TABLE DR1: LOCATIONS OF ALL SAMPLES ANALYSED IN THIS STUDY

Stratigraphic Unit	Sample no.	No. on Fig 1b	GPS co-ordinates	comments	analyses
Subathu (s.s.)	90-32B	1	n.d.	Road section, Dogadda village, N29° 52' , E078° 32'	
Subathu (s.s.)	90-35B	2	n.d	Subathu-Arki Rd, below Subathu village N30° 58' E076° 59.5'	spinel
Subathu (s.s.)	90-36A	3	n.d.	Kalka-solon Rd, Dharampur village, N30° 54' E77° 02'.	spinel
Subathu (s.s.)	90-40C	4	n.d.	Bilaspur-Simla Highway, river section (Bhadar Khad) accessed at milestone 52.	XRF
Subathu (s.s.)	91-6iiB	5	n.d.	Bilaspur-Shimla Highway, at Naugaun link road junction	XRF
Subathu (s.s.)	93-13A	6	n.d.	Bilaspur-Simla Highway, river section (Bhadar Khad) accessed at milestone 52.	XRF
Subathu (s.s.)	96-15A	7	N30° 53.955' E077° 01.611'	Dharampur village Road section	XRF
Subathu (s.s.)	96-15B	8	N30° 53.955' E077° 01.661'	Dharampur village Road section	Petrography
Subathu (s.s.)	96-15D	9	N30° 53.955' E077° 01.661'	Dharampur village Road section	Petrography
Subathu (s.s.)	96-28E	10	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	XRF
Red Subathu	93-12C	11	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	spinel
Red Subathu	96-28C	12	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	Petrography
Red Subathu	96-28G	13	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	Petrography
Red Subathu	96-28I	14	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	XRF
Red Subathu	96-28J	15	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	Petrography
Red Subathu	96-28K	16	N30° 58.442' E076° 58.757'	River section, Kuthar Nadi, accessed from Subathu-Arki road	XRF
Subathu-Dagshai contact	93-C1	17	n.d.	Bilaspur-Simla Highway Milestone 51	XRF
Subathu-Dagshai contact	93-C2	18	n.d.	Bilaspur-Simla Highway Milestone 51	XRF
Basal Dagshai	96-9A	19	N31° 15.968' E076° 54.655'	Naugaun link road, off Bilaspur-Simla Highway	Petrography
Basal Dagshai	96-14B	20	N31° 14.535'	Bilaspur-Simla Highway, at junction to Arki road	Petrography

			E076° 54.000′		
Lower Dagshai	91-6iiF	21	n.d.	Bilaspur-Simla Highway, between milestone 50 & Naugaun link rd.	XRF
Lower Dagshai	96-10A	22	N31° 15.645′ E076° 54.723′	Bilaspur-Simla Highway	Petrography
Lower Dagshai	96-12A	23	N31° 14.770′ E076° 54.772′	Bilaspur-Simla Highway, next to electricity substation.	Petrography
Lower Dagshai	96-14A	24	N31° 14.535′ E076° 54.000′	Bilaspur-Simla Highway, at junction to Arki road	Petrography
Lower Dagshai	96-14C	25	N31° 14.535′ E076° 54.000′	Bilaspur-Simla Highway, at junction to Arki road	Petrography
Lower Dagshai	96-17F	26	N30° 33.768′ E077° 01.859′	Dharampur-Dagshai Road	XRF
Lower Dagshai	96-17C	27	N30° 53.880′ E077° 01.745′	Dharampur-Dagshai Road	Petrography
Lower Dagshai	96-17D	28	N30° 53.880′ E077° 01.745′	Dharampur-Dagshai Road	Petrography
Main Dagshai	90-29A	29	n.d.	Tons valley, accessed at bridge at N30° 32.638′ E077° 49.272′	XRF
Main Dagshai	90-29C	30	n.d.	Tons valley, accessed at bridge at N30° 32.638′ E077° 49.272′	XRF
Main Dagshai	91-8E	31	n.d.	Dharampur - Dagshai Cantt Rd Dagshai : N30° 53′ E077° 03.0′	spinel
Main Dagshai	91-8H	32	n.d.	Dharampur - Dagshai Cantt Road Dagshai: N30° 53′ E077° 03.0′	XRF
Main Dagshai	96-17E	33	N30° 53.768′ E077° 01.859′	Dharampur-Dagshai Road	Petrography
Main Dagshai	96-17F	34	N30° 33.768′ E077° 01.859′	Dharampur-Dagshai Road	XRF
Main Dagshai	96-17G	35	N30° 53.768′ E077° 01.859′	Dharampur-Dagshai Road	Petrography
Main Dagshai	96-18B	36	N30° 53.624′ E077° 02.153′	Road section, under Dagshai Cantt.	XRF
Main Dagshai	96-19A	37	N30° 53.590′ E077° 02.383′	Dagshai – Kumahatti Road uphill of culvert 89-5	Petrography
Main Dagshai	96-29C	38	N30° 57.694′ E076° 59.655′	Subathu-Dharampur Road	Petrography
Main Dagshai	96-30A	39	N30° 57.113′ E077° 00.178′	Subathu-Dharampur Road 200m west of milestone 10	Petrography
Main Dagshai	96-37A	40	N30° 53.063′	Kumahatti-Nahan Road Culvert 1-2	Petrography

