



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH05

PROJECT : WATTLE VALE QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
 SHEET : 1 OF 5

POSITION : E: 365304.580, N: 6711968.930 (56 MGA94)

SURFACE ELEVATION : 1125.364 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

DRILLER : DALE

DATE STARTED : 2/4/16

DATE COMPLETED : 4/4/16

DATE LOGGED : 4/4/16

LOGGED BY : BD

CHECKED BY : SB

| DRILLING          |         |                      |                     |             | MATERIAL                 |               |                       |  |                    |             |                  |                                |
|-------------------|---------|----------------------|---------------------|-------------|--------------------------|---------------|-----------------------|--|--------------------|-------------|------------------|--------------------------------|
| DRILLING & CASING | SAMPLES | DRILLING PENETRATION | GROUND WATER LEVELS | FIELD TESTS | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG   | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY | RELATIVE DENSITY | STRUCTURE & Other Observations |
| ADIT<br>HQ Casing |         |                      |                     |             | 0.0<br>1125.0            | [Hatched Box] | CI-CH                 | Silty CLAY<br>red brown, with basalt cobbles, with basalt boulders   | M                  |             |                  | RESIDUAL SOIL                  |
|                   |         |                      |                     |             | 1.0<br>1124.5            |               |                       | Continued as Cored Drill Hole  |                    |             |                  |                                |
|                   |         |                      |                     |             | 2.0<br>1123.5            |               |                       |  |                    |             |                  |                                |
|                   |         |                      |                     |             | 3.0<br>1122.5            |               |                       |  |                    |             |                  |                                |
|                   |         |                      |                     |             | 4.0<br>1121.5            |               |                       |  |                    |             |                  |                                |
|                   |         |                      |                     |             | 5.0<br>1120.5            |               |                       |  |                    |             |                  |                                |

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH05**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
SHEET : 2 OF 5

POSITION : E: 365304.580, N: 6711968.930 (56 MGA94)

SURFACE ELEVATION : 1125.364 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 2/4/16

DATE COMPLETED : 4/4/16

DATE LOGGED : 4/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m BIT : Diamond Impreg S10-12

