

GSC Open File 8923, Appendix B: Field observations, VC2

Core sample #	Site	Borehole #	Sampling date and time	Sampler	Trip # at nominal depth	Nominal depth top	Nominal depth bottom	Nominal depth top	Nominal depth bottom	Approx. push length	Difficulty to push	Wait time before retrieval	Resistance to break/pull core	Sampling observations	Approximate core recovery at drill rig	Depth to top of core in field lab	Depth to bottom of core in field lab	Recovered core length (field lab calculated)	Recovered core length (field lab calculated)	Pocket penetrometer measurement depth	Pocket penetrometer measurement	Measured depth to top of sediment in borehole, after casing advance	Casing advance observations (note that casing is advanced after core is retrieved)
						ft	ft	m	m	in		min			in	cm	cm	cm	in	cm from base	ton/sq ft or kg/cm2	ft, in	
R-101	GSC-VC2	1	Wed, 23-10-2019 10:46	SS (H sized)	1	0	2	0.00	0.61	24		0		Blow counts (4-8-10-6), Fill, brown silty sand	14			35.6	14.0				No casing used after split spoon
R-102	GSC-VC2	1	Wed, 23-10-2019 10:50	SS (N sized)	1	2	4	0.61	1.22	24		0		Blow counts (7-7-8-5)	21			53.3	21.0				HWT casing advanced to 4'
R-103	GSC-VC2	1	Wed, 23-10-2019 11:04	SS (H sized)	1	4	6	1.22	1.83	24		0		Blow counts (9-19-15-14)	12			30.5	12.0				Casing not advanced, remains at 4'
R-104	GSC-VC2	1	Wed, 23-10-2019 11:07	SS (N sized)	1	6	8	1.83	2.44	24		0		Blow counts (7-14-12-8)	15			38.1	15.0				Casing advanced to 8'
R-105	GSC-VC2	1	Wed, 23-10-2019 11:18	SS (H sized)	1	8	10	2.44	3.05	24		0		Blow counts (2-5-6-7)	22			55.9	22.0				Casing advanced to 10'
R-106	GSC-VC2	1	Wed, 23-10-2019 11:26	SS (H sized)	1	10	12	3.05	3.66	24		0		Blow counts (6-14-24-21)	24			61.0	24.0				Casing not advanced, remains at 10'
R-107	GSC-VC2	1	Wed, 23-10-2019 11:32	SS (N sized)	1	12	14	3.66	4.27	24		0		Blow counts (8-4-4-1), bedding at base, shells in spoon tip	14			35.6	14.0				Casing advanced to 14'
R-108	GSC-VC2	1	Wed, 23-10-2019 12:06	A-rod	1	14	16	4.27	4.88	20		18	Low resistance to turn		27.5	7.0	0.0	69.2	27.2	base	0.5		
R-109	GSC-VC2	1	Wed, 23-10-2019 12:52	A-rod	1	16	18	4.88	5.49	20	Pushed by hand	26	Low resistance to turn		24	16.6	0.0	59.6	23.5	base	0.75		
R-110	GSC-VC2	1	Wed, 23-10-2019 13:35	A-rod	1	18	20	5.49	6.10	20	4" by hand, 16" with rig	25			24.25	16.0	-1.4	61.6	24.3	base	0.7		
R-111	GSC-VC2	1	Wed, 23-10-2019 14:14	A-rod	1	20	22	6.10	6.71	20	2" by hand, 18 with rig	23	Low resistance to turn		25	15.6	0.0	60.6	23.9	base	0.75		
R-112	GSC-VC2	1	Wed, 23-10-2019 14:49	A-rod	1	22	24	6.71	7.32	22	Pushed by rig	23	Low resistance to turn		28	5.0	0.0	71.2	28.0	base	0.7		
R-113	GSC-VC2	1	Wed, 23-10-2019 15:39	A-rod	1	24	26	7.32	7.92	19	Pushed by rig	34	Low resistance to turn		28	4.8	0.0	71.4	28.1	base	0.7		On 25-10-2019, replaced HWT casing with P casing before coring. Advanced to 26', measured to 24'. Washed out 2' of mud.
R-114	GSC-VC2	1	Fri, 25-10-2019 10:18	A-rod	1	26.08	28	7.95	8.53	19	15" weight of rods, 4" by rig	15	Low to moderate resistance to turn	2" slough for half width of Shelby tube	22	14.0	0.0	62.2	24.5	base	0.7	27'11"	Measured 1" sediment in casing. A little sand in cuttings.
R-115	GSC-VC2	1	Fri, 25-10-2019 10:53	A-rod	1	28	30	8.53	9.14	23	16" weight of rods, 7" by hand	15	Low resistance to turn		26	6.0	0.0	70.2	27.6	base	0.7	29'9"	Advanced casing to 30'. Pulled up 5" to clamp. 3" sediment inside casing.
R-116	GSC-VC2	1	Fri, 25-10-2019 11:35	A-rod	1	30	32	9.14	9.75	22	weight of rods	16	Low resistance to turn		17	34.6	0.0	41.6	16.4	base	0.5	30'	Casing advanced to 32'; sediment at 30'. Washed casing to 12:15; sediment still at 30'.
	GSC-VC2	1	Fri, 25-10-2019 12:25	SS	2	30	32	9.14	9.75	12	weight of rods	0		Not a true sample, used split spoon to remove 1' of sediment and see its composition (mud).								31'7"	Took 1' split spoon to clear mud. Washed out until 12:45. 5" sediment inside casing.
