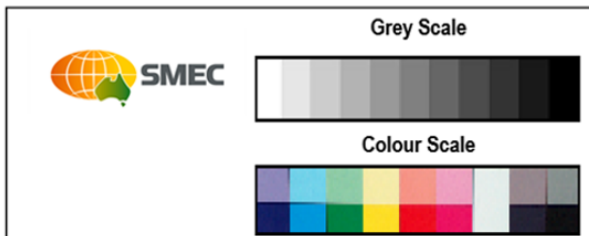
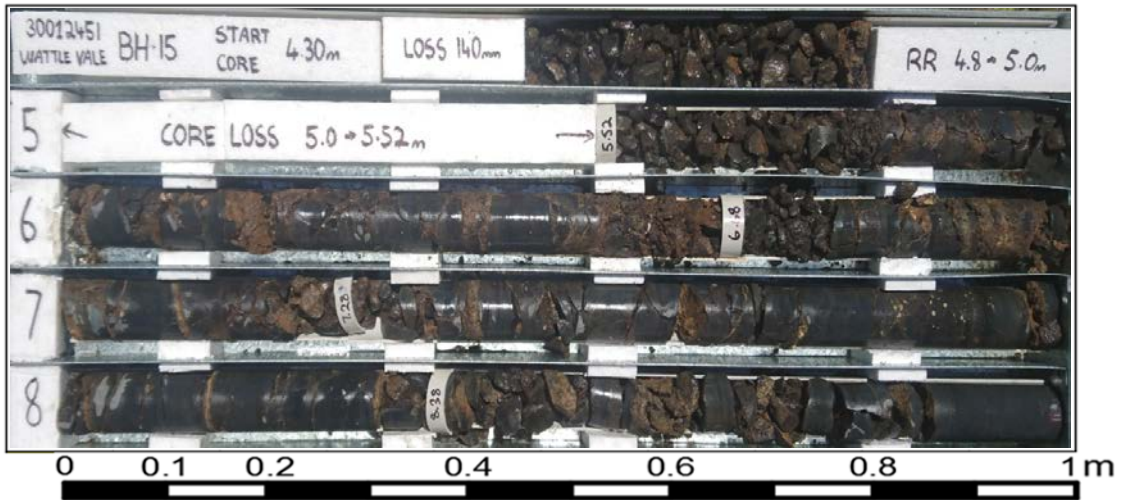



Borehole Number		<b>BH-15</b>	
Box	1	of	4
Depth	4.30m	to	9.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		




Borehole Number		<b>BH-15</b>	
Box	2	of	4
Depth	9.00m	to	14.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		






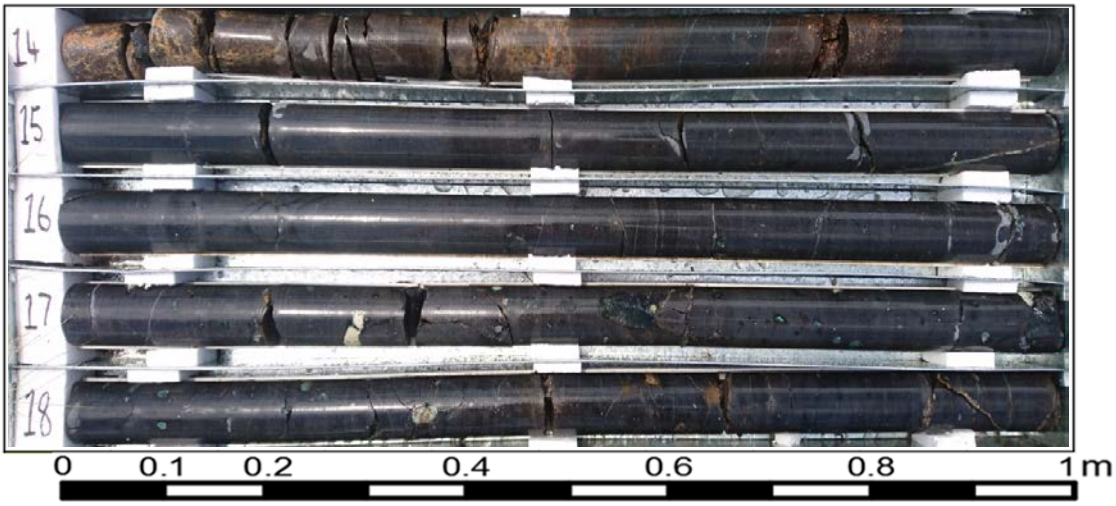

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-15</b>	
Box	3	of	4
Depth	14.00m	to	19.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

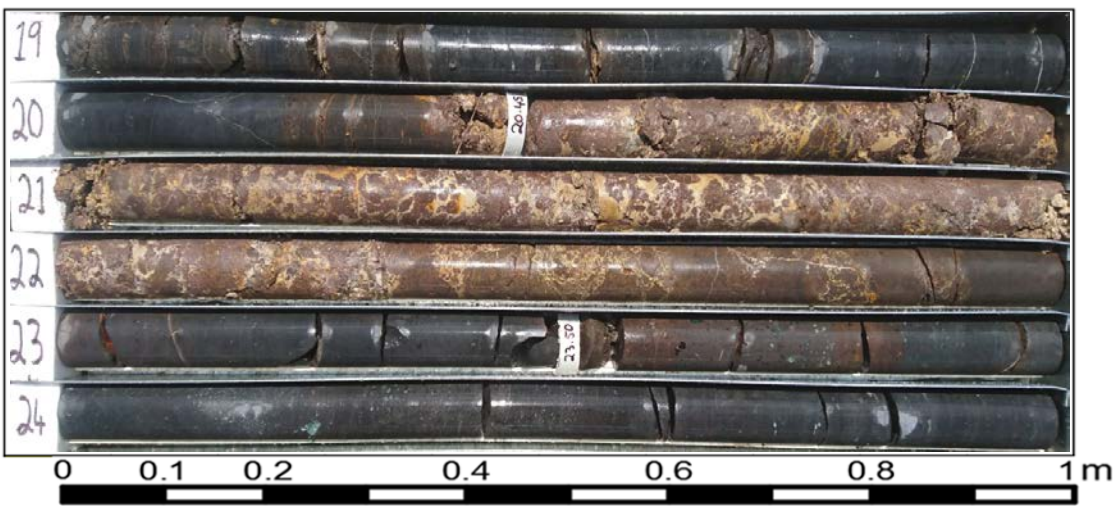
**Grey Scale**



**Colour Scale**



Borehole Number		<b>BH-15</b>	
Box	4	of	4
Depth	19.00m	to	25.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH16

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 1 OF 4

POSITION : E: 365358.700, N: 6710782.000 (56 WGS84)

SURFACE ELEVATION : 1175.032 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT

MOUNTING : TRUCK

CONTRACTOR : DRILL POWER

DRILLER : MARK

DATE STARTED : 7/10/16

DATE COMPLETED : 10/10/16

DATE LOGGED : 10/10/16

LOGGED BY : BD

CHECKED BY : BD

DRILLING				MATERIAL					
METHOD & SUPPORT	PENETRATION	WATER	SAMPLES	FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
METHOD & SUPPORT: ADIT, CASING, WR PENETRATION: VE, U, L, I, S, T WATER: none SAMPLES: none FIELD TESTS: 1.00m SPT, 20/120mm NT=50, 1.12m					1175.0	CI	Silty CLAY: firm, medium plasticity, dark brown with rootlets	F	TOPSOIL
					1174.0	CI-CH	Silty CLAY: stiff, medium to high plasticity, grey brown, moist, moist	St	RESIDUAL SOIL 0.70: auger grinding on rock
					1174.0		BASALT: slightly weathered to moderately weathered, high strength to very high strength, fine grained, grey, iron stained, highly fractured		BEDROCK 1.01: fresh BASALT in SPT
Continued as Cored Drill Hole									
ELEVATION (RL) DEPTH (m) scale from 1175.0 to 1168.0									

UPDATED SMEC LIBRARY\_AGS 3\_1 RTA\_1\_1 LIB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC NON-CORE DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG10677.GDW 15/12/2016 19:11 10.0.000

<b>METHOD</b> HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit WB Wash-bore drilling RR Rock Roller NQ NQ core barrel (42mm diameter) NMLC NMLC core barrel (52mm diameter) HQ HQ Core Barrel (62mm diameter)	<b>PENETRATION</b> No Resistance <b>WATER</b> 	<b>SAMPLES &amp; FIELD TESTS</b> B Bulk Disturbed Sample D Disturbed Sample E Environmental Sample EW Water Sample HM Hammer Bouncing HP Hand Penetrometer (UCS kPa) Nc SPT with solid cone SS Split Spoon Sample R Refusal SPT Standard Penetration Test U50 Undisturbed Sample (50mm dia) U75 Undisturbed Sample (75mm dia) VS Vane Shear; peak/remouded(kPa)	<b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b> Based on Unified Classification System  <b>MOISTURE</b> D Dry M Moist W Wet PL Plastic limit LL Liquid limit	<b>CONSISTENCY/ RELATIVE DENSITY</b> VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



# CORED DRILL HOLE LOG

**HOLE NO : BH16**

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 2 OF 4

POSITION : E: 365358.700, N: 6710782.000 (56 WGS84) SURFACE ELEVATION : 1175.032 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 7/10/16 DATE COMPLETED : 10/10/16 DATE LOGGED : 10/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : HWt BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING		MATERIAL				ROCK MASS					
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL RUN (%)	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
				0.0							
				1.60		1.60m START CORING AT 1.60m					
				2.00		BASALT: grey, fine grained, iron stained around defects, rare amygdales up to 8mm, highly fractured	SW		20		1.60-1.78: FZ, 60-70°, Fe Sn, 0-20mm 1.89-1.95: FZ, 60-70°, Fe Sn, 0-20mm 2.00-2.16: FZ, 60-90°, Fe Sn, 0-20mm (partially open) 2.20: JT, 40°, PR, Ro, Fe Sn
				2.65					35		2.46: JT, 10°, PR, Ro, Fe Sn 2.47-2.58: FZ, Fe Sn, 20-40mm 2.65: JT, 25°, PR, Ro, Fe Sn 2.80-2.84: FZ, Fe Sn 2.84-3.00: JT, 30-90°, PR, Ro, Fe Sn 3.12-3.13: CS, 10-15°, PR, Ro, Fe Sn 3.32: JT, 80°, PR, Ro, Fe Sn
				3.00					25		3.36-3.85: JT, 15-30°, PR, Ro, Fe Sn, 40-100mm spacing 3.75-3.77: SM, 10°, Clay FILLED 3.84-3.95: JT, 80°, PR, Ro, Fe Sn
				4.00		4.00m some dark grey bands, iron stained on fractures, fragmented to highly fractured			45		4.00-5.10: FZ, Fe Sn, 20-40mm (partially open)
				5.40					10		5.21: FC, 0°, IR, Ro, Fe Sn 5.40-5.55: FZ, Fe Sn, 0-20mm 5.51: FC, 55°, PR, Ro, Fe Sn 5.60-5.89: FC, 10-20°, Fe Sn 5.93: JT, 40°, PR, Ro, Fe Ct, 5mm 6.05-6.75: FZ, 10-50°, IR, Ro, Cn 6.71: JT, 60°, PR, Ro, Fe Sn 6.75: JT, 50°, PR, Ro, Fe Clay Ct, 5mm 6.87: JT, PR, Ro, Fe Sn 6.97: JT, 20°, PR, Ro, Fe Sn 7.08: drill spin 7.32: JT, 10-20°, PR, Ro, Fe Sn 7.45: JT, 10-20°, IR, Ro, Fe Sn, 10 mm 7.60: JT, 20°, PR, Fe Sn, 5 mm 7.68: JT, 0-5°, PR, Ro, Fe Sn
				7.00		7.00m LAPILLI TUFF: dark brown clasts in brown matrix, appears matrix supported	HW		55		
				9.0							

DRILLING	WATER	STRENGTH	DEFECT TYPE	COATING	INFILL
AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow  WEATHERING FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low  ROUGHNESS POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handling Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm)  PLANARITY CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