BIT CONDITION : Good

| DRILLING          |                |                       |                       | MATERIAL                 |             |  |            | ROCK MASS                 |             |         |                     |   |
|-------------------|----------------|-----------------------|-----------------------|--------------------------|-------------|--|------------|---------------------------|-------------|---------|---------------------|---|
| DRILLING & CASING | WATER RETURN % | CORE LOSS DRILL RUN % | SAMPLES & FIELD TESTS | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>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)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|                   |                |                       |                       |                          |             |  |            | ● Axial                   | ○ Diametral |         |                     |   |
|                   |                |                       |                       | 0.0                      |             |  |            |                           |             |         |                     |   |
|                   |                |                       |                       | 0.70m                    |             | START CORING AT 0.70m  |            |                           |             |         |                     |   |
|                   |                |                       |                       | 0.95m                    |             | SILTY CLAY<br>red orange, very stiff, low plasticity<br>some rounded cobbles / coarse gravel of basalt   | RS         |                           |             |         |                     |   |
|                   |                |                       |                       | 1.0                      |             | BASALT<br>fine grained, dark grey<br>occasional laths and amygdalae, frequent clay seams up to 50mm thick  | FR to SW   |                           |             |         |                     |   |
|                   |                |                       |                       | 1.70m                    |             | clay seams 120-250mm spacing   |            |                           |             | 33      |                     | 0.95-1.70: clay seams<br>40-100mm spacing 25-45mm thick   |
|                   |                |                       |                       | 2.10m                    |             | massive, no clay seams   |            |                           |             |         |                     | 1.86-1.87: FZ, Clay FILLED  |
|                   |                |                       |                       | 2.20m                    |             |  |            |                           |             |         |                     | 2.02-2.06: SM, 30-40°, Clay FILLED  |
|                   |                |                       |                       | 2.22m                    |             |  |            |                           |             |         |                     | 2.22: JT, 40°, PR, RF, Clay Vr, 2 mm  |
|                   |                |                       |                       | 2.30m                    |             |  |            |                           |             |         |                     | 2.30: JT, 0-25°, Clay Ct, 2 mm  |
|                   |                |                       |                       | 2.33m                    |             |  |            |                           |             |         |                     | 2.33: JT, 0-20°, IR, RF, Fe Sn  |
|                   |                |                       |                       | 2.40m                    |             |  |            |                           |             |         |                     | 2.40: JT, 15°, PR, RF, Cn   |
|                   |                |                       |                       | 2.73m                    |             |  |            |                           |             |         |                     | 2.73: JT, 15°, PR, RF, Cn   |
|                   |                |                       |                       | 3.25m                    |             |  |            |                           |             |         |                     | 3.25: JT, 50°, PR, RF, Cn   |
|                   |                |                       |                       | 3.30m                    |             |  |            |                           |             |         |                     | 3.30: JT, 65°, PR, RF, Cn   |
|                   |                |                       |                       | 3.38m                    |             | fractured, iron stained on fractures   |            |                           |             |         |                     | 3.38-3.65: FZ, 20-65°, Fe Sn, 20-40mm spacing   |
|                   |                |                       |                       | 3.67m                    |             |  |            |                           |             |         |                     | 3.67: JT, 80°, PR, RF, Fe Sn  |
|                   |                |                       |                       | 3.74-3.84m               |             |  |            |                           |             |         |                     | 3.74-3.84: FZ, PR, RF, Fe Sn  |
|                   |                |                       |                       | 3.95-4.52m               |             |  |            |                           |             |         |                     | 3.95-4.52: JT, 15-25°, PR, RF, Fe Sn, 40-100mm spacing  |
|                   |                |                       |                       | 4.63m                    |             |  |            |                           |             |         |                     | 4.63: JT, 30°, PR, RF, Fe Sn  |
|                   |                |                       |                       | 4.65m                    |             |  |            |                           |             |         |                     | 4.65: JT, 45°, PR, RF, Fe Sn  |
|                   |                |                       |                       | 4.79m                    |             |  |            |                           |             |         |                     | 4.79: JT, 30°, PR, RF, Fe Sn  |

|  |  |  |   |  |   |
|--|--|--|---|--|---|
| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>OZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

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PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
SHEET : 3 OF 5

POSITION : E: 365304.580, N: 6711968.930 (56 MGA94)

SURFACE ELEVATION : 1125.364 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 2/4/16

DATE COMPLETED : 4/4/16

DATE LOGGED : 4/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : Diamond Impreg S10-12

