

APPENDIX A

Sampling Procedures

Following types of samples were collected for this study:

1. Samples from surface sediments and exposed sections.
2. Samples from trenches.
3. Samples from Nal Sarovar core.

All the samples were labelled and sealed in the field, with the records maintained in a field log book. Locations of these samples were marked on copies of toposheets. In most cases, photographs of the field location were also taken. Since most laboratory analyses for this work have been carried out on samples recovered from core drilling, the sampling procedure for these are described in detail.

The core for this study was raised in June 1992 with the help of the Directorate of Geology and Mining (DGM), Govt. of Gujarat. Owing to a weak monsoon the previous year, the water level was already low and the lake had completely dried up by the time the coring operation was in progress. The core was raised from the deepest part of the lake to ensure an undisturbed near surface record. A tungsten carbide drill bit, with a 5cm internal diameter (ID) core tube, was used for the purpose of drilling. After about every 1.5m of drilling, the core was raised and the sample removed from the casing tube either by hammering it on a clean surface (in case of sand horizons) or by hydraulic forcing (in case of clayey horizon). After about every 3m of drilling (more frequently in case of sand horizon) a casing (ID = 7.5cm) was lowered and the bore hole washed with water before deeper drilling.

Nearly all the samples from clayey horizon showed greater length than the actual depth drilled. While in the field the samples were labelled as sub samples of any particular drilling length, the actual depth of each subsection was estimated by distributing the excess recovered length between different sub samples in proportion to their individual recovered lengths.

The samples were partitioned in the field itself, as soon as they were received. The depth of the sample, its length and the down core direction was recorded accurately on the sample as well as in the logbook. The samples were then packed in polythene bags, labelled and sealed in the field itself. Samples for Thermoluminescence (TL) and Optically Stimulated Luminescence (OSL) dating were specially picked up from depths where lithological changes were observed. To avoid the possibility of changes in water content of samples as a result of bore hole washing, the samples for luminescence studies were collected from the lowermost portion of the core raised during any drilling run. These were then tightly wrapped in aluminium foil and sealed in airtight polythene bags to prevent water loss. As discussed earlier (Chapter 4) a correct estimate of water content of the sample is essential for calculation of TL/OSL ages.

A list of samples with their field number, laboratory number and corrected depth is given in Table A1.

The litholog was prepared in the field itself on the basis of visual, hand specimen estimate of grain size, colour etc. After arrival in the lab selected samples were subjected to a detailed laboratory analyses and the final litholog prepared.

Table A.1 Details of Nal Sarovar core samples.

