DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH07
	SHEET 1 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 830465.42 N 841363.99	DATE : 13/06/2011 to 18/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +6.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type	Depth	Reduced Level	Depth (m)	Legend	Grade	Description
13/06/2011	SW										+6.78	0.00			Brown (7.5YR 5/4), dappled greyish brown, silty fine to coarse SAND with some angular to subangular fine to medium gravel sized highly decomposed and moderately decomposed rock fragments. (FILL)
								En	A	0.50					
								En	B	1.00					
	SW 1.50							En	C	1.50	+5.28	1.50			
	PW								1						Firm, greyish brown (2.5Y 5/2), dappled light brown and brown, sandy SILT with some angular to subangular fine to medium gravel sized moderately decomposed rock fragments. (FILL)
			80	90						2.50					
									2	2.60					
		0.34m at 18:30						3.4, 3,3,4,3 N=13	3	2.70					
13/06/2011										3.00					
14/06/2011		3.00m at 08:00						58 blows	4 5	3.05	+3.73	3.05			
				56					En						Firm, light brown (7.5YR 6/4), dappled grey, slightly sandy slightly clayey SILT. (ALLUVIUM)
									6	3.50					
			80	98					7	3.55					
										4.55					
									8	4.65	+2.13	4.65			
								3,3, 4,6,6,7 N=23	9	4.75					Medium dense, greyish brown (2.5Y 5/2), silty / clayey fine to coarse SAND with some subangular fine gravel sized moderately decomposed rock fragments and quartz fragments. (ALLUVIUM)
								1.50×10^{-5} m/sec	10	5.05 5.10					
								87 blows			+1.23	5.55			
				100					11	5.55					Dense, light grey (N 6), fine to coarse SAND with some subangular fine gravel sized quartz fragments. (ALLUVIUM)
										6.00					
								10,10, 11,11,12,12 N=46	12	6.05					
									13	6.15					
								92 blows	14	6.45	+0.28	6.50			
								En	15	6.50					Grey (N 5), slightly clayey / silty fine to coarse SAND with some subangular fine gravel sized quartz fragments. (ALLUVIUM)
				96											
									16	6.85 7.00					
											-0.77	7.55			
								79 blows	17	7.55					Very dense, light grey (N 6), sandy subangular fine to coarse GRAVEL sized quartz fragments. (ALLUVIUM)
				91											
									18	8.00 8.05					
		3.30m at 13:00						7,10, 13,17,21,23 N=74	19	8.15					
14/06/2011									20	8.45 8.50					
15/06/2011		4.75m at 08:00													
											-2.77	9.55			
								63 blows	21	9.55					Very dense, light grey (N 6), fine to coarse SAND with some angular to subangular fine to medium gravel sized quartz fragments. (ALLUVIUM)
				91						10.00					

INSPECTION PIT

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezomotor tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/06/2011
CHECKED	E. Leung
DATE	27/06/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A constant head permeability test was carried out from 5.00m to 6.50m depth.
3. A falling head permeability test was carried out from 15.00m to 16.50m depth.
4. An acoustic televiewer survey was carried out from 27.50m to 33.51m depth.
5. Piezometers were installed at 11.40m and 25.80m depth.
6. A sample for equipment blank and field blank was collected between 3.05m and 3.50m.
7. A duplicate environmental sample was collected between 3.05m and 3.50m.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH07
	SHEET 2 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 830465.42 N 841363.99	DATE : 13/06/2011 to 18/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 6.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW								-3.22	10.00				See sheet 1 of 4
				96				8,11, 11,13,15,16 N=55 120 blS	22 10.05 23 10.15 24 10.45 25 10.50 En 26 10.95 11.00					
									11.40	-4.62	11.40			Light grey (N 6), slightly sandy angular to subangular COBBLE sized moderately decomposed Tuff and Quartz with some angular to subangular medium to coarse gravel sized moderately decomposed rock fragments. (ALLUVIUM)
			80	40					T2101					
			80	44					27 11.90	-5.62	12.40		V	Extremely weak, light brown, dappled pink, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with some angular fine quartz gravel)
			80	95					28 12.90 29 13.00					
								6,16, 18,20,31,31/55mm (100/280mm)	30 14.00 14.10 31 14.18 32 14.48 14.53					
			80	98				8.17×10^{-7} m/sec	33 15.00	-8.22	15.00		V	Extremely weak, light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT)
								4,4, 5,5,6,7 N=23 77 blS En	34 16.00 16.10 35 16.20 36 16.50 37 16.55					
15/06/2011		0.89m at 17:30												
16/06/2011		4.75m at 08:00		96					38 17.00	-10.27	17.05			
			80	98					39 17.05 40 18.05 18.15				V	Extremely weak, light brown, dappled greyish brown, completely decomposed coarse ash crystal TUFF with some iron and manganese stained relict joints, dipping 60° to 70° and 70° to 80°. (Slightly sandy SILT with some angular to subangular fine quartz gravel)
								3,4, 4,5,7,8 N=24	41 18.25 42 18.55 18.60					
			80	94					43 19.05					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/06/2011
CHECKED	E. Leung
DATE	27/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH07
		SHEET 3 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 830465.42 N 841363.99	DATE : 13/06/2011 to 18/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 6.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-13.22	20.00			
	PW							5,5, 6,7,7,9 N=29 113 blS	44 20.05–20.15 45 20.25 46 20.55–20.60 47 En 48 21.05–21.10 49				V	See sheet 2 of 4
21		0.73m at 18:30		96										
	16/06/2011													
	17/06/2011	4.90m at 08:00	80	95										
22									50 22.10–22.20					
								4,6, 8,13,17,21 N=59	51 22.30 52 22.60–22.65					
23														
24										-17.42	24.20		V	Extremely weak, light brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with occasional angular to subangular fine quartz gravel)
	PW 24.65							5,6, 7,14,18,26 N=65 231 blS	53 24.30 54 24.60 55 24.65 En					
	HW			93										
25									56 25.10–25.15	-18.37	25.15		IV	Very weak to weak, light brown, dappled brown, highly decomposed coarse ash crystal TUFF. (Recovered as slightly silty sandy angular fine to coarse GRAVEL with some angular cobble)
			85	90					57					
26														
									58 26.15–26.25					
								50/40mm 100/60mm (100/60mm)	59 26.35	-19.57	26.35		IV	Weak to moderately weak, light brown, dappled brown, highly decomposed coarse ash crystal TUFF. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 20° to 30°.
	HW 26.90	0.66m at 18:30	70	97	25	0	>20		T2 101					
27	17/06/2011						NI							
	18/06/2011	4.75m at 08:00							26.95					
			70	100	83	16	15.2		T2 101	-20.42	27.20		III	Moderately strong, light brown, dappled greyish brown and brown, moderately decomposed slightly metamorphosed coarse ash crystal TUFF. Joints are very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 30° to 40°. From 28.05m to 28.20m : With very closely spaced microfractures, dipping 50° to 60°.
28									27.90					
			70	100	38	0	>20		T2 101	-21.42	28.20		II	Strong, grey, dappled dark grey, spotted light grey, slightly decomposed slightly metamorphosed coarse ash crystal TUFF. Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, clean, occasional kaolin and calcite coated, dipping 10° to 20°, 20° to 30°, 50° to 60° and occasional 60° to 70°.
							10.7		28.70					
29			70	100	88	56	4.0		T2 101					
									29.27					
			70	100	77	41	11.6		T2 101					
30							>20							

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/06/2011
CHECKED	E. Leung
DATE	27/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH07
	SHEET 4 OF 4