	GSC-VC2	1	Fri, 25-10-2019 13:04	A-rod	1	32	34	9.75	10.36	20	weight of rods (had to hold back)	16	Low resistance to turn	Shelby tube empty		no recovery	no recovery	0.0	0.0			33'	1' mud inside casing. More washing did not clear it out but pushed piston sampler through sediment (R-117).
R-117	GSC-VC2	1	Fri, 25-10-2019 13:41	piston	1	34	36	10.36	10.97	24		10	Great suction on Shelby tube when pulled		23	17.0	0.0	59.2	23.3	base	0.3		Casing not advanced (remained at 34'), pushed piston sampler through sediment to correct depth (R-118)
R-118	GSC-VC2	1	Fri, 25-10-2019 14:02	piston	1	36	38	10.97	11.58	24		10		Lost 6" at bottom of core	8.5	41.1	11.0	24.1	9.5			36'8"	Casing advanced to 38'. 1'4" sediment inside casing. Pushed piston through it (R-119)
R-119	GSC-VC2	1	Fri, 25-10-2019 14:46	piston	1	38	40	11.58	12.19	24		10	Pulled with water pressure on	Core sticking 1.5" out of bottom of Shelby tube. Sample was sliding out of Shelby tube by its own weight	24.5	14.0	0.0	62.2	24.5	base	0.25		Casing not advanced, casing remains at 38'. Pushed piston to correct depth (R-120)
R-120	GSC-VC2	1	Fri, 25-10-2019 15:03	piston	1	40	42	12.19	12.80	24		10	Pulled with water pressure on	Sample sliding a little in tube	18.5	39.0	0.0	37.2	14.6	base	0.5		Casing not advanced, casing remains at 38'. Pushed piston to correct depth (R-121)
R-121	GSC-VC2	1	Mon, 28-10-2019 07:56	piston	1	42	44	12.80	13.41	24		11	Pulled with water pressure on		23	15.5	0.0	60.7	23.9	base	1.2	43'	Advanced casing to 44'. 1' of sediment inside casing
R-122	GSC-VC2	1	Mon, 28-10-2019 08:48	piston	1	44	46	13.41	14.02	24		10	Pulled with water pressure on		23	15.6	-0.5	61.1	24.1	base	1.2		Casing not advanced, pushed piston to correct depth (R-123)
R-123	GSC-VC2	1	Mon, 28-10-2019 09:15	piston	1	46	48	14.02	14.63	24		13	Pulled with water pressure on		20	27.2	0.0	49.0	19.3	base	1.2		Casing not advanced (at 44'), pushed piston to correct depth (no recovery)

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Core sample #	Site	Borehole #	Sampling date and time	Sampler	Trip # at nominal depth	Nominal depth top ft	Nominal depth bottom ft	Nominal depth top m	Nominal depth bottom m	Approx. push length in	Difficulty to push	Wait time before retrieval min	Resistance to break/pull core	Sampling observations	Approximate core recovery at drill rig in	Depth to top of core in field lab cm	Depth to bottom of core in field lab cm	Recovered core length (field lab calculated) cm	Recovered core length (field lab calculated) in	Pocket penetrometer measurement depth cm from base	Pocket penetrometer measurement ton/sq ft or kg/cm2	Measured depth to top of sediment in borehole, after casing advance ft, in	Casing advance observations (note that casing is advanced after core is retrieved)
	GSC-VC2	1	Mon, 28-10-2019 09:40	piston	1	48	50	14.63	15.24	24		11	Pulled with water pressure on	No recovery, a little clay on cone, sandy grit on piston	0	no recovery	no recovery	0.0	0.0			48'11"	Advanced casing to 50'. 1'1" of sediment inside casing, silty sand felt in cuttings. Casing clamped at approx. 49'; as clamp is above g.s.
R-124	GSC-VC2	1	Mon, 28-10-2019 10:32	piston	1	50	52	15.24	15.85	24		11	Pulled with water pressure on	8" to bottom of sample	10	31.4	21.5	23.3	9.2				Casing not advanced, pushed piston to correct depth (R-125)
R-125	GSC-VC2	1	Mon, 28-10-2019 11:13	piston	1	52	54	15.85	16.46	24		20	Pulled with water pressure on	19" to bottom of sample. Top of sample stuck to cone. Had to detach sample from cone, it fell to bottom	7.5	55.9	0.0	20.3	8.0	base	0.5	52'9"	Advanced casing to 54'. 1'3" of mud inside casing, would not wash out. Sandy cuttings to surface showing up in sump. pushed piston to correct depth (R-126a)
R-126a	GSC-VC2	1	Mon, 28-10-2019 12:34	piston	1	54	56	16.46	17.07	24		21	Pulled with water pressure on	1" of core came up, it fell out. No recovery in Shelby tube. "Chunk" may have been bagged.	0	no recovery	no recovery	0.0	0.0				Recovered core with A-rod (R-126b) before advancing casing
R-126b	GSC-VC2	1	Mon, 28-10-2019 13:03	A-rod	2	54	56	16.46	17.07			20		Recovery of sediment not retained by the piston corer	28	4.8	0.0	71.4	28.1	base	1.3	56'	Advanced casing to 56'. 1'4" of sediment inside casing. Tried to wash it out with a tremmie line and a Honda pump. On 29-10-2019, switched back to HWT casing to improve washing. P casing removed to 20'. HWT casing advanced to 56'. Washed until almost clear.