# CORED DRILL HOLE LOG

**HOLE NO : BH16**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 3 OF 4

POSITION : E: 365358.700, N: 6710782.000 (56 WGS84) SURFACE ELEVATION : 1175.032 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 7/10/16 DATE COMPLETED : 10/10/16 DATE LOGGED : 10/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : HWt BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	ELEVATION (RL) (m)	DEPTH (m)	DESCRIPTION	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS
					ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)		● Axial ○ Diametral EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -5 EH -10			(joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC 70% RETURN 0% LOSS 11.55 11.55 70% RETURN 0% LOSS 13.65 14.75 0% LOSS 15.00 15.00 0% LOSS 16.00	0% LOSS	8.35	1167.0	8.0	LAPILLI TUFF: dark brown clasts in brown matrix, appears matrix supported ( <i>continued</i> )	HW		55		7.72: JT, 0-5°, PR, Ro, Fe Sn 7.85: JT, 20°, PR, Ro, Fe Sn 8.06: JT, 30°, PR, Ro, Fe Sn
	0% LOSS	8.55	1166.0	8.26m	BASALT: dark grey-brown, fine grained	MW		0		8.26: JT, 30°, CU, S, Fe Sn 8.31: JT, 10°, Un, S, Fe Sn 8.35-8.60: JT, 0-10°, IR, Ro, Fe Sn 8.66: JT, 40°, PR, Ro, Fe Sn 8.79: FZ, 20°, Fe Sn, 0-10mm
			1165.0	9.0	becoming grey-brown frequent open and closed fractures, iron stained, amygdalae					9.24: JT, 30°, PR, Ro, Fe Sn 9.00-10.00: FZ, Fe Sn, 20-40mm (partially open)
			1165.0	10.0				5		9.92: JT, 70°, PR, Ro, Clay Ct 10.10-10.30: FZ, 80-90°, Clay FILLED 10.30: FC, 65°, PR, Ro, Fe Sn
			1164.0	11.0	11.04m	slightly weathered band to 11.14m				10.30-11.04: FC, 5-20°, PR, Ro, Fe Sn, 20-60mm spacing
			1163.0	12.0	11.55m	becoming more grey with dark grey bands, less iron stained				12.16: JT, 75°, PR, Fe Sn, 5 mm 11.14-13.65: FZ, 5-10°, PR, Ro, Fe Sn, 10-20mm spacing 12.44: JT, 70°, PR, S, Fe Sn 12.49: JT, 15°, PR, S, Fe Sn
			1162.0	13.0					0	12.86: JT, 10°, PR, Ro, Clay Ct 13.00-14.10: FZ, 20-40°, Ro, Sn
			1161.0	14.0					10	14.10-14.35: 10°, Clay FILLED 14.28: 45°, PR, Ro, Fe Sn 14.29: 40°, PR, Ro, Fe Sn
			1160.0	15.0	15.00m	some grey-brown bands, stained with iron on defects				14.40-15.75: FZ, Fe Sn, 20-40mm 15.35: JT, 75°, Un, Ro, Fe Sn 15.40: JT, 25°, PR, Ro, Fe Sn 15.41: JT, 30°, PR, Ro, Fe Sn
			Is(50)	16.0	16.00m					

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handling Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (≥ 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09\_WITH FENCE TOOL GW-20160229 GLB Log SMC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:08 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH16**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 4 OF 4

POSITION : E: 365358.700, N: 6710782.000 (56 WGS84) SURFACE ELEVATION : 1175.032 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 7/10/16 DATE COMPLETED : 10/10/16 DATE LOGGED : 10/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : HWt BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

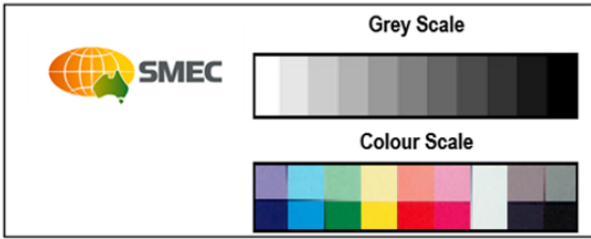
DRILLING			MATERIAL				ROCK MASS		
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL RUN (%)	SAMPLES & FIELD TESTS	DESCRIPTION	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS
			ELEVATION (RL) DEPTH (m)	ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)		● Axial ○ Diametral			(joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	70% RETURN	0% LOSS	d=3.41 MPa Is(50) d=0.84 MPa	LAPILLI TUFF: fine to medium dark brown clasts in pale brown matrix, matrix supported	MW		50		16.54: JT, 5°, IR, Ro, Cn
			16.40m	clast size increasing, generally clast supported					16.80: JT, 5°, Pl, Ro, Cn 16.88: JT, 15°, PR, Ro, Cn 16.89-16.95: JT, 15°, PR, Ro, Cn
NMLC	70% RETURN	0% LOSS	Is(50) d=0.84 MPa	BASALT: dark grey, fine grained, some fine olivine crystals, occasional calcite veins	MW to SW		35		18.20: JT, 10°, Un, Ro, Cn 18.29: JT, 10°, PR, Ro, Fe CA Ct, 3 mm 18.41: JT, 10°, PR, Ro, Fe Sn, 60mm spacing 18.64-18.67: JT, 10°, PR, Ro, Fe Sn, 60mm spacing 18.80: JT, 55°, PR, Ro, Fe Sn 18.92: JT, 10°, IR, Ro, Cn 18.93: JT, 15°, PR, Ro, CA Vr
			18.20m	grey trace grey-brown staining around defects					19.12-19.72: JT, 15-20°, PR, Ro, Fe Sn, 100-300mm spacing
NMLC	70% RETURN	0% LOSS	Is(50) d=0.9 MPa				60		19.91-19.92: FZ, Fe Sn 20.04-20.07: FZ, PR, Ro, Fe Sn
			18.60m						
			Is(50) d=5.17 MPa	BOREHOLE BH16 TERMINATED AT 20.20 m Target depth					

UPDATED SMEC LIBRARY\_AGS\_3\_1 RTA\_1\_1 UB\_09\_WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:08 10.0.000

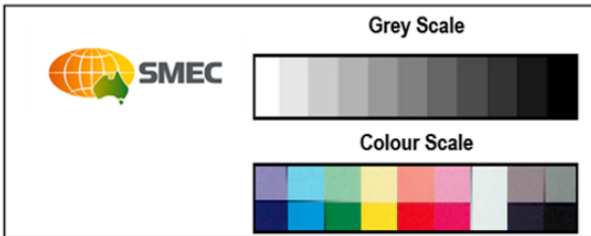
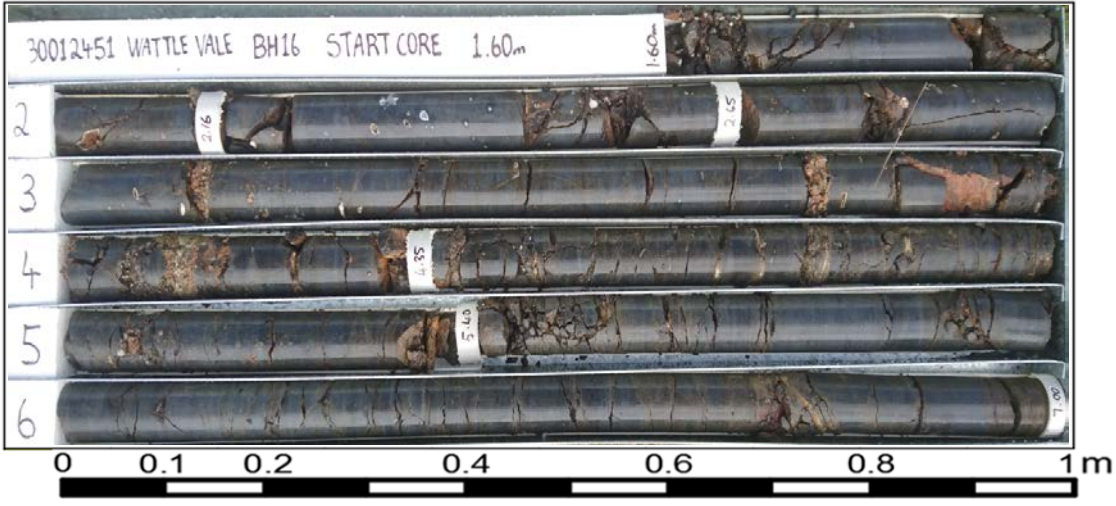
<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

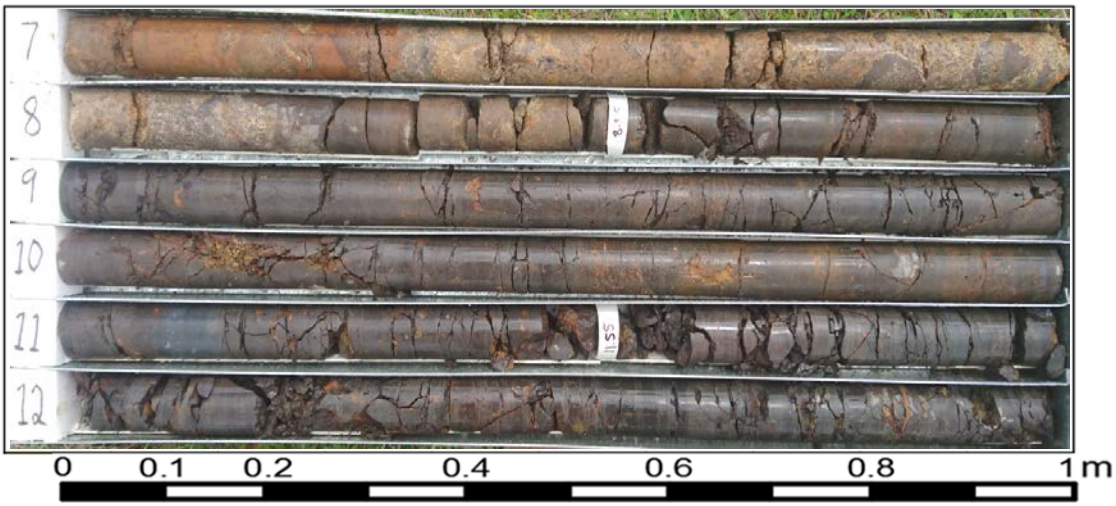





Borehole Number		<b>BH-16</b>	
Box	1	of	4
Depth	1.60m	to	7.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		




Borehole Number		<b>BH-16</b>	
Box	2	of	4
Depth	7.00m	to	13.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		






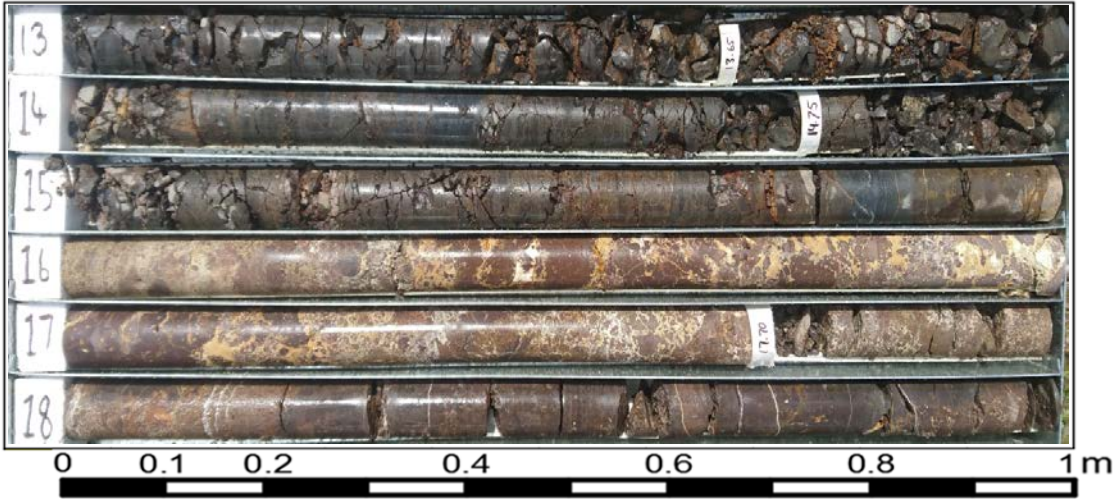

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-16</b>	
Box	3	of	4
Depth	13.00m	to	19.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

**Grey Scale**



**Colour Scale**



Borehole Number		<b>BH-16</b>	
Box	4	of	4
Depth	19.00m	to	20.20m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		





# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH17

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 1 OF 4

POSITION : E: 365428.200, N: 6710740.200 (56 WGS84)

SURFACE ELEVATION : 1176.783 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT

