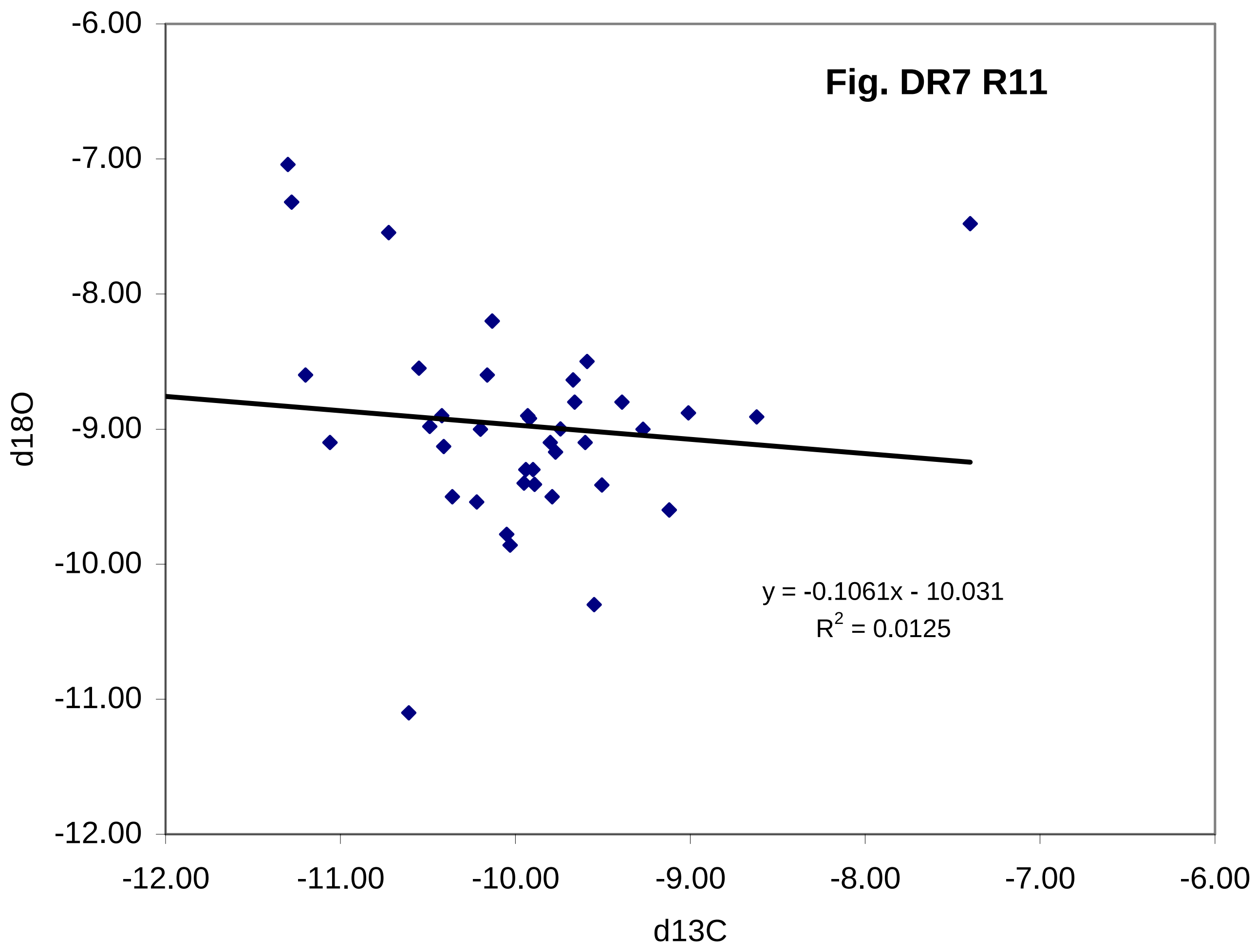


Fig. DR7 R11
-6.00
-7.00
-8.00
-9.00
-10.00
-11.00
-12.00
d18O
y = -0.1061x - 10.031
R2 = 0.0125
-12.00
-11.00
-10.00
-9.00
-8.00
-7.00
-6.00
d13C

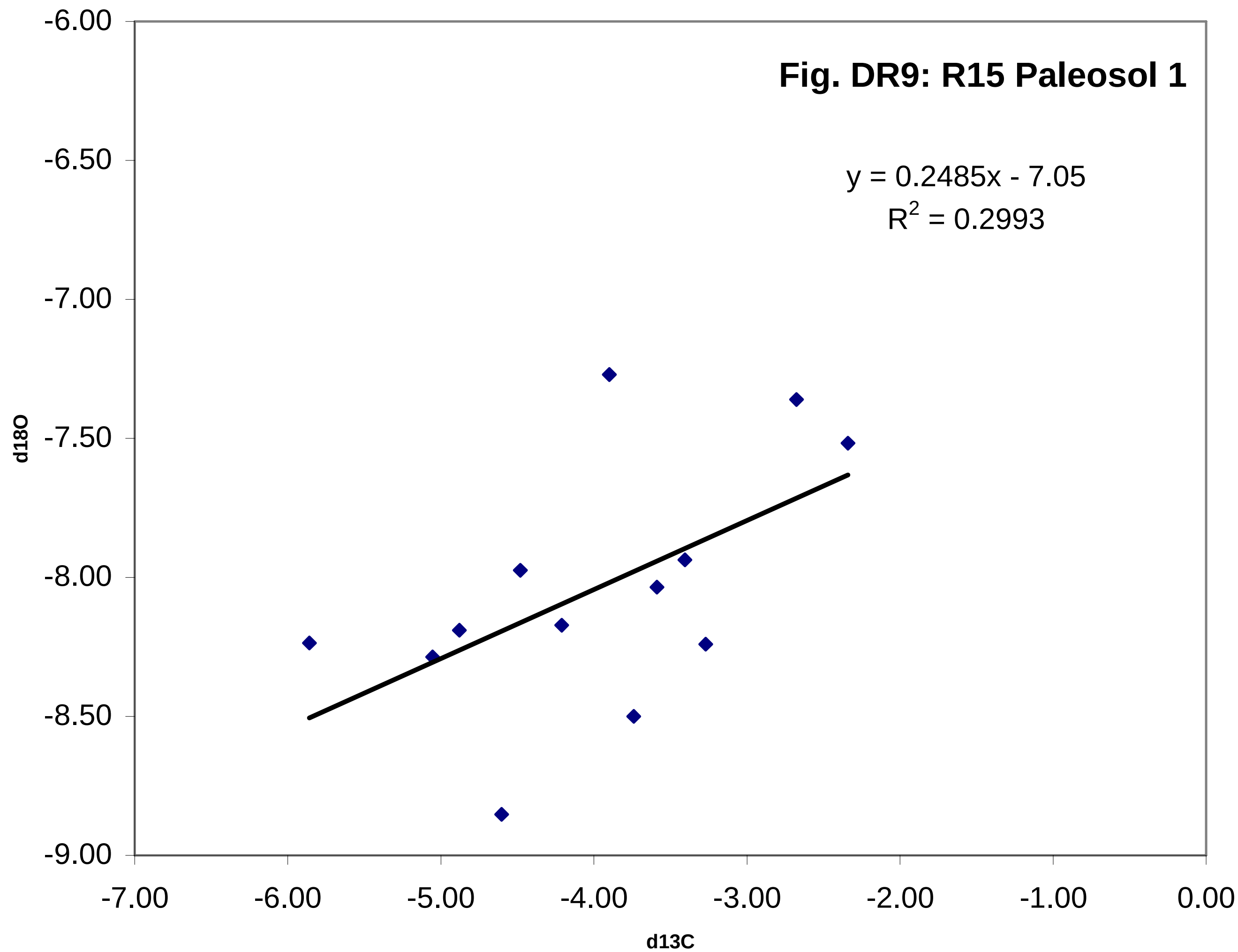


Fig. DR9: R15 Paleosol 1
y = 0.2485x - 7.05
R2 = 0.2993
-6.00
-6.50
-7.00
-7.50
-8.00
-8.50
-9.00
d18O
-7.00
-6.00
-5.00
-4.00
-3.00
-2.00
-1.00
0.00
d13C