			E077° 03.534′		
Main Dagshai	96-39A	41	n.d.	Kumahatti-Nahan Road Culvert 3-7	Petrography
Main Dagshai	96-41A	42	N30° 50.787′ E077° 05.204′	Kumahatti-Nahan Road Culvert 8-5	Petrography
Main Dagshai	96-43A	43	N30° 49.258′ E077° 05.917′	Kumahatti-Nahan Road Culvert 16-2?	Petrography
Main Dagshai	96-45A	44	N30° 48.475′ E077° 06.915	Kumahatti-Nahan Road Culvert 19-3	Petrography
Kumahatti-Solon	96-20A	45	N30° 53.893′ E077° 03.510′	Quarry. Track off main road, to left, going uphill from Kumahatti	Petrography
Kumahatti-Solon	96-22A	46	N32° 53.433′ E077° 03.942′	Kumahatti-Solon Road Uphill of bridge 96-1	Petrography
Kumahatti-Solon	96-22B	47	N32° 53.478′ E077° 04.090′	Kumahatti-Solon Road Culvert 94-6, milestone 94.	Petrography
Kumahatti-Solon	96-22E	48	N32° 53.361′ E077° 04.144′	Kumahatti-Solon Road Quarry	Petrography
Kasauli	90-33B	49	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9A	50	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9B	51	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	Garnet
Kasauli	91-9E	52	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9F	53	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9G	54	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-10A	55	n.d.	Rd. section uphill from Kumahatti village N30° 53.5′ E077° 03.5′	XRF
Kasauli	91-85A	56	N31° 14.928′ E076° 52.423′	Bilaspur-Simla Highway, milestone 59	garnet
Kasauli	96-2A	57	N31° 14.949′ E076° 53.255′	Bilaspur-Simla Highway Bhararighat Village	Petrography
Kasauli	96-5A	58	N31° 14.856′ E076° 52.476′	Bilaspur-Simla Highway, past milestone 58, direction Bilaspur	Petrography
Kasauli	96-25B	59	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	Petrography
Kasauli	96-25C	60	N30° 54.112′	Kasauli village, side road to hospital	Petrography

			E076° 57.642′		
Kasauli	96-26B	61	N30° 54.268′	Kasauli-Kalka Road	Petrography
			E076° 57.882′	Culvert 21-6	
Kasauli	96-27B	62	N30° 54.136′	Kasauli-Solon Road	Petrography
			E076° 58.072′	Culvert 10-4	
Kasauli	96-32A	63	n.d.	Dagshai-Nahan Highway, west of Sarahan village,	Petrography
				culvert 37-7	
Kasauli	96-32G	64	N30° 43.575′	Dagshai –Nahan Highway,	Petrography
			E077° 11.007′	200m east of culvert 36-4	
Kasauli	96-33A	65	N30° 44.296′	Dagshai-Nahan Highway	Petrography
			E077° 10.271′	20m east of culvert 33-8.	
Kasauli	96-36A	66	N30° 45.462′	Dagshai-Nahan Highway	Petrography
			E077° 09.756′	50m east of culvert 30/2	

Table DR1: Locations of all samples used in this study. Numbers can be correlated with map Fig. 1b. Note that some roads in India are currently being resurveyed and milestone and culvert markings may have changed since these samples were collected.

TABLE A1: PETROGRAPHY OF INDIAN FORELAND BASIN SANDSTONES

UNIT	Site	Sample (Prefix Hm96-)	Grain size (microns)	Q	F	Lv	Lc	Lp	Lch	Lm	Lo	P/F	monocrystalline quartz	polycrystalline quartz	plagioclase	alkali feldspars	felsitic volcanic grains	carbonate grains	terrigenous grains	chert grains	slate grains	phyllite/metasandstone grains	micaschist/gneiss grains	serpentine/metabasite grains	micas	heavy minerals	intrabasinal grains	siltstes	matrix	cement	authigenic minerals	TOTAL
KASAULI FORMATION																																
	Kumahatti-Nahan HW	36A	205	45	8	1	0	2	1	42	0	68	29	5	3	2	1	0	2	1	4	30	4	0	2	0	0	0	10	6	1	100.0
	Kumahatti-Nahan HW	33A	300	51	9	2	0	3	0	35	0	32	29	9	2	4	2	0	4	0	4	25	4	0	2	1	1	0	4	9	1	100.0
	Kumahatti-Nahan HW	32G	370	50	6	4	0	10	0	30	1	77	24	10	2	1	3	0	9	0	6	18	3	1	1	2	7	0	5	7	1	100.0
	Kumahatti-Nahan HW	32A	340	51	2	2	0	7	1	37	0	67	31	7	1	0	1	0	7	1	7	24	2	0	0	1	0	0	11	6	1	100.0
	Kasauli	27B	225	53	10	2	0	2	0	33	0	52	26	14	4	4	1	0	2	0	0	28	2	0	9	2	0	0	5	2	0	100.0
	Kasauli	26B	170	50	9	2	0	3	0	36	0	60	29	8	4	3	2	0	3	0	1	25	2	0	8	2	0	0	4	10	1	100.0
	Kasauli	25C	290	54	6	0	0	3	0	37	0	54	24	13	2	2	0	0	2	0	4	25	2	0	8	0	0	1	9	7	0	100.0
	Kasauli	25B	210	54	17	1	0	1	0	27	0	49	26	12	4	6	1	0	1	0	4	23	3	0	4	1	0	0	11	4	0	100.0
	Bilaspur-Simla HW	5A	230	59	3	1	0	3	0	34	0	50	32	10	0	1	1	0	3	0	3	24	2	0	3	1	0	0	10	9	0	100.0
	Bilaspur-Simla HW	2A	200	57	6	1	0	1	0	34	0	60	31	12	3	2	1	0	1	0	4	20	4	0	6	2	0	0	10	4	1	100.0
	MEAN	**n=10**	**254**	**52**	**8**	**2**	**0**	**4**	**0**	**35**	**0**	**57**	**28**	**10**	**3**	**2**	**1**	**0**	**3**	**0**	**4**	**24**	**3**	**0**	**4**	**1**	**1**	**0**	**8**	**6**	**1**	**100.0**
	ST.DEV.		*67*	*4*	*4*	*1*	*0*	*3*	*0*	*4*	*0*	*13*	*3*	*3*	*1*	*2*	*1*	*0*	*3*	*0*	*2*	*4*	*1*	*0*	*3*	*1*	*2*	*0*	*3*	*3*	*1*	
Kumahatti-Solon																																
	Kumahatti-Solon HW	22E	380	45	3	0	0	15	2	35	0	43	23	7	0	1	0	0	15	2	8	20	3	0	3	0	2	1	9	4	1	100.0
	Kumahatti-Solon HW	22B	270	49	6	2	0	8	0	35	0	86	28	7	3	1	1	0	8	0	7	23	1	0	2	0	1	0	11	7	0	100.0
	Kumahatti-Solon HW	22A	470	41	2	0	0	10	2	45	0	n.d.	20	10	0	0	0	0	10	2	15	26	0	0	1	0	1	1	10	2	1	100.0
	Kumahatti-Solon HW	20A	390	43	4	0	1	5	3	44	0	60	24	9	1	1	0	1	4	2	9	26	2	0	0	0	4	0	3	9	5	100.0
	MEAN	**n=4**	**378**	**44**	**4**	**1**	**0**	**9**	**2**	**40**	**0**	**63**	**24**	**8**	**1**	**1**	**0**	**0**	**9**	**2**	**10**	**24**	**1**	**0**	**2**	**0**	**2**	**1**	**8**	**5**	**2**	**100.0**
	ST.DEV.		*82*	*4*	*2*	*1*	*0*	*4*	*1*	*6*	*0*	*22*	*3*	*1*	*1*	*0*	*1*	*0*	*5*	*1*	*4*	*3*	*1*	*0*	*1*	*0*	*1*	*1*	*4*	*3*	*2*	
DAGSHAI FORMATION																																
	Kumahatti-Nahan HW	45A	280	47	2	0	0	2	1	47	0	67	26	7	1	0	0	0	3	1	14	28	1	0	0	0	0	0	7	11	1	100.0
	Kumahatti-Nahan HW	43A	310	38	2	1	0	9	2	49	0	n.d.	21	6	0	0	1	0	11	1	14	30	1	0	0	0	1	0	11	3	2	100.0
	Kumahatti-Nahan HW	41A	265	48	1	0	0	11	2	38	0	n.d.	30	4	0	0	0	0	10	1	20	11	0	0	1	0	1	1	13	3	5	100.0
	Kumahatti-Nahan HW	39A	440	44	1	1	0	10	5	38	0	n.d.	23	7	0	0	1	0	15	4	27	6	0	0	0	0	1	0	6	5	4	100.0