MOUNTING : TRUCK

CONTRACTOR : DRILL POWER

DRILLER : MARK

DATE STARTED : 10/10/16

DATE COMPLETED : 12/10/16

DATE LOGGED : 12/10/16

LOGGED BY : BD

CHECKED BY : BD

DRILLING				MATERIAL								
METHOD & SUPPORT	PENETRATION	WATER	SAMPLES	FIELD TESTS	ELEVATION (RL) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	STRUCTURE & Other Observations
NMLC CASING GNO NW Casing		GNO	SPT 4, 6, 7 N=13  1.00m SPT 4, 6, 7 N=13  1.45m  1.87m SPT 36/130mm N=R N*=83 2.00m	0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0	1176.0 1175.0 1174.0 1173.0 1172.0 1171.0 1170.0 1169.0		CI-CH CI-CH CI (Bedrock pattern)	Silty CLAY: firm, medium to high plasticity, dark brown with rootlets, moist	M	F  St	1.95: auger refusal	TOPSOIL
								Silty CLAY: stiff, medium to high plasticity, grey-brown, moist				RESIDUAL SOIL
								Silty CLAY: stiff, medium plasticity, orange mottled grey, moist				BEDROCK
								BASALT: extremely weathered, extremely low strength, grey-brown stained dark brown, some slightly weathered fragments				Continued as Cored Drill Hole

<b>METHOD</b> HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit WB Wash-bore drilling RR Rock Roller NQ NQ core barrel (42mm diameter) NMLC NMLC core barrel (52mm diameter) HQ HQ Core Barrel (62mm diameter)	<b>PENETRATION</b> No Resistance	<b>SAMPLES &amp; FIELD TESTS</b> B Bulk Disturbed Sample D Disturbed Sample E Environmental Sample EW Water Sample HM Hammer Bouncing HP Hand Penetrometer (UCS kPa) Nc SPT with solid cone SS Split Spoon Sample R Refusal SPT Standard Penetration Test U50 Undisturbed Sample (50mm dia) U75 Undisturbed Sample (75mm dia) VS Vane Shear; peak/remoulded(kPa)	<b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b> Based on Unified Classification System	<b>CONSISTENCY/RELATIVE DENSITY</b> VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
<b>SUPPORT</b> T Timbering C Casing M Mud	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow	<b>MOISTURE</b> D Dry M Moist W Wet PL Plastic limit LL Liquid limit		

See Explanatory Notes for details of abbreviations & basis of descriptions.



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 LIB 09 WITH FENCE TOOL GW-20160229.GLB Log SMC NON-CORE DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG10677.GDW 15/12/2016 19:11 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH17**

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 2 OF 4

POSITION : E: 365428.200, N: 6710740.200 (56 WGS84) SURFACE ELEVATION : 1176.783 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 10/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : HWT/NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
			0.0							
			1175.0							
			2.00m		2.00m START CORING AT 2.00m					
			2.30m		BASALT: grey, fine grained, occasional amygdalae up to 10mm, iron stained on defects, highly fractured	SW				2.00-2.27: FZ, Fe Sn, 20-40mm
		0% LOSS	2.65		extremely weathered zone to 2.5m	EW		0		2.30-2.50: weathered seam
			1174.0			SW				
			3.10m		becoming slightly fractured, frequent healed fractures 40-60mm spacing					2.50-2.85: FZ, Fe Sn, 40-60mm 2.89: FC, 5°, IR, Ro, Fe Sn 3.02-3.03: SM, Clay FILLED
			1173.0							
			4.0					40		3.06-3.38: JT, 10-25°, PR, Ro, Clay Ct, <5 mm, 20-100mm spacing 3.63-3.65: SM, Clay FILLED 3.78: JT, 65°, PR, Ro, Fe Sn 3.86: JT, 60°, Un, Ro, Clay Ct, 2 mm 4.02: JT, 60°, PR, Ro, Fe Sn 4.13-4.14: SM, 5°, Clay FILLED 4.14-4.33: JT, 80-90°, Un, Ro, Fe Sn 4.35: JT, 60°, PR, Ro, Fe Sn 4.50: JT, 55°, DIS, Ro, Fe Sn 4.38-4.97: JT, 10-20°, PR, Ro, Clay Ct, <5 mm, 60-180mm spacing
		0% LOSS	5.55							5.06-5.07: SM, 10°, Clay FILLED 5.27: JT, 10°, PR, Ro, Clay Ct, 3 mm 5.40: JT, 10-15°, PR, Ro, Fe Sn 5.50: JT, 65°, CU, Ro, Fe Sn 5.56-5.62: FZ, Fe Sn, 0-20mm 5.80-5.82: CS 5.89: FC, 5°, IR, Ro, Fe Sn
			1172.0							
			6.0		6.00m occasional crushed seams			15		6.00-6.94: FZ, 0-20°, Clay Vr, 0-20mm
		0% LOSS	6.65		fragmented, some clay in fractures					
			1171.0							
			7.00		6.94m CORE LOSS 0.06m (6.94-7.00) 7.00m CORE LOSS 0.12m (7.00-7.12) 7.12m BASALT: becoming less fractured between 7.66-8.16m	SW		0		7.12-7.66: FZ, Fe Sn, 0-20mm
		0% LOSS	7.00							
			1170.0							
			8.0					15		7.83-7.85: CS, Clay Ct 7.90-8.00: FZ, Fe Sn
			1169.0							

DRILLING	WATER	STRENGTH	DEFECT TYPE	COATING	INFILL
AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow  WEATHERING FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low  ROUGHNESS POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handling Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm)  PLANARITY CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous

See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



UPDATED SMEC LIBRARY\_AGS 3.1 RTA 1.1 LIB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:08 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH17**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 3 OF 4

POSITION : E: 365428.200, N: 6710740.200 (56 WGS84) SURFACE ELEVATION : 1176.783 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 10/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : HWT/NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING		MATERIAL				ROCK MASS						
METHOD & CASING	WATER RETURN (%)	CORE LOSS (m)	SAMPLES & FIELD TESTS	ELEVATION (RL) (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS
							ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)		● Axial ○ Diametral			(joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NW Casing	0% LOSS	8.25		1168.0	8.0		8.16m BASALT: becoming less fractured between 7.66-8.16m (continued)	SW	VL	15	20-40mm	8.00-8.16: FZ, Fe Sn, 20-40mm
	0% LOSS			1168.0	8.25		CORE LOSS 0.09m (8.16-8.25)	SW				8.25-8.60: FZ, Fe Sn, 20-40mm
	0% LOSS			1168.0	8.60		BASALT: becoming highly fractured	MW				8.53-8.70: FC, 80-90°, IR, Ro, Fe Sn
	0% LOSS			1168.0	9.0		becoming dark grey-black with iron staining	MW				8.82-9.00: FC, 80-90°, IR, Ro, Fe Sn
	0% LOSS			1168.0	9.25			EW				9.06-9.12: FZ, Fe Sn, 20-40mm
	0% LOSS			1168.0	9.35		LAPILLI TUFF: brown mottled dark brown-grey, weathered to clay in parts	EW				9.25-9.35: extremely weathered zone
	0% LOSS			1168.0	9.59		CORE LOSS 0.24m (9.35-9.59)	EW				9.59-9.80: extremely weathered zone
	0% LOSS			1168.0	9.80		LAPILLI TUFF: brown mottled dark brown-grey, weathered to clay in parts	EW to HW				9.82-9.92: FZ, Fe Sn, 0-20mm
	0% LOSS			1168.0	10.0		becoming dark grey-brown with iron stains, some highly weathered zones	EW to HW				10.07-10.12: FZ, Fe Sn, 0-10mm
	0% LOSS			1168.0	10.25			MW to HW				10.20: SM, weathered rock
	0% LOSS		Is(50) d=0.7 MPa	1168.0	10.25		BASALT: frequent decomposed amygdaloids up to 15mm, becoming less fractured	MW to HW				10.25-10.94: JT, 10-20°, PR, Ro, Fe Sn, 40-100mm spacing
	0% LOSS			1168.0	11.0		frequent healed fracturing	MW to HW				10.96: JT, 40-60°, PR, Ro, Fe Sn
	0% LOSS			1168.0	11.55			MW to HW				11.02: JT, 20-40°, PR, Ro, Fe Sn
	0% LOSS			1168.0	11.65			MW to HW				11.10-11.55: JT, 5-10°, IR, Ro, Fe Sn, 40-100mm spacing (partially open)
	0% LOSS			1168.0	11.85			MW to HW				11.57-11.65: DB
	0% LOSS			1168.0	12.0			MW to HW				11.67-11.68: FZ, Fe Sn
	0% LOSS			1168.0	12.0			MW to HW				11.75-11.77: SM, 10-15°, Clay FILLED
	0% LOSS			1168.0	12.0			MW to HW				11.86: JT, 30°, PR, Ro, Fe Sn
	0% LOSS			1168.0	12.0			MW to HW				11.92-11.98: SM, Clay FILLED
	0% LOSS			1168.0	13.0			MW to HW				12.06-13.04: FC, 5-40°, IR, Ro, Fe Sn, 20-60mm spacing (partially open)
	0% LOSS			1168.0	13.25		dark grey-black, highly fractured	MW				13.04-13.20: JT, 80-90°, IR, Ro, Fe Sn
	0% LOSS			1168.0	13.25			MW				13.20-13.42: DB, (rock roller) during casing install
	0% LOSS			1168.0	13.48			MW				13.48-13.68: FC, 5°, IR, Ro, Fe Sn, 20-60mm spacing
	0% LOSS			1168.0	13.82			MW				13.82: JT, 35°, PR, Ro, Fe Sn
	0% LOSS			1168.0	13.90			MW				13.90: FC, 20°, IR, Ro, Fe Sn
	0% LOSS			1168.0	14.0			MW				14.00-15.01: FZ, 20-40mm (possible drill break)
	0% LOSS			1168.0	15.0			MW				15.08-15.41: JT, 30-80°, PR, Ro, Fe Sn, 20-40mm
	0% LOSS			1168.0	15.30		AGGLOMERATE: dark brown clasts in pale brown matrix, clast supported, clast size reducing 15.70-15.93m	MW to HW				15.49: JT, 10°, PR, Ro, Cn
	0% LOSS			1168.0	15.67			MW to HW				15.67: JT, 10°, PR, Ro, Cn
	0% LOSS			1168.0	15.72			MW to HW				15.72: JT, 10°, IR, Ro, Cn
	0% LOSS			1168.0	15.92			MW to HW				15.92: JT, 10-25°, IR, Ro, Cn,

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09\_WITH FENCE TOOL GW-20160229.GLB Log SMC CORED DRILL HOLE\_GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:08 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH17**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 4 OF 4

POSITION : E: 365428.200, N: 6710740.200 (56 WGS84) SURFACE ELEVATION : 1176.783 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 10/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : HWT/NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	ELEVATION (RL) (m)	DEPTH (m)	DESCRIPTION	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS
					ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)		● Axial ○ Diametral EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -5 EH -10			(joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	50% RETURN	0% LOSS	16.0	16.20m	some thin calcite veins	MW to HW		25		20 mm 16.02-16.39: JT, 10-30°, PR, Ro, Fe Sn 16.51-16.55: FZ, Fe Sn, 0-20mm 16.66-16.71: weathered seam
			17.0	16.80m	LAPILLI TUFF: fine-course gravel sized clasts in pale brown matrix, matrix supported	HW		20		16.91-17.20: JT, 10-20°, IR, Ro, Cn, 40-60mm spacing (possible drill break) 17.24-17.59: FZ, Cn, 0-20mm 17.64: FC, IR, Ro, Cn 17.77: FC, IR, Ro, Cn 17.84-17.88: FZ, Cn, 0-20mm 18.02: JT, 5°, PR, Ro, Cn
			18.0	18.10m	clast size increasing appears clast supported. calcite veins more prevalent AGGLOMERATE	HW to MW		45		18.26: JT, 15°, PR, Ro, Fe Sn 18.47: JT, 15°, PR, Ro, CA Ct, 2 mm 18.54: VN, 25-40°, PR, Ro, CA Ct, (open) 18.63: JT, 20°, PR, Ro, CA Vr 18.72: FC, 5°, DIS, Ro, Fe Sn
			19.0	18.55m	appears to transition into BASALT with thin calcite veins	MW				18.83-19.55: FZ, IR, Fe Sn, 40-60mm 19.67: JT, 15°, IR, Ro, Cn 19.71-19.77: CS, FILLED, calcite fragments
			20.0	19.00m	clasts becoming evident, matrix visible, some calcite infill in vugs at 19.6-19.7m sub vertical fractures throughout	MW to HW				
			20.0	20.00m	BOREHOLE BH17 TERMINATED AT 20.00 m Target depth					