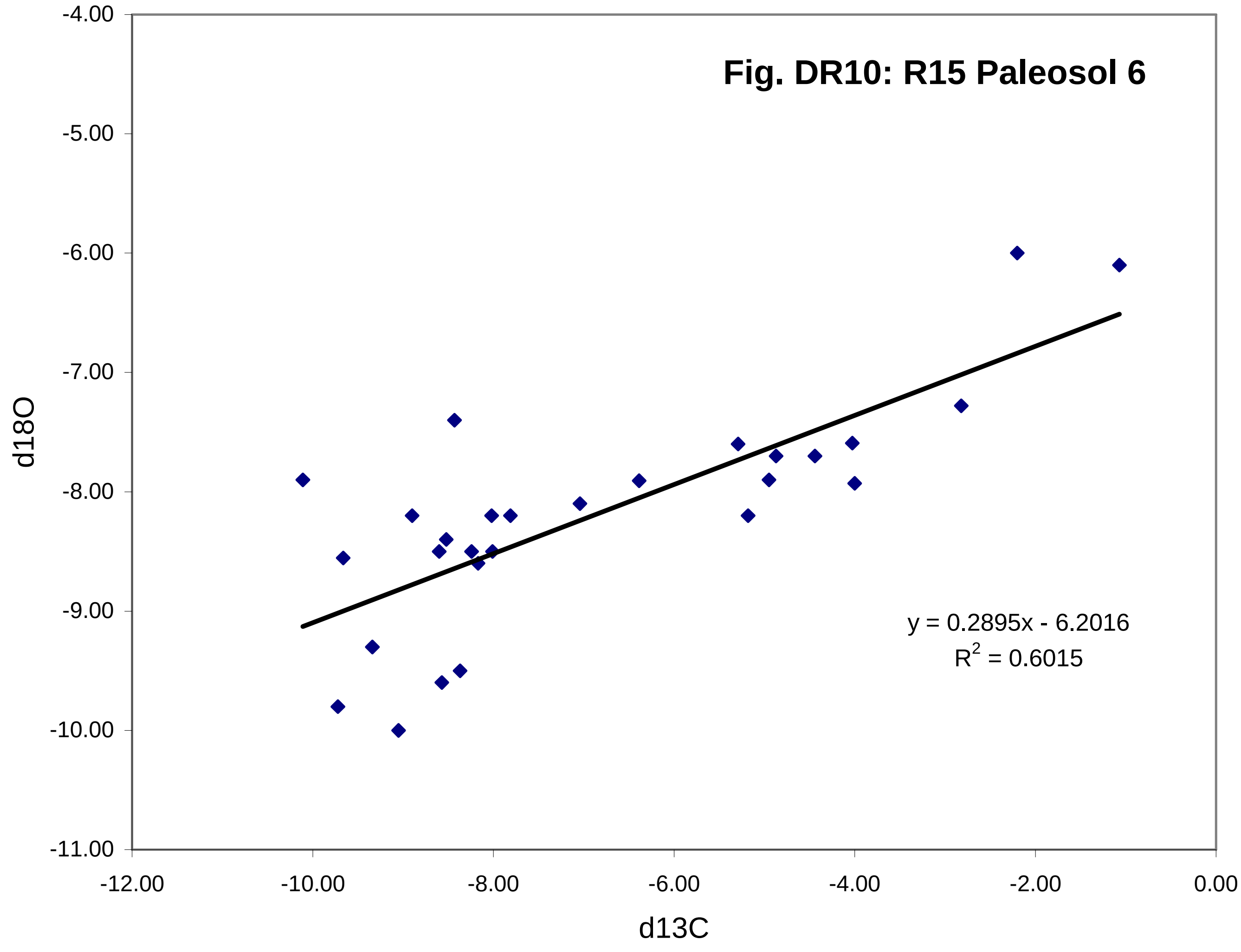
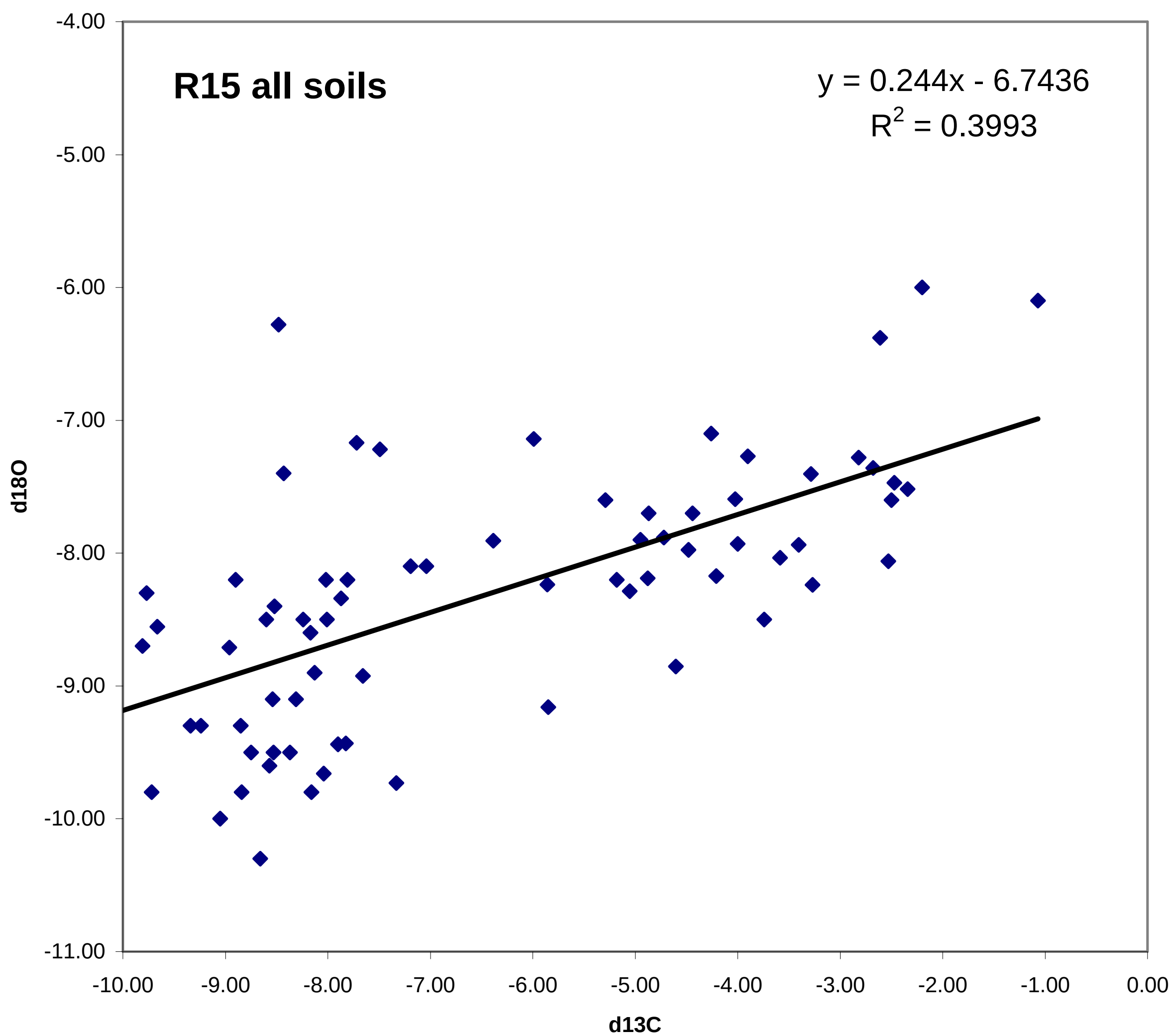


Fig. DR10: R15 Paleosol 6
d18O
d13C
y = 0.2895x - 6.2016
R2 = 0.6015
-4.00
-5.00
-6.00
-7.00
-8.00
-9.00
-10.00
-11.00
-12.00
-10.00
-8.00
-6.00
-4.00
-2.00
0.00


R15 all soils
y = 0.244x - 6.7436
$R^2 = 0.3993$
-4.00
-5.00
-6.00
-7.00
-8.00
-9.00
-10.00
-11.00
d18O
-10.00
-9.00
-8.00
-7.00
-6.00
-5.00
-4.00
-3.00
-2.00
-1.00
0.00
d13C

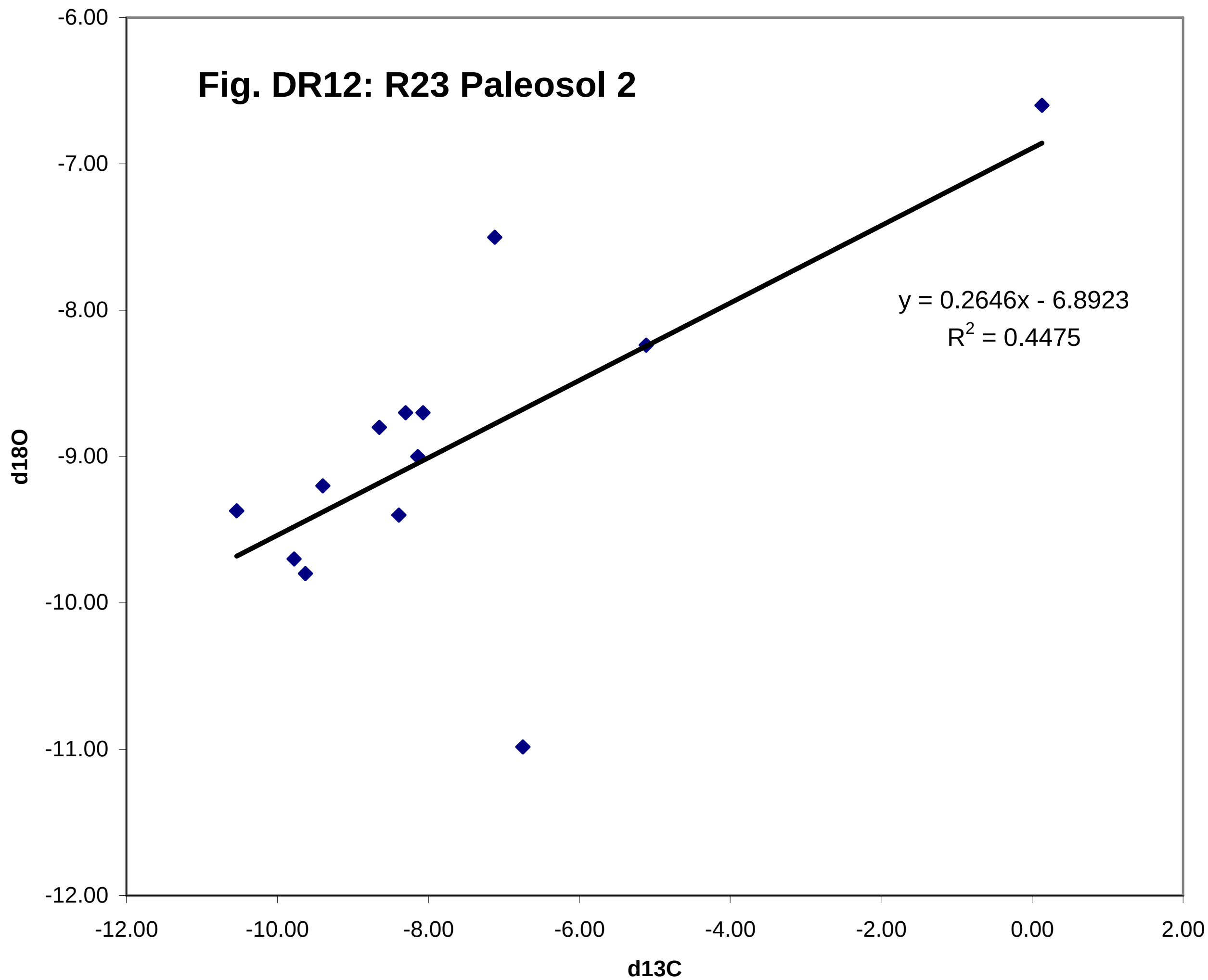


Fig. DR12: R23 Paleosol 2
y = 0.2646x - 6.8923
R2 = 0.4475
d18O
d13C
-6.00
-7.00
-8.00
-9.00
-10.00
-11.00
-12.00
-12.00
-10.00
-8.00
-6.00
-4.00
-2.00
0.00
2.00