BIT CONDITION : Good

| DRILLING          |                  |                         | MATERIAL                         |                            |             |   | ROCK MASS   |                             |             |   |  |   |
|-------------------|------------------|-------------------------|----------------------------------|----------------------------|-------------|---|---|-----------------------------|-------------|---|--|---|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS (DRILL DEPTH) | SAMPLES & FIELD TESTS            | ELEVATION (RL) / DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable) | Weathering  | ESTIMATED STRENGTH (Is(50)) |             | RQD (%)   | DEFECT SPACING (mm)  | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other                        |
|                   |                  |                         |                                  |                            |             |   |   | ● Axial                     | ○ Diametral |   |  |   |
| NMLC              | 100<br>% RETURN  | 09/04/16                |                                  | 5.0<br>1120.0              |             | BASALT<br>fine grained, dark grey ( <i>continued</i> )<br>iron stained healed fractures 40-100mm spacing  | FR<br>to<br>SW  | VL                          | EH          | 0   | 4.90-5.69: JT, 20-30°, Fe Sn,<br>20-40mm spacing   |   |
|                   |                  |                         | 5.48m<br>Is(50)<br>a=0.95<br>MPa | 5.5<br>1120.0              |             |   |   | L                           | M           | 0   | 5.77: JT, 20°, PR, RF, Fe Sn<br>5.82: JT, 5°, PR, RF, Fe Sn  |   |
|                   |                  |                         | 5.80m<br>Is(50)<br>d=1.06<br>MPa | 6.0<br>1119.5              |             | 6.00m   | some sub-vertical joints  | L                           | M           | 15  | 6.00: JT, 70°, CU, RF, Fe Sn<br>6.00-6.30: JT, 80-90°, Un, RF, Fe Sn<br>6.17: JT, 20°, PR, RF, Fe Sn<br>6.35: JT, 80°, PR, RF, Fe Sn |   |
|                   |                  |                         |                                  | 6.5<br>1119.0              |             |   |   | L                           | M           | 0   | 6.40-6.70: FZ, Fe Sn,<br>20-40mm spacing   |   |
|                   |                  |                         |                                  | 7.0<br>1118.5              |             |   |   | L                           | M           | 0   | 6.70-6.83: JT, 80°, Sn, filled,<br>basalt<br>6.83-6.95: JT, 10-15°, PR, RF, Fe Sn  |   |
|                   |                  |                         |                                  | 7.5<br>1118.0              |             |   |   | L                           | M           | 0   | 7.00-7.27: JT, 15-30°, Fe Sn,<br>20-40mm spacing<br>7.30: JT, 70°, IR, RF, Fe Sn   |   |
|                   |                  |                         | 7.63m<br>Is(50)<br>d=4<br>MPa    | 8.0<br>1117.5              |             |   |   | L                           | M           | 0   | 7.30-7.70: JT, 10-50°, PR, RF, Fe Sn   |   |
|                   |                  |                         |                                  | 8.5<br>1117.0              |             |   |   | L                           | M           | 0   | 7.70-7.95: FZ, 20-40°, Fe Sn   |   |
|                   |                  |                         |                                  | 9.0<br>1116.5              |             |   |   | L                           | M           | 0   | 8.13-8.20: JT, 30-60°, PR, RF, Fe Sn,<br>0-20mm spacing  |   |
|                   |                  |                         | 8.50m<br>Is(50)<br>d=9.28<br>MPa | 9.5<br>1116.0              |             | 9.35m   | dark grey to black, frequent iron stained partly open fractures 20-40mm, some sub-vertical joints | SW<br>to<br>MW              | L           | M   | 0  | 8.48: JT, 30°, PR, RF, Cn<br>8.57: JT, 30°, PR, RF, Cn<br>8.70-8.80: FZ, 20-40°, Cn<br>8.80-8.90: JT, 10-30°, Fe Sn,<br>50 mm<br>9.00-9.27: FZ, Fe Sn, 0-10mm |
|                   |                  |                         |                                  | 10.0<br>1115.5             |             |   | L   | M                           | 0           | 9.50-9.70: JT, 80-90°, Un, RF, Fe Sn<br>9.76-9.80: SM, 65°, filled extremely weathered rock<br>9.83: JT, 25°, PR, S, Clay Vr<br>9.88: JT, 10°, PR, S, Clay Vr |  |   |

|  |  |  |   |  |   |
|--|--|--|---|--|---|
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|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH05**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
SHEET : 4 OF 5

POSITION : E: 365304.580, N: 6711968.930 (56 MGA94)

SURFACE ELEVATION : 1125.364 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 2/4/16

DATE COMPLETED : 4/4/16

DATE LOGGED : 4/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m BIT : Diamond Impreg S10-12