UPDATED SMEC LIBRARY\_AGS 3\_1 RTA 1\_1 UB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:08 10.0.0000

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA






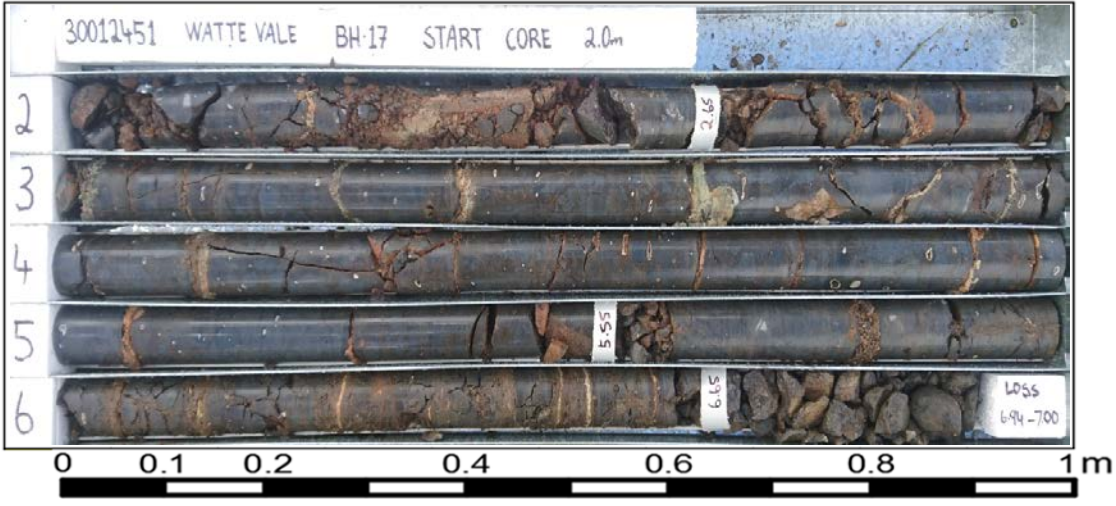

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-17</b>	
Box	1	of	4
Depth	2.00m	to	7.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

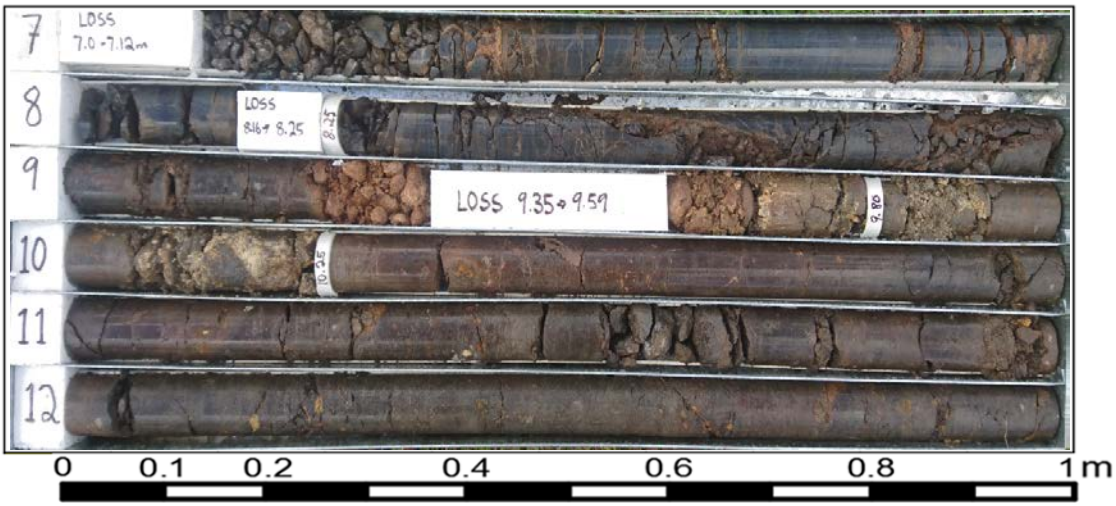
**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-17</b>	
Box	2	of	4
Depth	7.00m	to	13.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		






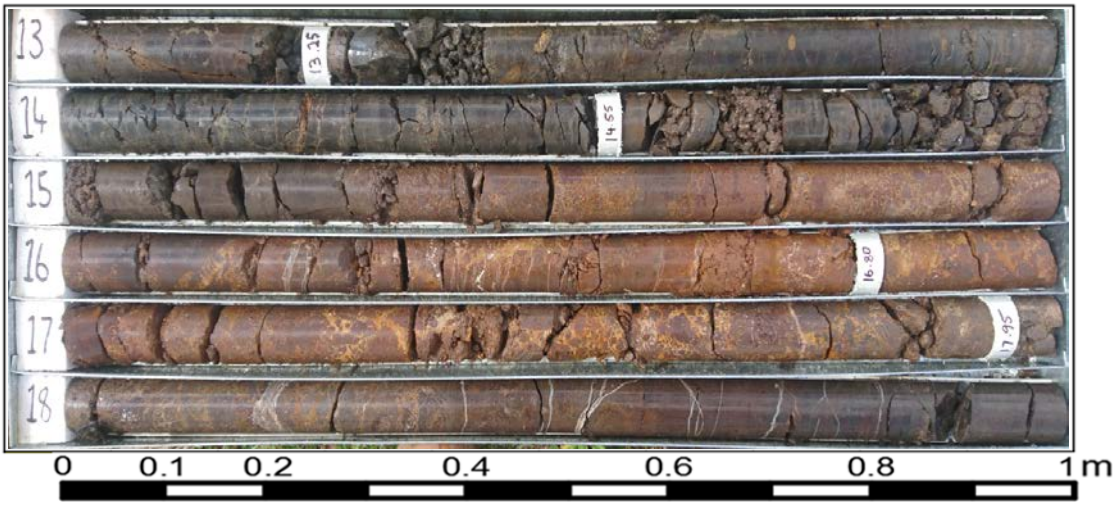

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-17</b>	
Box	3	of	4
Depth	13.00m	to	19.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

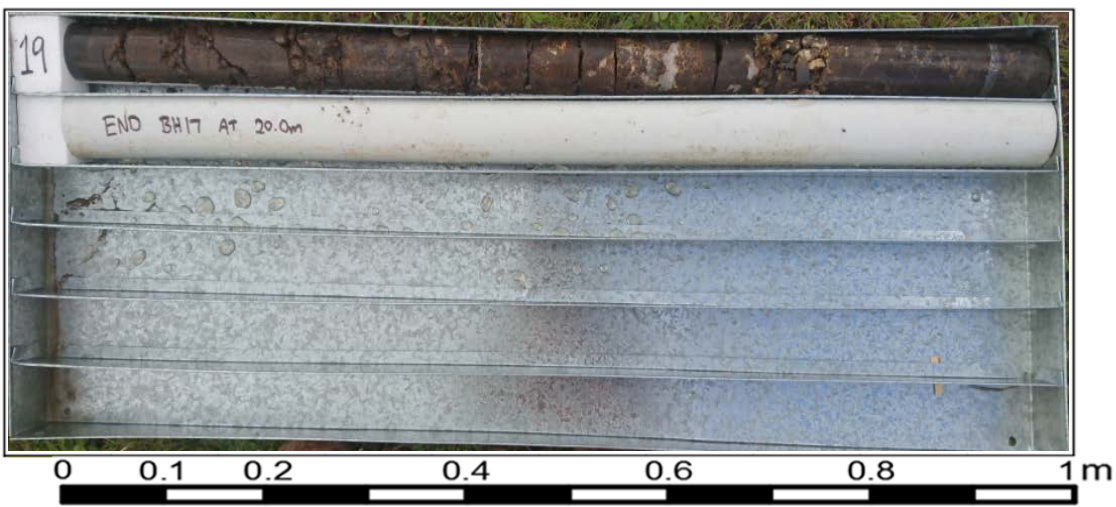
**Grey Scale**



**Colour Scale**



Borehole Number		<b>BH-17</b>	
Box	4	of	4
Depth	19.00m	to	20.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH18

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 1 OF 5

POSITION : E: 365469.000, N: 6710667.800 (56 WGS84)

SURFACE ELEVATION : 1180.683 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT

MOUNTING : TRUCK

CONTRACTOR : DRILL POWER

DRILLER : MARK

DATE STARTED : 11/10/16

DATE COMPLETED : 12/10/16

DATE LOGGED : 12/10/16

LOGGED BY : BD

CHECKED BY : BD

DRILLING				MATERIAL								
METHOD & SUPPORT	PENETRATION	WATER	SAMPLES	FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	STRUCTURE & Other Observations
METHOD & SUPPORT ADIT NW Casing RR	PENETRATION VE WB AD ADT WB RR NQ NMLC HQ	WATER Level on Date shown Drilling water level water inflow water outflow	SAMPLES 1.00m SPT 30/150mm HB N <sub>60</sub> =60 1.15m	FIELD TESTS	0.0		CI-CH	0.20m Silty CLAY: firm, medium to high plasticity, dark brown, moist	M	F	-	TOPSOIL
					0.80m Silty CLAY: stiff, medium to high plasticity, grey-brown, moist		SI	RESIDUAL SOIL				
					1180.0		0.80m BASALT: moderately weathered BASALT fragments in brown clay matrix		BEDROCK			
					1179.0			Continued as Cored Drill Hole				1.50: moderately weathered BASALT and CLAY in cuttings
					1178.0							
					1177.0							
					1176.0							
					1175.0							
					1174.0							
					1173.0							
					9.0							

<b>METHOD</b> HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit WB Wash-bore drilling RR Rock Roller NQ NQ core barrel (42mm diameter) NMLC NMLC core barrel (52mm diameter) HQ HQ Core Barrel (62mm diameter)	<b>PENETRATION</b> No Resistance	<b>SAMPLES &amp; FIELD TESTS</b> B Bulk Disturbed Sample D Disturbed Sample E Environmental Sample EW Water Sample HM Hammer Bouncing HP Hand Penetrometer (UCS kPa) Nc SPT with solid cone SS Split Spoon Sample R Refusal SPT Standard Penetration Test U50 Undisturbed Sample (50mm dia) U75 Undisturbed Sample (75mm dia) VS Vane Shear; peak/remouded(kPa)	<b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b> Based on Unified Classification System
<b>SUPPORT</b> T Timbering C Casing M Mud	<b>MOISTURE</b> D Dry M Moist W Wet PL Plastic limit LL Liquid limit	<b>CONSISTENCY/ RELATIVE DENSITY</b> VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense	

See Explanatory Notes for details of abbreviations & basis of descriptions.



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 LIB 09 WITH FENCE TOOL GW-20160229.GLB Log SMC NON-CORE DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG10677.GDW 15/12/2016 19:11 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH18**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 2 OF 5

POSITION : E: 365469.000, N: 6710667.800 (56 WGS84) SURFACE ELEVATION : 1180.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 11/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING				MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
				0.0							
				1180.0							
				1179.0							
				1178.0		2.70m START CORING AT 2.70m					
	0% LOSS 2.85			3.0		BASALT: grey some pale orange staining, fine grained, some healed fractures	MW to SW		0		2.70-3.25: recovered as rubble possible clay fines washed out
	0% LOSS 3.30			3.50m		sub vertical fracture to 3.90m			0		3.25-3.49: FZ, Fe Sn, 20-40mm (partially open) 3.50: JT, 35°, PR, Ro, Fe Sn 3.50-3.90: 70-90°, Ro, Clay FILLED, <7 mm, extremely weathered basalt 3.90: JT, 35°, IR, Ro, Fe Sn 4.03-4.07: FZ, 10-30°, FILLED, highly weathered rock
	0% LOSS 4.50		Is(50) d=1.28 MPa	4.0					0		4.24-4.50: FZ, 10-90°, Fe Sn, 0-20mm (partially open) 4.59: JT, 15°, PR, Ro, Fe Sn
	0% LOSS 4.75			4.60m		brown becoming grey, orange-brown bands, frequent partially open fractures	HW		0		4.65-5.07: FZ, Fe Sn, 10-20mm 5.07-5.10: SZ, <10 mm, lenticular
	0% LOSS 5.25			5.0			MW to HW		0		5.18-5.74: FZ, Fe Sn, 20-40mm (partially open) 5.74-5.75: CS, Fe Sn, 0-10mm 5.76: JT, PR, Ro, Fe Sn 5.83: JT, 30°, PR, Ro, Fe Sn
	0% LOSS 5.85			6.0					0		5.84-6.40: FZ, Fe Sn, 20-40mm (partially open) 6.10-6.32: JT, 20-30°, PR, Ro, Fe Sn, 40-80mm spacing
	0% LOSS 6.40			6.40m		some extremely low strength zones, fragmented 6.70-7.13m recorded as rubble picked up in next core run, possible clay fines washed away			0		7.17: JT, 80°, PR, S, Fe Sn
	0% LOSS 6.95			7.0					0		7.39-7.40: SM, 15°, Clay FILLED 7.48: JT, 80°, PR, S, Fe Sn 7.15-7.85: FZ, Fe Sn, 20-40mm
	0% LOSS 7.20			7.15m		dark grey, trace iron staining, less fractured, some healed fracturing above 9.8m	SW		0		7.90: FC, 70-80°, IR, Ro, Fe
	0% LOSS			1173.0					20		