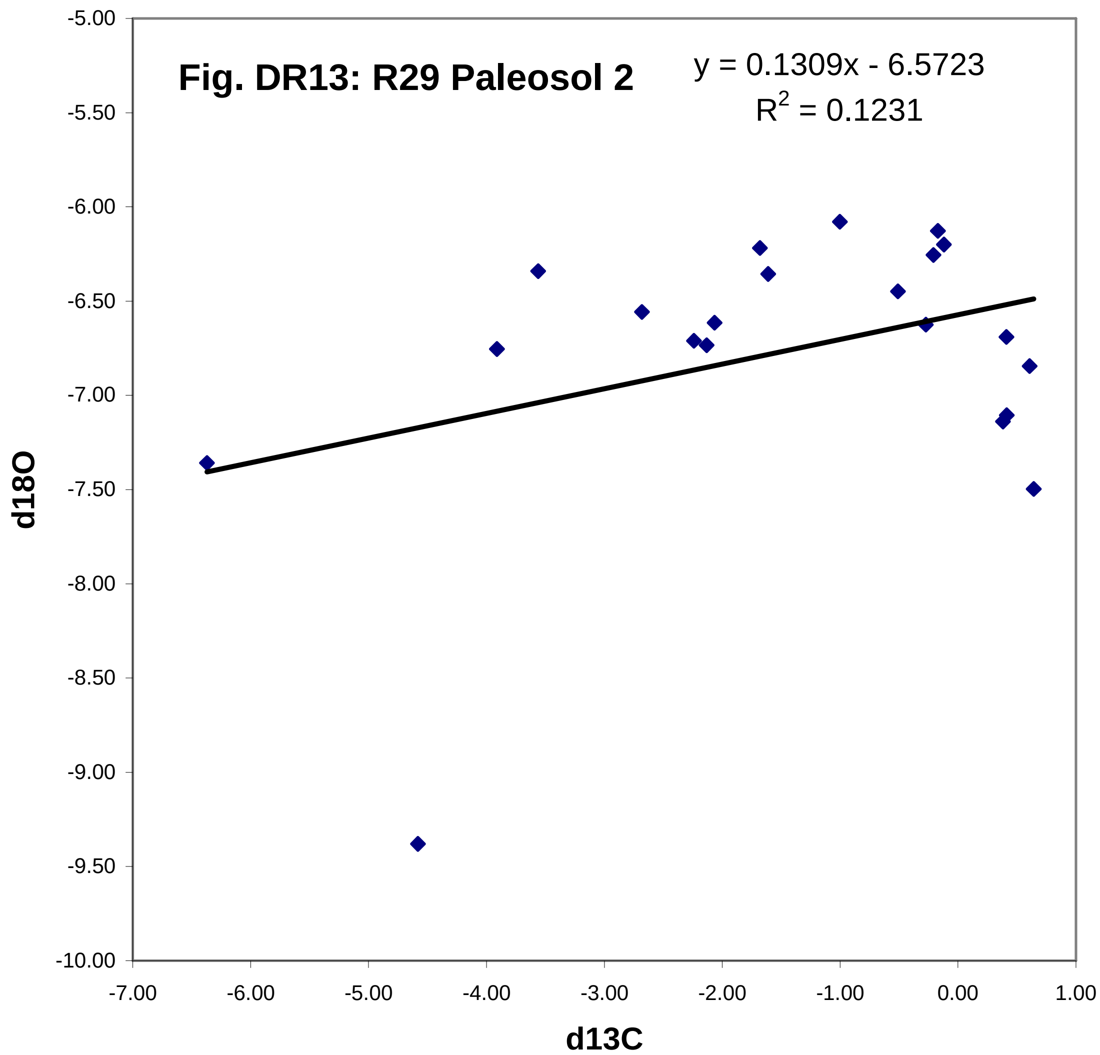


Fig. DR13: R29 Paleosol 2
y = 0.1309x - 6.5723
R2 = 0.1231
d18O
d13C
-5.00
-5.50
-6.00
-6.50
-7.00
-7.50
-8.00
-8.50
-9.00
-9.50
-10.00
-7.00
-6.00
-5.00
-4.00
-3.00
-2.00
-1.00
0.00
1.00

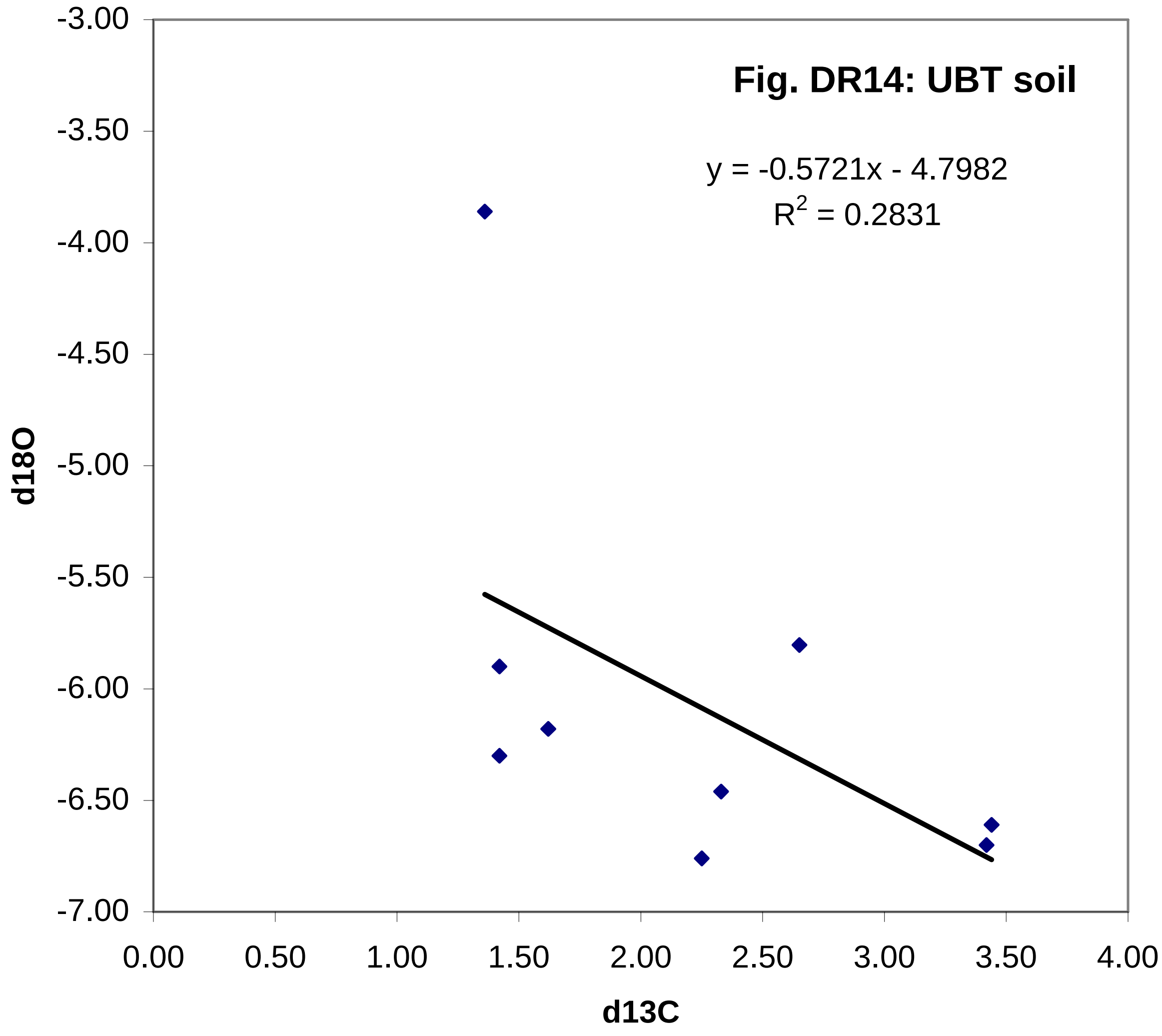
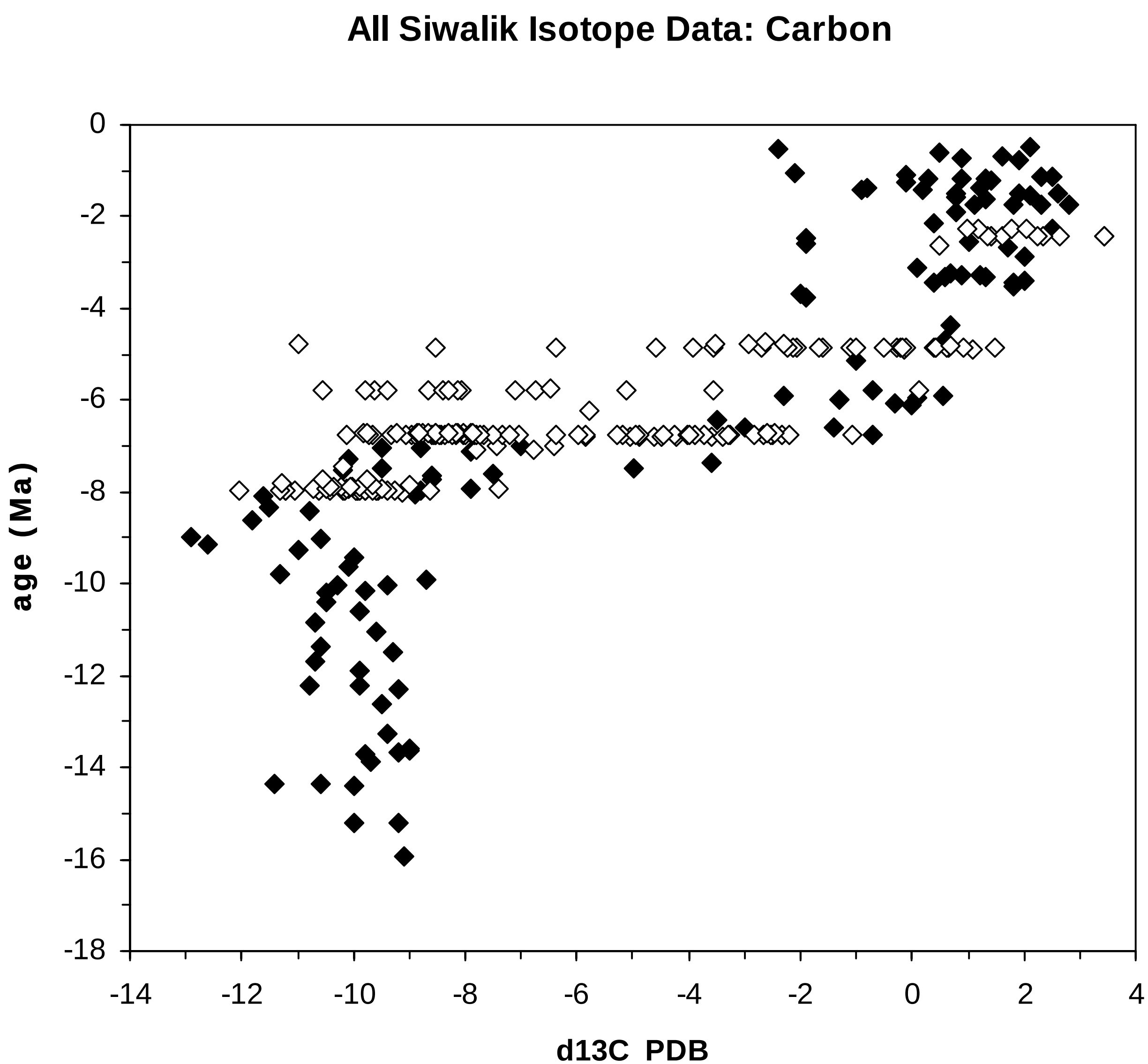
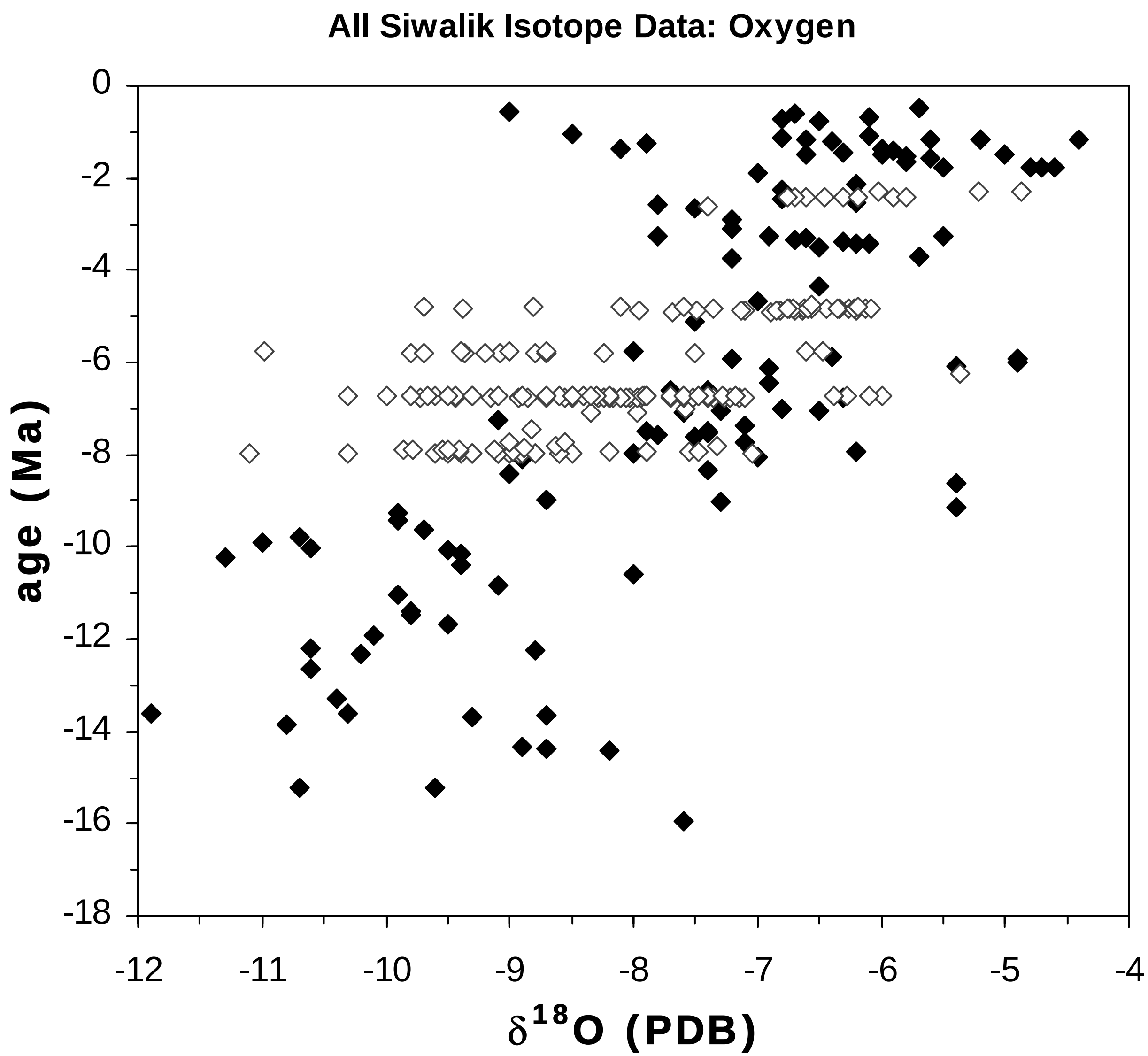