Kumahatti-Nahan HW	37A	410	35	1	2	0	15	3	44	0	n.d.	17	5	0	0	1	0	20	2	21	20	0	0	0	0	3	0	3	5	1	100.0
Subathu-Dharampur rd.	30A	360	45	1	1	0	17	2	34	0	n.d.	25	9	0	0	1	0	19	2	16	17	0	0	0	0	0	0	5	4	1	100.0
Subathu-Dharampur rd.	29C	530	40	3	0	2	10	6	39	0	86	18	8	1	0	0	1	14	5	25	10	1	0	0	0	1	0	4	0	11	100.0
Dharampur-Kumahatti HW	19 A	205	56	2	0	0	8	1	33	0	n.d.	33	7	1	0	0	0	13	1	8	21	0	0	1	0	0	0	12	2	2	100.0
Dharampur-Kumahatti HW	17G	260	57	0	1	0	2	2	38	0	n.d.	33	5	0	0	1	0	4	1	18	16	0	0	0	0	2	0	11	7	1	100.0
Dharampur-Kumahatti HW	17E	275	46	2	2	0	4	2	43	0	67	26	9	1	1	1	0	5	2	21	18	1	0	0	0	0	0	7	6	2	100.0
MEAN	**n=10**	**334**	**46**	**1**	**1**	**0**	**9**	**2**	**40**	**0**	**73**	**25**	**7**	**0**	**0**	**1**	**0**	**11**	**2**	**18**	**18**	**0**	**0**	**0**	**0**	**1**	**0**	**8**	**5**	**3**	**100.0**
ST.DEV.		*100*	*7*	*1*	*1*	*1*	*5*	*2*	*5*	*0*	*11*	*6*	*2*	*0*	*0*	*0*	*0*	*6*	*1*	*6*	*7*	*0*	*0*	*0*	*0*	*1*	*0*	*3*	*3*	*3*	
Lower Dagshai																																
Bilaspur-Simla HW	10A	220	45	3	0	0	6	2	44	0	100	24	5	2	0	0	0	7	1	6	32	0	0	0	0	5	0	9	1	6	100.0
Bilaspur-Simla HW	12A	330	49	0	2	0	4	2	42	0	n.d.	25	7	0	0	1	0	7	1	28	6	0	0	0	1	1	0	11	9	2	100.0
Bilaspur-Simla HW	14A	250	72	0	2	0	3	1	21	0	n.d.	46	6	0	0	1	0	4	1	14	3	0	0	0	0	0	0	8	6	8	100.0
Bilaspur-Simla HW	14C	320	92	0	1	0	3	2	4	0	n.d.	51	7	0	0	0	0	3	1	2	1	0	0	0	0	5	0	7	22	2	100.0
Dharampur-Kumahatti HW	17D	200	89	0	1	0	0	0	8	0	n.d.	54	7	0	0	1	0	1	0	5	1	0	0	0	0	10	0	6	4	10	100.0
Dharampur-Kumahatti HW	17C	170	69	0	2	0	1	1	26	0	n.d.	43	5	0	0	2	0	2	1	16	4	0	0	1	0	2	0	10	12	2	100.0
Basal Dagshai																																
Bilaspur-Simla HW	14B	350	81	0	1	0	5	3	10	0	n.d.	52	10	0	0	1	0	4	2	6	1	0	0	0	0	0	0	5	18	0	100.0
Bilaspur-Simla HW	9A	235	64	2	1	0	4	1	26	1	67	38	13	1	1	1	0	3	1	9	15	0	1	0	0	0	0	6	9	3	100.0
MEAN	**n=8**	**259**	**70**	**1**	**1**	**0**	**3**	**1**	**23**	**0**	**83**	**42**	**7**	**0**	**0**	**1**	**0**	**4**	**1**	**11**	**5**	**0**	**0**	**0**	**0**	**3**	**0**	**8**	**10**	**4**	**100.0**
ST.DEV.		*66*	*17*	*1*	*1*	*0*	*2*	*1*	*15*	*0*	*24*	*12*	*3*	*1*	*0*	*1*	*0*	*2*	*1*	*8*	*11*	*0*	*0*	*0*	*0*	*4*	*0*	*2*	*7*	*4*	
SUBATHU FORMATION																																
Red Subathu																																
Kuthar Nadi, Subathu	28J	145	65	4	26	0	2	1	1	2	83	34	2	2	0	15	0	1	0	0	0	0	1	0	1	11	0	12	5	15	100.0
Kuthar Nadi, Subathu	28G	95	61	2	23	0	3	2	2	6	n.d.	34	2	1	0	13	0	2	1	1	1	0	4	0	0	9	0	8	7	18	100.0
Kuthar Nadi, Subathu	28C	80	52	9	28	1	2	1	0	8	82	21	1	3	1	12	0	1	0	0	0	0	3	0	1	16	0	19	2	20	100.0
MEAN	**n=3**	**107**	**59**	**5**	**25**	**0**	**3**	**1**	**1**	**5**	**83**	**30**	**2**	**2**	**0**	**13**	**0**	**1**	**1**	**0**	**0**	**0**	**3**	**0**	**1**	**12**	**0**	**13**	**5**	**17**	**100.0**
ST.DEV.		*34*	*7*	*3*	*2*	*0*	*1*	*1*	*1*	*3*	*1*	*7*	*1*	*1*	*0*	*2*	*0*	*1*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*3*	*0*	*6*	*2*	*2*	
Subathu Fm. s.s.																																
Dharampur-Kumahatti HW	15D	85	58	7	8	2	16	2	4	2	50	37	2	2	2	6	1	11	2	3	0	0	2	0	0	7	0	4	1	20	100.0
Dharampur-Kumahatti HW	15B	65	75	11	5	0	2	3	3	3	67	26	2	3	1	2	0	1	1	1	0	0	1	0	0	5	1	13	0	44	100.0
MEAN	**n=2**	**75**	**66**	**9**	**6**	**1**	**9**	**3**	**3**	**3**	**58**	**32**	**2**	**3**	**2**	**4**	**1**	**6**	**1**	**2**	**0**	**0**	**1**	**0**	**0**	**6**	**1**	**9**	**0**	**32**	**100.0**
ST.DEV.		*14*	*12*	*3*	*3*	*1*	*10*	*0*	*1*	*0*	*12*	*8*	*0*	*0*	*1*	*3*	*1*	*7*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*	*1*	*6*	*1*	*17*	