UPDATED SMEC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09\_WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA





# CORED DRILL HOLE LOG

**HOLE NO : BH18**

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 3 OF 5

POSITION : E: 365469.000, N: 6710667.800 (56 WGS84) SURFACE ELEVATION : 1180.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 11/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS				
METHOD & CASING	WATER RETURN (%)	CORE LOSS (%)	ELEVATION (RL) (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS
						ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	SW to FR	EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH -10	20		(joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
	0% LOSS		8.0			dark grey, trace iron staining, less fractured, some healed fracturing above 9.8m (continued)					Sn 8.00-8.05: FZ, Sn, 20-40mm 8.05: JT, 10°, PR, S, Clay Ct 8.16: JT, 15°, PR, S, Clay Vr 8.22-8.23: CS, Fe Sn, 0-10mm 8.27: JT, 15°, PR, S, Fe Sn 8.36-8.45: JT, 10-20°, PR, S, Fe Sn, 10-30mm spacing 8.60-8.63: FZ, Fe Sn, 0-10mm 8.67: JT, 0°, PR, Ro, Fe Sn 8.86-8.87: FZ, 5-10°, Fe Sn, 10 mm 8.96-9.04: JT, 10-15°, PR, Ro, Fe Sn 9.15-9.16: CS, 5°, Fe Sn 9.27-9.28: CS, 10°, Fe Sn 9.42: JT, 60°, PR, Ro, Fe Sn 9.44-9.74: FZ, Fe Sn, 20-40mm 9.79-9.81: CS, PR, Ro, Fe Sn 9.91-9.94: FZ, Cn, 20-40mm 10.03-10.11: FZ, Fe Sn, 20-40mm 10.28: FC, 5-10°, IR, Ro, Fe Sn 10.29: JT, 10°, PR, Ro, Fe Sn 10.82: JT, 5°, PR, S, Clay Vr 10.91: JT, 15°, PR, Ro, Cn 11.02-11.04: FZ, Cn, 0-10mm 11.11: JT, 10°, Un, Ro, Fe Ct 11.33-11.53: FC, 70-90°, Un, Ro, MU Vr 11.45: JT, 10°, IR, Ro, Fe Sn 11.60: JT, 10°, PR, Ro, Fe Sn 11.95: JT, 50°, PR, Ro, Fe Sn 12.06: FC, 65°, IR, Ro, Fe Vr 12.14-12.19: CS, Fe Sn, 0-10mm 12.50: JT, 15°, PR, Ro, Fe Sn 12.51: JT, 75°, DIS, Ro, Fe Sn 12.57-12.92: FZ, 0-40°, Fe Sn, 20-40mm 13.03: FC, 10°, PR, Ro, Cn 13.47: FC, 60°, PR, Ro, Fe Sn 13.80: FC, 30°, PR, Ro, Fe Sn 14.35-14.50: SM, weathered rock 14.58: DB 14.59: DB 14.93: FC, 45-50°, IR, Ro, CA Vr 15.10: DB 15.42: FC, 5°, IR, Ro, Cn
	0% LOSS		8.60			Is(50) d=6.65 MPa					
	0% LOSS		11.72.0			Is(50) d=1.33 MPa					
	0% LOSS		11.71.0			Is(50) d=5.95 MPa					
	0% LOSS		11.70.0			Is(50) d=8.04 MPa					
	0% LOSS		11.69.0			Is(50) d=0.22 MPa					
	0% LOSS		12.20m			dark grey-brown, frequent thin calcite veins and healed fractures	MW				
	0% LOSS		12.31m			grey-brown band of hardened clay mineral					
	0% LOSS		12.51m			dark grey-brown, frequent thin calcite veins and healed fracturing					
	0% LOSS		12.51m			LAPILLI TUFF: dark brown clasts in brown matrix, matrix supported					
	0% LOSS		13.23m			BASALT: fine grained grey-brown to dark grey frequent thin calcite veins and healed fractures					
	0% LOSS		13.90m			LAPILLI TUFF: dark brown clasts in pale orange-brown matrix					
	0% LOSS		14.50m			BASALT: fine grained grey to grey-brown some orange occasional thin calcite veins					
	0% LOSS		14.85m			grey to dark grey some vugs up to 20mm filled with green blue clay mineral					
	0% LOSS		15.0			Is(50) d=5.15 MPa					
	0% LOSS		15.65.0								

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slicksided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09 WITH FENCE TOOL GW-20160229.GLB Log SMC CORED DRILL HOLE\_GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH18**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 4 OF 5

POSITION : E: 365469.000, N: 6710667.800 (56 WGS84) SURFACE ELEVATION : 1180.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 11/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH (%)	ELEVATION (RL) / DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC 100% RETURN	0% LOSS	Is(50) d=1.76 MPa	16.0	[V-pattern]	grey to dark grey some vugs up to 20mm filled with green blue clay mineral ( <i>continued</i> )	SW to FR	[Strength Scale]	90	[Defect Spacing Scale]	16.24: JT, 15°, IR, Ro, CA Ct 16.29-16.43: FZ, Cn, 0-20mm
			17.0		16.60: JT, 10°, PR, S, Cn 16.80: JT, 15°, IR, Ro, Cn					
			17.70m		some healed fractures generally 30°					17.22: JT, 15°, PR, S, Cn 17.31: JT, 30°, PR, Ro, Cn 17.36: JT, 70°, PR, S, Cn 17.41: JT, 10°, PR, Ro, Cn 17.61: JT, 10°, PR, Ro, Cn
			18.0		17.85: JT, 45°, PR, S, MU Vr					
			18.60m		some iron stained healed fractures 45°-75°					18.06: JT, 30°, PR, Ro, Cn 18.21: JT, 20°, PR, S, Cn 18.42: JT, 30°, PR, Ro, Fe Sn
			19.0		18.68: FC, 15°, DIS, S, Cn					
			19.12m		dark grey-brown					
			19.00m		AGGLOMERATE: high strength, dark brown clasts in pale brown matrix, clasts up to 80mm appears matrix supported					19.70-20.40: DB, drill break
			20.0		matrix becoming pale grey					
			20.42							
NMLC 100% RETURN	0% LOSS	Is(50) d=0.46 MPa	20.42	[V-pattern]		HW	[Strength Scale]	100	[Defect Spacing Scale]	
			21.0							
			22.0							
			22.00m		BASALT: dark grey grey-brown thin sub vertical veins of unidentified mineral, fine grained					MW
NMLC 100% RETURN	0% LOSS	Is(50) d=0.77 MPa	22.0	[V-pattern]	grey to dark grey, rare healed fractures	SW to FR	[Strength Scale]	100	[Defect Spacing Scale]	22.75: JT, 75°, PR, Ro, Cn 22.93: JT, 10°, PR, Ro, Cn 23.12: FC, 65°, CU, Ro, MU Vr 23.33: JT, 30°, IR, Ro, Cn 23.48: JT, 15°, PR, Ro, Cn
			22.50m							
			23.0							
			23.43							
NMLC 100% RETURN	0% LOSS	Is(50) d=1.34 MPa	23.0	[V-pattern]		SW to FR	[Strength Scale]	100	[Defect Spacing Scale]	
			23.43							
NMLC 100% RETURN	0% LOSS	Is(50) d=3.38 MPa	23.43	[V-pattern]		SW to FR	[Strength Scale]	100	[Defect Spacing Scale]	
			23.85m		some bands of blue green clay mineral inclusions					
24.0										

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY\_AGS\_3\_1 RTA\_1\_1 UB\_09\_WITH FENCE TOOL GW-20160229.GLB Log SMC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH18**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 5 OF 5

POSITION : E: 365469.000, N: 6710667.800 (56 WGS84) SURFACE ELEVATION : 1180.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 11/10/16 DATE COMPLETED : 12/10/16 DATE LOGGED : 12/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

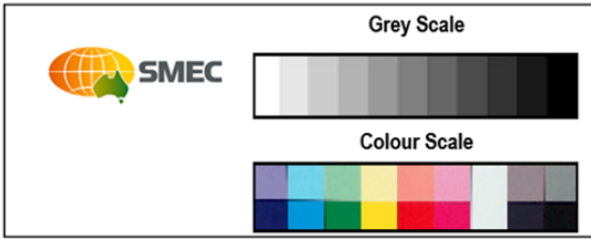
DRILLING				MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL RUN (%)	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	100% RETURN	0% LOSS	Is(50) d=5.59 MPa	24.0	▽	some bands of blue green clay mineral inclusions (continued)	SW to FR	L	100	24.16: JT, PR, S, MU Vr 24.48: JT, 25°, PR, S, Cn	
	25.00	25.00		25.0	▽	24.84m 25.00m grey BOREHOLE BH18 TERMINATED AT 25.00 m Target depth					
				26.0							
				27.0							
				28.0							
				29.0							
				30.0							
				31.0							
				32.0							

UPDATED SMEC LIBRARY\_AGS 3\_1 RTA 1\_1 UB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

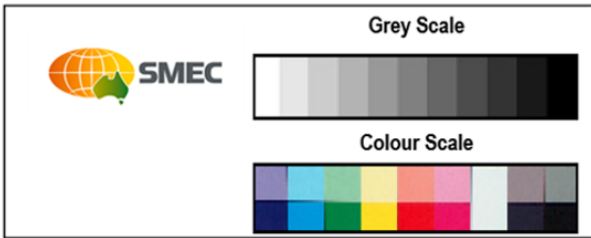
<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.






Borehole Number		<b>BH-18</b>	
Box	1	of	4
Depth	2.70m	to	8.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		




Borehole Number		<b>BH-18</b>	
Box	2	of	4
Depth	8.00m	to	14.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		






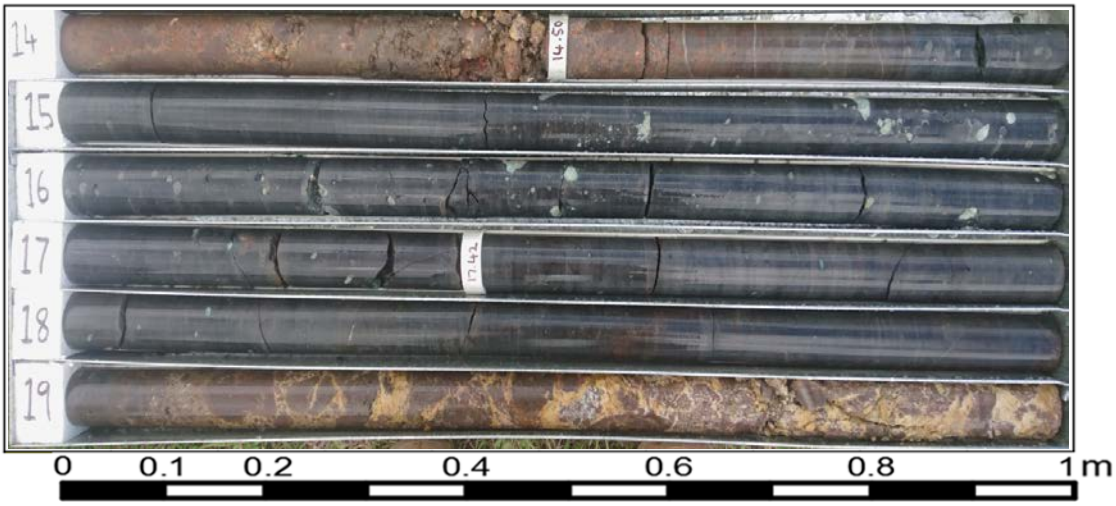

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-18</b>	
Box	3	of	4
Depth	14.00m	to	20.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