BIT CONDITION : Good

| DRILLING             |                     |                                   |                          | MATERIAL                       |                |  |                | ROCK MASS                    |           |         |                           |  |
|----------------------|---------------------|-----------------------------------|--------------------------|--------------------------------|----------------|--|----------------|------------------------------|-----------|---------|---------------------------|--|
| PROGRESS             |                     | CORE LOSS<br>(% CORE LOSS)        | SAMPLES &<br>FIELD TESTS | ELEVATION<br>(RL)<br>DEPTH (m) | GRAPHIC<br>LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness<br>alteration, cementation, etc as applicable) | Weathering     | ESTIMATED STRENGTH<br>Is(50) |           | RQD (%) | DEFECT<br>SPACING<br>(mm) | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling<br>or coating, shape, roughness,<br>thickness, other |
| DRILLING<br>& CASING | WATER<br>RETURN (%) |                                   |                          |                                |                |  |                | AXIAL<br>DIAMETRAL           | DIAMETRAL |         |                           |  |
| NMLC                 |                     | 100                               |                          | 10.0                           |                | BASALT<br>fine grained, dark grey (continued)<br>dark grey to black, frequent iron stained partly open<br>fractures 20-40mm, some sub-vertical joints      | SW<br>to<br>MW | VL                           | EH        | 0       |                           | 9.94: JT, 25°, CU, S, Fe Sn<br>9.99: JT, 25°, CU, S, Fe Sn   |
|                      |                     |                                   |                          | 10.5                           |                |  |                |                              |           | 0       |                           | 10.05-10.80: FZ, Fe Sn,<br>20-40mm spacing   |
|                      |                     |                                   |                          | 10.85m                         |                |  |                |                              |           |         |                           |  |
|                      |                     |                                   |                          | 11.0                           |                | LAPILLI TUFF<br>orange brown to grey and brown<br>remolds to low plasticity silty clay with fine to medium<br>sand   | EW             |                              |           | 0       |                           |  |
|                      |                     |                                   |                          | 11.30m                         |                | dark grey brown clasts up to 30mm, appears<br>predominantly clast supported  | HW             |                              |           |         |                           | 11.30: JT, 40°, CU, RF, Cn<br>11.44: JT, 30°, PR, RF, Fe Sn<br>11.57: JT, 20°, IR, RF, Fe Sn<br>11.66: CS, Fe Sn, 10 mm                      |
|                      |                     | 11.44m<br>Is(50)<br>d=0.79<br>MPa |                          | 11.5                           |                |  |                |                              |           |         |                           |  |
|                      |                     |                                   |                          | 12.0                           |                |  |                |                              |           | 72      |                           |  |
|                      |                     |                                   |                          | 12.20m                         |                | BASALT<br>fine grained, dark red-brown<br>iron stained healed fractures 20-40mm spacing  | HW<br>to<br>MW |                              |           |         |                           | 12.25: JT, 60°, CU, RF, Clay<br>Vr   |
|                      |                     | 12.45m<br>Is(50)<br>d=0.53<br>MPa |                          | 12.5                           |                | dark grey occasional amygdalae, some green and white<br>mineral infill in fractures, micro fractures 40-100mm<br>spacing                                   | FR             |                              |           |         |                           | 12.75-12.90: FZ, Cn, 0-10mm<br>spacing<br>12.94: JT, 5°, IR, RF, Cn<br>13.00: JT, 5°, IR, RF, Cn   |
|                      |                     |                                   |                          | 13.0                           |                |  |                |                              |           | 12      |                           | 13.12: JT, 30-60°, Un, RF, MU<br>Vr  |
|                      |                     | 13.10m<br>Is(50)<br>d=0.79<br>MPa |                          | 13.5                           |                |  |                |                              |           |         |                           | 13.35: JT, 65°, PR, RF, MU Vr<br>13.42: JT, 30-40°, PR, RF, MU<br>Vr<br>13.50: JT, 45°, PR, S, Cn  |
|                      |                     |                                   |                          | 14.0                           |                | 14.00m<br>micro fractures reducing   |                |                              |           | 74      |                           | 13.65: JT, 25-20°, CU, S, Sn<br>13.82: JT, 15°, PR, RF, MU Vr  |
|                      |                     |                                   |                          | 14.5                           |                |  |                |                              |           |         |                           | 14.23: JT, 20-30°, PR, RF, MU<br>Vr<br>14.30: JT, 15°, IR, RF, MU Vr   |
|                      |                     |                                   |                          | 15.0                           |                |  |                |                              |           |         |                           | 14.52: JT, 30°, PR, RF, MU Vr  |

|  |  |  |   |  |   |
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 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
 SHEET : 5 OF 5

POSITION : E: 365304.580, N: 6711968.930 (56 MGA94)

SURFACE ELEVATION : 1125.364 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

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CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 2/4/16

DATE COMPLETED : 4/4/16

DATE LOGGED : 4/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : Diamond Impreg S10-12