R-127	GSC-VC2	1	Tue, 29-10-2019 09:26	A-rod	1	56	58	17.07	17.68	23	weight of rods	20			28	5.1	0.0	71.1	28.0	base	0.9		Advanced casing to 58'. (Note: all casing measurements on 29-10-2019 are 2" too deep because of an incorrect measurement of the casing shoe. Corrected casing depth = 57'10").
R-128	GSC-VC2	1	Tue, 29-10-2019 10:11	A-rod	1	58	60	17.68	18.29	20		15	Low resistance to turn		24	13.9	0.0	62.3	24.5	base	1	59'11"	1" of sediment in casing (note: reported sediment depths were based on presumed casing depth. Corrected casing depth = 59'10").
R-129	GSC-VC2	1	Tue, 29-10-2019 10:53	A-rod	1	60	62	18.29	18.90	22	weight of rods	16			27	8.4	0.0	67.8	26.7	base	0.7	61'11"	casing at 62'2"; 3" of sediment in casing. Cuttings are all grey so far today (no apparent sand). (Corrected casing depth = 62'0").
R-130	GSC-VC2	1	Tue, 29-10-2019 11:35	A-rod	1	62	64	18.90	19.51	20	weight of rods	12			23	17.5	0.0	58.7	23.1	base	0.3	63'9"	5" sediment inside casing, washed some more. 3" sediment inside casing. (Corrected casing depth = 63'10" so only 1" inside casing).
R-131	GSC-VC2	1	Tue, 29-10-2019 12:25	A-rod	1	64	66	19.51	20.12	22		15			26	10.0	0.0	66.2	26.1	base	0.7	65'11"	1" sediment in casing (casing top near ground surface). (Corrected casing depth = 65'10")
R-132	GSC-VC2	1	Tue, 29-10-2019 13:04	A-rod	1	66	68	20.12	20.73	22		15	Low to moderate resistance to turn	slough at top	25	12.5	0.0	63.7	25.1	base	0.6		(Corrected casing depth = 67'10")
R-133	GSC-VC2	1	Tue, 29-10-2019 13:56	A-rod	1	68	70	20.73	21.34	22	weight of rods	17			25	13.0	0.0	63.2	24.9	base	0.6	69'10"	2" sediment inside casing. (Corrected casing depth = 69'10")
R-134	GSC-VC2	1	Tue, 29-10-2019 14:43	A-rod	1	70	72	21.34	21.95	24	16" weight of rods, 8" by hand	16			26	7.0	0.0	69.2	27.2	base	0.5	71'10"	2" sediment inside casing. (Corrected casing depth = 71'10")
R-135	GSC-VC2	1	Tue, 29-10-2019 15:31	A-rod	1	72	74	21.95	22.56	24	by hand, went in easy	14			27.5	6.0	0.0	70.2	27.6	base	0.5	73'10"	2" sediment inside casing. (Corrected casing depth = 63'10")
R-136	GSC-VC2	1	Tue, 29-10-2019 16:13	A-rod	1	74	76	22.56	23.16	24	12" weight of rods, 12" by hand	12			27.5	6.0	0.0	70.2	27.6	base	0.4	75'9"	3" of sediment inside casing. (Corrected casing depth = 75'10")
R-137	GSC-VC2	1	Wed, 30-10-2019 08:10	A-rod	1	76	78	23.16	23.77	24		15	Moderate resistance to turn		26	9.6	0.0	66.6	26.2	base	0.5	77'10"	Recognized and corrected for 2" miscalculation in casing depth (2" shallower than indicated). 8" sediment inside casing; wash some more. Sand coming up in cuttings. 2" sediment inside casing

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Core sample #	Site	Borehole #	Sampling date and time	Sampler	Trip # at nominal depth	Nominal depth top	Nominal depth bottom	Nominal depth top	Nominal depth bottom	Approx. push length	Difficulty to push	Wait time before retrieval	Resistance to break/pull core	Sampling observations	Approximate core recovery at drill rig	Depth to top of core in field lab	Depth to bottom of core in field lab	Recovered core length (field lab calculated)	Recovered core length (field lab calculated)	Pocket penetrometer measurement depth	Pocket penetrometer measurement	Measured depth to top of sediment in borehole, after casing advance	Casing advance observations (note that casing is advanced after core is retrieved)
						ft	ft	m	m	in		min			in	cm	cm	cm	in	cm from base	ton/sq ft or kg/cm2	ft, in	
R-138	GSC-VC2	1	Wed, 30-10-2019 09:16	A-rod	1	78	80	23.77	24.38	25		21	Moderate resistance to turn	Shelby tube full	28	4.9	0.0	71.3	28.1	base	0.6	79'9"	3" sediment inside casing
	GSC-VC2		Wed, 30-10-2019 10:09	A-rod	1	80	82	24.38	24.99	24	weight of rods	16	small resistance to turn	Shelby tube empty	0	no recovery	no recovery	0.0	0.0			81'	1'6" sediment inside casing; wash more. 8" inside casing; wash more. 12" inside casing; using piston sampler (R-139)
R-139	GSC-VC2	1	Wed, 30-10-2019 11:26	piston	1	82	84	24.99	25.60	24		15	Pulled with water pressure on	Bumping A-rod on way up; sample 11" from bottom	12	17.5	27.8	30.9	12.2				casing not advanced
	GSC-VC2	1	Wed, 30-10-2019 12:03	piston	1	84	86	25.60	26.21	24		15	Pulled with water pressure on	Shelby tube empty	0	no recovery	no recovery	0.0	0.0				Casing advanced from 82' to 85'5"; casing top near ground surface
R-140	GSC-VC2	1	Wed, 30-10-2019 12:56	A-rod	1	86	88	26.21	26.82	24		15	Good shear	Sample from 85'5" to 87'5"	24	14.5	0.0	61.7	24.3	base	0.6	87'9"	Back to correct casing depth (88'). 3" sediment inside casing