Fig. DR14: UBT soil
y = -0.5721x - 4.7982
R2 = 0.2831
-3.00
-3.50
-4.00
-4.50
-5.00
-5.50
-6.00
-6.50
-7.00
d18O
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
d13C


All Siwalik Isotope Data: Carbon
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
age (Ma)
-14
-12
-10
-8
-6
-4
-2
0
2
4
d13C PDB


All Siwalik Isotope Data: Oxygen
age (Ma)
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-12
-11
-10
-9
-8
-7
-6
-5
-4
δ18O (PDB)

	A	B	C	D	E	F	G
1	**Table DR7 All Siwalik Data**						
2	Pakistan soil carbonate results-multiple areas for composite section.						
3	**sample #**	**section**	**d13C**	**d18O**	**age (Bergren)**	**Cande and Kent 1995; Barry et al. 2002**	**age**
4	9148	Gabhir Kas	-9.10	-7.60	-17.00	15.93	-15.93
5	9143	Gabhir Kas	-9.20	-9.60	-16.00	15.21	-15.21
6	9141	Gabhir Kas	-10.00	-10.70	-16.00	15.21	-15.21
7	9135	Gabhir Kas	-10.00	-8.20	-15.10	14.40	-14.40
8	9134	Gabhir Kas	-10.60	-8.70	-15.05	14.38	-14.38
9	9132	Gabhir Kas	-11.40	-8.90	-15.00	14.35	-14.35
10	7869	Gabhir Kas	-9.70	-10.80	-14.30	13.87	-13.87
11	7826	Gabhir Kas	-9.00	-11.90	-13.97	13.60	-13.60
12	7827	Gabhir Kas	-9.00	-10.30	-14.00	13.63	-13.63
13	7828	Gabhir Kas	-9.20	-8.70	-14.04	13.67	-13.67
14	7829	Gabhir Kas	-9.80	-9.30	-14.08	13.69	-13.69
15	7862	Gabhir Kas	-9.40	-10.40	-13.52	13.27	-13.27
16	7860	Gabhir Kas	-9.50	-10.60	-12.67	12.64	-12.64
17	7859	Gabhir Kas	-9.20	-10.20	-12.22	12.31	-12.31
18	7865	Gabhir Kas	-9.90	-10.60	-12.08	12.20	-12.20
19	7857	Gabhir Kas	-9.90	-10.10	-11.69	11.91	-11.91
20	7855	Gabhir Kas	-9.30	-9.80	-11.10	11.47	-11.47
21	7916	Gabhir Kas	-10.60	-9.80	-11.06	11.38	-11.38
22	7917?	Gabhir Kas	-9.60	-9.90	-10.54	11.02	-11.02
23	7918	Gabhir Kas	-10.70	-9.10	-10.28	10.85	-10.85
24	7919	Gabhir Kas	-10.50	-9.40	-9.52	10.39	-10.39
25	7935	Gabhir Kas	-10.50	-11.30	-9.34	10.21	-10.21
26	7929	Gabhir Kas	-10.30	-9.50	-9.10	10.05	-10.05
27	7931	Gabhir Kas	-9.40	-10.60	-9.05	10.02	-10.02
28	7933	Gabhir Kas	-8.70	-11.00	-8.90	9.90	-9.90
29	7934	Gabhir Kas	-11.30	-10.70	-8.78	9.78	-9.78
30	9158	Kaulial Kas	-12.60	-5.40	-8.35	9.15	-9.15
31	9160	Kaulial Kas	-10.60	-7.30	-8.21	9.04	-9.04
32	9162	Kaulial Kas	-12.90	-8.70	-8.15	8.97	-8.97
33	9168	Kaulial Kas	-11.80	-5.40	-7.75	8.63	-8.63
34	9173	Kaulial Kas	-11.50	-7.40	-7.38	8.34	-8.34
35	9174	Kaulial Kas	-8.90	-7.00	-7.28	8.06	-8.06
36	9175	Kaulial Kas	-11.60	-8.90	-7.30	8.11	-8.11
37	9177	Kaulial Kas	-8.60	-7.10	-6.90	7.74	-7.74

	A	B	C	D	E	F	G
38	**Table DR7 All Siwalik Data**						
39	Pakistan soil carbonate results-multiple areas for composite section.						
40	**sample #**	**section**	**d13C**	**d18O**	**age (Bergren)**	**Cande and Kent 1995; Barry et al. 2002**	**age**
41	9178	Kaulial Kas	-8.60	-7.50	-6.80	7.63	-7.63
42	9180	Kaulial Kas	-7.50	-7.80	-6.77	7.59	-7.59
43	9181	Kaulial Kas	-10.20	-7.40	-6.73	7.52	-7.52
44	9182	Kaulial Kas	-9.50	-7.90	-6.70	7.48	-7.48
45	9183	Kaulial Kas	-3.60	-7.10	-6.65	7.37	-7.37
46	9184	Kaulial Kas	-10.10	-9.10	-6.57	7.27	-7.27
47	9185	Kaulial Kas	-7.90	-7.60	-6.40	7.10	-7.10
48	9186a	Kaulial Kas	-9.50	-7.30	-6.30	7.04	-7.04
49	9186b		-8.80	-6.50	-6.30	7.04	-7.04
50	9187	Kaulial Kas	-7.00	-6.80	-6.25	6.99	-6.99
51							0.00
52							0.00
53	8007	Mirpur	0.60	-6.70	-3.18	3.33	-3.33
54	8012	Mirpur	0.90	-5.50	-3.13	3.28	-3.28
55	8014	Mirpur	1.20	-6.90	-3.10	3.27	-3.27
56	8016	Mirpur	0.70	-7.80	-3.05	3.24	-3.24
57	8024	Mirpur	0.10	-7.20	3.00	3.10	-3.10
58	8037a	Mirpur	2.00	-7.20	2.80	2.89	-2.89
59	8043	Mirpur	1.70	-7.50	2.60	2.66	-2.66
60	8051	Mirpur	1.00	-6.20	2.50	2.55	-2.55
61	8056	Mirpur	-1.90	-6.80	2.40	2.45	-2.45
62	8065	Mirpur	0.40	-6.20	2.10	2.14	-2.14
63	8068	Mirpur	0.80	-7.00	1.80	1.90	-1.90
64	8075	Mirpur	2.60	-6.00	-1.54	1.50	-1.50
65	8076	Mirpur	0.80	-5.00	-1.52	1.48	-1.48
66							
67	7905	Pabbi Hills	1.80	-4.70	-1.67	1.76	-1.76
68	9189	Pabbi Hills	1.10	-4.80	-1.67	1.76	-1.76
69	9190	Pabbi Hills	2.30	-5.50	-1.67	1.76	-1.76
70	9191	Pabbi Hills	2.80	-4.60	-1.67	1.76	-1.76
71	9192	Pabbi Hills	1.30	-5.80	-1.55	1.64	-1.64
72	9193	Pabbi Hills	0.80	-5.60	-1.48	1.56	-1.56
73	9194	Pabbi Hills	2.10	-5.80	-1.45	1.54	-1.54
74	9196	Pabbi Hills	1.90	-6.60	-1.40	1.49	-1.49
75	9197	Pabbi Hills	0.20	-6.30	-1.34	1.43	-1.43