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 830465.42 N 841363.99	DATE : 13/06/2011 to 18/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 6.78 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										-23.22	30.00		II	See sheet 3 of 4
			70	100	77	41			T2 I 01 30.73					From 30.50m to 31.18m : With calcite and kaolin infilled joint 2mm thick, dipping 70° to 80°.
31			70	100	91	76	5.8		T2 I 01 31.28					
			70	100	96	56			T2 I 01 32.27					From 31.95m to 32.50m : Subvertical joint.
32							11.2							
							5.4							
33			70	100	95	75	20.0		T2 I 01					
18/06/2011		0.77m at 18:00					5.8		33.74	-26.96	33.74			
														End of Investigation Hole at 33.74m.
34														
35														
36														
37														
38														
39														
40														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	23/06/2011
CHECKED	E. Leung
DATE	27/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH08
	SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 831858.71 N 840914.74	DATE : 16/06/2011 to 04/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 4.87 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
16/06/2011	SW									+4.87	0.00			
16/06/2011 17/06/2011									En A 0.50	+4.37	0.50			Firm, brown (7.5YR 5/4), sandy SILT with some angular to subangular fine to medium gravel sized moderately decomposed rock fragments. (FILL)
									En B 1.00					Firm, greyish brown (2.5Y 5/2), slightly sandy SILT. (ALLUVIUM)
									En C 1.50	+3.37	1.50			
			85	95					1 2.50					Soft to firm, light brown (7.5YR 6/4), silty CLAY with occasional organic matters. (ALLUVIUM)
		0.25m at 18:00							2 2.60					
17/06/2011	SW 2.60								3 2.70					
18/06/2011	PW	0.45m at 08:00						1,1, 2,1,2,2 N=7	4 3.00					
				56				29 blo	En 5 3.05					
									6 3.50	+1.32	3.55			
			85	95					7 3.55					Firm, dark grey (N 3), dappled black, slightly clayey SILT with some decayed wood pieces. (ALLUVIUM)
									8 4.55 4.65	+0.22	4.65			
								2,3, 3,6,7,8 N=24	9 4.75					Medium dense, light grey (N 6), dappled grey, silty fine to coarse SAND with some subangular fine gravel sized quartz fragments. (ALLUVIUM)
									10 5.05 5.10					
									11 5.55	-0.68	5.55			Firm, brown (7.5YR 5/4), dappled dark brown, sandy SILT with occasional angular to subangular fine gravel sized moderately decomposed rock fragments and occasional subrounded cobble sized quartz. (ALLUVIUM)
			85	70					12 6.55 6.65	-1.78	6.65			
								8.80×10^{-7} m/sec	13				V	Extremely weak, greyish brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with occasional angular to subangular fine gravel)
			85	85					14 7.65 7.75					
		0.30m at 13:00							15 7.85					
18/06/2011								7,13, 18,27,24,31 N=100	16 8.15 8.20					
20/06/2011		2.85m at 08:00								-3.78	8.65			
									17 8.65				V	Extremely weak to very weak, greyish brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine to coarse gravel and occasional angular cobble)
			85	95										
									18 9.65 9.75					
								9,11, 18,52,30/40mm (100/190mm)	19					

↕ Disturbed sample
■ Piston sample
▨ U76 undisturbed sample
■ U100 undisturbed sample
▨ Mazier sample
□ SPT liner sample
▲ Water sample
En Environmental Sample
↓ Standard penetration test
V In-situ vane shear test
I Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	11/07/2011
CHECKED	E. Leung
DATE	12/07/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 6.20m to 7.70m depth.
3. An acoustic televiewer survey was carried out from 17.12m to 22.71m depth.
4. Piezometers were installed at 4.50m and 10.60m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH08
	SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 831858.71 N 840914.74	DATE : 16/06/2011 to 04/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 4.87 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW								20 10.04 10.09	-5.13	10.00		V	See sheet 1 of 3
	PW 10.60								10.60	-5.73	10.60			
	HW									-5.83	10.70		IV	Weak to moderately weak, light brown, dappled brown, highly decomposed coarse ash crystal TUFF. (Sandy angular COBBLE with some angular fine to coarse gravel)
T1		1.20m at 18:00	75	90	0	0			T2 I O I		10.80			From 10.70m to 10.80m : Quartz vein.
20/06/2011 22/06/2011		2.75m at 08:00					NA		11.10	-5.93				
			75	100	31	19			T2 I O I	-6.78	11.65		III	Moderately strong, locally moderately weak, grey, dappled greyish brown and light brown, moderately decomposed lapilli coarse ash crystal TUFF.
T2							10.8		11.90					Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 30° to 40°, 40° to 50°, 50° to 60° and occasional 10° to 20°.
			75	100	59	26	>20		T2 I O I					From 11.80m to 12.30m : Vertical joint.
T3							9.5		12.85					
			75	100	74	29			T2 I O I					
							15.7							
T4							>20		14.06					
			75	86	10	0			T2 I O I					
			75	100	20	0	13.3		14.55					
T5									T2 I O I					
			75	86	60	24	8.0		14.90					
									T2 I O I					
									21 15.40	-10.53	15.40		IV	Weak to moderately weak, greyish brown, highly decomposed coarse ash crystal TUFF. (Sandy angular COBBLE with some angular fine to coarse gravel)
T6			75	63										
		1.35m at 18:00							22 16.20 16.30	-11.43	16.30			
22/06/2011 30/06/2011		2.55m at 08:00											III	Moderately strong, light brown, dappled greyish brown, moderately decomposed lapilli coarse ash crystal TUFF.
			70	97	61	40	>20		T2 I O I					Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 30° to 40° and 50° to 60°.
T7	HW 17.12						5.7		17.00					From 16.50m to 17.00m : Fine ash crystal TUFF.
			70	100	53	25	>20		T2 I O I					
							14.1		17.91					
T8										-13.23	18.10		II	Strong to very strong, grey, spotted light grey, slightly decomposed slightly metamorphosed lapilli coarse ash crystal TUFF.
			70	100	93	75	10.0		T2 I O I					Joints are widely spaced, locally closely to medium spaced, rough planar, tight to extremely narrow, clean and locally iron stained, dipping 10° to 20°, 20° to 30° and occasional 70°.
T9							3.1		19.36					
			70	100	100	96	2.0		T2 I O I					
20														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	11/07/2011
CHECKED	E. Leung
DATE	12/07/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. FLN-BH08

CONTRACT NO. : GE/2009/15

SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 831858.71 N 840914.74	DATE : 16/06/2011 to 04/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 4.87 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR%	SCR%	RQD%	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
			70	100	100	96	2.0		T2 01				II	See sheet 2 of 3
							10.0		20.65					
21			70	100	100	100			T2 01					
22		1.25m at 18:00 30/06/2011					0.0		22.11					
		2.74m at 13:00 04/07/2011	70	100	100	100			T2 01					
23		1.35m at 18:00 04/07/2011							23.20	-18.33	23.20			End of Investigation Hole at 23.20m.
24														
25														
26														
27														
28														
29														
30														

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	11/07/2011
CHECKED	E. Leung
DATE	12/07/2011