R-141	GSC-VC2	1	Wed, 30-10-2019 13:42	A-rod	1	88	90	26.82	27.43	20	weight of rods; did not go any deeper with hand push using pipe wrenches	16		Core sticking 1" out of bottom of Shelby tube	15	40.0	-1.5	37.7	14.8	base	0.6	89'9"	3" sediment inside casing
R-142	GSC-VC2	1	Wed, 30-10-2019 14:27	A-rod	1	90	92	27.43	28.04	24	weight of rods	16	Moderately stiff to break		22	20.5	0.0	55.7	21.9	base	0.75	92'1"	8" sediment inside casing, wash some more, 1" ahead of casing
R-143	GSC-VC2	1	Wed, 30-10-2019 15:23	A-rod	1	92	94	28.04	28.65	24		13	Harder to turn	Looks like a concretion at top of core	24	13.5	0.3	62.4	24.6	base	0.7	93'11.5"	0.5" sediment inside casing
R-144	GSC-VC2	1	Wed, 30-10-2019 16:07	A-rod	1	94	96	28.65	29.26	24		14				14.6	0.0	61.6	24.3	base	0.9	95'10"	2" sediment inside casing
R-145	GSC-VC2	1	Thu, 31-10-2019 08:06	A-rod	1	96	98	29.26	29.87	24	weight of rods (easy)	15	Moderate resistance to turn		26.5	9.3	0.0	66.9	26.3	base	0.8	97'8"	4" sediment inside casing
R-146	GSC-VC2	1	Thu, 31-10-2019 08:57	A-rod	1	98	100	29.87	30.48	24	weight of rods	15	Moderate resistance to turn		26	10.0	0.0	66.2	26.1	base	0.7	99'8"	Advanced casing to 100'1", pulled back to clamp; 4" of sediment at base
R-147	GSC-VC2	1	Thu, 31-10-2019 09:46	A-rod	1	100	102	30.48	31.09	25		15			26	11.8	0.5	63.9	25.2	base	0.6	102'	Clear (no sediment inside casing)
R-148	GSC-VC2	1	Thu, 31-10-2019 10:36	A-rod	1	102	104	31.09	31.70			21	Less resistance to turn (easier)		20	27.4	0.0	48.8	19.2	base	1.4	103'7"	6" sediment inside casing, washed; 5" sediment inside casing. A little sand in cuttings (minor)
R-149	GSC-VC2	1	Thu, 31-10-2019 11:31	A-rod	1	104	106	31.70	32.31	24		15	Moderate resistance to turn		25	12.4	0.0	63.8	25.1	base	1.2	106'	Clear (no sediment inside casing). Water level dropped rapidly when casing disconnected.
R-150	GSC-VC2	1	Thu, 31-10-2019 12:17	A-rod	1	106	108	32.31	32.92	24		15	Easy to moderate resistance to turn		16.5	38.8	0.5	36.9	14.5	base	1.4	107'5"	7" sediment inside casing, washed again. Still 7" sediment inside casing
R-151	GSC-VC2	1	Thu, 31-10-2019 13:11	A-rod	1	108	110	32.92	33.53	24		15	Harder to turn, stiffer		27.25	7.7	0.0	68.5	27.0	base	0.7	110'1"	1" below bottom of casing
R-152	GSC-VC2	1	Thu, 31-10-2019 14:00	A-rod	1	110	112	33.53	34.14	24		16	Moderate resistance to turn		16	36.6	0.7	38.9	15.3	base	0.8	111'5"	7" sediment inside casing, not likely to clear as bottom is firm, will push
R-153	GSC-VC2	1	Thu, 31-10-2019 14:51	A-rod	1	112	114	34.14	34.75	24		15	Stiff, moderate resistance to turn		27	8.5	0.3	67.4	26.5	base	1	113'11"	1" sediment in casing
	GSC-VC2	1	Thu, 31-10-2019 15:38	A-rod	1	114	116	34.75	35.36	24	last 5" with drill rig, stiffer to push. Could not push by hand with pipe wrenches	15	No suction when pulled	Driller noted green clay on outside of Shelby tube. Shelby tube empty	0	no recovery	no recovery	0.0	0.0			114'6"	1'6" sediment inside casing. Tried washing sediment, still 1'6" sediment inside casing. Split spoon sample of sediment inside casing (R-154)
R-154	GSC-VC2	1	Fri, 01-11-2019 08:11	SS	2	114.5	116	34.90	35.36	18		0		1-3 blow counts, clay, no sand, a short "blocky" section. Sampled in Ziplock bags				61.0	24.0	9, 12, 31, 49	1.1, 0.7, 0.4, 0.5		wash again
	GSC-VC2	1	Fri, 01-11-2019 08:50	A-rod	1	116	118	35.36	35.97			15	Normal resistance to turn	Shelby tube empty	0	no recovery	no recovery	0.0	0.0				did not advance casing, took SS (R-155)

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						ft	ft	m	m	in		min			in	cm	cm	cm	in	cm from base	ton/sq ft or kg/cm2	ft, in	
R-155	GSC-VC2	1	Fri, 01-11-2019 09:00	SS	2	116	118	35.36	35.97					Concretion, one pebble outside of clay, sampled in Ziplock bags				61.0	24.0			117'8"	4" sediment inside casing
R-156	GSC-VC2	1	Fri, 01-11-2019 10:11	A-rod	1	118	120	35.97	36.58	24		31	Hard to turn		23	17.0	0.0	59.2	23.3	base	1.3		Water flowing over top of casing (backflow) 5' above ground surface
R-157	GSC-VC2	1	Fri, 01-11-2019 11:16	A-rod	1	120	122	36.58	37.19	24		30	Stiff, suction when pulled			21.0	0.0	55.2	21.7	base	0.8	121'9"	3" sediment inside casing on 4-11-2019
R-158	GSC-VC2	1	Mon, 04-11-2019 08:13	A-rod	1	122	124	37.19	37.80	24		26			25.5	12.2	0.0	64.0	25.2	base	1.1	123'9"	"Clunky" when casing went down. A lot of return water. Continued after pump shut off. Flow stopped in 2 minutes (Note: unclear if this was return water or backflow). 3" sediment inside casing
	GSC-VC2	1	Mon, 04-11-2019 09:17	A-rod	1	124	126	37.80	38.40	24	Pushed 12" by "accident", pushed to 24" at 9:04	13	Low resistance to turn, no suction on pull	Shelby tube empty	0	no recovery	no recovery	0.0	0.0			125'11"	1" sediment inside casing, a lot of water return (note: unclear if this was return water or backflow).