	A	B	C	D	E	F	G
76	**Table DR7 All Siwalik Data**						
77	Pakistan soil carbonate results-multiple areas for composite section.						
78	**sample #**	**section**	**d13C**	**d18O**	**age (Bergren)**	**Cande and Kent 1995; Barry et al. 2002**	**age**
79	9200	Pabbi Hills	-0.90	-5.90	-1.32	1.41	-1.41
80	9201	Pabbi Hills	-0.80	-6.00	-1.28	1.37	-1.37
81	9202	Pabbi Hills	1.20	-8.10	-1.27	1.36	-1.36
82	9203	Pabbi Hills	-0.10	-7.90	-1.17	1.26	-1.26
83	9204	Pabbi Hills	1.40	-6.40	-1.13	1.22	-1.22
84	9205	Pabbi Hills	1.30	-5.20	-1.10	1.18	-1.18
85	9206	Pabbi Hills	0.30	-4.40	-1.08	1.17	-1.17
86	9207	Pabbi Hills	1.30	-5.20	-1.08	1.16	-1.16
87	9208	Pabbi Hills	0.90	-5.60	-1.07	1.16	-1.16
88	9209	Pabbi Hills	2.50	-6.60	-1.06	1.15	-1.15
89	9210	Pabbi Hills	2.30	-6.80	-1.03	1.11	-1.11
90	9211	Pabbi Hills	-0.10	-6.10	-1.01	1.10	-1.10
91	9212	Pabbi Hills	-2.10	-8.50	-0.96	1.05	-1.05
92	9216	Pabbi Hills	1.90	-6.50	-0.72	0.77	-0.77
93	9217	Pabbi Hills	0.90	-6.80	-0.69	0.73	-0.73
94	9718	Pabbi Hills	1.60	-6.10	-0.67	0.69	-0.69
95	9720	Pabbi Hills	0.50	-6.70	-0.58	0.60	-0.60
96	9721	Pabbi Hills	-2.40	-9.00	-0.54	0.54	-0.54
97	9722	Pabbi Hills	2.10	-5.70	-0.48	0.48	-0.48
98							
99	9733	Jalalpur	2.50	-6.80	-2.70	2.27	-2.27
100	9730	Jalalpur	-1.90	-7.80	-2.85	2.58	-2.58
101	9701	Jalalpur	1.30	-6.60		3.30	-3.30
102	9698	Jalalpur	2.00	-6.30	-3.90	3.39	-3.39
103	9694	Jalalpur	1.80	-6.20	-4.00	3.43	-3.43
104	9693	Jalalpur	0.40	-6.10	-4.05	3.44	-3.44
105	9689	Jalalpur	1.80	-6.50	-4.15	3.50	-3.50
106	9683	Jalalpur	-2.00	-5.70		3.69	-3.69
107	9669	Jalalpur	-1.90	-7.20	-4.40	3.74	-3.74
108	9676	Jalalpur	0.70	-6.50	-4.60	4.36	-4.36
109	9671	Jalalpur	0.60	-7.00	-5.00	4.68	-4.68
110	9665	Jalalpur	-1.00	-7.50	-5.20	5.13	-5.13
111	9663	Jalalpur	-0.70	-8.00	-5.35	5.77	-5.77
112	9657	Jalalpur	0.54	-6.40	-5.45	5.89	-5.89
113	9655	Jalalpur	-2.30	-4.90	-5.50	5.91	-5.91

	A	B	C	D	E	F	G
114	**Table DR7 All Siwalik Data**						
115	Pakistan soil carbonate results-multiple areas for composite section.						
116	**sample #**	**section**	**d13C**	**d18O**	**age (Bergren)**	**Cande and Kent 1995; Barry et al. 2002**	**age**
117	9654	Jalalpur	0.10	-7.20	-5.60	5.94	-5.94
118	9652	Jalalpur	-1.30	-4.90	-5.70	5.98	-5.98
119	9648	Jalalpur	-0.30	-5.40	-5.75	6.07	-6.07
120	9646	Jalalpur	0.00	-6.90	-5.85	6.13	-6.13
121	9643	Jalalpur	-3.50	-6.90	-5.95	6.43	-6.43
122	9640	Jalalpur	-1.40	-7.40	-6.10	6.59	-6.59
123	9639	Jalalpur	-3.00	-7.70	-6.20	6.61	-6.61
124	9637	Jalalpur	-0.70	-6.30	-6.30	6.76	-6.76
125	9630	Jalalpur	-5.00	-7.40	-6.60	7.48	-7.48
126	9625	Jalalpur	-7.90	-7.90	-7.20	7.92	-7.92
127	9624	Jalalpur	-11.20	-6.20	-7.20	7.95	-7.95
128	9622	Jalalpur	-8.80	-8.00	-7.30	7.98	-7.98
129	9619	Jalalpur	-10.80	-9.00	-7.70	8.40	-8.40
130	9613	Jalalpur	-11.00	-9.90	-8.50	9.27	-9.27
131	9607	Jalalpur	-10.00	-9.90	-8.85	9.41	-9.41
132	9611	Jalalpur	-10.10	-9.70	-8.90	9.64	-9.64
133	9764	Jalalpur	-9.80	-9.40	-9.50	10.14	-10.14
134	9762	Jalalpur	-9.90	-8.00	-10.10	10.60	-10.60
135	9758	Jalalpur	-10.70	-9.50	-11.80	11.67	-11.67
136	9757	Jalalpur	-10.80	-8.80	-13.10	12.23	-12.23
137							
138	9024	Rohtas	0.10	-5.80	-3.98	old data	
139	8083	Rohtas	-1.20	-6.90	-4.30	old data	
140	8085	Rohtas	-0.10	-7.30	-4.39	old data	
141	9796	Rohtas	-0.80	-6.80	-4.49	old data	
142	8086	Rohtas	-0.13	-7.80	-4.53	old data	
143	8088	Rohtas	2.00	-6.30	-4.56	old data	
144	8091	Rohtas	1.10	-7.60	-4.66	old data	
145	8092	Rohtas	0.80	-7.00	-4.78	old data	
146	8094	Rohtas	-3.50	-5.90	-5.02	old data	
147	8095	Rohtas	-5.00	-8.50	-5.20	old data	
148	9795	Rohtas	-2.50	-7.60	-5.54	old data	
149	9793	Rohtas	-9.00	-8.70	-5.74	old data	
150	9794	Rohtas	-7.00	-9.40	-5.76	old data	
151	9792	Rohtas	-10.20	-8.70	-5.78	old data	