TABLE A2: Electron microprobe analyses of detrital spinels from the Himalayan foreland basin, Northern India

Sample (Hm-)	90-32B	90-32B	90-32B	90-36A	90-36A	90-36A	90-36A	90-36A	90-36A	90-36A	90-36A	90-36A	90-36A	90-35B	90-35B	90-35B	90-35B	90-35B	90-35B	90-35B	90-35B	93-12C	93-12C	91-8E	91-8E	91-8E	91-8E
grain no.	1 (core)	2 (core)	3(core)	5 (core)	6 (core)	7(core)	7 (rim)	9 (core)	9 (rim)	10 (core)	10 (rim)	11 (core)	11 (rim)	12 (core)	12 (rim)	13 (core)	13 (rim)	14 (core)	14 (rim)	15 (core)	15 (rim)	17 (core)	17 (rim)	18 (core)	18 (rim)	19 (core)	19 (rim)
wt. %																											
MgO	15.207	13.155	10.733	10.443	12.517	10.456	10.317	15.827	15.755	8.883	11.116	10.627	10.927	12.277	12.421	10.720	10.743	11.265	11.061	12.311	12.582	11.080	11.003	11.670	11.625	12.648	12.617
AL_2O_3	46.156	32.860	15.660	9.899	30.438	24.743	25.194	46.801	46.602	21.584	24.616	23.522	23.581	30.417	30.241	24.108	23.626	17.240	17.245	30.630	30.627	26.058	27.014	27.072	26.780	30.404	30.383
CaO	0.032	0.109	0.071	0.315	0.105	0.297	0.484	0.092	0.200	0.378	0.526	0.085	0.132	0.194	0.336	0.042	0.190	0.098	0.409	0.196	0.410	0.160	0.276	0.000	0.006	0.001	0.021
MnO	0.143	0.244	0.424	2.063	0.210	0.276	0.283	0.156	0.124	0.979	0.232	0.293	0.243	0.229	0.230	0.315	0.310	0.279	0.276	0.187	0.234	0.263	0.238	0.226	0.261	0.223	0.213
SiO_2	0.060	0.062	0.051	0.145	0.092	0.068	0.094	0.021	0.039	0.674	0.064	0.039	0.051	0.021	0.030	0.026	0.075	0.030	0.036	0.030	0.024	0.053	0.064	0.056	0.101	0.060	0.094
TiO_2	0.088	0.072	0.118	0.052	0.082	0.197	0.210	0.063	0.048	0.127	0.093	0.070	0.058	0.100	0.110	0.133	0.158	0.275	0.264	0.093	0.115	0.083	0.080	0.078	0.088	0.048	0.072
CR_2O_3	18.644	32.837	52.520	60.465	34.932	40.993	40.075	18.197	18.254	42.418	41.764	43.114	42.947	33.578	33.466	40.641	40.212	49.093	48.356	33.575	33.911	41.224	39.788	39.705	39.932	35.638	35.310
FeO	13.636	15.521	16.779	12.776	15.723	18.536	18.757	13.291	13.333	19.176	17.343	17.664	17.527	16.273	15.906	17.891	17.629	16.397	16.520	16.366	16.106	17.687	17.741	16.960	16.936	15.846	15.827
Fe_2O_3	0.000	0.911	0.584	0.000	0.308	0.636	0.792	0.000	0.000	1.137	0.299	0.396	0.503	2.001	2.112	1.951	2.554	2.018	2.291	1.947	2.111	0.000	0.000	0.003	0.078	0.573	0.667
TOTAL	93.966	95.772	96.941	96.159	94.407	96.202	96.206	94.448	94.355	95.354	96.055	96.010	95.969	95.091	94.851	95.826	95.499	96.695	96.459	95.336	96.119	96.608	96.204	95.770	95.826	95.441	95.204
stoichiometric values																											
MG	5.248	4.782	4.217	4.224	4.664	3.985	3.927	5.415	5.401	3.478	4.225	4.145	4.18	4.562	4.623	4.106	4.134	4.393	4.329	4.56	4.622	4.164	4.135	4.384	4.371	4.671	4.669
AL	12.596	9.445	4.866	3.166	8.968	7.456	7.584	12.662	12.631	6.683	7.398	7.12	7.133	8.937	8.901	7.301	7.188	5.316	5.337	8.97	8.897	7.745	8.026	8.042	7.961	8.878	8.89
CA	0.008	0.029	0.02	0.092	0.028	0.081	0.132	0.023	0.049	0.106	0.144	0.023	0.036	0.052	0.09	0.012	0.053	0.027	0.115	0.052	0.108	0.043	0.074	0	0.002	0	0.006
MN	0.028	0.05	0.095	0.474	0.045	0.06	0.061	0.03	0.024	0.218	0.05	0.064	0.053	0.048	0.049	0.069	0.068	0.062	0.061	0.039	0.049	0.056	0.051	0.048	0.06	0.047	0.045
SI	0.014	0.015	0.014	0.039	0.023	0.018	0.024	0.005	0.009	0.177	0.016	0.01	0.013	0.005	0.007	0.007	0.019	0.008	0.01	0.007	0.006	0.013	0.016	0.014	0.025	0.015	0.023
TI	0.015	0.013	0.023	0.011	0.015	0.038	0.04	0.011	0.008	0.025	0.018	0.014	0.011	0.019	0.021	0.026	0.031	0.054	0.052	0.017	0.021	0.016	0.015	0.015	0.017	0.009	0.013
CR	3.413	6.332	10.947	12.973	6.905	8.287	8.092	3.303	3.319	8.811	8.42	8.754	8.715	6.618	6.608	8.257	8.208	10.156	10.039	6.596	6.608	8.219	7.931	7.913	7.964	6.981	6.931
FE[2+]	2.641	3.166	3.699	2.9	3.287	3.964	4.006	2.552	2.564	4.213	3.698	3.794	3.762	3.393	3.322	3.845	3.806	3.588	3.628	3.401	3.32	3.73	3.74	3.575	3.573	3.283	3.286
FE[3+]	0	0.167	0.116	0	0.058	0.122	0.152	0.00	0.00	0.225	0.057	0.076	0.097	0.375	0.397	0.377	0.498	0.397	0.453	0.364	0.392	0	0	0.001	0.015	0.107	0.125
TOTAL	23.964	23.998	23.997	23.878	23.994	24.01	24.02	24	24.006	23.937	24.026	23.999	24.001	24.009	24.017	23.998	24.002	24.001	24.022	24.008	24.023	23.987	23.988	23.991	23.986	23.991	23.988
Cr#	0.213	0.401	0.692	0.804	0.435	0.526	0.516	0.207	0.208	0.569	0.532	0.551	0.550	0.425	0.426	0.531	0.533	0.656	0.653	0.424	0.426	0.515	0.497	0.496	0.500	0.440	0.438
Mg#	0.665	0.602	0.533	0.593	0.587	0.501	0.495	0.680	0.676	0.452	0.533	0.522	0.526	0.573	0.582	0.516	0.521	0.550	0.544	0.573	0.582	0.527	0.525	0.551	0.550	0.587	0.587