R-159	GSC-VC2	1	Mon, 04-11-2019 10:20	A-rod	1	126	128	38.40	39.01	24	weight of rods, very, very soft	31	Stiffer to break, suction sound on pull		18.5	29.5	0.7	46.0	18.1	base	1	127'7"	8" sediment inside casing, will wash more. 5" sediment inside casing
R-160	GSC-VC2	1	Mon, 04-11-2019 11:29	A-rod	1	128	130	39.01	39.62	24	weight of rods	30	Hard to break		26	9.5	0.4	66.3	26.1	base	1.25	130'	no sediment inside casing
R-161	GSC-VC2	1	Mon, 04-11-2019 12:38	A-rod	1	130	132	39.62	40.23	24	weight of rods	32	Hard to break		27.5	5.5	1.0	69.7	27.4	base	1.8	131'9"	3" sediment inside casing
R-162	GSC-VC2	1	Mon, 04-11-2019 13:32	A-rod	1	132	134	40.23	40.84	24		18	Easier to turn	Gel-like substance in A-rods, oozing out	24	14.5	0.0	61.7	24.3	base	0.8	133'4"	8" sediment inside casing (hard, based on tape measure), wash out again. Sand in cuttings. Still 8" sediment in casing. Push anyway
R-163	GSC-VC2	1	Mon, 04-11-2019 14:38	A-rod	1	134	136	40.84	41.45	16	weight of rods, appears to be full	20	Very soft, no suction when pulled	1" of core sticking out bottom of Shelby tube	19	31.5	-2.2	46.9	18.5	base	1.5	135'	12" sediment inside casing, try to wash out. Still 12" sediment inside casing. Try to push. Small pebbles in cuttings
R-164	GSC-VC2	1	Mon, 04-11-2019 15:52	A-rod	1	136	138	41.45	42.06	24	20" weight of rods and hand push with pipe wrenches, 4" with rig. 24" push to a depth of 137'	30	Felt "gritty" when turned. No suction. Easy to break		19	27.5	-0.4	49.1	19.3	base	0.5	138'	Casing advanced on 5-11-2019. Took approximately 50 minutes to get return flow from borehole (i.e. flow to surface, outside casing); borehole took in a lot of water. no sediment in casing to 138'
R-165	GSC-VC2	1	Tue, 05-11-2019 08:57	A-rod	1	138	140	42.06	42.67	24	12" weight of rods, 12" with rig	29	Moderate to hard resistance to turn	Lower part of Shelby tube flattened by something hard, scratches at 13" from bottom	28	5.4	0.0	70.8	27.9	base	0.9	140'	Easy to drill (soft). No sediment inside casing
R-166	GSC-VC2	1	Tue, 05-11-2019 10:09	A-rod	1	140	142	42.67	43.28	24	weight of rods, very soft	32	Easy to turn (soft like butter)		16	37.5	0.0	38.7	15.2	base	0.7	141'7"	Soft, but did not wash out. 5" of sediment inside casing
R-167	GSC-VC2	1	Tue, 05-11-2019 11:25	A-rod	1	142	144	43.28	43.89	24	weight of rods	31			21	18.0	0.0	58.2	22.9	base	0.5	144'	Casing clear (no sediment inside casing)
R-168	GSC-VC2	1	Tue, 05-11-2019 12:36	A-rod	1	144	146	43.89	44.50	23	weight of rods	32	A little harder to turn		24	14.5	0.0	61.7	24.3	base	1.7	145'8"	4" of sediment inside casing
R-169	GSC-VC2	1	Tue, 05-11-2019 13:38	A-rod	1	146	148	44.50	45.11	24	18" weight of rods, 6" with rig	21	Moderate to hard resistance to turn		27	4.9	0.0	71.3	28.1	base	1.25	147'6"	6" sediment inside casing
R-170	GSC-VC2	1	Tue, 05-11-2019 14:39	A-rod	1	148	150	45.11	45.72	22		20			20	30.0	-1.2	47.4	18.7	base	1.7	149'10"	2" of sediment inside casing
R-171	GSC-VC2	1	Tue, 05-11-2019 15:39	A-rod	1	150	152	45.72	46.33	24	weight of rods	20			17	34.0	0.0	42.2	16.6	base	1.5	151'8"	casing advanced on 5-11-2019. 4" sediment inside casing, measured on 6-11-2019.