	A	B	C	D	E	F
152	**Table DR7 All Siwalik Data**					
153	Pakistan soil carbonate results-multiple areas for composite section.					
154	**sample #**	**section**	**d13C**	**d18O**	**age (Bergren)**	**Cande and Kent 1995; Barry et al. 2002**
155	9791	Rohtas	-9.10	-9.20	-5.78	old data
156	9005	Rohtas	-10.10	-7.90	-6.08	old data
157	9006	Rohtas	-11.00	-9.70	-6.18	old data
158	9754	Rohtas	-11.00	-9.90	-6.22	old data
159	9008	Rohtas	-8.90	-10.90	-6.28	old data
160	9009	Rohtas	-10.40	-9.60	-6.40	old data
161	9020	Rohtas	-10.40	-10.60	-6.65	old data
162	9019	Rohtas	-9.90	-9.90	-6.90	old data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	**Table DR8: All Rohtas soil data**					This is the master data set for Rohtas as of March, 2007. For summary of final sample isotope values and ages, see Repository 2, Tables DR4 and DR5.														
2	Reorder #	Field Number	sample	Level	Paleosol	Num.	material	Lateral Position	Leached Depth	Depth w/Caliche	Sample Depth	Kaymeters	d13C	Average, S.D.	Kayage	d18O	Average, S.D.	CaCO3/ C %	Color	Facies
3	These samples were excluded from the final plots and tallies because of CaCO3 <40%.																			
4	185		KB96-008 m	R29-3S2	5.0	E1509	matrix					900.2	-1.77		4.77	-11.28		15.53		
5	127		KB96-016	R15	CFS-2A	E1380	nodule					500.0	-5.20			-8.51		22.92	OB	CF
6	83		KB96-039	R15-3N2	6.0	E1386	nodule					446.0	-8.53		7.06	-9.41		36.17	YB	FP
7	186		KB96-053	R29-4	5.0	E1399	nodule					900.2	-3.37		4.77	-8.50		39.09	R	CS
8	188		KB96-054	R29-1	5.0	E1389	nodule					901.4	-3.67		4.77	-8.14		38.92	R	CS
9	189		KB96-055	R29-3	6.0	E1400	nodule					907.8	-3.98		4.75	-7.55		20.37	O	CF
10	137		KB96-058	R23-4S3	2.0	E1390	nodule					675.5	-3.54		5.56	-9.08		39.71	RB	CS
11	109		RJF-K	R15-E`	6?	was "U"	soil cc					450.1	-7.39		7.04	-8.64		31.10	YB	
12	62	C1026	ROT-36 n2	R15-3	1.0	36	nodule					437.8	-6.72		7.08	-8.24		37.43	O	CT
13	122	C660	ROT 61	R15-5	7.0	61	nodule					452.6	-5.30		7.04	-3.08		39.01	B	CF
14	140	C691	ROT 92	R23-4	2.0	92	nodule					675.6	-11.19		5.58	-9.61		34.39	RB	CS
15																				
16	The samples below have CaCO3 >40%.																			
17	193		R-8	LBT?			nodule					1745.0	0.50		2.41?	-7.40				
18	37	C593	ROT 75	R11		75	nodule					198.8	-10.05		7.85	-9.78		75.38	RB	
19	32	C594	ROT 76	R11		76	nodule					197.4	-10.22		7.86	-9.54		69.50		
20	36	C484	ROT 78J	R11		78	nodule					198.4	-10.41		7.85	-9.13		54.92	RB	
21	35	C467	ROT 78K	R11		78	nodule					198.0	-9.89		7.85	-9.41		41.41		
22	34	C493	ROT 78K	R11		78	nodule					198.0	-10.36		7.85	-9.50		77.50	RB	
23	33	C395	ROT 78L	R11		78	nodule					197.6	-10.03		7.86	-9.86		55.96		
24																				
25	20	JQ 992	ROT 94-71	R11-4S1	1.0		soil cc	400.00	-2.80		-0.70	187.1	-12.03		7.92	-8.60		73.00	O+	FP
26	23	C670	ROT 152	R11-5	1.0	152	nodule	620.00	-3.00		-0.60	187.4	-11.30		7.92	-7.04		49.54	O	FP
27	16	JQ 991	ROT 94-74	R11-5A	1.0		soil cc	620.00	-3.00		-1.20	186.8	-11.20		7.92	-8.60		75.30	O	FP
28	10	JQ 1006	ROT 94-27	R11-4A	1.0		soil cc	511.00	-1.60		-0.50	186.1	-11.06		7.92	-9.10		71.30	O+	FP
29	11	JQ 1001	ROT 94-73	R11-5A	1.0		soil cc	620.00	-3.00		-1.80	186.2	-10.42		7.92	-8.90		70.10	YO	FP
30	14	JQ 1019	ROT 94-9	R11-3	1.0		soil cc	160.00	-2.20		-0.70	186.5	-10.20		7.92	-9.00		77.70	O+	FP
31	24	JQ 1085	ROT 94-75	R11-5A	1.0		soil cc	620.00	-3.00		-0.40	187.6	-10.16		7.92	-8.60		74.60	O	FP
32	12	C690	ROT 147	R11-4	1.0	147	nodule	430.00	-2.00		-0.70	186.3	-9.95		7.92	-9.40		70.18	O	FP
33	15	JQ 1010	ROT 94-7	R11-3	1.0		soil cc	160.00	-2.20		-0.40	186.8	-9.94		7.92	-9.30		72.20	O+	FP
34	3	JQ 1009	ROT 94-8	R11-3	1.0		soil cc	160.00	-2.20		-2.30	184.9	-9.93		7.92	-8.90		64.90	R	FP
35	7		KB96-026	R11-2N1	1.0	E1392	nodule	27.00	-2.40		-0.20	185.7	-9.92		7.92	-8.92		74.00	YB	FP
36	4	JQ 998	ROT94-4	R11-1N	1.0		soil cc	58.00	-2.10		-2.00	185.1	-9.79		7.92	-9.50		76.30	B	FP
37	17	E1168,-9,70	ROT-235-1	R11-2	1.0	235	nodule/rhizolith	270.00	-2.60		-0.60	187.0	-9.77		7.92	-9.17		50.80	O	FP
38	25	JQ 1005	ROT 94-72	R11-4S1	1.0		soil cc	400.00	-2.80		0.00	187.8	-9.66		7.92	-8.80		70.10	O+	FP
39	2	JQ 1021	ROT 94-1	R11-1	1.0		soil cc	0.00	-2.00		-2.20	184.8	-9.59		7.92	-8.50		60.20	R	FP
40	8	JQ1023	ROT94-3	R11-1	1.0		soil cc	0.00	-2.00		-1.20	185.8	-9.55		7.92	-10.30		68.20	O	FP
41	9	JQ 1011	ROT 94-6	R11-1N	1.0		soil cc	58.00	-2.10		-1.10	186.0	-9.39		7.92	-8.80		80.40	R	FP
42	5	JQ 1020	ROT 94-2	R11-1	1.0		soil cc	0.00	-2.00		-1.80	185.2	-9.27		7.92	-9.00		83.00	O	FP
43	1	JQ 1007	ROT 94-26	R11-4A	1.0		soil cc	511.00	-1.60		-2.00	184.6	-9.12		7.92	-9.60		51.10	R	FP
44	6	C667	ROT 121	R11-1	1.0	121	nodule	0.00	-2.00		-1.50	185.5	-8.62		7.92	-8.91		53.94	O	FP
45	Average													-10.04			-8.95			
46	St. Dev.													0.82			0.62			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
47	**Table DR8: All Rohtas soil data**					This is the master data set for Rohtas as of March, 2007. For summary of final sample isotope values and ages, see Repository 2, Tables DR4 and DR5.														
48	Reorder #	Field Number	sample	Level	Paleosol	Num.	material	Lateral Position	Leached Depth	Depth w/Caliche	Sample Depth	Kaymeters	d13C	Average, S.D.	Kayage	d18O	Average, S.D.	CaCO3/ C %	Color	Facies
49	17	E1168	ROT-235-1	R11-2	1.0	235	nodule/rhizolith	270.00				187.0	-9.90		7.92	-9.30		41.50	O	FP
50	18	E1169	ROT-235-2	R11-2	1.0	235	nodule/rhizolith	270.00				187.0	-9.80		7.92	-9.10		46.70	O	FP
51	19	E1170	ROT-235-3	R11-2	1.0	235	nodule/rhizolith	270.00				187.0	-9.60		7.92	-9.10		64.20	O	FP
52														-9.77			-9.17	50.80		
53	26	C697	ROT-123n	R11-1	2.0	123	nodule	0.00				191.3	-9.51		7.89	-9.42		40.36	LO	FP
54	30	C1029	ROT-125.n	R11-1	2.0	125	nodule	0.00				193.7	-10.13		7.89	-8.20		65.62	RO	FP
55	29	C663	ROT 124	R11-1	2.0	124	nodule	0.00				192.8	-7.40		7.89	-7.48		47.90	O	FP
56	28	C1031	ROT-149.n	R11-4	2.0	149	nodule	430.00				192.4	-10.72		7.89	-7.55		73.61	O	FP
57	31	C1032	ROT-153.n	R11-5	2.0	153	nodule	620.00				194.6	-10.49		7.89	-8.98		67.05	O	FP
58	38	C637	ROT 141	R11-3	3.0	141	nodule	160.00				203.3	-9.01		7.83	-8.88		58.68	LO	FP
59	39	C1030	ROT-142	R11-3	4.0	142	nodule	160.00				206.8	-9.67		7.82	-8.64		69.93		
60	40	C635	ROT 136	R11-3	4.5	136	nodule	160.00				210.8	-11.28		7.81	-7.32		60.95	R	CS?
61	42	C1035	ROT-234	R11-1	5.0	234	nodule	0.00				222.9	-9.74		7.70	-9.00		63.04	P	CF
62	41	C1036	ROT-237.n	R11-5	5.0	237	nodule	620.00				221.2	-10.55		7.70	-8.55		71.20	P	CF
63	21	JQ 1022	ROT 94-5	R11-1N	1.1		soil cc	58.00				187.3	-10.61		7.91	-11.10		53.70	R	
64																	-8.97			
65	43	C646	ROT 163	R12		163	nodule					289.0	-10.19		7.46	-8.83		67.37		
66	47	C683	ROT 164	R12		164	nodule					327.0	-7.79		7.37	-7.97		42.21		
67	46	C661	ROT 165	R12		165	nodule					326.8	-6.79		7.37	-8.35		52.07		
68	50	C693	ROT-160.n	R13		160	nodule					356.0	-6.42		7.25	-12.58		68.56		
69	49	C662	ROT 161	R13		161	nodule					354.0	-7.45		7.25	-7.58		54.65		
70																				
71	63	C576	ROT-36n	R15-3	1.0	36	nodule					437.8	-7.83		7.08	-9.43		49.86	O	CT
72																				
73	51		KB96-003	R15-5A	2.0	E1463	nodule	520.00	-0.60	-1.10	-0.60	435.0	-5.86		7.09	-8.24		60.00	R	FP
74	57		KB96-028	R15-5	2.0	E1393	nodule	520.00	-0.60	-1.10	-0.50	435.5	-5.06		7.09	-8.29		65.10		
75	53		KB96-033	R15-D	2.0	E1396	nodule	810.00	-0.80	-2.00	-1.00	435.0	-4.88		7.09	-8.19		72.00	R	FP
76	56		KB96-005	R15-5A	2.0	E1465	nodule	520.00	-0.60	-1.10	-1.00	435.4	-4.60		7.09	-8.85		66.10	R	FP
77	58		KB96-030	R15-B	2.0	E1394	nodule	993.00	-0.70	-0.70	-0.50	435.5	-4.48		7.09	-7.97		68.98	R	FP
78	54		KB96-004	R15-5A	2.0	E1464	nodule	520.00	-0.60	-1.10	-0.80	435.2	-4.21		7.09	-8.17		63.60	R	FP
79	64	C592	ROT 71	R15-7	2.0	71	nodule	730.00	-0.50	-1.30	-1.00	438.0	-3.90		7.08	-7.27		64.74	R	FP
80	61	C570	ROT 17	R15-1	2.0	17	nodule	0.00	-0.70	-1.85	-0.50	437.3	-3.74		7.08	-8.50		66.02	R	FP
81	52		KB96-032	R15-C	2.0	E1395	nodule	1073.00	-0.80	-1.70	-0.80	435.0	-3.59		7.09	-8.04		67.00	R	FP
82	55		KB96-029	R15-A	2.0	E1384	nodule	930.00	-0.70	-1.70	-0.80	435.2	-3.41		7.09	-7.94		56.52	R	FP
83	60	C569	ROT 16	R15-1	2.0	16	nodule	0.00	-0.70	-1.85	-0.70	437.1	-3.27		7.08	-8.24		62.90	R	FP
84	65	C1033	ROT-225	R15-6	2.0	225	nodule	631.00	-0.20	-1.20	-0.30	438.4	-2.68		7.08	-7.36		72.97	R	FP
85	67	C1027	ROT-37	R15-3	2.0	37	nodule	245.00	-0.60	-1.30	-1.00	439.8	-2.34		7.07	-7.52		64.95	R	FP
86				R15-4	2.0			395.00	-0.90	-1.37										
87	Average													-4.00			-8.04			
88	S.D.													0.98			0.45			
89	59		KB96-034	R15-D'	2.1	E1498	nodule					436.7	-7.66		7.08	-8.92		73.83	R	FP
90	66		9795	R15	2.5		nodule					438.5	-2.50		7.08	-7.60				
91	70	C1034	ROT-227	R15-2	2.5	227	nodule					441.5	-3.29		7.07	-7.40		73.47		
92	71	C572	ROT 28	R15-2	2.5	28	nodule					442.3	-2.53		7.07	-8.06		59.60		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
93	**Table DR8: All Rohtas soil data**					This is the master data set for Rohtas as of March, 2007. For summary of final sample isotope values and ages, see Repository 2, Tables DR4 and DR5.														
94	Reorder #	Field Number	sample	Level	Paleosol	Num.	material	Lateral Position	Leached Depth	Depth w/Caliche	Sample Depth	Kaymeters	d13C	Average, S.D.	Kayage	d18O	Average, S.D.	CaCO3/ C %	Color	Facies
95	72	C623	ROT 53	R15-3	2.5	53	nodule					442.6	-8.96		7.07	-8.71		61.27	Y	FP
96	69	C465	ROT 26	R15-1	3.0	26	nodule					440.8	-7.33		7.07	-9.73		59.18	LR	FP
97	68	C571	ROT 27	R15-1	3.0	27	nodule					440.4	-5.85		7.07	-9.16		53.91	LR	FP
98	78	C578	ROT-51.n	R15-2	4.0	51	nodule					444.9	-7.19		7.06	-8.10		73.45	YB	FP
99	74	C482	ROT 29	R15-2	4.0	29	nodule					444.2	-7.49		7.06	-7.22		55.23	YB	FP
100	75	C573	ROT 29	R15-2	4.0	29	nodule					444.2	-5.99		7.06	-7.14		58.65	YB	FP
101	76	C578	ROT 51	R15-2	4.0	51	nodule					444.9	-4.26		7.06	-7.10		59.24	YB	FP
102														-5.73			-8.10			
103	104	JQ 995	ROT 94-21	R15-1S	6.0		soil cc	-50.00	-1.70		-0.50	448.1	-8.52		7.05	-8.40		73.60	Y	FP
104	95	C639	ROT 49	R15-1	6.0	49	nodule	0.00	-2.50		-1.40	447.3	-2.82		7.05	-7.28		69.11	YB	FP
105	96	JQ 996	ROT 94-18	R15-1A	6.0		soil cc	0.00	-2.50		-1.30	447.3	-2.20		7.05	-6.00		94.30	YB	FP
106	94	JQ 987	ROT 94-23	R15-1N	6.0		soil cc	35.00	-2.20		-1.40	447.2	-8.43		7.05	-7.40		75.80	YB	FP
107	100	JQ 986	ROT 94-24	R15-1N	6.0		soil cc	35.00	-2.20		-1.00	447.6	-1.07		7.05	-6.10		68.90	YB	FP
108	93	JQ 997	ROT 94-13	R15-2A	6.0	`	soil cc	110.00	-2.00		-1.30	447.2	-4.95		7.05	-7.90		72.90	B	FP
109	98	JQ 989	ROT 94-11	R15-2A	6.0		soil cc	110.00	-2.00		-1.10	447.4	-4.44		7.05	-7.70		71.90	B	FP
110	87	C1028	ROT-52	R15-2	6.0	52	nodule	110.00	-2.00		-1.90	446.6	-4.03		7.05	-7.59		73.46	YB	FP
111	102	JQ 1084	ROT 94-35	R15-3S1	6.0		soil cc	200.00	-2.30		-0.40	447.6	-5.29		7.05	-7.60		77.80	RB	FP
112	101	JQ 1018	ROT 94-29	R15-3A	6.0		soil cc	245.00	-2.10		-0.40	447.6	-9.34		7.05	-9.30		59.90	YB	FP
113	105	JQ 1005	ROT 94-30	R15-3A	6.0		soil cc	245.00	-2.10		-0.10	448.4	-8.24		7.05	-8.50		65.30	YB	FP
114	84	JQ 988	ROT 94-14	R15-3A	6.0		soil cc	245.00	-2.10		-1.80	446.2	-4.87		7.05	-7.70		73.80	B	FP
115	89	C626	ROT 54	R15-3	6.0	54	nodule	245.00	-2.10		-1.20	446.8	-4.00		7.05	-7.93		66.09	YB	FP
116	90	JQ 1008	ROT 94-16	R15-3N1	6.0		soil cc	270.00	-2.40		-1.30	446.8	-10.11		7.05	-7.90		60.80	Y	FP
117	82		KB96-038	R15-3N2	6.0	E1521	nodule	334.00	-1.40		-1.00	446.0	-8.60		7.06	-8.5		49.02	GR	FP
118	79	JQ 993	ROT 94-70	R15-4A	6.0		soil cc	390.00	-3.10		-0.80	445.7	-8.90		7.05	-8.20		64.30	Y	FP
119	77	JQ 979	ROT 94-69	R15-4A	6.0		soil cc	390.00	-3.10		-1.60	444.9	-8.02		7.06	-8.20		71.10	YB	FP
120	73	JQ 980	ROT 94-58	R15-4A	6.0		soil cc	390.00	-3.10		-2.40	444.1	-7.04		7.06	-8.10		60.10	Y	FP
121	81		KB96-035	R15-5S	6.0	E1385	nodule	460.00	-2.50		-1.00	446.0	-9.66		7.05	-8.56		51.70		
122	92	JQ 982	ROT 94-41	R15-5A	6.0		soil cc	520.00	-2.00		-1.20	447.0	-9.72		7.05	-9.80		57.40	Y	CF
123	99	JQ 1003	ROT 94-44	R15-5A	6.0		soil cc	520.00	-2.00		-0.60	447.5	-9.05		7.05	-10.00		60.90	Y	CF
124	88	JQ 983	ROT 94-38	R15-5A	6.0		soil cc	520.00	-2.00		-1.50	446.7	-8.57		7.05	-9.60		63.70	YB	CF
125	97	JQ 1004	ROT 94-43	R15-5A	6.0		soil cc	520.00	-2.00		-0.80	447.3	-8.37		7.05	-9.50		59.20	Y	CF
126	91	JQ 1017	ROT 94-40	R15-5A	6.0		soil cc	520.00	-2.00		-1.40	446.8	-8.17		7.05	-8.60		62.50	YB	CF
127	85	JQ 984	ROT 94-37	R15-5A	6.0		soil cc	520.00	-2.00		-1.80	446.4	-7.81		7.05	-8.20		67.40	YB	FP
128	103	JQ 981	ROT 94-57	R15-6A	6.0		soil cc	631.00	-4.70		-0.10	448.0	-8.01		7.05	-8.50		51.50	YO	CF
129	80	JQ 994	ROT 94-56	R15-6A	6.0		soil cc	631.00	-4.70		-2.30	445.8	-5.18		7.06	-8.20		65.80	YB	CF
130	86	C698	ROT-73n	R15-7	6.0	73	nodule	730.00	-4.00		-1.60	446.5	-6.39		7.05	-7.91		47.09	YB	
131			KB96-37	R15-3N2	6.0		soil cc	334.00	-1.60		-1.00	446.0	-4.72		7.06	-7.88			YB	FP
132														-6.85			-8.18			
133														2.50			0.93			
134	124	C590	ROT 66	R15-6	9.0	66	nodule					453.4	-7.87		7.03	-8.34		52.57	OB	FP
135	123	C481	ROT 32	R15-2	9.5	32	nodule					452.9	-2.47		7.03	-7.47		67.60	B	
136	125	C679	ROT 59	R15-4	11.0	59	nodule					455.8	-2.61		7.03	-6.38		68.78	B	
137	126	C591	ROT 68	R15-6	11.0	68	nodule					456.2	-8.84		7.02	-9.80		49.10	OB	FP