Note: Analyses were carried out at Edinburgh University using a Cameca Camebax Microbeam, with PAP correction software supplied by Cameca. Samples were analysed at 20kV with a beam current of 20nA.

TABLE A3: ELECTRON MICROPROBE ANALYSES OF DETRITAL GARNETS FROM THE KASAULI FORMATION

Sample (Hm-)	91-85A	91-85A	91-85A	91-85A	91-85A	91-85A	91-85A	91-85A	91-9B	91-9B	91-9B	91-9B	91-9B	91-9B	91-9B
grain	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G
analysis ID	4	5	2	3, run 2	3	3	3	3, run 2	3, run 2	4	2, run 2	4	4	5	4
wt. %															
F	0	0	0	0	0	0	0.125	0.074	0	0.021	0	0.224	0	0.204	0.068
NA_2O	0	0.009	0.007	0.012	0.022	0.009	0.047	0.034	0.026	0.028	0.018	0.049	0.008	0.023	0.027
MGO	1.083	1.502	2.671	1.509	3.706	2.016	1.04	1.766	3.187	0.885	2.005	1.885	2.414	1.615	3.656
AL_2O_3	20.678	20.519	21.133	20.993	21.301	21.143	20.884	20.889	21.103	20.761	21.116	21.018	21.109	20.753	21.241
SIO_2	36.212	35.957	36.911	37.001	37.185	37.057	36.785	36.832	37.142	36.892	36.836	36.821	37.301	36.434	37.224
K_2O	0	0.033	0.005	0	0	0.005	0	0.002	0.001	0	0	0.012	0	0.002	0
CAO	1.118	2.677	3.317	7.476	1.118	7.185	5.71	4.066	3.68	5.695	1.945	3.915	7.549	3.165	2.661
TIO_2	0.055	0.058	0.065	0.192	0.072	0.065	0.078	0.092	0.057	0.092	0.043	0.058	0.103	0.04	0.037
FEO*	32.085	37.776	34.59	27.819	36.464	30.537	31.402	30.389	33.531	32.194	31.605	35.693	24.417	36.028	34.244
MNO	8.11	0.538	1.4	4.867	0.883	1.894	3.827	5.489	1.321	3.88	7.298	1.118	7.182	1.416	0.823
CR_2O_3	0.004	0.023	0.05	0.029	0	0	0.028	0.037	0.025	0.022	0.035	0.022	0.012	0.015	0
TOTAL	99.345	99.093	100.149	99.898	100.751	99.911	99.926	99.67	100.072	100.47	100.901	100.816	100.094	99.696	99.979
Stoichiometric values															
F	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.019	0.000	0.005	0.000	0.057	0.000	0.053	0.017
NA	0.000	0.001	0.001	0.002	0.003	0.001	0.007	0.005	0.004	0.004	0.003	0.008	0.001	0.004	0.004
MG	0.133	0.185	0.321	0.181	0.442	0.241	0.125	0.213	0.381	0.107	0.241	0.226	0.287	0.196	0.436
AL	2.009	1.995	2.007	1.992	2.007	2.001	1.993	1.995	1.996	1.980	2.007	1.989	1.987	1.991	2.004
SI	2.985	2.966	2.973	2.978	2.972	2.976	2.977	2.984	2.980	2.984	2.970	2.956	2.978	2.986	2.979
K	0.000	0.003	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
CA	0.099	0.237	0.286	0.645	0.096	0.618	0.495	0.353	0.316	0.494	0.168	0.337	0.646	0.276	0.228
TI	0.003	0.004	0.004	0.012	0.004	0.004	0.005	0.006	0.003	0.006	0.003	0.004	0.006	0.002	0.002
FE	2.211	2.605	2.329	1.872	2.437	2.050	2.125	2.058	2.249	2.177	2.130	2.395	1.630	2.451	2.291
MN	0.566	0.038	0.096	0.332	0.060	0.129	0.262	0.377	0.090	0.266	0.498	0.076	0.486	0.098	0.056
CR	0.000	0.002	0.003	0.002	0.000	0.000	0.002	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.000
TOTAL	8.007	8.035	8.019	8.014	8.021	8.021	8.024	8.014	8.020	8.022	8.024	8.050	8.022	8.038	8.018