REMARKS

J2009456_22A

DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH10
		SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833597.17 N 838907.09	DATE : 10/06/2011 to 16/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 39.48 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
10/06/2011	SW									+39.48	0.00			Concrete surface.
									A 0.50	+38.98	0.50			Light brown (7.5YR 6/4), silty fine to coarse SAND with some angular to subangular fine gravel sized highly decomposed and moderately decomposed rock fragments and occasional concrete fragments. (FILL)
									En B 1.00	+38.48	1.00		VI	Firm, brown, slightly sandy SILT with some angular fine gravel sized quartz fragments. (RESIDUAL SOIL)
									En C 1.50					
10/06/2011									En D 2.00	+37.48	2.00			
11/06/2011		Dry at 08:00	70	96					1				V	Extremely weak, light brown, dappled light grey and pink, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with some angular fine quartz gravel)
	SW 3.10 PW								2 3.00 3.10					
								2,2, 2,3,3,4 N=12	3 3.20					
								33 bls	4 3.50					
				100					En 5 3.55					
									6 4.00					
			70	87					7 4.05					
									8 5.05					
								2,2, 3,4,4,5 N=16	5.15					
									9 5.25					
									10 5.55 5.60					
										+33.43	6.05			
			70	96					11 6.05				V	Extremely weak, light brown, dappled brown and reddish brown, completely decomposed coarse ash crystal TUFF with some iron and manganese stained relict joints. (Slightly sandy SILT with some angular to subangular fine gravel)
									12 7.05 7.15					
		Dry at 18:00						2,2, 3,5,11,19 N=38	13 7.25					
11/06/2011									14 7.55					
13/06/2011		Dry at 08:00						157 bls	En 15 7.60					
	PW 8.10			100										
	HW								16 8.05 8.10					
			70	86					17					
									18 9.10 9.20					
									19 9.30					
								2,3, 5,9,10,12 N=36	20 9.60 9.65					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	21/06/2011
CHECKED	E. Leung
DATE	22/06/2011

REMARKS
1. An inspection pit was excavated to 2.00m depth.
2. A falling head permeability test was carried out from 13.50m to 15.00m depth.
3. An acoustic televiewer survey was carried out from 21.63m to 26.95m depth.
4. A piezometer was installed at 21.50m depth.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH10
	SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833597.17 N 838907.09	DATE : 10/06/2011 to 16/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 39.48 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									+29.48	10.00			
									21 10.10	+29.38	10.10		V	See sheet 1 of 3 Extremely weak, light grey, dappled light brown and brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular to subangular fine gravel)
T1			70	95					22 11.10 11.20					
								5,7, 9,11,14,19 N=53	23 11.30					
									24 11.60					
								128 b/s En	25 11.65					
T2				96					26 12.10	+27.38	12.10			
									27 12.15	+27.33	12.15			From 12.10m to 12.15m : FAULT GOUGE 30mm thick, dipping subvertically. (SILT with some angular to subangular fine to medium gravel)
			70	93										
T3									28 13.15 13.25	+26.23	13.25			
								38,12/15mm 100/70mm (100/70mm)	29 13.41				IV	Weak to very weak, light brown, dappled brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular fine to coarse GRAVEL with some angular cobble)
T4														
									30 14.15					
		0.65m at 18:00	70	100				3.03 x 10^{-7} m/sec	31 14.75 14.85					
	13/06/2011								32					
T5	14/06/2011	14.30m at 08:00	70	89					33 15.30 15.40	+24.08	15.40			
							>20						IV	Weak to moderately weak, light brown, dappled brown, highly decomposed coarse ash crystal TUFF. Joints are very closely to closely spaced, rough planar, extremely narrow to very narrow, iron and manganese stained, dipping 0° to 10°, 10° to 20° and 50° to 60°.
							13.3							
T6			70	100	44	25			T2 101					
							NI							
							8.0							
									34 16.50	+22.98	16.50		V	Extremely weak to very weak, light brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Slightly silty fine to coarse SAND with some angular fine to coarse gravel and occasional angular cobble)
T7			70	96										
									35 17.50 17.60					
								35,15/15mm 100/60mm (100/60mm)	36 17.75					
T8														
		0.90m at 18:00							37 18.50					
	14/06/2011													
T9	15/06/2011	14.10m at 08:00	70	86					38 19.50 19.60					
								50/65mm 100/65mm (100/65mm)	39 19.73					From 19.50m to 19.56m : With firm, light brown, silt / clay infilled relict joints 2mm to 4mm thick, dipping 50° to 60°.
T10														

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample
Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Accoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	21/06/2011
CHECKED	E. Leung
DATE	22/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH10
	SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833597.17 N 838907.09	DATE : 10/06/2011 to 16/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 39.48 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW								20.10	+19.48	20.00			See sheet 2 of 3
			70	100	27	13	NI		T2101	+19.08	20.40		IV	Weak to moderately weak, locally moderately strong, light brown, highly decomposed coarse ash crystal TUFF. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 50° to 60° and 60° to 70°. From 20.40m to 20.85m : Moderately strong, moderately decomposed TUFF.
							8.9		20.85				III	
21			70	100	7	0	>20		T2101	+18.63	20.85		IV	
	HW 21.63						NI		21.60					
			70	96	30	0	>20		T2101	+17.74	21.74		III	Moderately strong, light brown, dappled grey, moderately decomposed coarse ash crystal TUFF. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50°, 50° to 60° and occasional 60° to 70°.
22							15.2		22.04					
			70	100	84	51	7.4		T2101					
23									23.49					
			70	100	35	29	10.7		T2101					
24									24.04	+15.38	24.10			
			70	100	88	76			T2101				II	Strong, grey, spotted light grey, slightly decomposed coarse ash crystal TUFF. Joints are medium spaced, locally very closely to closely spaced, rough planar and rough stepped, tight to extremely narrow, clean, locally iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
25							3.0		25.52					
			70	100	100	100			T2101					
26		0.95m at 18:00							26.52					
	15/06/2011	15/06/2011 14.03m at 08:00							T2101					
27	16/06/2011	13.50m at 18:30	70	100	92	72	5.8		27.12	+12.36	27.12			End of Investigation Hole at 27.12m.
28														
29														
30														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	21/06/2011
CHECKED	E. Leung
DATE	22/06/2011

REMARKS

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH12
	SHEET 1 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833632.87 N 838731.55	DATE : 01/06/2011 to 07/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +58.30 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
01/06/2011	SW									+58.30	0.00			Concrete surface.
										+58.20	0.10			Firm, light brown (7.5YR 6/4), sandy SILT with occasional subangular fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
									En A 0.60					
									En B 1.10	+57.30	1.00		V	Extremely weak, pinkish brown, dappled light brown and brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine gravel)
									En C 1.60					
01/06/2011									En D 2.00					
02/06/2011		Dry at 08:00	70	98					1					
	SW 3.10								2 3.00 3.10					
	PW							2,3, 3,4,6,7 N=20	3 3.20					
								68 bls	4 3.50					
				84					En 5 3.55					
									6 4.00	+54.30	4.00			
			70	98					7 4.05				V	Extremely weak, light brown, dappled brown and brownish grey, completely decomposed coarse ash crystal TUFF. (Sandy SILT with occasional angular to subangular fine gravel)
									8 5.05 5.15					
								3,5, 7,10,12,16 N=45	9 5.25					
									10 5.55 5.60					
									11 6.05					
			70	98					12 7.05 7.15	+51.15	7.15			
								3,5, 5,6,7,9 N=28	13 7.25				V	Extremely weak, light grey, dappled brown and light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine gravel)
								68 bls	14 7.55					
									En 15 7.60					
				160					16 8.05					
									17 8.10					
			70	90										
								6.44×10^{-7} m/sec	18 9.10					
								7,9,12, 25,45,30/50mm (100/200mm)	19 9.20					From 9.10m to 9.20m : Sandy SILT with some angular to subangular fine gravel.
									20 9.50 9.55					
10	PW													

INSPECTION PIT

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	09/06/2011
CHECKED	E. Leung
DATE	10/06/2011