R-172	GSC-VC2	1	Wed, 06-11-2019 07:39	A-rod	1	152	154	46.33	46.94	24	18" weight of rods, 6" very very hard, pushed with rig	15			26	13.6	0.0	62.6	24.6	base	0.8	153'8.5"	3.5" sediment inside casing
R-173	GSC-VC2	1	Wed, 06-11-2019 08:44	A-rod	1	154	156	46.94	47.55	24	19" weight of rods, 5" with rig	20			28	5.0	0.0	71.2	28.0	base	1.1	155'11"	1" sediment inside casing

GSC Open File 8923, Appendix B: Field observations, VC2

Core sample #	Site	Borehole #	Sampling date and time	Sampler	Trip # at nominal depth	Nominal depth top ft	Nominal depth bottom ft	Nominal depth top m	Nominal depth bottom m	Approx. push length in	Difficulty to push	Wait time before retrieval min	Resistance to break/pull core	Sampling observations	Approximate core recovery at drill rig in	Depth to top of core in field lab cm	Depth to bottom of core in field lab cm	Recovered core length (field lab calculated) cm	Recovered core length (field lab calculated) in	Pocket penetrometer measurement depth cm from base	Pocket penetrometer measurement ton/sq ft or kg/cm2	Measured depth to top of sediment in borehole, after casing advance ft, in	Casing advance observations (note that casing is advanced after core is retrieved)
R-174	GSC-VC2	1	Wed, 06-11-2019 09:50	A-rod	1	156	158	47.55	48.16	24	weight of rods	21	Softer, easy to turn		7.5	58.0	0.0	18.2	7.2	base	1.4	157'3"	9" inside casing, washed again, 9" inside casing again, sand coming up in cuttings
	GSC-VC2	1	Wed, 06-11-2019 11:13	A-rod	1	158	160	48.16	48.77	18	weight of rods, would not go deeper by hand (pipe wrenches)	32	Easy to turn, no suction on pull	No recovery	0	no recovery	no recovery	0.0	0.0			159'10"	2" sediment inside casing, very soft (sand?)
R-175	GSC-VC2	1	Wed, 06-11-2019 12:19	A-rod	1	160	162	48.77	49.38	23	weight of rods	30			20	25.5	0.0	50.7	20.0	base	0.65	161'7"	5" sediment inside casing
R-176	GSC-VC2	1	Wed, 06-11-2019 13:30	A-rod	1	162	164	49.38	49.99	24	20" weight of rods, 4" with rig, water overflowing casing	30	Moderate to hard resistance to turn		28	5.0	0.0	71.2	28.0	base	0.6	163'6"	12" sediment inside casing, water flow from casing (backflow) 5'6" above ground surface, flow decreasing over time. Sediment inside casing decreased to 6" from flow, removed 5' of casing and flow did not resume (i.e. water level in casing was below 6")
	GSC-VC2	1	Wed, 06-11-2019 14:50	A-rod	1	164	166	49.99	50.60	24	20" weight of rods, 4" with rig	27		No recovery	0	no recovery	no recovery	0.0	0.0			165'8"	4" of sediment inside casing, some backflow up casing but less than for 162-164'
R-177	GSC-VC2	1	Wed, 06-11-2019 16:05	A-rod	1	166	168	50.60	51.21	15	Most of the weight of rods, 3" push with rig (stiff), hard to push	30	Hard to break	Over full	28	5.0	0.0	71.2	28.0	base	1.3	167'11"	Casing advanced on 7-11-2019. 7" sediment inside casing, washed again, 1" sediment inside casing, a lot of flow from casing (backflow) but it stopped
R-178	GSC-VC2	1	Thu, 07-11-2019 09:47	A-rod	1	168	170	51.21	51.82	24	4" weight of rods, 20" with rig	20	Hard to break using snipe (pipe extension on handle of large pipe wrench), suction on pull		24	14.1	0.0	62.1	24.4	base	1.6	169'5"	Hard to measure, a lot of transient backflow (all the water flows back into the borehole, no overflow to pit), washed again, 7" sediment in casing
R-179	GSC-VC2	1	Thu, 07-11-2019 11:25	A-rod	1	170	172	51.82	52.43	22	14" weight of rods, approx. 8" with rig, got stiff for the last 3"	20	Hard to break using snipe, suction on pull		28	4.6	0.0	71.6	28.2	base	0.4	171'6"	6" sediment inside casing, minimal backflow. As rods are lowered into casing, there is backflow but all the water is going into the borehole
R-180	GSC-VC2	1	Thu, 07-11-2019 12:33	A-rod	1	172	174	52.43	53.04	21	13" weight of rods, approx. 8" with rig (got stiff)	15	Hard to break			6.2	0.0	70.0	27.6	base	0.5	173'9"	3" sediment inside casing, backflow started when rods are being lowered, water was clear at first and then dirty.