Note: Analyses were carried out at Edinburgh University using a Cameca Camebax Microbeam, with PAP correction software supplied by Cameca. Samples were analysed at 20kV with a beam current of 20nA

* FeO = total, $FeO+Fe_2O_3$

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TABLE A4: X-RAY FLUORESCENCE ANALYSES OF HIMALAYAN FORELAND BASIN MUDSTONES

Sample (Hm	90-40C	91-6iiB	93-13A	96-15A	96-28E	96-28I	96-28K	93-C1	93-C2	91-6iiF	90-29A	90-29C	91-8H	96-17F	96-18B	90-33B	91-9A	91-9E	91-9F	91-9G	91-10A
Fm.*	Sub	Sub	Sub	Sub	Sub	Red Sub	Red Sub	passage	passage	Lower Dag	Dag	Dag	Dag	Dag	Dag	Kas	Kas	Kas	Kas	Kas	Kas
wt. % oxide																					
SiO_2	57.88	50.92	37.34	58.78	54.79	54.43	62.15	71.73	67.62	54.44	69.77	19.27	65.78	52.41	71.81	67.66	48.25	65.55	57.23	63.37	62.47
Al_2O_3	16.35	9.7	7.86	12.25	13.78	15.12	17.26	13.34	13.48	15.59	15.27	6.26	18.18	16.54	13.05	17.51	17.14	17.72	20.17	18.61	19.47
Fe_2O_3	7.24	5.59	4.93	5.98	6.41	8.49	7.46	5.02	10.45	6.58	3.67	3.17	6.41	6.87	5	5.87	5.97	6.54	7.26	6.97	6.65
MgO	3.47	2.25	2.51	3.13	3.09	2.12	2.49	1.54	1.73	2.11	1.55	1.65	1.79	2.42	1.69	2.06	2.36	1.84	1.85	2.48	1.94
CaO	4.23	14.13	23.52	7.09	7.69	6.59	1.33	0.48	0.49	8.24	0.88	35.94	0.34	7.24	0.69	0.19	9.15	0.18	0.3	0.4	0.38
Na_2O	0.25	0.4	0.24	0.45	0.39	0.18	0.32	0.19	0.22	0.77	0.55	0.26	0.37	0.08	0.3	1.01	0.84	0.29	0.09	1.25	0.62
K_2O	2.691	1.471	1.123	1.796	2.413	2.203	1.633	1.909	1.943	3.055	3.345	1.192	4.058	3.439	2.748	3.472	4.397	3.765	4.477	3.94	4.357
TiO_2	1.007	0.609	0.512	0.939	0.939	1.036	1.194	1.089	1.042	0.669	0.741	0.356	0.913	0.822	0.757	0.683	0.576	0.618	0.645	0.645	0.753
MnO	0.057	0.178	0.192	0.082	0.08	0.056	0.022	0.025	0.03	0.176	0.015	0.44	0.027	0.074	0.027	0.056	0.323	0.063	0.083	0.086	0.039
P_2O_5	0.159	0.171	0.345	0.15	0.152	0.162	0.094	0.168	0.197	0.137	0.07	0.098	0.109	0.121	0.073	0.082	0.247	0.074	0.055	0.126	0.149
TOTAL	92.334	85.42	78.572	90.64	89.73	90.38	93.94	95.491	97.202	91.76	95.861	68.64	97.977	90.03	96.15	98.593	89.253	96.64	92.16	97.877	96.828
element (ppm)																					
Nb	21.5	12.4	10.5	11.9	20.5	23.3	24.8	22.6	21.4	13.4	16.9	6.5	18.3	19.3	16.3	16.4	10.6	15.1	16.3	14.9	16.1
Zr	202.3	147.8	141	276	201.5	218.2	249.5	329.9	321.5	156.4	228.5	59.4	223.2	175.6	235.7	176.2	148.8	161.2	166.3	147.8	204.9
Y	27.3	22.1	23	19.7	26	27.8	27.2	36.5	37.2	39.1	30	12	33.2	27.1	33.3	26.9	68	32.6	45.2	35.1	36.3
Sr	115.8	159.4	373.9	171.7	186.1	156.8	105.4	76.3	76.4	67.5	67.4	372.8	55.6	114.2	53.6	45.7	94.3	26.3	31.4	54.6	63.4
Rb	120.1	64	49.8	31.9	101.3	113.7	97.9	91.2	93.6	145.1	164.8	67.1	184	150.4	117.6	154.1	226.2	168.6	218.5	181.1	191.9
Th	11	8.8	7.1	3.6	9.5	11.6	11.9	11.2	14.7	16.2	12.1	2.6	19.7	14.2	13	11.3	16.7	16.2	18.7	17.4	18.3
Pb	11.7	13	17.4	6.1	11.1	19	18.9	16.6	17.5	34.2	18.3	16.2	29.7	27.1	18.2	22.3	56.3	31.4	36.1	33.7	27.5
Zn	99.3	71.1	62.8	54.5	90.2	103.5	112.3	90.4	99.8	97.3	82.9	85.8	113.9	102.2	83.9	98.1	105.9	100.7	113.8	100.5	105.7
Cu	42.7	35.6	38.8	25.7	41.1	38.8	38.5	44.6	36.5	39.7	11.1	44.1	32.6	33.9	28.4	37.5	51.3	39.4	49.7	38.4	38.3
Ni	193.8	101.1	121.8	98.6	137.8	124.8	159.2	145.8	159.8	49.2	34.9	48.4	53.6	56.4	48.7	39.8	47	45.9	49.1	47.2	47.9
Cr	233.1	164.6	247.7	406.8	205.1	202.4	238.5	261	263	105.2	90	97.9	119.7	124.3	90.9	90.4	117.3	96.6	112.1	111.9	115
Ce	101	60.3	74.5	67.7	96.9	118.1	109.4	102	91.9	87.7	93.8	59.4	97	104.5	97.8	63.1	90.8	81.1	125.3	91.1	86.5
Nd	42.1	26.9	35.5	35.3	37.9	46.7	41.7	43.2	41.8	38.4	31.4	27	42.3	44	37.2	29.5	58.7	35.7	51.2	39.9	35
La	44.8	28.4	43	37.6	44.8	46.9	49.7	43.2	38.9	443	38.4	26.1	50.6	50.4	49.4	31.1	74.8	49.8	69.3	47.3	43.1
V	159.7	110.8	110.9	115.5	145.6	160.2	159.5	134.6	143.5	132	106.9	80.6	151.7	153.9	107.5	120.2	161.4	128.2	153.1	128.6	146.5
Ba	204.5	155.1	148	118.1	202.4	166.8	154.7	377.7	415.8	737.7	592.2	185.3	777.3	657.8	592.1	832.8	1132.4	747.2	901.1	866.3	1010
Sc	19.9	18.6	6.3	15.8	17.3	16.9	21	18.1	18.3	20	17.3	16.2	20.8	19.6	13.9	19.2	20.2	18.2	26.4	24.5	19.4
Ti	6036.97	0	3069.44	n.d.#	n.d.	n.d.	n.d.	6528.56	6246.79	0	4442.3	n.d.	5473.435	n.d.	n.d.	4094.585	3453.12	3704.91	3866.775	3866.775	4514.235