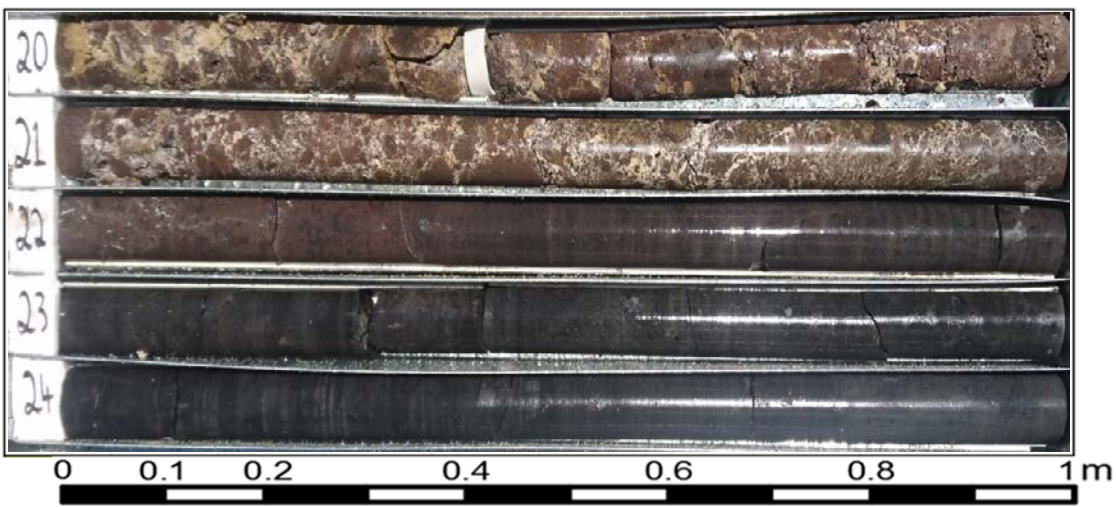
**Grey Scale**



**Colour Scale**



Borehole Number		<b>BH-18</b>	
Box	4	of	4
Depth	20.00m	to	25.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH19

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 1 OF 5

POSITION : E: 365236.100, N: 6710549.800 (56 WGS84)

SURFACE ELEVATION : 1179.683 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT

MOUNTING : TRUCK

CONTRACTOR : DRILL POWER

DRILLER : MARK

DATE STARTED : 20/10/16

DATE COMPLETED : 21/10/16

DATE LOGGED : 21/10/16

LOGGED BY : BD

CHECKED BY : BD

DRILLING				MATERIAL								
METHOD & SUPPORT	PENETRATION	WATER	SAMPLES	FIELD TESTS	ELEVATION (RL) / DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	STRUCTURE & Other Observations
RR NW Casing ADT				1.00m SPT 4, 9, 13 N=22	0.0		CI-CH	Silty CLAY: firm, medium to high plasticity, dark brown, moist	M	St		TOPSOIL
					0.20m		CI-CH	Silty CLAY: still, medium to high plasticity, brown, moist				RESIDUAL SOIL
					1.00m		1.00m BASALT: extremely low strength, extremely weathered, grey and dark brown, some moderately weathered chips	1.45m SPT 30/130mm N1=69 2.63m	1.00m			BEDROCK
2.00m	3.45m Continued as Cored Drill Hole											
2.50m						1179.0	1178.0	1177.0		1176.0	1175.0	

UPDATED SMEC LIBRARY\_AGS 3\_1 RTA\_1\_1 LIB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC NON-CORE DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG10677.GDW 15/12/2016 19:11 10.0.000

<b>METHOD</b> HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit WB Wash-bore drilling RR Rock Roller NQ NQ core barrel (42mm diameter) NMLC NMLC core barrel (52mm diameter) HQ HQ Core Barrel (62mm diameter)	<b>PENETRATION</b> No Resistance  <b>WATER</b> 	<b>SAMPLES &amp; FIELD TESTS</b> B Bulk Disturbed Sample D Disturbed Sample E Environmental Sample EW Water Sample HM Hammer Bouncing HP Hand Penetrometer (UCS kPa) Nc SPT with solid cone SS Split Spoon Sample R Refusal SPT Standard Penetration Test U50 Undisturbed Sample (50mm dia) U75 Undisturbed Sample (75mm dia) VS Vane Shear; peak/remoude(kPa)	<b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b> Based on Unified Classification System  <b>MOISTURE</b> D Dry M Moist W Wet PL Plastic limit LL Liquid limit	<b>CONSISTENCY/ RELATIVE DENSITY</b> VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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See Explanatory Notes for details of abbreviations & basis of descriptions.



# CORED DRILL HOLE LOG

**HOLE NO : BH19**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 2 OF 5

POSITION : E: 365236.100, N: 6710549.800 (56 WGS84) SURFACE ELEVATION : 1179.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS				
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
				0.0							
				1179.0							
				1178.0							
				1177.0							
				3.45m		3.45m START CORING AT 3.45m					
				1176.0		BASALT: grey stained with iron, fine grained, fragmented	SW				3.45-3.85: FZ, Fe Sn, 0-20mm
		0% LOSS		4.25					0		3.95-4.00: FZ, Fe Sn, 0-20mm 4.05: JT, 40-70°, CU, Ro, Fe Sn
		0% LOSS		5.20					0		4.12-4.16: SM, 15°, Clay FILLED
		0% LOSS		5.50					0		4.20-5.20: FZ, Fe Sn, 0-20mm
		0% LOSS		5.50					0		
		0% LOSS		5.75					0		
		0% LOSS		6.35					0		5.50-6.45: FZ, Fe Sn, 0-20mm
		0% LOSS		6.48m		6.48m less fractured, occasional amygdalae					
		0% LOSS		7.0					25		6.45-6.83: FC, 20-70°, Clay Ct, <5 mm, 20-70mm spacing 6.83-6.85: CS, 15-20°, Fe Sn, 0-10mm 6.85-7.00: FZ, 15-30°, CA Vr, 0-20mm rock roller when installing neasial 6.95: JT, 25°, PR, S, Clay Ct, <2 mm 7.05-7.10: FZ, Fe Sn, 0-20mm 7.10: JT, 70°, IR, Ro, Fe Sn 7.15: JT, 15°, PR, Ro, Clay Vr 7.26: JT, 10°, PR, Ro, Fe Sn 7.45: JT, 15°, CU, Ro, Clay Ct,

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (≥ 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09\_WITH FENCE TOOL GW-20160229.GLB Log SMC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.0000

# CORED DRILL HOLE LOG

**HOLE NO : BH19**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 3 OF 5

POSITION : E: 365236.100, N: 6710549.800 (56 WGS84) SURFACE ELEVATION : 1179.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS					
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other		
NMLC 21/11/16 100% RETURN	0% LOSS	8.25	8.0	V	less fractured, occasional amygdalae ( <i>continued</i> )	FR		25		<2 mm 7.45-7.77: FZ, Fe Sn, 20-40mm (partially open) 7.76: JT, 50°, PR, S, Clay Vr 7.79-7.81: FZ, 10-15°, IR, Ro, Fe Sn 8.02: JT, 10-15°, CU, Ro, Fe Sn 8.16: JT, 20°, CU, Ro, Clay Vr 8.17: JT, 10°, PR, Ro, Clay Vr 8.45: JT, 75°, PR, Ro, Fe Sn 8.26-9.00: JT, 5-30°, PR, Ro, Fe Ct, 60-100mm spacing 8.86: JT, 65°, IR, Ro, Fe Sn 8.95-9.05: JT, 80°, PR, Ro, Fe Vr 9.51: JT, 65°, PR, Ro, CA Ct 9.60: JT, 15°, PR, Ro, Fe Sn 9.62: JT, 15°, PR, Ro, Fe Sn 9.75-9.92: JT, 10-30°, PR, Ro, Fe Sn, 60mm spacing 10.18: JT, 55°, PR, Ro, Fe Sn 10.35-10.44: JT, 15-30°, PR, Ro, Fe Sn, 20mm spacing 10.53-10.84: FC, PR, Ro, Fe Sn, (drill break)		
			9.0		9.10m	massive, slightly fractured rare calcite veins						40
			10.0		10.37m	dark grey-brown					MW	
			11.0		10.50m	AGGLOMERATE: dark brown clasts in brown matrix, clasts up to 100mm, clast supported					HW	60
			12.0		12.64m	BASALT: grey, fine grained clay mineral inclusions, grey-brown band 12.78-12.87m, occasional thin calcite veins, slightly fractured					FR	
13.0	15.10m	calcite veins more frequent occasional healed fractures		60								
14.0												
15.0												
16.0												

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (≥ 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09 WITH FENCE TOOL GW-20160229.GLB Log SMC CORED DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000



# CORED DRILL HOLE LOG

**HOLE NO : BH19**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 4 OF 5

POSITION : E: 365236.100, N: 6710549.800 (56 WGS84) SURFACE ELEVATION : 1179.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING		MATERIAL				ROCK MASS					
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH (%)	SAMPLES & FIELD TESTS	ELEVATION (RL) / DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	100% RETURN	0% LOSS	Is(50) d=2.62 MPa	16.0 - 17.63		calcite veins more frequent occasional healed fractures (continued)	FR	●	95	20 40 100 300 1000	16.16: JT, 5°, PR, Ro, Fe Sn 16.64: JT, 20°, PR, Ro, Fe Sn 17.08: JT, 20°, PR, Ro, MU FILLED 17.17: JT, 10°, Un, Ro, Fe Sn, 8 mm 17.63: JT, 5°, PR, S, Fe Vr
		0% LOSS	Is(50) d=0.16 MPa	17.63 - 18.10		17.90m dark grey-brown 18.10m LAPILLI TUFF: dark brown clasts in pale brown matrix, clasts up to 40mm, matrix supported	MW HW	○			18.28-18.68: JT, IR, Ro, Cn, drill breaks
		0% LOSS	Is(50) d=0.66 MPa	18.10 - 20.10		AGGLOMERATE: dark brown clasts up to 200mm of high strength basalt, brown pale brown matrix clast supported	HW to MW	○	100		19.63: JT, 45°, IR, Ro, Cn
		0% LOSS	Is(50) d=1.41 MPa	20.10 - 21.53		BASALT: grey some grey-brown staining around fractures, fine grained, occasional healed fractures with green clay mineral veneers	SW	○			20.80: JT, 10°, IR, VR, Cn 21.00: JT, 30°, PR, S, Cn 21.05: JT, 45°, PR, S, Cn
		0% LOSS	Is(50) d=1.51 MPa	21.53 - 22.05		BASALT: grey some grey-brown staining around fractures, fine grained, occasional healed fractures with green clay mineral veneers	SW	○	95		21.63: JT, 20°, PR, Ro, CA Vr 21.79: JT, 20°, PR, Ro, Fe Sn
		0% LOSS	Is(50) d=6.01 MPa	22.05 - 23.05		23.05m dark grey, calcite veins up to 10mm thick occasional infilled vesicles	FR	○			22.47: CS, 10°, Fe Sn, 0-10mm 22.59: FC, 20°, IR, VR, Fe Sn 22.63: FC, 10°, IR, VR, Cn 22.78: JT, 5°, PR, Ro, Fe Sn 22.90-23.00: JT, 85°, PR, S, MU Vr
		0% LOSS	Is(50) d=6.34 MPa	23.05 - 24.0		dark grey, calcite veins up to 10mm thick occasional infilled vesicles	FR	○			

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMC AUSTRALIA



UPDATED SMC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB 09\_WITH FENCE TOOL GW-20160229.GLB Log SMC CORED DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

# CORED DRILL HOLE LOG

**HOLE NO : BH19**

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 5 OF 5

POSITION : E: 365236.100, N: 6710549.800 (56 WGS84) SURFACE ELEVATION : 1179.683 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

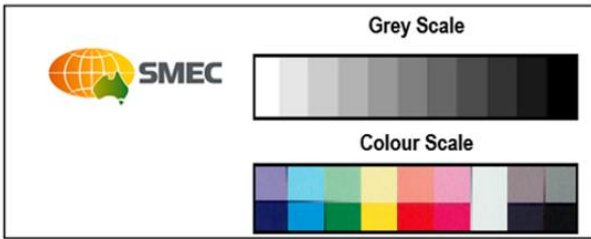
DRILLING				MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL RUN (%)	SAMPLES & FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	100% RETURN	0% LOSS	Is(50) d=7.45 MPa	24.0	25.00m	dark grey, calcite veins up to 10mm thick occasional infilled vesicles ( <i>continued</i> )	FR	95	24.05: SM, 5°, CA FILLED, 10mm thick 24.60: JT, 5°, PR, S, MU Cn-Ct, 2 mm 24.94: JT, 50°, PR, S, CA Ct		
BOREHOLE BH19 TERMINATED AT 25.00 m Target depth											