REMARKS
1. An inspection pit was excavated to 2.00m depth.
2. A falling head permeability test was carried out from 9.00m to 10.50m depth.
3. A piezometer was installed at 10.40m depth.
4. A sample for equipment blank and field blank was collected at 1.10m.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH12
	SHEET 2 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833632.87 N 838731.55	DATE : 01/06/2011 to 07/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 58.30 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										+48.30	10.00			
	10.10 HW									+48.20	10.10			See sheet 1 of 2
			70	90					21 10.10				IV	Weak to moderately weak, greyish brown, dappled brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular COBBLE with some angular fine to coarse gravel)
		3.90m at 18:00												
T1 02/06/2011									22 10.85					
03/06/2011		10.28m at 08:00							10.95	+47.35	10.95		III	
			70	88	81	64	8.6							Moderately strong, grey, spotted light grey, dappled light brown, moderately decomposed coarse ash crystal TUFF. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
							>20		T2 101					
							9.1		11.78	+46.42	11.88			
T2			70	40	30	0	NR		T2 101				V	From 11.88m to 12.18m : No recovery, inferred to be completely decomposed TUFF.
									12.28	+46.12	12.18			
			0	54	27	27	13.3		T2 101	+45.82	12.48		III	
							NR		12.65	+45.65	12.65		V	From 12.48m to 12.65m : No recovery, inferred to be completely decomposed TUFF.
							9.5		T2 101	+45.44	12.86		III	
T3			0	42	30	20	NR		13.15	+45.15	13.15		V	From 12.86m to 13.15m : No recovery, inferred to be completely decomposed TUFF.
									T2 101	+44.90	13.40		III	
							16.0		13.70	+44.60	13.70		V	From 13.40m to 13.70m : No recovery, inferred to be completely decomposed TUFF.
	HW 13.70		0	46	24	0	NR		T2 101					
							7.4			+44.30	14.00		II	Strong, grey, spotted light grey, slightly decomposed coarse ash crystal TUFF.
T4			0	96	92	83	>20			+44.20	14.10		III	Joints are medium spaced, locally closely and widely spaced, rough planar, locally rough stepped, extremely narrow, iron and manganese stained, occasional clean, dipping 0° to 10°, 30° to 40°, 50° to 60° and occasional 60° to 70°.
		5.45m at 18:00											II	
03/06/2011														
04/06/2011		13.55m at 08:00					5.1		14.70					From 14.00m to 14.10m : Moderately strong, moderately decomposed TUFF.
T5			0	100	98	79			T2 101					
							11.7							
T6									16.18					
							1.9		T2 101					
							15.6							
T7			0	100	100	89								
							1.1		17.64					
		8.30m at 18:00							T2 101					
04/06/2011														
07/06/2011		16.53m at 08:00					18.2							
T8			0	100	97	90								
							2.4							
07/06/2011									18.82	+39.48	18.82			
T9														End of Investigation Hole at 18.82m.
20														

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	09/06/2011
CHECKED	E. Leung
DATE	10/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. FLN-BH14
CONTRACT NO. : GE/2009/15	SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 833666.88 N 838857.46	DATE : 26/05/2011 to 31/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +73.23 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
26/05/2011	SW									+73.23	0.00			
								En	A 0.50	+72.73	0.50		V	Brown (7.5YR 5/4), dappled greyish brown, silty fine to coarse SAND with some angular to subangular fine to medium gravel sized highly decomposed and moderately decomposed rock fragments. (FILL)
								En	B 1.00					Extremely weak, pinkish grey, dappled light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine gravel)
								En	C 1.50					
	SW 2.00							En	D 2.00					
	PW		85	160					1					
									2 3.00	+70.13	3.10		V	
		0.52m at 18:30						2,2, 4,5,8,10 N=27	3 3.20					Extremely weak, light brown, dappled greyish brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with occasional angular to subangular fine gravel)
26/05/2011									4 3.50					
27/05/2011		Dry at 08:00		180				51 bls	En 5 3.55					
									6 4.00	+69.18	4.05			
			80	95					7 4.05				V	Extremely weak to very weak, greyish brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine to medium gravel)
									8 5.05					
								31,19/25mm 100/40mm (100/40mm)	9 5.15 5.29					
										+67.18	6.05			
								7.74×10^{-7} m/sec	10 6.05				V	Extremely weak, grey, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine gravel)
	PW 7.15		80	92					11 7.05 7.15	+66.08	7.15			
	HW	0.86m at 12:30						6,12, 19,38,43/60mm (100/210mm)	12 7.16				IV	Very weak to weak, greyish brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular fine to coarse GRAVEL)
27/05/2011									13 7.46 7.51 7.55	+65.68	7.55			
28/05/2011		7.40m at 08:00					NI			+65.48	7.75		IV	Moderately strong, greyish brown, dappled light brown, moderately decomposed coarse ash crystal TUFF. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20° and 60° to 70°. From 7.55m to 7.75m : Weak to moderately weak, highly decomposed TUFF. From 8.30m to 8.45m : Silicified.
			60	86	32	20	11.4		T2101				III	
										+64.78	8.45		IV	
							NI		8.65					
			0	87	6	0			T2101	+64.23	9.00			
							15.0		9.20	+64.03	9.20		III	Weak to moderately weak, light brown, dappled greyish brown, highly decomposed coarse ash crystal TUFF. Joints are very closely to closely spaced, locally extremely closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 0° to 10°, 20° to 30° and 30° to 40°. From 9.00m to 9.20m : Moderately strong, moderately
			0	94	6	0	NI		T2101				IV	

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	09/06/2011
CHECKED	E. Leung
DATE	10/06/2011

REMARKS
1. An inspection pit was excavated to 2.00m depth.
2. A falling head permeability test was carried out from 6.00m to 7.50m depth.
3. A piezometer was installed at 7.00m depth.
4. An acoustic televiewer survey cannot be conducted because water level cannot be raised up to the test section.

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH14
	SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 833666.88 N 838857.46	DATE : 26/05/2011 to 31/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL +73.23 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	Fi	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW		0	94	6	0			T2 01 10.20	+63.23	10.00		IV	decomposed TUFF. See sheet 1 of 3
			0	92	5	0	NI		T2 01	+62.23	11.00			From 10.50m to 10.70m : Silicified.
T1									11.12				III	From 11.00m to 11.65m : Moderately strong, moderately decomposed TUFF.
			0	96	39	17	11.8 >20		T2 01	+61.58	11.65		IV	
T2							13.2		12.27					From 12.00m to 12.27m : Fault Breccia sized up to 40mm thick, with quartz vein sized up to 20mm thick, dipping 70° to 80°.
			0	93	7	0	NI		T2 01					
T3							>20			+59.88	13.35			
			0	76					14 13.35				IV	Weak to moderately weak, greyish brown, dappled brown, highly decomposed coarse ash crystal TUFF. (Recovered as sandy angular fine to coarse GRAVEL)
T4		0.61m at 18:30												
28/05/2011									15 14.25					
30/05/2011		Dry at 08:00							14.35	+58.88	14.35		IV	Moderately strong, locally moderately weak, greyish brown, dappled light brown and brown, moderately decomposed coarse ash crystal TUFF with very closely spaced microfractures, dipping 70° to 80° and subvertically. Joints are very closely to closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 60° to 70° and 70° to 80°.
			0	90	6	0	NI		T2 01	+58.53	14.70		III	From 14.35m to 14.70m : Weak to moderately weak, highly decomposed TUFF.
T5			0	89	11	0	>20		14.85					From 15.40m to 15.60m : Subvertical joint.
							10.8		T2 01					From 15.80m to 16.27m : Quartz vein 20mm thick, dipping subvertically.
			0	98	49	20			15.30					From 15.95m to 16.27m : Fault Breccia 20mm to 30mm thick, dipping subvertically.
T6							>20		T2 01					
	HW 16.53								16.53	+56.70	16.53		II	Strong, locally moderately strong, grey, dappled light grey and brown, slightly decomposed coarse ash crystal TUFF. Joints are closely to medium spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 20° to 30°, 40° to 50°, 50° to 60° and occasional 60° to 70°.
										+56.53	16.70		III	From 16.70m to 16.88m : Moderately strong, moderately decomposed TUFF.
							17.0			+56.35	16.88		II	
T7			0	100	70	50	9.5		T2 01					
		Dry at 18:00					>20		17.83					
30/05/2011										+54.98	18.25		III	From 18.25m to 18.65m : Moderately strong, moderately decomposed TUFF.
31/05/2011 T8		Dry at 08:00	0	100	46	20	4.8 >20		T2 01	+54.58	18.65		II	From 18.47m to 18.52m : Quartz vein 60mm thick, dipping 10° to 20°.
							13.3		18.82					
T9							3.0		T2 01					
			0	100	96	72	8.8		19.82					
20			0	98	95	55								