Note: All analyses were carried out at the Department of Geology and Geophysics, Edinburgh University.

Major element analyses used fused glass discs, prepared with flux, after ignition in an oven at 1100C, according to the method of Fitton and Dunlop (1985).

Fused discs were scanned by a Philips PW1480 Sequential Automatic X-ray spectrometer.

Trace element analyses were carried out on pressed powder pellets analysed in a Philips PW1450 Sequential Automatic X-ray spectrometer.

* Sub = Subathu Formation (s.s.), Dag = Dagshai Formation, Kas = Kasauli Formation. 'Passage beds' (Mathur 1979) are the rocks at the Subathu-Dagshai contact.

n.d. = not determined.

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Table DR1: Locations of all samples used in this study. Numbers can be correlated with map Fig. 1b. Note that some roads in India are currently being resurveyed and milestone and culvert markings may have changed since these samples were collected.

TABLE DR1: LOCATIONS OF ALL SAMPLES ANALYSED IN THIS STUDY

Stratigraphic Unit	Sample no.	No. on Fig 1b	GPS co-ordinates	comments	analyses
Subathu (s.s.)	90-32B	1	n.d.	Road section, Dogadda village, N29° 52′ , E078° 32′	
Subathu (s.s.)	90-35B	2	n.d	Subathu-Arki Rd, below Subathu village N30° 58′ E076° 59.5′	spinel
Subathu (s.s.)	90-36A	3	n.d.	Bilaspur-Simla Rd, Dharampur village, N30° 54′ E77° 02′.	spinel
Subathu (s.s.)	90-40C	4	n.d.	Bilaspur-Simla Highway, river section (Bhadar Khad) accessed at milestone 52.	XRF
Subathu (s.s.)	91-6iiB	5	n.d.	Bilaspur-Shimla Highway, at Naugaun link road junction	XRF
Subathu (s.s.)	93-13A	6	n.d.	Bilaspur-Simla Highway, river section (Bhadar Khad) accessed at milestone 52.	XRF
Subathu (s.s.)	96-15A	7	N30° 53.955′ E077° 01.611′	Dharampur village Road section	XRF
Subathu (s.s.)	96-15B	8	N30° 53.955′ E077° 01.661′	Dharampur village Road section	Petrography
Subathu (s.s.)	96-15D	9	N30° 53.955′ E077° 01.661′	Dharampur village Road section	Petrography
Subathu (s.s.)	96-28E	10	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	XRF
Red Subathu	93-12C	11	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	spinel
Red Subathu	96-28C	12	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	Petrography
Red Subathu	96-28G	13	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	Petrography
Red Subathu	96-28I	14	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	XRF
Red Subathu	96-28J	15	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	Petrography
Red Subathu	96-28K	16	N30° 58.442′ E076° 58.757′	River section, Kuthar Nadi, accessed from Subathu-Arki road	XRF
Subathu-Dagshai contact	93-C1	17	n.d.	Bilaspur-Simla Highway Milestone 51	XRF
Subathu-Dagshai contact	93-C2	18	n.d.	Bilaspur-Simla Highway Milestone 51	XRF
Basal Dagshai	96-9A	19	N31° 15.968′ E076° 54.655′	Naugaun link road, off Bilaspur-Simla Highway	Petrography
Basal Dagshai	96-14B	20	N31° 14.535′	Bilaspur-Simla Highway, at junction to Arki road	Petrography