UPDATED SMEC LIBRARY\_AGS 3\_1 RTA\_1\_1 UB\_09\_WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT\_WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

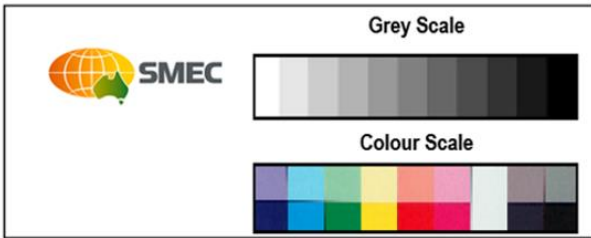
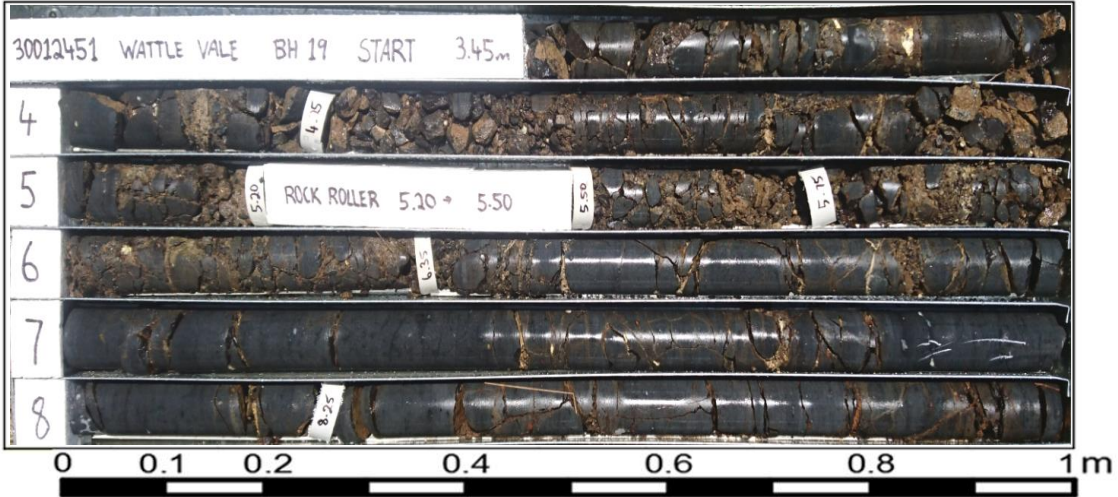
<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

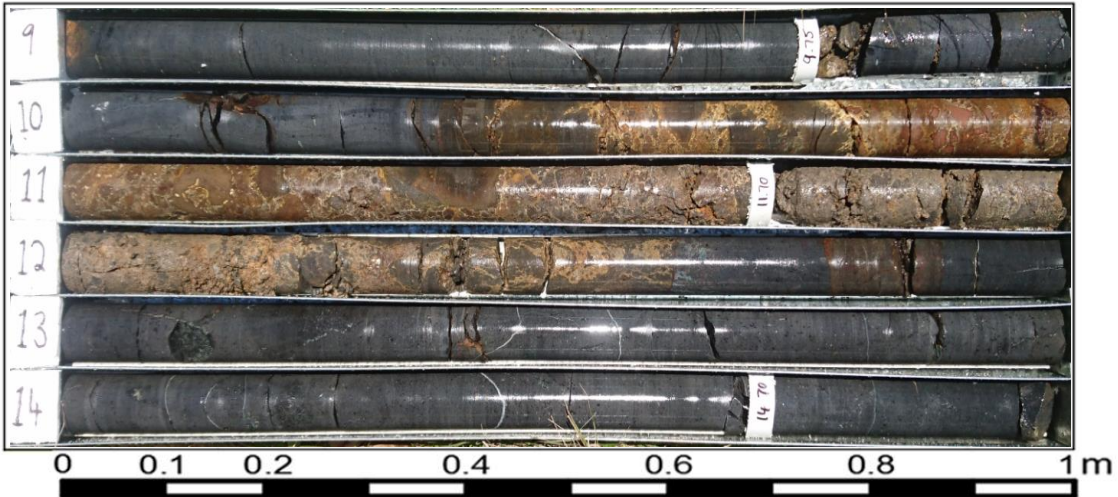





Borehole Number		<b>BH-19</b>	
Box	1	of	4
Depth	3.45m	to	9.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		




Borehole Number		<b>BH-19</b>	
Box	2	of	4
Depth	9.00m	to	15.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		






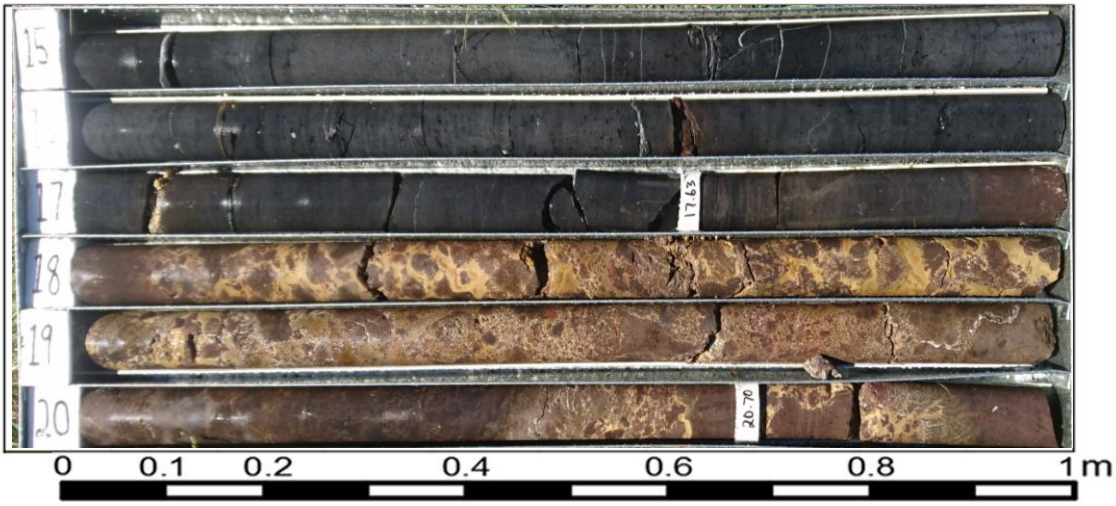

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-19</b>	
Box	3	of	4
Depth	15.00m	to	21.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

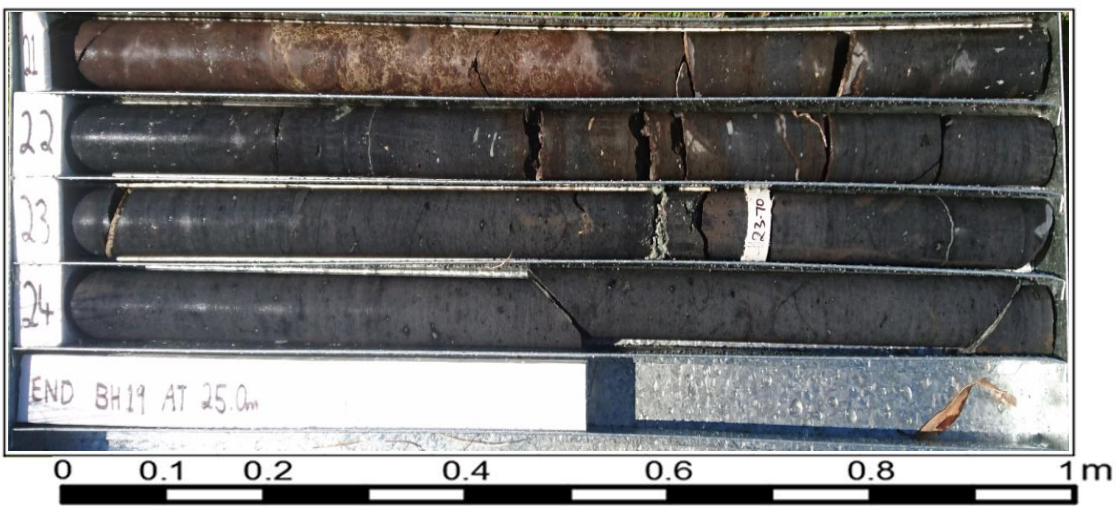
**Grey Scale**



**Colour Scale**



Borehole Number		<b>BH-19</b>	
Box	4	of	4
Depth	21.00m	to	25.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH20

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 1 OF 4

POSITION : E: 365186.100, N: 6710585.500 (56 WGS84) SURFACE ELEVATION : 1174.634 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER DRILLER : MARK

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

DRILLING				MATERIAL					
METHOD & SUPPORT	PENETRATION	WATER	SAMPLES	FIELD TESTS	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components	MOISTURE CONDITION CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
METHOD & SUPPORT ADIT RR NW Casing	PENETRATION 	WATER 	SAMPLES 	FIELD TESTS 1.00m SPT 11, 30/130mm N=69 1.28m	0.0	CI-CH	Silty CLAY: firm, medium to high plasticity, dark brown, moist	F	TOPSOIL
					0.20m		Silty CLAY: stiff, medium plasticity, grey-brown, with BASALT gravel and cobbles moist	St	RESIDUAL SOIL
					1.00m	CI	BASALT: extremely weathered to moderately weathered, extremely low strength, some high strength zones		BEDROCK 1.01: SPT at 1.0m could not be done due to boulder.  1.50: moderately weathered high strength chips in cuttings 1.65: RR refusal
					1.95m		Continued as Cored Drill Hole		

UPDATED SMEC LIBRARY\_AGS 3\_1 RTA\_1\_1 LIB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC NON-CORE DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG10677.GDW 15/12/2016 19:11 10.0.000

<b>METHOD</b> HA Hand auger AS Auger screwing ADV Auger drilling with V bit ADT Auger drilling with TC bit WB Wash-bore drilling RR Rock Roller NQ NQ core barrel (42mm diameter) NMLC NMLC core barrel (52mm diameter) HQ HQ Core Barrel (62mm diameter)	<b>PENETRATION</b> No Resistance	<b>SAMPLES &amp; FIELD TESTS</b> B Bulk Disturbed Sample D Disturbed Sample E Environmental Sample EW Water Sample HM Hammer Bouncing HP Hand Penetrometer (UCS kPa) Nc SPT with solid cone SS Split Spoon Sample R Refusal SPT Standard Penetration Test U50 Undisturbed Sample (50mm dia) U75 Undisturbed Sample (75mm dia) VS Vane Shear; peak/remoulded(kPa)	<b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b> Based on Unified Classification System
<b>SUPPORT</b> T Timbering C Casing M Mud	<b>MOISTURE</b> D Dry M Moist W Wet PL Plastic limit LL Liquid limit	<b>CONSISTENCY/ RELATIVE DENSITY</b> VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard Fb - Friable VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense	

See Explanatory Notes for details of abbreviations & basis of descriptions.



# CORED DRILL HOLE LOG

**HOLE NO : BH20**

PROJECT : WATTLE VALLEY QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
SHEET : 2 OF 4

POSITION : E: 365186.100, N: 6710585.500 (56 WGS84) SURFACE ELEVATION : 1174.634 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS			
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL RUN (%)	ELEVATION (RL) DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
			0.0							
			1.95m		START CORING AT 1.95m					
		0% LOSS 2.20	2.0		BASALT: dark grey, fine grained, massive, highly fractured, iron stained on defects	SW		0		2.05-2.15: JT, 30-70°, PR, Ro, Fe Sn
		0% LOSS 2.50	2.50					0		2.15-2.65: FZ, Fe Sn, 0-20mm
		0% LOSS 3.00	3.00					0		2.65-3.18: JT, 5-20°, PR, Ro, Fe Sn, 40-60mm spacing
			3.00							3.18-3.49: FZ, Fe Sn, 20-40mm spacing
			4.0							3.50-4.45: FZ, 5-20°, Fe Sn, 20-60mm spacing (partially open)
		0% LOSS	4.15m		less fractured, some iron stained healed fractures			30		4.42: JT, 15°, PR, Ro, Fe Sn
			5.0							4.55-5.27: JT, 10-40°, PR, Ro, Fe Sn, 30-120mm spacing
			5.35m		grey to grey-brown, sub vertical iron coated fractures, some root matter	MW				5.27-5.60: JT, 80-90°, Un, Ro, Fe Ct, 2 mm
			5.60							5.70: JT, 50°, PR, Ro, Fe Sn
			5.90m		dark grey-brown, sub vertical fracturing throughout, some remnants of infilled vesicles up to 10mm	HW				5.60-6.00: FZ, Fe Sn, 20-40mm spacing
		0% LOSS	6.0					5		6.00-6.25: FC, IR, Ro, Cn, 20-80mm spacing
			6.37-6.48							6.37-6.48: FC, IR, Ro, Fe Sn
			6.52-7.25							6.52-7.25: FZ, 20-40mm (partially open)
			7.0							7.25-7.45: FZ, 0-20mm
		0% LOSS	7.25							7.45-7.70: FZ, 10-30°, IR, Ro, Fe Sn, 10-60mm spacing
			7.45m		grey to grey-brown, fragmented, iron stained on fractures, some sub vertical fractures	MW				7.70-7.99: FZ, Fe Sn, 10-20mm (partially open)
		0% LOSS	7.70					0		

UPDATED SMEC LIBRARY\_AGS\_3\_1 RTA\_1\_1 UB\_09\_WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE GINT - WATTLE VALE QUARRY - STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.