R-181	GSC-VC2	1	Thu, 07-11-2019 13:37	A-rod	1	174	176	53.04	53.64	24	5" weight of rods, 19" with rig, did not get stiff	16	Medium to hard to turn	Shelby tube gritty on outside	27	7.5	0.0	68.7	27.0	base	0.9	175'9.5"	A lot of backflow, but no overflow to sump pit (i.e., all backflow into borehole), water clear at first, then dirty, then flow stopped as Shelby was lowered) 2.5" of sediment inside casing
R-182	GSC-VC2	1	Thu, 07-11-2019 14:35	A-rod	1	176	178	53.64	54.25	23	11" weight of rods, 12" with rig	10	Hard to turn		26	11.6	0.0	64.6	25.4	base	1.2	177'10"	15" sediment inside casing, wash out some more, 2" sediment inside casing, a small amount of backflow from casing but no overflow to sump pit
R-183	GSC-VC2	1	Thu, 07-11-2019 15:43	A-rod	1	178	180	54.25	54.86	20	12" weight of rods, 8" push with rig, felt like it was full	10	Hard to turn, suction on pull		27.5	6.0	0.0	70.2	27.6	base	1	179'2"	Casing advanced on 8-11-2019. 1' sediment inside casing, washed again, 10" sediment in casing, backflow, clear at first, then dirty, flow decrease
R-184	GSC-VC2	1	Fri, 08-11-2019 08:55	A-rod	1	180	182	54.86	55.47	21	7" weight of rods, 14" with rig, felt full	10	Difficult to turn	Over full	28	4.8	0.0	71.4	28.1	base	1	182'1"	11" sediment inside casing, wash again, 1" below bottom of casing, some backflow, clean and then dirty
R-185	GSC-VC2	1	Fri, 08-11-2019 10:10	A-rod	1	182	184	55.47	56.08	24	14" weight of rods, 10" with rig	11	Hard to break with snipe		24	13.0	0.0	63.2	24.9	base	1	182'11"	13" sediment inside casing, wash again, 19" sediment inside casing, wash again, 13" sediment inside casing (is it catching on the casing adaptor?) some backflow

GSC Open File 8923, Appendix B: Field observations, VC2

Core sample #	Site	Borehole #	Sampling date and time	Sampler	Trip # at nominal depth	Nominal depth top ft	Nominal depth bottom ft	Nominal depth top m	Nominal depth bottom m	Approx. push length in	Difficulty to push	Wait time before retrieval min	Resistance to break/pull core	Sampling observations	Approximate core recovery at drill rig in	Depth to top of core in field lab cm	Depth to bottom of core in field lab cm	Recovered core length (field lab calculated) cm	Recovered core length (field lab calculated) in	Pocket penetrometer measurement depth cm from base	Pocket penetrometer measurement ton/sq ft or kg/cm2	Measured depth to top of sediment in borehole, after casing advance ft, in	Casing advance observations (note that casing is advanced after core is retrieved)
R-186	GSC-VC2	1	Fri, 08-11-2019 11:41	A-rod	1	184	186	56.08	56.69	24	16" weight of rods, 8" with rig	10	Hard to turn		27	5.0	0.0	71.2	28.0	base	1.25	186'2"	2" below the bottom of the casing, some backflow
	GSC-VC2	1	Fri, 08-11-2019 12:47	A-rod	1	186	188	56.69	57.30	24	11" weight of rods, 13" with rig	15	Hard to turn, no suction	No recovery	0	no recovery	no recovery	0.0	0.0			186'4"	1'8" inside casing on Friday (8-11-2019), washed again, 1'8" sediment inside casing, took split spoon inside casing to remove sediment (SS not sampled).
	GSC-VC2	1	Fri, 08-11-2019 14:00	SS	2	186	188	56.69	57.30	24				not sampled, split spoon to remove sediment that could not be washed out								188'4"	On Monday (11-11-2019), casing already at 188', no return flow yet, sediment 4" below bottom of casing
R-187	GSC-VC2	1	Mon, 11-11-2019 10:11	A-rod	1	188	190	57.30	57.91	24	12" weight of rods, 4" with pipe wrenches, 8" with rig	15	Hard to break with snipe and 2 people		23	19.0	0.0	57.2	22.5	base	2.2		As the A-rod (sampler) was lowered, there was backflow from the casing. No return flow during advance of the casing.
R-188	GSC-VC2	1	Mon, 11-11-2019 11:23	A-rod	1	190	192	57.91	58.52	24	16" weight of rods, 8" with rig	11	Hard to break with snipe and 2 people		25	11.5	0.0	64.7	25.5	base	2.1		No return flow @ 11:54, 1' sediment inside casing, wash again, return flow with sediment. A lot of backflow initially when disconnected, decrease to zero in a few minutes
R-189	GSC-VC2	1	Mon, 11-11-2019 12:36	A-rod	1	192	194	58.52	59.13	24	12" weight of rods, 12" with rig	11	Hard to break with snipe and 2 people		26	9.5	0.0	66.7	26.3	base	2.2	193'7"	5" sediment inside casing, no backflow, cuttings are sandy and brown (not grey), Backflow after the Shelby tube was pushed, flow decreased over time and stopped before Shelby tube was pulled, all backflow went down the borehole outside the casing (before advancing the casing). During casing advance, cuttings coming up grey brown again (sandy silt?), 8" sediment inside casing, no backflow
R-190	GSC-VC2	1	Mon, 11-11-2019 13:40	A-rod	1	194	196	59.13	59.74	24	Approx. 8-10" weight of rods, approx. 14-16" with rig	13	Hard to turn	Shelby tube full but not overfull (no sediment nipple from adaptor)	28	4.9	0.0	71.3	28.1	base	1.9	195'4"	P casing was sinking and was brought back above surface. With threads, total depth is 2" short. Cuttings and drilling fluid a grey brown, 6" sediment, no backflow
	GSC-VC2	1	Mon, 11-11-2019 14:41	A-rod	1	196	198	59.74	60.35	17	weight of rods	12	Moderate to easy to break, no suction	No recovery	0	no recovery	no recovery	0.0	0.0	base		197'6"	Advanced casing on 12-11-2019. Water truck late, set up in snow, no return flow, 1" below bottom of casing
R-191	GSC-VC2	1	Mon, 11-11-2019 15:45	A-rod	1	198	200	60.35	60.96	22	mostly with rig. Shelby tube likely full	10	hard to break, suction	Overfilled, sediment nipple where sediment rises into the adaptor	28	4.8	0.0	71.4	28.1	base	1.7	200'1"	Sediment 0.5" below bottom of casing, no return flow, no backflow
R-192	GSC-VC2	1	Tue, 12-11-2019 09:36	A-rod	1	200	202	60.96	61.57	24	6" weight of rods, approx. 18" with rig	11	could not break with two on snipe, had to pull without breaking the core	Overfilled, sediment nipple where sediment rises into the adaptor	28	5.9	0.0	70.3	27.7	base	2.2	202'0.5"	No return flow, some backflow.