BIT CONDITION : Good

| DRILLING          |                     |                                   |                       | MATERIAL   |             |   |            | ROCK MASS                 |             |         |  |  |
|-------------------|---------------------|-----------------------------------|-----------------------|--|-------------|---|------------|---------------------------|-------------|---------|--|--|
| DRILLING & CASING | WATER RETURN (%)    | CORE LOSS (DRILL DEPTH)           | SAMPLES & FIELD TESTS | ELEVATION (RL) DEPTH (m)   | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable) | Weathering | ESTIMATED STRENGTH Is(50) |             | RQD (%) | DEFECT SPACING (mm)  | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|                   |                     |                                   |                       |  |             |   |            | ● Axial                   | ○ Diametral |         |  |  |
| NMLC              | 100<br>WATER RETURN | 15.57m<br>Is(50)<br>d=3.03<br>MPa |                       | 15.0<br>15.5<br>16.0<br>16.5<br>17.0<br>17.5<br>18.0<br>18.5<br>19.0<br>19.5<br>20.0 | 17.35m      | BASALT<br>fine grained, dark red-brown (continued)  | FR         | VL                        | EH          | 90      | 14.95-15.05: JT, 10-20°, RF, Cn, 10-20mm spacing<br><br>15.53: JT, 10°, IR, S, MU Vr<br><br>15.70: JT, 15°, PR, RF, MU Vr<br><br>15.85: JT, 30°, PR, S, MU Vr<br>15.85-15.87: JT, 30°, PR, MU FILLED<br>15.94-15.96: JT, 30°, PR, MU FILLED<br><br>17.06: JT, 10°, IR, RF, CA Vr |  |
|                   |                     |                                   |                       | 17.35  |             | BOREHOLE BH05 TERMINATED AT 17.35 m<br>Target depth   |            |                           |             |         |  |  |

|  |  |  |   |  |   |
|--|--|--|---|--|---|
| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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



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|                                    |                        |                      |                                |
|------------------------------------|------------------------|----------------------|--------------------------------|
| TITLE: <b>Wattle Valley Quarry</b> |                        |                      |                                |
| PROJECT NO:<br>30012451            | TEST DATE:<br>4/4/2016 | INCLINATION:<br>-90° | CORED LENGTH:<br>0.7m – 17.35m |
| DRILL RIG:<br>P160                 | CONTRACTOR:<br>NCD     | LOGGED BY:<br>BD     | CHECKED BY:<br>NP              |

**BH05**







10

11

12

13

14

15

16

17

END BH-05 AT 17.35m



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH07

PROJECT : WATTLE VALE QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
 SHEET : 1 OF 3

POSITION : E: 365338.410, N: 6711994.300 (56 MGA94)

SURFACE ELEVATION : 1124.964 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

DRILLER : DALE


DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

| DRILLING          |         |                      |                     |             | MATERIAL                 |   |                       |  |   |                                |
|-------------------|---------|----------------------|---------------------|-------------|--------------------------|---|-----------------------|--|---|--------------------------------|
| DRILLING & CASING | SAMPLES | DRILLING PENETRATION | GROUND WATER LEVELS | FIELD TESTS | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG   | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components | MOISTURE CONDITION<br>CONSISTENCY<br>RELATIVE DENSITY | STRUCTURE & Other Observations |
| AD/T<br>HQ Casing |         |                      |                     |             | 0.0                      |  | CI-CH                 | Silty CLAY<br>red brown, with basalt cobbles, with basalt boulders   | M   | RESIDUAL SOIL                  |
|                   |         |                      |                     |             | 1124.5                   |   | 0.60m                 | Continued as Cored Drill Hole  |   |                                |
|                   |         |                      |                     |             | 1124.0                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1123.5                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1123.0                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1122.5                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1122.0                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1121.5                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1121.0                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1120.5                   |   |                       |  |   |                                |
|                   |         |                      |                     |             | 1120.0                   |   |                       |  |   |                                |