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
139	**Table DR8: All Rohtas soil data**					This is the master data set for Rohtas as of March, 2007. For summary of final sample isotope values and ages, see Repository 2, Tables DR4 and DR5.														
140	Reorder #	Field Number	sample	Level	Paleosol	Num.	material	Lateral Position	Leached Depth	Depth w/Caliche	Sample Depth	Kaymeters	d13C	Average, S.D.	Kayage	d18O	Average, S.D.	CaCO3/ C %	Color	Facies
141	112		RJF-H	R15-E	6?		soil cc	1.10	-2.60		-0.80	450.2	-9.81		7.04	-8.70			YB	
142	114		RJF-J	R15-E	6?		soil cc	2.50	-2.60		-0.60	450.4	-9.77		7.04	-8.30			YB	
143	115		RJF-C	R15-E	6?		soil cc	2.30	-2.60		-0.20	450.6	-9.24		7.04	-9.30			YB	
144	113		RJF-I	R15-E	6?		soil cc	1.50	-2.60		-0.70	450.2	-8.85		7.04	-9.30			YB	
145	108		RJF-P	R15-E	6?		soil cc	3.10	-2.60		-1.30	449.8	-8.75		7.04	-9.50		47.60	YB	
146	111		RJF-M	R15-E	6?		soil cc	0.70	-2.60		-0.90	450.1	-8.66		7.04	-10.30		56.00	YB	
147	116		RJF-E	R15-E	6?		soil cc	1.10	-2.60		-0.20	450.6	-8.54		7.04	-9.10			YB	
148	120		RJF-B	R15-E	6?		soil cc	1.90	-2.60		-0.10	450.8	-8.53		7.04	-9.50			YB	
149	106		RJF-N	R15-E	6?		soil cc	2.50	-2.60		-1.50	449.5	-8.48		7.04	-6.28		49.00	YB	
150	121		RJF-D	R15-E	6?		soil cc	2.70	-2.60		-0.10	450.8	-8.31		7.04	-9.10			YB	
151	119		RJF-A	R15-E	6?		soil cc	1.40	-2.60		-0.10	450.8	-8.16		7.04	-9.80			YB	
152	117		RJF-F	R15-E	6?		soil cc	0.70	-2.60		-0.20	450.6	-8.13		7.04	-8.90			YB	
153	110		RJF-L	R15-E	6?		soil cc	2.10	-2.60		-0.90	450.1	-8.04		7.04	-9.66		40.00	YB	
154	118		RJF-G	R15-E	6?	was "Q"	soil cc	0.10	-2.60		-0.20	450.6	-7.90		7.04	-9.44		50.70	YB	
155	107		RJF-O	R15-E	6?		soil cc	2.30	-2.60		-1.40	449.5	-7.72		7.04	-7.17		57.50	YB	
156														-8.59			-8.96			
157														0.62			1.03			
158	128		KB96-019	R15	CFS-2C	E1381	nodule					500.0	-4.51			-8.27		65.52	B	FP
159	129		KB96-020	R15	CFS-2D	E1382	nodule					500.0	-8.48			-8.88		47.41	B	CF
160																				
161	130	C692	ROT 114	R17-3	4.0	114	nodule					569.1	-5.79		6.65	-5.36		43.90	R	CF
162	215		R-4	R23?	4?		nodule						0.60			-5.00				
163	148	C695	ROT-82n	R23-1	4.0	82	nodule					681.5	-6.47		5.55	-6.47			Y	CF
164																				
165	139	C674	ROT 92	R23-4	2.0	92	nodule	77.00	-0.50		-0.40	675.6	-10.54		5.58	-9.37		62.95	RB	CS
166	138	JQ 677	ROT 94-60	R23-4A	2.0		soil cc	77.00	-0.53		-0.40	675.5	-9.78		5.58	-9.70		47.40	R	CS
167	134	JQ 1016	ROT 94-64	R23-4A	2.0		soil cc	77.00	-0.53		-0.62	675.4	-9.63		5.58	-9.80		64.40	YG	CS
168	141	JQ 1015	ROT 94-66	R23-4	2.0		soil cc	27.00	-0.58		-0.38	675.6	-9.40		5.58	-9.20		66.40	R	CS
169	136	JQ 672	ROT 94-65	R23-4S1	2.0		soil cc	63.00	-0.60		-0.55	675.4	-8.65		5.58	-8.80		61.50	R	CS
170	145	JQ 676	ROT 94-61r	R23-4A	2.0		soil cc	77.00	-0.53		-0.10	675.9	-8.39		5.57	-9.40		40.00	R	CS
171	144	JQ 1076	ROT 94-61	R23-4A	2.0		soil cc	77.00	-0.53		-0.10	675.9	-8.30		5.57	-8.70		57.60	R	CS
172	146	JQ 670	ROT 94-67	R23-4N1	2.0		soil cc	89.00	-0.15		-0.08	675.9	-8.14		5.57	-9.00		50.50	R	CS
173	142	JQ 671	ROT 94-66	R23-4S2	2.0		soil cc	27.00	-0.58		-0.38	675.6	-8.07		5.58	-8.70		41.20	R	CS
174	135	JQ 673	ROT 94-64r	R23-4A	2.0		soil cc	77.00	-0.53		-0.62	675.4	-7.12		5.58	-7.50		59.80	YG	CS
175	147		KB96-060	R23-4S3	2+	E1402	nodule	0.00	-0.78		0.30	676.3	-6.75		5.56	-10.98		63.35	R	CS
176	133		KB96-057	R23-4S3	2.0	E1505	nodule	0.00	-0.78		-0.78	675.2	-5.11		5.57	-8.24		57.71		
177	143		KB96-059	R23-4S3	2.0	E1522	nodule	0.00	-0.78		-0.10	675.9	0.13		5.57	-6.60		76.44	RB	CS
178														-7.67			-8.92			
179														2.74			1.09			
180	157		KB96-047	R29-1	1.0	E1503	nodule	315.00	-1.22		-0.30	885.3	1.48		4.80	-6.64		69.20	RB	FP
181	159		KB96-046	R29-2	1.0	E1502	nodule	210.00	-1.03		-0.30	885.7	0.91		4.80	-6.82		63.70	R	FP
182	156		KB96-045	R29-3	1.0	E1501	nodule	122.00	-1.09		-0.30	885.2	-1.09		4.80	-7.96		57.81	LR	FP