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	09/06/2011
CHECKED	E. Leung
DATE	10/06/2011

REMARKS

VIBRO

DRILLHOLE RECORD

HOLE NO. FLN-BH14

CONTRACT NO. : GE/2009/15

SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM32	E 833666.88 N 838857.46	DATE : 26/05/2011 to 31/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 73.23 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
31/05/2011		17.20m at 15:00	0	98	95	55	8.8		T2101	+53.23	20.00		II	See sheet 2 of 3 From 20.16m to 20.40m : With closely spaced, quartz veins up to 20mm thick, dipping 40° to 50°.
			0	99	85	69	2.9 7.5		20.82 T2101 21.83	+51.40	21.83			From 21.10m to 21.66m : Quartz vein 5mm thick, dipping subvertically.
														End of Investigation Hole at 21.83m.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	09/06/2011
CHECKED	E. Leung
DATE	10/06/2011

REMARKS

J200946e_22A

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH19
	SHEET 1 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level +12.53	Depth (m) 0.00	Legend	Grade	Description
21/06/2011	SW								A En 0.50					Firm, brown (7.5YR 5/4), slightly sandy SILT with some angular to subangular fine gravel sized highly decomposed rock fragments. (FILL)
									B En 1.00	+11.53	1.00			
									C En 1.50					Firm, light brown (7.5YR 6/4), dappled reddish brown, slightly sandy SILT with occasional subangular fine gravel sized highly decomposed rock fragments. (COLLUVIUM)
21/06/2011									D En 2.00	+10.53	2.00			
22/06/2011		Dry at 08:00	70	95					1					Firm, light brown (7.5YR 6/4), dappled grey and light grey, slightly sandy clayey SILT with occasional subangular to subrounded fine to coarse gravel sized quartz fragments. (ALLUVIUM)
	SW 3.10								2 3.00 3.10	+9.43	3.10			
	PW							2,5, 5,6,8,11 N=30 188 b/s	3 3.20					Medium dense to dense, greyish brown (2.5Y 5/2), dappled brown, slightly silty sandy subangular to subrounded fine to coarse GRAVEL sized moderately decomposed rock fragments and occasional subrounded cobble sized quartz and moderately decomposed Sandstone. (ALLUVIUM)
				84					4 3.50					
									En 5 3.55					
									6 4.00 4.05					
		0.30m at 18:00	70	83					T2 I 0 I	+8.03	4.50			
22/06/2011									4.65					
23/06/2011		3.36m at 08:00	70	80					T2 I 0 I					Greyish brown (2.5Y 5/2), dappled brown, subangular to subrounded COBBLE sized quartz and moderately decomposed Sandstone with some subangular to subrounded fine to coarse gravel sized moderately decomposed rock fragments. (ALLUVIUM)
			70	70					5.15					
									T2 I 0 I					
			70	78				7.09 x 10^{-6} m/sec	5.75					
									T2 I 0 I	+6.43	6.10			
			70	90					7 6.30					Firm, light brown (7.5YR 6/4), sandy SILT with some subangular to subrounded fine to coarse gravel sized quartz and moderately decomposed rock fragments and occasional angular to subangular cobble sized moderately decomposed Sandstone. (ALLUVIUM)
									8 6.70 6.80	+5.73	6.80			
			70	95					T2 I 0 I					Dark grey (N 3), dappled greyish brown, subrounded COBBLE sized moderately decomposed Sandstone with some subangular to subrounded medium to coarse gravel sized moderately decomposed rock fragments. (ALLUVIUM)
									9 7.40	+4.93	7.60			
			70	85					10 8.40 8.50				V	Extremely weak, greyish brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with some angular to subangular fine gravel)
		0.38m at 18:00						3,5, 7,9,10,14 N=40 165 b/s	11 8.60					
23/06/2011									12 8.90					
24/06/2011		3.48m at 08:00		84					En 13 8.95					
									14 9.40					
			70						15 9.45					
10														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	15/07/2011
CHECKED	E. Leung
DATE	16/07/2011

REMARKS
1. An inspection pit was excavated to 2.00m depth.
2. Constant head permeability tests were carried out from 5.90m to 7.40m and 20.50m to 22.00m depth.
3. An acoustic televiewer survey was carried out from 53.02m to 60.49m depth.
4. A piezometer was installed at 52.50m depth.

DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH19
		SHEET 2 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	PW		70	62					10.00	+2.53			V	See sheet 1 of 7
									16 10.45 17 10.55	+1.98	10.55		V	Extremely weak, grey, dappled light brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with much angular fine gravel)
T1			70	98					18 11.55 11.65	+0.88	11.65		V	Extremely weak, light brown, dappled grey, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with some angular fine gravel)
T2	24/06/2011	3.20m at 13:00						2,7, 8,11,16,21 N=56	19 11.75 20 12.05 12.10					
	25/06/2011	3.53m at 08:00							21 12.55					
T3			70	90					22 13.55 13.65					
								3,4, 7,11,15,18 N=51	23 13.75					
T4	25/06/2011	0.45m at 18:00							24 14.05					
	27/06/2011	3.63m at 08:00		100				97 blS	En 25 14.10					
									26 14.55 27 14.60					
T5			70	98					28 15.60 15.70					
								3,7, 11,13,18,23 N=65	29 15.80					
T6									30 16.10 16.15					
									31 16.60					
T7			70	98					32 17.60 17.70					
	PW 17.70								33 17.77					From 17.70m to 18.12m : Extremely weak to very weak.
T8	HW							7,12, 17,23,32,28/45mm (100/270mm)	34 18.07 18.12	-5.59	18.12			
			70	66	0	0	NI		T2 101	-5.92	18.45		III	Moderately strong, light grey, dappled light brown, moderately decomposed QUARTZ VEIN. Fractured.
							NA						V	Extremely weak, light brown, dappled grey and brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular fine gravel)
T9			70	98					35 18.70					
								6,14, 17,24,32,27/35mm (100/260mm)	36 19.70 19.80 37 19.86					
20														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	15/07/2011
CHECKED	E. Leung
DATE	16/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. FLN-BH19
CONTRACT NO. : GE/2009/15	SHEET 3 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW								38 20.16 20.21	-7.47	20.00		V	See sheet 2 of 7
			70	92				4.75 x 10^{-6} m/sec	39 20.70					
									40 21.70 21.80					
		0.53m at 18:00						5,12, 15,20,30,35/55mm (100/280mm)	41 21.88					From 21.70m to 21.80m : With iron and manganese stained relict joints, dipping 60°.
27/06/2011									42 22.18 22.23					
28/06/2011		3.74m at 08:00												
										-11.27	23.80		V	
								7,13, 17,22,34,27/35mm (100/260mm)	43 23.86					Extremely weak to very weak, grey, dappled light brown and brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine gravel)
									44 24.16 24.21					
			70	98					45 24.70					
									46 25.70 25.80					
								9,23, 31,43,26/30mm (100/180mm)	47					
									48 26.06 26.13					
		0.70m at 18:00						10,25, 36,47,17/10mm (100/60mm)	49 27.80					
28/06/2011									50 28.06 28.11					
29/06/2011		3.84m at 08:00												
									51 28.70					
			70	98										
								50/75mm 100/55mm (100/55mm)	52 29.70 29.80	-17.27	29.80		V	From 29.70m to 29.80m : With much angular fine to coarse gravel sized quartz fragments. (Quartz vein)
									53 29.93					