Lab. No.	Field No.	Depth* (cm)	Lab. No.	Field No.	Depth* (cm)
N-1	NS 0-10	0-10	N-39	NS 97-99	97-99
N-2	NS 0-10	0-10	N-40	NS 99-101	99-101
N-3	NS 10-20	10-20	N-41	NS 101-103	101-103
N-4	NS 10-20	10-20	N-42	NS 103-105	103-105
N-5	NS 24.5-29.5	24.5-29.5	N-43	NS 105-107	105-107
N-6	NS 29.5-30.5	29.5-30.5	N-44	NS 107-110	107-110
N-7	NS 30.5-32	30.5-32	N-45	NS 110-112	110-112
N-8	NS 32-34	32-34	N-46	NS 112-114	112-114
N-9	NS 34-36.5	34-36.5	N-47	NS 114-116	114-116
N-10	NS 36.5-38.5	36.5-38.5	N-48	NS 116-118	116-118
N-11	NS 38.5-40.5	38.5-40.5	N-49	NS 118-120	118-120
N-12	NS 40.5-42.5	40.5-42.5	N-50	NS 120-122	120-122
N-13	NS 42.5-44.5	42.5-44.5	N-51	NS 122-124	122-124
N-14	NS 44.5-46.5	44.5-46.5	N-52	NS 124-126	124-126
N-15	NS 46.5-48.5	46.5-48.5	N-53	NS 126-127	126-127
N-16	NS 48.5-50.5	48.5-50.5	N-54	NS 127-129	127-129
N-17	NS 50.5-52.5	50.5-52.5	N-55	NS 129-131	129-131
N-18	NS 52.5-54.5	52.5-54.5	N-56	NS 131-133	131-133
N-19	NS 54.5-56.5	54.5-56.5	N-57	NS 133-135	133-135
N-20	NS 56.5-58.5	56.5-58.5	N-58	NS 135-138	135-138
N-21	NS 58.5-60.5	58.5-60.5	N-59	NS 138-140	138-140
N-22	NS 60.5-62.5	60.5-62.5	N-60	NS 140-142	140-142
N-23	NS 62.5-64.5	62.5-64.5	N-61	NS 142-144	142-144
N-24	NS 64.5-66.5	64.5-66.5	N-62	NS 144-146	144-146
N-25	NS 66.5-68.5	66.5-68.5	N-63	NS 146-148	146-148
N-26	NS 68.5-70.5	68.5-70.5	N-64	NS 148-150	148-150
N-27	NS 70.5-72.5	70.5-72.5	N-65	NS 150-152	150-152
N-28	NS 72.5-74.5	72.5-74.5	N-66	NS 152-154	152-154
N-29	NS 74.5-76.5	74.5-76.5	N-67	NS 154-156	154-156
N-30	NS 76.5-78.5	76.5-78.5	N-68	NS 156-158	156-158
N-31	NS 78.5-80.5	78.5-80.5	N-69	NS 158-160	158-160
N-32	NS 80.5-83.5	80.5-83.5	N-70	NS 160-162	160-162
N-33	NS 83.5-86.5	83.5-86.5	N-71	NS 162-164	162-164
N-34	NS 86.5-90.0	86.5-90.0	N-72	NS 164-166	164-166
N-35	NS 90-92	90-92	N-73	NS 166-177	166-177
N-36	NS 92-93	92-93	N-74	NS 177-195	177-195
N-37	NS 93-95	93-95	N-75	NS 195-207	195-207
N-38	NS 95-97	95-97	N-76	NS 207-220	207-220

* Depth is given as measured from surface

Table A.1 continued

Lab. No.	Field No.	Depth* (cm)
N-77	NS 220-230	220-230
N-78	NS 230-240	230-240
N-79	NS 240-250	240-250
N-80	NS 250-261	250-261
N-81	NS 261-270	261-270
N-82	NS 270-280	270-280
N-83	NS 280-290	280-290
N-84	NS 290-293	290-293
N-85	NS 293-300	293-300
N-86	NS 300-309	300-309
N-87	NS 309-312	309-312
N-88	NS 312-317	312-317
N-89	NS 317-322	317-322
N-90	NS 322-327	322-327
N-91	NS 327-331	327-331
N-92	NS 331-341	331-341
N-93	NS 341-351	341-351
N-94	NS 351-363	351-363
N-95	NS 363-373	363-373
N-96	NS 373-384	373-384
N-97	NS 384-388	384-388
N-98	NS 388-390	388-390
N-99	NS 390-393	390-393
N-100	NS 393-417	393-417
N-101	NS 417-427	417-427
N-102	NS 427-447	427-447
N-103	NS 447-463	447-463
N-104	NS 463-477	463-477
N-105	NS 477-522	477-522
N-106	NS 522-540	522-540
N-107	NS 540-552	540-552
N-108	NS 552-562	552-562
N-109	NS 562-572	562-572
N-110	NS 572-584	572-584
N-111	NS 584-595	584-595
N-112	NS 595-600	595-600