R-193	GSC-VC2	1	Tue, 12-11-2019 10:47	A-rod	1	202	204	61.57	62.18	24	16" weight of rods, 8" with rig	30			20	28.0	0.0	48.2	19.0	base	1.7		

GSC Open File 8923, Appendix B: Field observations, VC2

Core sample #	Site	Borehole #	Sampling date and time	Sampler	Trip # at nominal depth	Nominal depth top	Nominal depth bottom	Nominal depth top	Nominal depth bottom	Approx. push length	Difficulty to push	Wait time before retrieval	Resistance to break/pull core	Sampling observations	Approximate core recovery at drill rig	Depth to top of core in field lab	Depth to bottom of core in field lab	Recovered core length (field lab calculated)	Recovered core length (field lab calculated)	Pocket penetrometer measurement depth	Pocket penetrometer measurement	Measured depth to top of sediment in borehole, after casing advance	Casing advance observations (note that casing is advanced after core is retrieved)
						ft	ft	m	m	in		min			in	cm	cm	cm	in	cm from base	ton/sq ft or kg/cm2	ft, in	
R-194	GSC-VC2	1	Tue, 12-11-2019 11:48	A-rod	1	204	206	62.18	62.79	22	18" weight of rods, 2" by hand (pipe wrenches)	6	Hard to turn with 2 people on snipe	16" from top to sediment, 1" sediment out bottom	15	42.0	0.0	34.2	13.5	base	2.4	206'	More backflow (significant) as the Shelby tube is lowered, backflow stopped (prior to sampling). When casing advanced, return flow (i.e. circulation) established, looks thin. 12:31 significant backflow, decreased and stopped, another "puck" of sediment coming up the casing with the backflow, rising up to 130' depth and then sinking slowly, tried to wash it out. 12:56. Significant backflow and then stopped rapidly, still a plug of sediment rising to 126' depth, could not clear it. (Intended to) skip to next interval. Advanced casing from 206' to 208' (before sampling), did not rotate when washing, 2' of sediment inside casing, decided to sample the sediment inside the casing (R-195)
R-195	GSC-VC2	1	Tue, 12-11-2019 13:52	A-rod	1	206	208	62.79	63.40	20	with rig, hit something very hard at 4" sediment depth	10	Easy to moderate to turn, fell 4-5" when broken	Sample was inside casing when sampled (included the "plug" that could not be washed). Sample may be disturbed, 12" from top, core extends 2" out bottom	20	28.5	0.0	47.7	18.8	base	1.1	207'7"	Did not advance casing, just washing out, 5" sediment inside casing
R-196	GSC-VC2	1	Tue, 12-11-2019 14:43	A-rod	1	208	210	63.40	64.01	22	Approx. 18" weight of rods, approx. 4" by hand (pipe wrenches). Shelby likely full.	8	Hard to turn with 2 people using snipe		17	33.0	0.0	43.2	17.0	base	1.6	210'6"	Casing advanced on 13-11-2019. Sediment settled in casing overnight, washed out, 6" ahead (below) casing
R-197	GSC-VC2	1	Wed, 13-11-2019 09:23	A-rod	1	210	212	64.01	64.62	24	20" weight of rods, 4" with rig	7	Medium to hard to break with 2 people on snipe	sandy slough on top of core sample	20	22.5	0.0	53.7	21.1	base	2.4	211'9"	3" sediment in casing, no backflow.
R-198	GSC-VC2	1	Wed, 13-11-2019 10:34	A-rod	1	212	214	64.62	65.23	19	17" weight of rods, 2" with rig, Shelby tube felt full	13	Medium to hard to break with 2 people on snipe (low effort)	a litte sandy slough	24	20.4	0.0	55.8	22.0	base	1.6	213'5"	Backflow as A-rod (with sampler) is lowered, flow stopped prior to sampling. Sample taken and casing advanced. Return flow when casing was advanced. Significant backflow (when disconnected), a "puck" of mud rose to 140' while the casing was flowing, then it sank to bottom. 7" sediment in casing.
R-199	GSC-VC2	1	Wed, 13-11-2019 11:56	A-rod	1	214	216	65.23	65.84	24	19" weight of rods, 5" with rig	9	Medium to hard to break with 2 people on snipe (low effort)		19	29.0	-0.2	47.4	18.7	base	2.2		A little return flow, during casing advance, "foam" from sand, sand in cuttings. After advancing the casing to 216', the backflow was significant but lasted longer (5-10 minutes) than usual. Flow became very turbid. The mud level outside the casing was not visible (too deep). The drilling mud inside the casing settled to approx. 3' above ground surface at the top of the casing. Decided to end drilling.