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	15/07/2011
CHECKED	E. Leung
DATE	16/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO

HOLE NO. FLN-BH19

CONTRACT NO. : GE/2009/15

SHEET 4 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-17.47	30.00		V	Extremely weak to very weak, light brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Sandy SILT with some angular fine to coarse gravel)
								35,15/15mm 100/70mm (100/70mm)	54 31.96					
			70	98					55 32.70					
									56 33.70 33.80					From 33.70m to 33.80m : With iron and manganese stained relict joints, dipping 20° to 30°.
								30,20/35mm 100/70mm (100/70mm)	57 33.98					
29/06/2011 30/06/2011		0.75m at 18:00 3.35m at 08:00						50/60mm 100/70mm (100/70mm)	58 35.93					
									36.40	-23.87	36.40		III	
							>20			-24.07	36.60		IV	Weak to moderately weak, light brown, dappled greyish brown, highly decomposed tuffaceous SANDSTONE. (Slightly sandy angular COBBLE with some angular fine to coarse gravel)
			70	98	25	15	NA		T2 I O I					From 36.40m to 36.60m : Moderately strong, moderately decomposed QUARTZ VEIN. Fractured.
										-24.60	37.13			From 37.13m to 37.30m : Moderately strong, light brown, moderately decomposed tuffaceous SANDSTONE.
							11.8			-24.77	37.30		III	Joints are closely spaced, rough planar, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 30° to 40°.
									37.40				IV	
			70	100	0	0			T2 I O I					
									38.00					
			70	100	0	0	NA		T2 I O I					
									38.88					
			70	100	0	0			T2 I O I					
									39.43	-26.90	39.43		III	From 39.43m to 39.83m : Moderately strong, moderately decomposed QUARTZ VEIN. Fractured.
			70	100	15	0	NI		T2 I O I					
									39.83	-27.30	39.83			
			70	97	28	8	NA		T2 I O I				IV	

Disturbed sample
Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
Water sample
En Environmental Sample

Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED T. C. Yip
DATE 15/07/2011
CHECKED E. Leung
DATE 16/07/2011

REMARKS

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH19
	SHEET 5 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	HW									-27.47	40.00			
							NA			-28.07	40.60		IV	See sheet 4 of 7
41			70	97	28	8	7.5		T2101	-28.47	41.00		III	From 40.60m to 41.00m : Moderately strong, light brown, moderately decomposed tuffaceous SANDSTONE. Joints are closely spaced, rough planar, extremely narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 30° to 40°.
							NA		41.28	-28.82	41.35		IV	
							9.3						III	Moderately strong, light brown, dappled brown and greyish brown, moderately decomposed tuffaceous SANDSTONE. Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 0° to 10°, 10° to 20°, 20° to 30° and occasional 40° to 50°. From 41.98m to 42.02m : With quartz veins up to 7mm thick, dipping 10° to 20°.
42			70	100	85	42	>20		T2101					
							4.0							
							20.0							
		0.90m at 18:00					4.0			-30.17	42.70			
	30/06/2011 02/07/2011						NA		42.78	-30.37	42.90		IV	From 42.58m to 42.63m : With quartz veins up to 7mm thick, dipping 10° to 20°.
43		3.40m at 08:00					15.0			-30.57	43.10		III	From 42.70m to 42.90m : Weak to moderately weak, light brown, highly decomposed tuffaceous SANDSTONE. (Angular COBBLE)
							NA			-30.87	43.40		IV	
			70	108	85	37	10.4		T2101				III	From 43.10m to 43.40m : Weak to moderately weak, light brown, highly decomposed tuffaceous SANDSTONE. (Angular COBBLE)
										-31.35	43.88			
44							NA		44.23	-31.87	44.40		IV	Weak to moderately weak, light brown, dappled grey and greyish brown, highly decomposed tuffaceous SANDSTONE. (Slightly sandy angular COBBLE with occasional angular fine to coarse gravel and occasional angular boulder sized up to 250mm)
							5.0			-32.07	44.60		III	From 44.40m to 44.60m : Moderately strong, light brown, moderately decomposed tuffaceous SANDSTONE. Joints are closely spaced, locally medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
							NA			-32.47	45.00		IV	
45			70	100	69	41	5.0		T2101	-32.67	45.20		III	From 45.00m to 45.20m : Moderately strong, light brown, moderately decomposed tuffaceous SANDSTONE. Joints are closely spaced, locally medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
							NA			-32.92	45.45		IV	
							10.7		45.73	-33.20	45.73		III	From 45.45m to 45.73m : Moderately strong, light brown, moderately decomposed tuffaceous SANDSTONE. Joints are closely spaced, locally medium spaced, rough planar and rough stepped, extremely narrow, iron and manganese stained, dipping 10° to 20°, 40° to 50° and 50° to 60°.
46							NA						IV	
			70	57	0	0			T2101	-33.75	46.28		V	From 46.28m to 46.70m : No recovery, inferred to be completely decomposed SANDSTONE.
							NR			-34.17	46.70			
									59 46.70				IV	Very weak, brown, dappled light grey, highly decomposed tuffaceous SANDSTONE with some iron and manganese stained relict joints, dipping 70° to 80°. (Sandy angular fine to coarse GRAVEL with some angular cobble)
47			70	96										
		2.75m at 18:00							60 47.70	-35.27	47.80			Extremely weak, light brown, dappled brown, completely decomposed tuffaceous SANDSTONE. (Sandy SILT with some angular fine gravel)
48	02/07/2011 HW 47.99 04/07/2011 NW	3.38m at 08:00						28,22/45mm 100/70mm (100/70mm)	61 47.99					
		0.85m at 18:00												
49	04/07/2011 05/07/2011	3.20m at 08:00												
								15,34, 65,35/15mm (100/90mm)	62 49.80 49.99					
50														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	15/07/2011
CHECKED	E. Leung
DATE	16/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15		HOLE NO. FLN-BH19
		SHEET 6 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
	NW								63 50.04	-37.47	50.00		V	See sheet 5 of 7
								27,23/35mm 100/60mm (100/60mm)	64 51.97					
	NW 53.02								53.02	-40.49	53.02		III	Moderately strong, brown, dappled grey and greyish brown, moderately decomposed metamorphosed coarse ash crystal TUFF with closely to medium spaced quartz veins 10mm to 15mm thick, dipping 60° to 70° and 70° to 80°. Joints are medium spaced, rough planar, extremely narrow, iron and manganese stained, occasional chlorite coated, dipping 40° to 50° and 60° to 70°.
			70	100	100	100	4.8		TNW 53.54					
			70	100	100	91	15.4		TNW					
							3.7		55.02					
			70	100	56	49	12.1		TNW 55.47					
			70	100	72	0	NI		TNW 55.79	-43.02	55.55		II	Strong, grey, dappled light grey, locally dappled light brown, slightly decomposed metamorphosed coarse ash crystal TUFF. Joints are closely spaced, locally very closely and medium spaced, rough planar and rough stepped, extremely narrow, chlorite coated, locally iron and manganese stained, dipping 10° to 20°, 20° to 30° and 50° to 60°. From 56.65m to 56.73m : With quartz veins up to 15mm thick, dipping 10° to 20°.
			70	100	91	49	11.4		TNW					
							6.7		57.27					
05/07/2011		1.30m at 18:00	70	100	100	91			TNW 57.82					
06/07/2011		3.18m at 08:00	70	100	92	49	11.9		TNW 58.64					From 58.22m to 58.28m : With quartz veins up to 15mm thick, dipping 10° to 20°. From 58.60m to 58.70m : With quartz veins up to 15mm thick, dipping 10° to 20°.
			70	100	66	16	>20		TNW 59.25					
			70	100	76	44	10.2		TNW					From 59.25m to 59.50m : With closely spaced, quartz veins 20mm thick, dipping 10° to 20°.
							>20			-47.17	59.70		III	From 59.70m to 59.90m : Moderately strong, moderately decomposed TUFF.
							11.1			-47.37	59.90			