Lab. No.	Field No.	Depth* (cm)
N-113	NS 600-610	600-610
N-114	NS 610-625	610-625
N-115	NS 625-647	625-647
N-116	NS 647-672	647-672
N-117	NS 672-685	672-685
N-118	NS 685-702	685-702
N-119	NS 702-717	702-717
N-120	NS 717-732	717-732
N-121	NS 732-745	732-745
N-122	NS 745-760	745-760
N-123	NS 760-775	760-775
N-124	NS 775-790	775-790
N-125	NS 870-887	870-887
N-126	NS 887-907	887-907
N-127	NS 907-920	907-920
N-128	NS 920-937	920-937
N-129	NS 937-950	937-950
N-130	NS 950-965	950-965
N-131	NS 965-987	965-987
N-132	NS 987-1000	987-1000
N-133	NS 1000-1025	1000-1025
N-134	NS 1025-1052	1025-1052
N-135	NS 1052-1065	1052-1065
N-136	NS 1065-1102	1065-1102
N-137	NS 1102-1122	1102-1122
N-138	NS 1122-1152	1122-1152
N-139	NS 1152-1165	1152-1165
N-140	NS 1165-1184	1165-1184
N-141	NS 1184-1199	1184-1199
N-142	NS 1199-1217	1199-1217
N-143	NS 1217-1225	1217-1225
N-144	NS 1225-1247	1225-1247
N-145	NS 1247-1272	1247-1272
N-146	NS 1272-1285	1272-1285
N-147	NS 1285-1299	1285-1299
N-148	NS 1299-1324	1299-1324

Table A.1 continued:

Lab. No.	Field No.	Depth* (cm)
N-149	NS 1324-1346	1324-1346
N-150	NS 1346-1366	1346-1366
N-151	NS 1366-1392	1366-1392
N-152	NS 1392-1405	1392-1405
N-153	NS 1405-1430	1405-1430
N-154	NS 1430-1455	1430-1455
N-155	NS 1455-1485	1455-1485
N-156	NS 1485-1515	1485-1515
N-157	NS 1515-1539	1515-1539
N-158	NS 1539-1552	1539-1552
N-159	NS 1552-1565	1552-1565
N-160	NS 1565-1592	1565-1592
N-161	NS 1592-1602	1592-1602
N-162	NS 1602-1615	1602-1615
N-163	NS 1615-1645	1615-1645
N-164	NS 1645-1662	1645-1662
N-165	NS 1662-1675	1662-1675
N-166	NS 1675-1775	1675-1775
N-167	NS 1825-1835	1825-1835
N-168	NS 1835-1842	1835-1842
N-169	NS 1842-1852	1842-1852
N-170	NS 1852-1857	1852-1857
N-171	NS 1857-1862	1857-1862
N-172	NS 1862-1867	1862-1867
N-173	NS 1867-1874	1867-1874
N-174	NS 1874-1879	1874-1879
N-175	NS 1879-1884	1879-1884
N-176	NS 1884-1889	1884-1889
N-177	NS 1889-1894	1889-1894
N-178	NS 1894-1899	1894-1899
N-179	NS 1899-1904	1899-1904
N-180	NS 1904-1909	1904-1909
N-181	NS 1909-1914	1909-1914
N-182	NS 1914-1920	1914-1920
N-183	NS 1920-1925	1920-1925
N-184	NS 1925-2025/7	1925-1945

Lab. No.	Field No.	Depth* (cm)
N-185	NS 1925-2025/6	1945-1953
N-186	NS 1925-2025/5	1953-1965
N-187	NS 1925-2025/4	1965-1981
N-188	NS 1925-2025/3	1981-1997
N-189	NS 1925-2025/2	1997-2016
N-190	NS 1925-2025/1	2016-2025
N-191	NS 2025-2135/9	2025-2036
N-192	NS 2025-2135/8	2036-2050
N-193	NS 2025-2135/7	2050-2063
N-194	NS 2025-2135/6	2063-2076
N-195	NS 2025-2135/5	2076-2090
N-196	NS 2025-2135/4	2090-2098
N-197	NS 2025-2135/3	2098-2109
N-198	NS 2025-2135/2	2109-2119
N-199	NS 2025-2135/1	2119-2135
N-200	NS 2135-2235/16	2135-2140
N-201	NS 2135-2235/15	2140-2145
N-202	NS 2135-2235/14	2145-2150
N-203	NS 2135-2235/13	2150-2157
N-204	NS 2135-2235/12	2157-2165
N-205	NS 2135-2235/11	2165-2171
N-206	NS 2135-2235/10	2171-2176
N-207	NS 2135-2235/9	2176-2184
N-208	NS 2135-2235/8	2184-2192
N-209	NS 2135-2235/7	2192-2198
N-210	NS 2135-2235/6	2198-2204
N-211	NS 2135-2235/5	2204-2210
N-212	NS 2135-2235/4	2210-2216
N-213	NS 2135-2235/3	2216-2222
N-214	NS 2135-2235/2	2222-2228
N-215	NS 2135-2235/1	2228-2235
N-216	NS 2235-2400/11	2235-2252
N-217	NS 2235-2400/10	2252-2264
N-218	NS 2235-2400/9	2264-2277
N-219	NS 2235-2400/8	2277-2290
N-220	NS 2235-2400/7	2290-2306