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



# CORED DRILL HOLE LOG

**HOLE NO : BH07**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
SHEET : 2 OF 3

POSITION : E: 365338.410, N: 6711994.300 (56 MGA94)

SURFACE ELEVATION : 1124.964 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m BIT : Diamond Impreg S10-12

BIT CONDITION : Good

| DRILLING          |                |                         |                       | MATERIAL                 |             |  |            | ROCK MASS                 |             |         |                     |   |
|-------------------|----------------|-------------------------|-----------------------|--------------------------|-------------|--|------------|---------------------------|-------------|---------|---------------------|---|
| DRILLING & CASING | WATER RETURN % | CORE LOSS (DRILL DEPTH) | SAMPLES & FIELD TESTS | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>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)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|                   |                |                         |                       |                          |             |  |            | ● Axial                   | ○ Diametral |         |                     |   |
|                   |                |                         |                       | 0.0                      |             |  |            |                           |             |         |                     |   |
|                   |                |                         |                       | 0.60                     |             | 0.60m START CORING AT 0.60m  |            |                           |             |         |                     |   |
|                   |                |                         |                       | 1.124.5                  |             |  |            |                           |             |         |                     |   |
|                   |                |                         |                       | 1.124.0                  |             | BASALT<br>fine grained, dark grey<br>very high strength corestones in extremely weathered matrix, spheroidal weathering evident in parts             | EW         |                           |             |         |                     |   |
|                   |                |                         |                       | 1.123.5                  |             | 1.53m<br>occasional red brown clay seams, occasional laths and amygdalae, partly open sub-vertical fractures stained with iron                       | SW         |                           |             | 44      |                     | 1.53: SM, 20°, Clay FILLED  |
|                   |                |                         |                       | 1.123.0                  |             |  |            |                           |             |         |                     | 1.86: JT, 30°, PR, S, Fe Clay Vr  |
|                   |                |                         |                       | 1.122.5                  |             |  |            |                           |             |         |                     | 2.10-2.24: SM, 70°, Un, Fe Clay FILLED  |
|                   |                |                         |                       | 1.122.0                  |             |  |            |                           |             |         |                     | 2.31: JT, 20°, Un, RF, Fe Sn  |
|                   |                |                         |                       | 1.121.5                  |             |  |            |                           |             |         |                     | 2.32-2.70: JT, 80-90°, Un, RF, Fe Sn  |
|                   |                |                         |                       | 1.121.0                  |             |  |            |                           |             |         |                     | 2.52: JT, 20°, Un, RF, Fe Sn  |
|                   |                |                         |                       | 1.120.5                  |             |  |            |                           |             |         |                     | 2.65: JT, 20°, IR, RF, Fe Sn  |
|                   |                |                         |                       | 1.120.0                  |             |  |            |                           |             |         |                     | 2.80: JT, 70°, PR, RF, Fe Sn  |
|                   |                |                         |                       | 1.119.5                  |             |  |            |                           |             |         |                     | 3.10: JT, 70°, Un, RF, Clay Ct, 5 mm  |
|                   |                |                         |                       | 1.119.0                  |             |  |            |                           |             |         |                     | 3.27: JT, 70°, Un, RF, Clay Ct, 7 mm  |
|                   |                |                         |                       | 1.118.5                  |             |  |            |                           |             |         |                     | 3.40: SM, 20°, FILLED, 10 mm  |
|                   |                |                         |                       | 1.118.0                  |             |  |            |                           |             |         |                     | 3.53: JT, 70°, PR, RF, Fe Sn  |
|                   |                |                         |                       | 1.117.5                  |             |  |            |                           |             |         |                     | 3.56-3.81: FZ, Fe Sn, 40-60mm spacing   |
|                   |                |                         |                       | 1.117.0                  |             |  |            |                           |             |         |                     | 3.81-3.83: SM, Clay FILLED, 20 mm   |
|                   |                |                         |                       | 1.116.5                  |             |  |            |                           |             |         |                     | 3.90: JT, 30°, PR, RF, Fe Sn  |
|                   |                |                         |                       | 1.116.0                  |             |  |            |                           |             |         |                     | 4.02-4.06: SM, 30-50°, FILLED   |
|                   |                |                         |                       | 1.115.5                  |             |  |            |                           |             |         |                     | 4.19: JT, 5°, Un, RF, Fe Sn   |
|                   |                |                         |                       | 1.115.0                  |             |  |            |                           |             |         |                     | 4.25-4.60: FZ, Clay FILLED, 20-40mm spacing   |
|                   |                |                         |                       | 1.114.5                  |             |  |            |                           |             |         |                     | 4.85-5.03: JT, 20-30°, Fe Sn,   |