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	15/07/2011
CHECKED	E. Leung
DATE	16/07/2011

REMARKS

DRILLHOLE RECORD

VIBRO	CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH19
		SHEET 7 OF 7

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM20	E 833026.99 N 839537.88	DATE : 21/06/2011 to 06/07/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 12.53 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	T C R %	S C R %	R Q D %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
06/07/2011		3.00m at 18:00	70	100	76	44	>20 7.0		TNW 60.73	-47.47 -48.20	60.00 60.73		II	From 59.90m to 60.35m : With quartz veins 40mm thick, dipping 60° to 70°. See sheet 6 of 7
														End of Investigation Hole at 60.73m.

61 62 63 64 65 66 67 68 69 70

Disturbed sample	Standard penetration test	LOGGED	T. C. Yip
Piston sample	In-situ vane shear test		
U76 undisturbed sample	Permeability test	DATE	15/07/2011
U100 undisturbed sample	Pressuremeter test		
Mazier sample	Packer Test	CHECKED	E. Leung
SPT liner sample	Acoustic or optical televiewer survey		
Water sample	Piezometer tip	DATE	16/07/2011
En Environmental Sample	Standpipe		

REMARKS

J2009456e_22A

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH20
	SHEET 1 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 833069.45 N 839394.33	DATE : 03/06/2011 to 10/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.35 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
03/06/2011	SW									+13.35	0.00			Firm, brown (7.5YR 5/4), sandy SILT with occasional angular to subangular fine gravel sized highly decomposed and moderately decomposed rock fragments. (FILL)
									En A 0.50					
									En B 1.00					
									En C 1.50					
			85	90					2.50					
									2 2.60	+10.75	2.60			
		0.35m at 18:00						1.1, 1,2,2,3 N=8 102 blows	3 2.70					Firm, brown (7.5YR 5/4), dappled greyish brown, slightly clayey sandy SILT with some subangular fine to coarse gravel sized highly decomposed rock fragments. (ALLUVIUM)
03/06/2011														
04/06/2011		0.40m at 08:00							4 5 3.05 En	+10.30	3.05			
	SW 3.55													Firm, light brown (7.5YR 6/4), sandy silty CLAY with some subangular to subrounded fine to medium gravel sized moderately decomposed rock fragments and occasional subrounded cobble sized moderately decomposed Tuff. (ALLUVIUM)
	PW			67					6 3.50	+9.80	3.55			
			80	73					T2101					Greyish brown (2.5Y 5/2), dappled light brown and brown, slightly silty sandy subangular to subrounded medium to coarse GRAVEL sized moderately decomposed rock fragments with some subangular to subrounded cobbles sized moderately decomposed Tuff. (ALLUVIUM)
			80	100					4.10					
			80	90					T2101 4.50					
									T2101 5.00					
			70	72					T2101 5.50					
			80	96					T2101 6.00					
		0.35m at 18:00	80	90					T2101 6.50					
04/06/2011														
07/06/2011		1.05m at 08:00	60	44					T2101 7.00					
			60	84					T2101 7.50					
			70	76						+5.65	7.70		V	Extremely weak, light grey, dappled light brown and brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with some angular to subangular fine gravel)
			85	64					7 8.00					
									8 9.00 9.10					
			85	95										

INSPECTION PIT

↕	Disturbed sample
■	Piston sample
▨	U76 undisturbed sample
▮	U100 undisturbed sample
▨	Mazier sample
▯	SPT liner sample
▲	Water sample
En	Environmental Sample
↓	Standard penetration test
V	In-situ vane shear test
I	Permeability test
I	Pressuremeter test
Packer	Packer Test
	Acoustic or optical televiewer survey
▲	Piezometer tip
▯	Standpipe

LOGGED	T. C. Yip
DATE	15/06/2011
CHECKED	E. Leung
DATE	16/06/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A falling head permeability test was carried out from 14.50m to 16.00m depth.
6. An acoustic televiewer survey was carried out from 18.88m to 26.15m depth.
3. Piezometers were installed at 7.50m and 15.80m depth.

DRILLHOLE RECORD

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH20
	SHEET 2 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 833069.45 N 839394.33	DATE : 03/06/2011 to 10/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.35 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
										+3.35	10.00			
T1	PW			80				2,4, 6,11,15,20 N=52 120 blis	10 10.10 10.20 11 10.30 12 10.60 13 10.65 En				V	See sheet 1 of 3
									14 11.10	+2.20	11.15			
			85	95					15 11.15				V	Extremely weak, light brown, dappled light grey, completely decomposed coarse ash crystal TUFF with occasional iron and manganese stained relict joint, dipping 10° to 20°. (Sandy SILT with some angular to subangular fine gravel)
T2		3.25m at 18:00							16 12.15 12.25					
07/06/2011									17 12.35					
08/06/2011		4.73m at 08:00						2,2, 3,3,6,10 N=22	18 12.65 12.70					
T3									19 13.15					
			85	95										
T4									20 14.15 14.25	-0.80	14.25			
								3,5, 7,11,16,22 N=56 117 blis	21 14.35				V	Extremely weak. light grey, dappled light brown, completely decomposed coarse ash crystal TUFF. (Slightly sandy SILT with occasional angular to subangular fine gravel)
									22 14.65	-1.35	14.70			
T5				49					En 23 14.70				V	Extremely weak to very weak, light brown, dappled brown, completely decomposed coarse ash crystal TUFF. (Silty fine to coarse SAND with some angular fine to medium gravel)
									24 15.15 25 15.20					
			85	95				9.57×10^{-7} m/sec						
T6		3.23m at 13:00												
08/06/2011	PW 16.30								26 16.20 16.30	-2.95	16.30			
09/06/2011	HW	4.33m at 08:00	75	100	96	96			T2 101				III	Moderately strong, locally strong, grey, dappled light brown, moderately decomposed coarse ash crystal TUFF. Joints are closely to medium spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, occasional clean, dipping 10° to 20° and 20° to 30°. From 16.30m to 16.60m : With closely spaced microfractures, dipping 50° to 60°.
T7							3.8		17.05					
			75	80	78	69			T2 101					
							15.4			-4.38	17.73			
							NR			-4.55	17.90		V	From 17.73m to 17.90m : No recovery, inferred to be completely decomposed TUFF.
T8									27 17.90				V	Extremely weak to very weak, brown, completely decomposed coarse ash crystal TUFF. (Silty fine to coarse SAND with much angular fine to medium gravel)
			80	87										
	HW 18.88								28 18.70 18.80	-5.45	18.80			
T9							12.0			-5.70	19.05		III	Moderately strong, locally strong, grey, spotted light grey, dappled light brown, moderately decomposed coarse ash crystal TUFF. Joints are closely to medium spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 0° to 10°, 10° to 20° and 40° to 50°. From 19.05m to 19.50m : Strong, slightly decomposed
									T2 101				II	
			80	100	100	86	4.0			-6.15	19.50		III	
20		1.85m at												

↕ Disturbed sample
■ Piston sample
U76 undisturbed sample
■ U100 undisturbed sample
Mazier sample
SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewer survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	15/06/2011
CHECKED	E. Leung
DATE	16/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH20
	SHEET 3 OF 3