Table A.1 continued

Lab. No.	Field No.	Depth* (cm)	Lab. No.	Field No.	Depth* (cm)
N-221	NS 2235-2400/6	2306-2322	N-257	NS 2870-2990/11	2870-2882
N-222	NS 2235-2400/5	2322-2332	N-258	NS 2870-2990/10	2882-2897
N-223	NS 2235-2400/4	2332-2347	N-259	NS 2870-2990/9	2897-2907
N-224	NS 2235-2400/3	2347-2364	N-260	NS 2870-2990/8	2907-2917
N-225	NS 2235-2400/2	2364-2381	N-261	NS 2870-2990/7	2917-2927
N-226	NS 2235-2400/1	2381-2400	N-262	NS 2870-2990/6	2927-2936
N-227	NS 2400-2560/9	2400-2422	N-263	NS 2870-2990/5	2936-2948
N-228	NS 2400-2560/8	2422-2444	N-264	NS 2870-2990/4	2948-2959
N-229	NS 2400-2560/7	2444-2463	N-265	NS 2870-2990/3	2959-2971
N-230	NS 2400-2560/6	2463-2484	N-266	NS 2870-2990/2	2971-2981
N-231	NS 2400-2560/5	2484-2497	N-267	NS 2870-2990/1	2981-2990
N-232	NS 2400-2560/4	2497-2518	N-268	NS 2990-3140/7	3021-3045
N-233	NS 2400-2560/3	2518-2533	N-269	NS 2990-3140/6	3045-3059
N-234	NS 2400-2560/2	2533-2550	N-270	NS 2990-3140/5	3059-3079
N-235	NS 2400-2560/1	2550-2560	N-271	NS 2990-3140/4	3079-3094
N-236	NS 2560-2750/11	2560-2570	N-272	NS 2990-3140/3	3094-3119
N-237	NS 2560-2750/10	2570-2588	N-273	NS 2990-3140/2	3119-3127
N-238	NS 2560-2750/9	2588-2608	N-274	NS 2990-3140/1	3127-3140
N-239	NS 2560-2750/8	2608-2625	N-275	NS 3140-3290/14	3140-3153
N-240	NS 2560-2750/7	2625-2638	N-276	NS 3140-3290/13	3153-3164
N-241	NS 2560-2750/6	2638-2657	N-277	NS 3140-3290/12	3164-3173
N-242	NS 2560-2750/5	2657-2676	N-278	NS 3140-3290/11	3173-3178
N-243	NS 2560-2750/4	2676-2699	N-279	NS 3140-3290/10	3178-3188
N-244	NS 2560-2750/3	2699-2715	N-280	NS 3140-3290/9	3188-3195
N-245	NS 2560-2750/2	2715-2737	N-281	NS 3140-3290/8	3195-3204
N-246	NS 2560-2750/1	2737-2750	N-282	NS 3140-3290/7	3204-3217
N-247	NS 2750-2870/10	2750-2758	N-283	NS 3140-3290/6	3217-3226
N-248	NS 2750-2870/9	2758-2768	N-284	NS 3140-3290/5	3226-3241
N-249	NS 2750-2870/8	2768-2781	N-285	NS 3140-3290/4	3241-3254
N-250	NS 2750-2870/7	2781-2793	N-286	NS 3140-3290/3	3254-3266
N-251	NS 2750-2870/6	2793-2805	N-287	NS 3140-3290/2	3266-3278
N-252	NS 2750-2870/5	2805-2820	N-288	NS 3140-3290/1	3278-3290
N-253	NS 2750-2870/4	2820-2832	N-289	NS 3290-3420/9	3290-3305
N-254	NS 2750-2870/3	2832-2847	N-290	NS 3290-3420/8	3305-3320
N-255	NS 2750-2870/2	2847-2861	N-291	NS 3290-3420/7	3320-3332
N-256	NS 2750-2870/1	2861-2870	N-292	NS 3290-3420/6	3332-3353