SMEC AUSTRALIA



# CORED DRILL HOLE LOG

**HOLE NO : BH20**

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 3 OF 4

POSITION : E: 365186.100, N: 6710585.500 (56 WGS84) SURFACE ELEVATION : 1174.634 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING			MATERIAL				ROCK MASS				
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL DEPTH	ELEVATION (RL)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
	0% LOSS	8.50	1166.0	8.0	V	grey to grey-brown, fragmented, iron stained on fractures, some sub vertical fractures ( <i>continued</i> )	MW	●	0	20	
	0% LOSS	9.60	1165.0	9.0	V			●	0	40	9.15-9.21: JT, 70-90°, Un, Ro, Fe Ct, 3 mm
	0% LOSS	11.20	1164.0	10.0	V			●	0	100	8.00-11.20: FZ, Fe Sn, 10-20mm (partially open)
	0% LOSS	11.55	1163.0	11.0	V	11.20m grey to dark grey, highly fragmented less iron stained		●	0	200	10.72-10.85: JT, 70-80°, Un, Ro, Fe Ct, 3 mm
	0% LOSS	12.00	1162.0	11.60m	V	11.60m AGGLOMERATE: dark brown clast in pale brown matrix, matrix supported	HW	○	0	300	11.30-11.57: JT, 5-10°, Ro, Fe Cn, 40-60mm spacing
	0% LOSS	14.50	1161.0	12.0	V			○	30	400	
	0% LOSS	14.70m	1160.0	13.0	V	14.70m BASALT: dark grey, grey iron stained on fractures	MW	○	30	500	
	0% LOSS	15.10m	1159.0	14.0	V	15.10m grey, with voids up to 15mm infilled with clay mineral	FR	○	30	1000	15.10: JT, 5°, Un, Ro, CA Ct
	0% LOSS	15.90	1158.0	14.70m	V			○	30	1000	14.73-15.90: JT, 10-30°, IR, Ro, Fe CA Cn-Vr, 20-100mm spacing
	0% LOSS	16.40	1157.0	15.0	V			○	30	1000	

UPDATED SMEC LIBRARY\_AGS 3.1 RTA\_1\_1 UB 09\_WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000

<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handing Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm) <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.



# CORED DRILL HOLE LOG

HOLE NO : BH20

PROJECT : WATTLE VALLEY QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY

FILE / JOB NO : 30012451  
 SHEET : 4 OF 4

POSITION : E: 365186.100, N: 6710585.500 (56 WGS84) SURFACE ELEVATION : 1174.634 (AHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HYDRAPOWER SCOUT MOUNTING : TRUCK CONTRACTOR : DRILL POWER HOLE DIA : mm

DATE STARTED : 20/10/16 DATE COMPLETED : 21/10/16 DATE LOGGED : 21/10/16 LOGGED BY : BD CHECKED BY : BD

CASING DIAMETER : NW BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S6-10 BIT CONDITION : GOOD

DRILLING		MATERIAL				ROCK MASS					
METHOD & CASING	WATER RETURN (%)	CORE LOSS DRILL RUN (%)	SAMPLES & FIELD TESTS	ELEVATION (RL) / DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral	RQD (%)	DEFECT SPACING (mm)	DEFECTS (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
NMLC	50% RETURN	0% LOSS	Is(50) d=1.29 MPa	16.0	▼	grey, with voids up to 15mm infilled with clay mineral <i>(continued)</i>	FR	●	60		16.27: JT, 15°, PR, Ro, CA Ct
				16.40m		some hardened bands of clay mineral up to 90mm thick					16.63-16.74: SM, 65°, IR, Ro, MU FILLED, <20 mm
				17.50							16.89: JT, 10°, Ro, MU Ct, 2 mm
				17.08: JT, 10°, PR, Ro, CA Ct, 2 mm							
17.50	17.50	0% LOSS	Is(50) d=5.75 MPa	17.0	▼	grey to dark grey, sub vertical joints with root matter	MW	○	55	17.35: JT, 10°, PR, Ro, CA Vr	
18.00m						17.49: JT, 5°, PR, Ro, MU Vr					
18.40	18.40	0% LOSS	Is(50) d=0.35 MPa	18.0	▼	brown with pale brown and blue green mineral inclusions	HW	●	55	17.56: JT, 10°, Un, Ro, CA Ct, 2 mm	
18.40m						17.67: JT, 20°, PR, Ro, CA Vr					
19.30	19.30	0% LOSS	Is(50) d=1.3 MPa	18.0	▼	dark grey, some thin fracture lined with green clay mineral	SW	○	55	17.80-17.86: SM, 20-70°, DIS, Ro, MU FILLED	
18.23: JT, 10°, PR, Ro, Cn											
20.00	20.00	0% LOSS	Is(50) d=1.3 MPa	19.0	▼	BOREHOLE BH20 TERMINATED AT 20.00 m Target depth				18.01-18.13: JT, 75°, PR, Ro, Fe Sn	
18.31-19.30: JT, IR, Ro, 40-100mm spacing (drill break)											
				20.0						19.89: JT, 20°, IR, Ro, Cn	

UPDATED SMEC LIBRARY\_AGS 3.1 RTA 1.1 UB 09 WITH FENCE TOOL GW-20160229.GLB Log SMEC CORED DRILL HOLE\_GINT-WATTLE VALE QUARRY-STAGE 2.GPJ DWG95764.GDW 15/12/2016 19:09 10.0.000


<b>DRILLING</b> AD/T Auger Drilling with TC Bit AD/V Auger Drilling with V Bit AS Auger Screwing DB Washbore with Drag Bit DT Diatube HMLC HMLC Core Barrel HQ3 HQ3 Core Barrel NMLC NMLC Core Barrel NQ3 NQ3 Core Barrel PQ3 PQ3 Core Barrel R Rock Roller	<b>WATER</b> dd/mm/yy Water Level on Date shown Drilling water level water inflow water outflow  <b>WEATHERING</b> FR Fresh SW Slightly Weathered MW Moderately Weathered HW Highly Weathered EW Extremely Weathered	<b>STRENGTH</b> EH Extremely High VH Very High H High M Medium L Low VL Very Low EL Extremely Low  <b>ROUGHNESS</b> POL Polished RF Rough S Smooth SL Slickensided VR Very Rough	<b>DEFECT TYPE</b> BP Bedding Plane CL Cleavage CS Crushed Seam CZ Crushed Zone DB Drilling Break FC Fracture HB Handling Break IS Infilled Seam JT Joint SM Seam SS Shear Seam SZ Shear Zone VN Vein VO Void FA Fault	<b>COATING</b> CN Clean CT Coating (>= 1.0m) FILLED Filled SN Stained VR Veneer (< 1.0mm)  <b>PLANARITY</b> CU Curved DIS Discontinuous IR Irregular PR Planar ST Stepped UN Undulose	<b>INFILL</b> CA Calcite CLAY Clay FE Iron Oxide FE Iron Oxide Clay CLAY Clay KT Chlorite MS Secondary Mineral MU Unidentified Mineral QZ Quartz X Carbonaceous
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See Explanatory Notes for details of abbreviations & basis of descriptions.


SMEC AUSTRALIA









**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-20</b>	
Box	1	of	4
Depth	1.95m	to	7.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

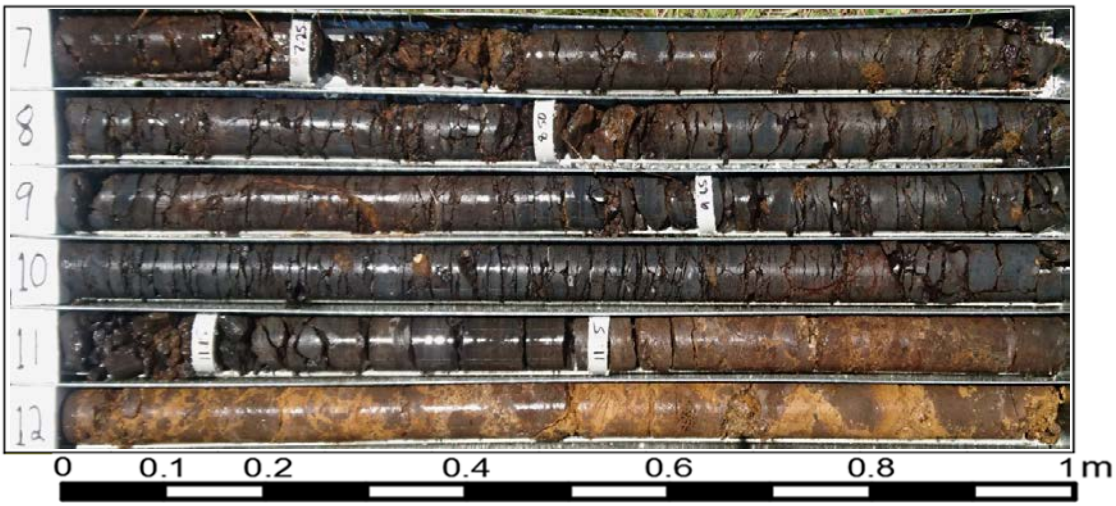
**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-20</b>	
Box	2	of	4
Depth	7.00m	to	13.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		






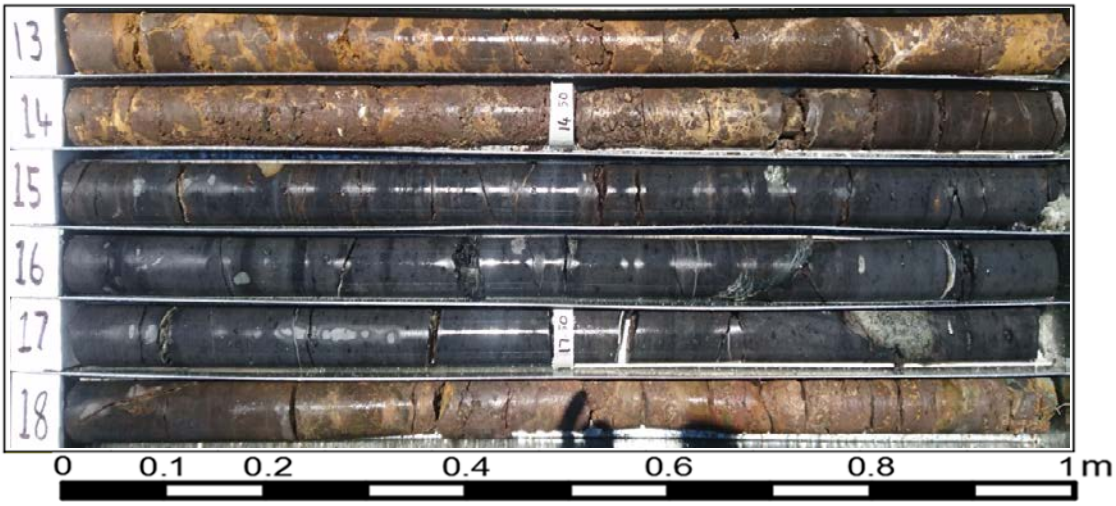

**Grey Scale**




**Colour Scale**




Borehole Number		<b>BH-20</b>	
Box	3	of	4
Depth	13.00m	to	19.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

**Grey Scale**



**Colour Scale**



Borehole Number		<b>BH-20</b>	
Box	4	of	4
Depth	19.00m	to	20.00m
Project	Wattle Vale Quarry		
Number	30012451		
Client	Glen Innes Severn Council		