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM53	E 833069.45 N 839394.33	DATE : 03/06/2011 to 10/06/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.35 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR%	SCR%	RQD%	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
10/06/2011		4.57m at 08:00	75	100	88	88	>20		T2 01 20.04	-6.65	20.00		III	TUFF.
							3.8			-6.85	20.20		II	See sheet 2 of 3 From 20.20m to 20.50m : Strong, slightly decomposed TUFF.
							11.1		20.38	-7.15	20.50		III	From 20.38m to 20.43m : Quartz vein 35mm thick, dipping 10° to 20°.
21			75	100	99	99			T2 01	-7.83	21.18		II	From 21.00m to 21.15m : Quartz vein 100mm thick, dipping 40° to 50°.
									21.78					Strong, grey, spotted light grey, slightly decomposed coarse ash crystal TUFF. Joints are medium spaced, locally closely and widely spaced, rough planar and rough stepped, extremely narrow to very narrow, locally clean, dipping 10° to 20°, 20° to 30°, 30° to 40° and occasional 60° to 70°.
22							3.1							
			75	100	99	99			T2 01					From 22.57m to 22.69m : Quartz vein 70mm thick, dipping 20° to 30°.
									23.14					From 23.10m to 23.14m : Quartz vein 20mm thick, dipping 10° to 20°.
23							1.1							
			75	100	97	78			T2 01					
24										-10.80	24.15			
							10.0			-10.95	24.30		III	From 24.15m to 24.30m : Moderately strong, moderately decomposed TUFF. From 24.35m to 24.95m : With slickensided planar chlorite coated joints, dipping 70°.
									24.58				II	
25			75	100	95	84	1.1		T2 01					
							12.5		25.85					
26		3.32m at 18:00	75	100	84	62	7.4		T2 01 26.35	-13.00	26.35			
10/06/2011														End of Investigation Hole at 26.35m.
27														
28														
29														
30														

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	15/06/2011
CHECKED	E. Leung
DATE	16/06/2011

REMARKS

DRILLHOLE RECORD

VIBRO	HOLE NO. FLN-BH22
CONTRACT NO. : GE/2009/15	SHEET 1 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 833179.25 N 838972.01	DATE : 17/05/2011 to 19/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.94 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
17/05/2011	SW									+13.94	0.00			Light brown (7.5YR 6/4), silty fine to coarse SAND with some angular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)
								En	A 0.50					
								En	B 1.00					
17/05/2011								En	C 1.50	+12.44	1.50			
18/05/2011			80	95					1 2.50					Firm, greyish brown (2.5Y 5/2), dappled brown, slightly clayey SILT. (ALLUVIUM)
									2 2.60	+11.34	2.60			
								2,1, 1,2,3,3 N=9	3 2.70					Loose, grey (N 5), silty fine SAND with occasional subangular coarse gravel sized moderately decomposed rock fragments. (ALLUVIUM)
				100				21 blS	En 4 3.00 5 3.05					
								2.07 x 10^{-5} m/sec 2.06 x 10 m/sec	6 3.50 7 3.55					
			80	88					8 4.55 4.65	+9.29	4.65			
								2,3, 5,3,10,12 N=30	9 4.75					Medium dense to dense, light brown (7.5YR 6/4), slightly silty / clayey fine to coarse SAND with some angular to subangular fine to medium gravel sized quartz and moderately decomposed rock fragments. (ALLUVIUM)
	SW 5.10								10 5.05 5.10					
	PW									+8.54	5.40			
			80	63					5.40					Grey (N 5), dappled light brown and brown, slightly sandy angular to subangular medium to coarse GRAVEL sized quartz and moderately decomposed rock fragments and occasional subangular to subrounded cobble sized moderately decomposed Tuff. (ALLUVIUM)
									T2|O|					
			80	60					6.00					
									T2|O|					
									6.80					
			80	50					T2|O|					
	PW 7.40								7.40					
	HW		80	75					T2|O|					
		4.10m at 18:00	80	67					7.80					
18/05/2011									T2|O|					
19/05/2011	HW 8.33	5.10m at 08:00	80	95	26	0	NI		8.10	+5.84	8.10		IV	Moderately strong to strong, grey, dappled light brown and brown, moderately decomposed lapilli coarse ash crystal TUFF. Joints are closely spaced, locally very closely spaced, rough planar and rough stepped, extremely narrow to very narrow, iron and manganese stained, dipping 10° to 20°, 20° to 30° and 40° to 50°. From 8.10m to 8.35m : Weak to moderately weak, highly decomposed TUFF. From 8.35m to 8.53m : Subvertical joint. Strong, grey, spotted light grey, locally dappled light brown, slightly decomposed lapilli coarse ash crystal TUFF.
							14.8		T2|O|	+5.59	8.35		III	
			80	100	100	67	7.7		8.49					
									T2|O|					
									9.15	+4.69	9.25		II	
			80	100	100	96	4.1		T2|O|					

↕ Disturbed sample
■ Piston sample
U76 undisturbed sample
U100 undisturbed sample
Mazier sample
SPT liner sample
▲ Water sample
En Environmental Sample

↓ Standard penetration test
V In-situ vane shear test
Permeability test
Pressuremeter test
Packer Test
Acoustic or optical televiewor survey
Piezometer tip
Standpipe

LOGGED	T. C. Yip
DATE	25/05/2011
CHECKED	E. Leung
DATE	26/05/2011

REMARKS
1. An inspection pit was excavated to 1.50m depth.
2. A constant head permeability test was carried out from 3.60m to 5.10m depth.
3. An acoustic televiewer survey was carried out from 8.33m to 13.46m depth.
4. A piezometer was installed at 4.90m depth.
5. A sample for equipment blank and field blank was collected between 3.05m and 3.50m.
6. A duplicate environmental sample was collected between 3.05m and 3.50m.

DRILLHOLE RECORD

VIBRO

CONTRACT NO. : GE/2009/15	HOLE NO. FLN-BH22
	SHEET 2 OF 2

PROJECT Ground Investigation - New Territories East (Term Contract)
Agreement No. CE 61/2007 (GE), North East New Territories New Development Areas, Planning and Engineering Study – Investigation Ground Investigation (G.I.) Phase 2 (Batch 2)

METHOD	Rotary	CO-ORDINATES	W.O.NO. GE/2009/15.22A
MACHINE & NO.	VBM35	E 833179.25 N 838972.01	DATE : 17/05/2011 to 19/05/2011
FLUSHING MEDIUM	Water	ORIENTATION Vertical	GROUND LEVEL + 13.94 mPD

Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Flush Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
							0.1			+3.94	10.00		II	Joints are medium spaced, locally closely spaced, rough planar and rough stepped, extremely narrow, clean and chlorite coated, locally iron and manganese stained, dipping 0° to 10°, 40° to 50° and 50° to 60°.
			80	100	100	96			T2 01					
							2.7		10.60					
			80	100	99	83			T2 01					
							8.6			+2.04	11.90			
							>20		11.99	+1.89	12.05		III II	From 11.90m to 12.05m : Moderately strong, moderately decomposed TUFF.
			80	100	100	93			T2 01					
							3.4		13.34					
19/05/2011		5.14m at 18:00	80	100	81	45	20.0		T2 01 13.65	+0.29	13.65			End of Investigation Hole at 13.65m.

- Disturbed sample
- Piston sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- SPT liner sample
- Water sample
- En Environmental Sample
- Standard penetration test
- V In-situ vane shear test
- Permeability test
- Pressuremeter test
- Packer Test
- Acoustic or optical televiewer survey
- Piezometer tip
- Standpipe

LOGGED	T. C. Yip
DATE	25/05/2011
CHECKED	E. Leung
DATE	26/05/2011

REMARKS