Table A.1 continued

Lab. No.	Field No.	Depth* (cm)
N-293	NS 3290-3420/5	3353-3368
N-294	NS 3290-3420/4	3368-3387
N-295	NS 3290-3420/3	3387-3398
N-296	NS 3290-3420/2	3398-3408
N-297	NS 3290-3420/1	3408-3420
N-298	NS 3420-3540/11	3420-3426
N-299	NS 3420-3540/10	3426-3437
N-300	NS 3420-3540/9	3437-3445
N-301	NS 3420-3540/8	3445-3457
N-302	NS 3420-3540/7	3457-3470
N-303	NS 3420-3540/6	3470-3484
N-304	NS 3420-3540/5	3484-3501
N-305	NS 3420-3540/4	3501-3518
N-306	NS 3420-3540/3	3518-3524
N-307	NS 3420-3540/2	3524-3531
N-308	NS 3420-3540/1	3531-3540
N-309	NS 3540-3690/12	3540-3553
N-310	NS 3540-3690/11	3553-3564
N-311	NS 3540-3690/10	3564-3575
N-312	NS 3540-3690/9	3575-3589
N-313	NS 3540-3690/8	3589-3603
N-314	NS 3540-3690/7	3603-3614
N-315	NS 3540-3690/6	3614-3626
N-316	NS 3540-3690/5	3626-3640
N-317	NS 3540-3690/4	3640-3658
N-318	NS 3540-3690/3	3658-3672
N-319	NS 3540-3690/2	3672-3688
N-320	NS 3540-3690/1	3688-3690
N-321	NS 3690-3840/10	3690-3691
N-322	NS 3690-3840/9	3691-3706
N-323	NS 3690-3840/8	3706-3723
N-324	NS 3690-3840/7	3723-3745
N-325	NS 3690-3840/6	3745-3762
N-326	NS 3690-3840/5	3762-3774
N-327	NS 3690-3840/4	3774-3785
N-328	NS 3690-3840/3	3785-3804

Lab. No.	Field No.	Depth* (cm)
N-329	NS 3690-3840/2	3804-3831
N-330	NS 3690-3840/1	3831-3840
N-331	NS 3840-3980/10	3840-3853
N-332	NS 3840-3980/9	3853-3869
N-333	NS 3840-3980/8	3869-3884
N-334	NS 3840-3980/7	3884-3903
N-335	NS 3840-3980/6	3903-3914
N-336	NS 3840-3980/5	3914-3931
N-337	NS 3840-3980/4	3931-3950
N-338	NS 3840-3980/3	3950-3960
N-339	NS 3840-3980/2	3960-3974
N-340	NS 3840-3980/1	3974-3980
N-341	NS 3840-3980/0	-
N-342	NS 3980-4180/13	3980-3989
N-343	NS 3980-4180/12	3989-4001
N-344	NS 3980-4180/11	4001-4015
N-345	NS 3980-4180/10	4015-4033
N-346	NS 3980-4180/9	4033-4053
N-347	NS 3980-4180/8	4053-4073
N-348	NS 3980-4180/7	4073-4094
N-349	NS 3980-4180/6	4094-4106
N-350	NS 3980-4180/5	4106-4120
N-351	NS 3980-4180/4	4120-4141
N-352	NS 3980-4180/3	4141-4154
N-353	NS 3980-4180/2	4154-4170
N-354	NS 3980-4180/1	4170-4180
N-355	NS 4180-4360/14	4180-4195
N-356	NS 4180-4360/13	4195-4209
N-357	NS 4180-4360/12	4209-4222
N-358	NS 4180-4360/11	4222-4244
N-359	NS 4180-4360/10	4244-4257
N-360	NS 4180-4360/9	4257-4274
N-361	NS 4180-4360/8	4274-4271
N-362	NS 4180-4360/7	4271-4281
N-363	NS 4180-4360/6	4281-4294
N-364	NS 4180-4360/5	4294-4309