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			E076° 54.000′		
Lower Dagshai	91-6iiF	21	n.d.	Bilaspur-Simla Highway, between milestone 50 & Naugaun link rd.	XRF
Lower Dagshai	96-10A	22	N31° 15.645′ E076° 54.723′	Bilaspur-Simla Highway	Petrography
Lower Dagshai	96-12A	23	N31° 14.770′ E076° 54.772′	Bilaspur-Simla Highway, next to electricity substation.	Petrography
Lower Dagshai	96-14A	24	N31° 14.535′ E076° 54.000′	Bilaspur-Simla Highway, at junction to Arki road	Petrography
Lower Dagshai	96-14C	25	N31° 14.535′ E076° 54.000′	Bilaspur-Simla Highway, at junction to Arki road	Petrography
Lower Dagshai	96-17F	26	N30° 33.768′ E077° 01.859′	Dharampur-Dagshai Road	XRF
Lower Dagshai	96-17C	27	N30° 53.880′ E077° 01.745′	Dharampur-Dagshai Road	Petrography
Lower Dagshai	96-17D	28	N30° 53.880′ E077° 01.745′	Dharampur-Dagshai Road	Petrography
Main Dagshai	90-29A	29	n.d.	Tons valley, accessed at bridge at N30° 32.638′ E077° 49.272′	XRF
Main Dagshai	90-29C	30	n.d.	Tons valley, accessed at bridge at N30° 32.638′ E077° 49.272′	XRF
Main Dagshai	91-8E	31	n.d.	Dharampur - Dagshai Cantt Rd Dagshai : N30° 53′ E077° 03.0′	spinel
Main Dagshai	91-8H	32	n.d.	Dharampur - Dagshai Cantt Road Dagshai: N30° 53′ E077° 03.0′	XRF
Main Dagshai	96-17E	33	N30° 53.768′ E077° 01.859′	Dharampur-Dagshai Road	Petrography
Main Dagshai	96-17F	34	N30° 33.768′ E077° 01.859′	Dharampur-Dagshai Road	XRF
Main Dagshai	96-17G	35	N30° 53.768′ E077° 01.859′	Dharampur-Dagshai Road	Petrography
Main Dagshai	96-18B	36	N30° 53.624′ E077° 02.153′	Road section, under Dagshai Cantt.	XRF
Main Dagshai	96-19A	37	N30° 53.590′ E077° 02.383′	Dagshai – Kumahatti Road uphill of culvert 89-5	Petrography
Main Dagshai	96-29C	38	N30° 57.694′ E076° 59.655′	Subathu-Dharampur Road	Petrography
Main Dagshai	96-30A	39	N30° 57.113′ E077° 00.178′	Subathu-Dharampur Road 200m west of milestone 10	Petrography
Main Dagshai	96-37A	40	N30° 53.063′	Kumahatti-Nahan Road Culvert 1-2	Petrography

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			E077° 03.534′		
Main Dagshai	96-39A	41	n.d.	Kumahatti-Nahan Road Culvert 3-7	Petrography
Main Dagshai	96-41A	42	N30° 50.787′ E077° 05.204′	Kumahatti-Nahan Road Culvert 8-5	Petrography
Main Dagshai	96-43A	43	N30° 49.258′ E077° 05.917′	Kumahatti-Nahan Road Culvert 16-2?	Petrography
Main Dagshai	96-45A	44	N30° 48.475′ E077° 06.915	Kumahatti-Nahan Road Culvert 19-3	Petrography
Kumahatti-Solon	96-20A	45	N30° 53.893′ E077° 03.510′	Quarry. Track off main road, to left, going uphill from Kumahatti	Petrography
Kumahatti-Solon	96-22A	46	N32° 53.433′ E077° 03.942′	Kumahatti-Solon Road Uphill of bridge 96-1	Petrography
Kumahatti-Solon	96-22B	47	N32° 53.478′ E077° 04.090′	Kumahatti-Solon Road Culvert 94-6, milestone 94.	Petrography
Kumahatti-Solon	96-22E	48	N32° 53.361′ E077° 04.144′	Kumahatti-Solon Road Quarry	Petrography
Kasauli	90-33B	49	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9A	50	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9B	51	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	Garnet
Kasauli	91-9E	52	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9F	53	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-9G	54	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	XRF
Kasauli	91-10A	55	n.d.	Rd. section uphill from Kumahatti village N30° 53.5′ E077° 03.5′	XRF
Kasauli	91-85A	56	N31° 14.928′ E076° 52.423′	Bilaspur-Simla Highway, milestone 59	garnet
Kasauli	96-2A	57	N31° 14.949′ E076° 53.255′	Bilaspur-Simla Highway Bharari ghat Village	Petrography
Kasauli	96-5A	58	N31° 14.856′ E076° 52.476′	Bilaspur-Simla Highway, past milestone 58, direction Bilaspur	Petrography
Kasauli	96-25B	59	N30° 54.112′ E076° 57.642′	Kasauli village, side road to hospital.	Petrography
Kasauli	96-25C	60	N30° 54.112′	Kasauli village, side road to hospital	Petrography

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			E076° 57.642′		
Kasauli	96-26B	61	N30° 54.268′	Kasauli-Kalka Road	Petrography
			E076° 57.882′	Culvert 21-6	
Kasauli	96-27B	62	N30° 54.136′	Kasauli-Solon Road	Petrography
			E076° 58.072′	Culvert 10-4	
Kasauli	96-32A	63	n.d.	Dagshai-Nahan Highway, west of Sarahan village,	Petrography
				culvert 37-7	
Kasauli	96-32G	64	N30° 43.575′	Dagshai –Nahan Highway,	Petrography
			E077° 11.007′	200m east of culvert 36-4	
Kasauli	96-33A	65	N30° 44.296′	Dagshai-Nahan Highway	Petrography
			E077° 10.271′	20m east of culvert 33-8.	
Kasauli	96-36A	66	N30° 45.462′	Dagshai-Nahan Highway	Petrography
			E077° 09.756′	50m east of culvert 30/2	

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