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
184	**Table DR8: All Rohtas soil data**					This is the master data set for Rohtas as of March, 2007. For summary of final sample isotope values and ages, see Repository 2, Tables DR4 and DR5.														
185	Reorder #	Field Number	sample	Level	Paleosol	Num.	material	Lateral Position	Leached Depth	Depth w/Caliche	Sample Depth	Kaymeters	d13C	Average, S.D.	Kayage	d18O	Average, S.D.	CaCO3/ C %	Color	Facies
186	177		KB96-068	R29-1G	2.0	E1407	nodule	0.40	-2.35		-0.35	887.5	-6.37		4.80	-7.36		51.67	YB	FP
187	178		KB96-072	R29-1G	2.0	E1409	nodule	0.80	-2.35		-0.35	887.5	-3.91		4.80	-6.75		55.85	YB	FP
188	176		KB96-062	R29-1G	2.0	E1404	nodule	0.00	-2.35		-0.35	887.5	-2.68		4.80	-6.56		57.46	YB	FP
189	169		KB96-070	R29-1G	2.0	E1408	nodule	0.40	-2.35		-1.15	886.7	-2.24		4.80	-6.71		65.27	YB	FP
190	170		KB96-076	R29-1G	2.0	E1411	nodule	0.80	-2.35		-1.15	886.7	-2.13		4.80	-6.73		64.00	YB	FP
191	168		KB96-064	R29-1G	2.0	E1405	nodule	0.00	-2.35		-1.15	886.7	-2.07		4.80	-6.62		60.11	YB	FP
192	175		KB96-073	R29-1G	2.0	E1514	nodule	0.80	-2.35		-0.75	887.1	-1.68		4.80	-6.22		67.87	YB	FP
193	174		KB96-069	R29-1G	2.0	E1512	nodule	0.40	-2.35		-0.75	887.1	-1.61		4.80	-6.36		65.71	YB	FP
194	173		KB96-063	R29-1G	2.0	E1510	nodule	0.00	-2.35		-0.75	887.1	-1.00		4.80	-6.08		66.11	YB	FP
195	167		KB96-074	R29-1G	2.0	E1515	nodule	0.80	-2.35		-1.55	886.3	-0.51		4.80	-6.45		67.57	YB	FP
196	165		KB96-065	R29-1G	2.0	E1511	nodule	0.00	-2.35		-1.55	886.3	-0.27		4.80	-6.63		59.01	YB	FP
197	166		KB96-071	R29-1G	2.0	E1513	nodule	0.40	-2.35		-1.55	886.3	-0.21		4.80	-6.25		63.96	YB	FP
198	161		KB96-075	R29-1G	2.0	E1410	nodule	0.80	-2.35		-1.95	885.9	0.38		4.80	-7.14		67.73	YB	FP
199	160		KB96-067	R29-1G	2.0	E1406	nodule	0.00	-2.35		-1.95	885.9	0.41		4.80	-7.10		64.41	YB	FP
200	162		KB96-077	R29-1G	2.0	E1412	nodule	0.40	-2.35		-1.95	885.9	0.61		4.80	-6.84		69.95	YB	FP
201														-1.55			-6.65			
202														1.86			0.36			
203	158		KB96-061	R29-1	2.0	E1506	nodule	315.00	-2.35		-2.25	885.6	0.64		4.80	-7.50		63.49		
204	179	C600	ROT 216	R29-1	2.0	216	nodule	315.00	-2.35		-0.40	887.5	-4.58		4.80	-9.38		51.48	YB	FP
205	163	C669	ROT 212	R29-2	2.0	212	nodule	210.00	-2.10		-1.95	886.0	-0.12		4.80	-6.20		62.04	B	FP
206	171		KB96-048	R29-3	2.0	E1504	nodule	122.00	-2.45		-1.30	886.8	-0.17		4.80	-6.13		69.82	B	FP
207	164	C641	ROT 206	R29-4	2.0	206	nodule	0.00	-1.64		-1.90	886.1	0.41		4.80	-6.69		64.82	YB	FP
208	172	C636	ROT 207	R29-4	2.0	207	nodule	0.00	-1.64		-0.90	887.0	-3.56		4.80	-6.34		46.83	YB	FP
209														-1.23			-7.04			
210														2.25			1.25			
211	181		KB96-050	R29-2	3.0	E1398	nodule	210.00				889.8	-8.53		4.79	-6.59		65.44	R	CS
212	182	C664	ROT 209	R29-4	4.0	209	nodule	0.00				896.3	0.67		4.85	-6.19		53.31		FP
213	183		KB96-051	R29-2	5.0	E1387	nodule	210.00				899.9	-2.31		4.77	-8.11		45.30	R	CS
214	187		KB96-052	R29-3	5.0	E1388	nodule	122.00				901.0	-2.91		4.77	-7.59		47.71	R	CS
215	184		KB96-008	R29-3S1	5.0	E1379	nodule	72.00				900.2	-3.54		4.77	-8.81		58.10	R	CS
216	190		KB96-056	R29-1S	6.0	E1401	nodule	352.00				910.0	-2.63		4.75	-6.56		67.90	O	CF
217	154		KB96-043	R29-4N1		E1499	nodule	-50.00				874.8	-0.16		4.83	-7.68		67.54	DG	FP
218	155		KB96-044	R29-4N2		E1500	nodule	-50.00				876.2	1.10		4.82	-6.90		65.63	LR	FP
219																	-6.93			
220	194	C644	ROT 171	UBT-1	1.0	171	nodule	0.00	-2.10		-0.40	1850.0	1.62		2.4?	-6.18		56.58	B	FP
221	195	C688	ROT 172	UBT-1	1.0	172	nodule	0.00	-2.10		-0.70	1850.0	1.42		2.4?	-6.30		46.00	B	FP
222	200	C682	ROT 187	UBT-3	1.0	187	nodule	270.00	-1.80		-0.50	1850.0	1.36		2.4?	-3.86		72.51	B	FP
223	202	C700	ROT-182n	UBT-2	2.0	182	nodule	160.00	-2.37		-0.65	1850.0	2.65		2.4?	-5.80		73.32	B	CF
224	197	C677	ROT 183	UBT-2	3.0	183	nodule	160.00	-1.62		-1.15	1850.0	2.25		2.4?	-6.76		88.16	B	FP
225	198	C642	ROT 184	UBT-2	3.0	184	nodule	160.00	-1.62		-1.15	1850.0	3.44		2.4?	-6.61		74.42	B	FP
226	199	C656	ROT 184	UBT-2	3.0	184	nodule	160.00	-1.62		-1.15	1850.0	2.33		2.4?	-6.46		81.45	B	FP
227	201	C643	ROT 188	UBT-3	3.0	188	nodule	270.00	-3.20		-2.90	1850.0	3.42		2.4?	-6.70		76.14	B	CF
228	196	C668	ROT 175	UBT-1	4.0	175	nodule	0.00	-2.90		-1.90	1850.0	1.42		2.4?	-5.90		56.51	B	CF
229																	-6.06			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
230	**Table DR8: All Rohtas soil data**					This is the master data set for Rohtas as of March, 2007. For summary of final sample isotope values and ages, see Repository 2, Tables DR4 and DR5.														
231	Reorder #	Field Number	sample	Level	Paleosol	Num.	material	Lateral Position	Leached Depth	Depth w/Caliche	Sample Depth	Kaymeters	d13C	Average, S.D.	Kayage	d18O	Average, S.D.	CaCO3/ C %	Color	Facies
232	191		8083				nodule					940.5	-1.20			-6.90				
233	180		8085				nodule					889.8	-0.10			-7.30				
234	152		8086				nodule					780.8	-0.13			-7.80				
235	151		8088				nodule					755.0	2.00			-6.30				
236	150		8091				nodule					725.0	1.10			-7.60				
237	149		8092				nodule					693.0	0.80			-7.00				
238	132		8094				nodule					572.0	-3.50			-5.90				
239	131		8095				nodule					570.0	-5.00			-8.50				
240	27		9005				nodule					191.9	-10.10		7.89	-7.90				
241	13		9006				nodule					185.0	-11.00		7.89	-9.70				
242	207		9008				nodule						-8.90			-10.90				
243	208		9009				nodule						-10.40			-9.60				
244	209		9019				nodule						-9.90			-9.90				
245	210		9020				nodule						-10.40			-10.60				
246	192		9024				nodule					996.4	0.10			-5.80				
247	211		9754				nodule						-11.00			-9.90				
248	44		9791				nodule					293.7	-9.10			-9.20				
249	45		9792				nodule					303.0	-10.20			-8.70				
250	48		9793				nodule					349.6	-9.00			-8.70				
251	153		9796				nodule					788.0	-0.80			-6.80				
252	212		R-16				nodule						0.50			-5.60				
253	213		R-20				nodule						-0.60			-6.50				
254	214		R-26				nodule						1.80			-5.20				
255	206	C704	ROT-104En2			104	nodule					1900.0	1.18		2.0?	-4.87		65.90		
256	203	C477	ROT 104D			104	nodule					1900.0	0.99		2.0?	-5.21		69.02		
257	204	C681	ROT 104F			104	nodule					1900.0	2.05		2.0?	-2.78		67.86		
258	205	C480	ROT 104H			104	nodule					1900.0	1.77		2.0?	-6.02		58.37		
259																	-4.72			