Table A.1 continued

Lab. No.	Field No.	Depth* (cm)
N-365	NS 4180-4360/4	4309-4320
N-366	NS 4180-4360/3	4320-4331
N-367	NS 4180-4360/2	4331-4346
N-368	NS 4180-4360/1	4346-4360
N-369	NS 4360-4560/13	4360-4373
N-370	NS 4360-4560/12	4373-4388
N-371	NS 4360-4560/11	4388-4402
N-372	NS 4360-4560/10	4402-4419
N-373	NS 4360-4560/9	4419-4430
N-374	NS 4360-4560/8	4430-4451
N-375	NS 4360-4560/7	4451-4470
N-376	NS 4360-4560/6	4470-4489
N-377	NS 4360-4560/5	4489-4501
N-378	NS 4360-4560/4	4501-4511
N-379	NS 4360-4560/3	4511-4522
N-380	NS 4360-4560/2	4522-4543
N-381	NS 4360-4560/1	4543-4560
N-382	NS 4560-4790/16	4560-4576
N-383	NS 4560-4790/15	4576-4592
N-384	NS 4560-4790/14	4592-4608
N-385	NS 4560-4790/13	4608-4623
N-386	NS 4560-4790/12	4623-4638
N-387	NS 4560-4790/11	4638-4654
N-388	NS 4560-4790/10	4654-4666
N-389	NS 4560-4790/9	4666-4677
N-390	NS 4560-4790/8	4677-4692
N-391	NS 4560-4790/7	4692-4709
N-392	NS 4560-4790/6	4709-4719
N-393	NS 4560-4790/5	4719-4738
N-394	NS 4560-4790/4	4738-4757

Lab. No.	Field No.	Depth* (cm)
N-395	NS 4560-4790/3	4757-4762
N-396	NS 4560-4790/2	4762-4781
N-397	NS 4560-4790/1	4781-4790
N-398	NS 4790-5000/15	4790-4803
N-399	NS 4790-5000/14	4803-4820
N-400	NS 4790-5000/13	4820-4836
N-401	NS 4790-5000/12	4836-4850
N-402	NS 4790-5000/11	4850-4865
N-403	NS 4790-5000/10	4865-4881
N-404	NS 4790-5000/9	4881-4901
N-405	NS 4790-5000/8	4901-4910
N-406	NS 4790-5000/7	4910-4928
N-407	NS 4790-5000/6	4928-4943
N-408	NS 4790-5000/5	4943-4957
N-409	NS 4790-5000/4	4957-4976
N-410	NS 4790-5000/3	4976-4986
N-411	NS 4790-5000/2	4986-4995
N-412	NS 4790-5000/1	4995-5000
N-413	NS 5284-5485/12	5285-5300
N-414	NS 5284-5485/11	5300-5316
N-415	NS 5284-5485/10	5316-5333
N-416	NS 5284-5485/9	5333-5348
N-417	NS 5284-5485/8	5348-5366
N-418	NS 5284-5485/7	5366-5381
N-419	NS 5284-5485/6	5381-5396
N-420	NS 5284-5485/5	5396-5414
N-421	NS 5284-5485/4	5414-5431
N-422	NS 5284-5485/3	5431-5448
N-423	NS 5284-5485/2	5448-5465
N-424	NS 5284-5485/1	5465-5485