| DRILLING  | WATER  | STRENGTH  | DEFECT TYPE   | COATING  | INFILL   |
|---|--|---|---|--|--|
| AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | 10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>OZ Quartz<br>X Carbonaceous |

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH07**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 3

FILE / JOB NO : 30012451  
SHEET : 3 OF 3

POSITION : E: 365338.410, N: 6711994.300 (56 MGA94)

SURFACE ELEVATION : 1124.964 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : Diamond Impreg S10-12

BIT CONDITION : Good

| DRILLING          |                  |                         |                       | MATERIAL           |             |   |            | ROCK MASS                  |             |         |                     |   |
|-------------------|------------------|-------------------------|-----------------------|--------------------|-------------|---|------------|----------------------------|-------------|---------|---------------------|---|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS (DRILL DEPTH) | SAMPLES & FIELD TESTS | ELEVATION (RL) (m) | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable) | Weathering | ESTIMATED STRENGTH (s(50)) |             | RQD (%) | DEFECT SPACING (mm) | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other  |
|                   |                  |                         |                       |                    |             |   |            | ● Axial                    | ○ Diametral |         |                     |   |
|                   |                  | 0% LOSS<br>5.15         | MP8                   | 5.0                | ▽           | BASALT<br>fine grained, dark grey (continued)   | SW to FR   |                            |             | 0       | 20 40 100 300 1000  | 40-100mm spacing<br>5.12: JT, 35°, Clay Ct, 5 mm<br>5.15-5.30: FZ, Clay Vr, 20-40mm spacing<br>5.35: JT, 20°, IR, RF, Clay Ct, 5 mm<br>5.51: JT, 15-30°, PR, RF, Clay Vr<br>5.65-5.69: SM, 30°, Clay FILLED |
|                   |                  | 0% LOSS<br>5.75         |                       | 5.5                | ▽           |   |            |                            |             | 22      |                     |   |
|                   |                  | 0% LOSS<br>5.95         |                       | 6.0                | X           | CORE LOSS 0.57m (5.95-6.52)   |            |                            |             | 0       |                     |   |
|                   |                  | 0% LOSS<br>6.7          |                       | 6.5                | ▽           | BASALT<br>as orange brown mottled gravelly clay, baked margin   | RS         |                            |             | 0       |                     |   |
|                   |                  | 6.80                    |                       | 6.80               | ▽           | fine grained dark grey, iron stained on joints  | SW to FR   |                            |             |         |                     |   |
|                   |                  | 100% RETURN             |                       | 7.5                | ▽           |   | MW         |                            |             |         |                     |   |
|                   |                  | 35% LOSS                |                       | 7.70               | X           | CORE LOSS 1.00m (7.70-8.70)   |            |                            |             | 0       |                     |   |
|                   |                  |                         |                       | 8.0                | X           |   |            |                            |             |         |                     |   |
|                   |                  |                         |                       | 8.70               | X           |   |            |                            |             |         |                     |   |
|                   |                  |                         |                       | 9.0                | ▽           | TUFF<br>red brown<br>remolds to gravelly clay, baked margin   | EW         |                            |             |         |                     |   |
|                   |                  |                         |                       | 9.30               | ▽           | LAPILLI TUFF<br>grey brown<br>fine to medium gravel sized clasts, iron stained healed fractures   |            |                            |             |         |                     |   |
|                   |                  |                         |                       | 9.65               | ▽           | BOREHOLE BH07 TERMINATED AT 9.65 m<br>Target depth  |            |                            |             |         |                     |   |

|  |  |  |   |  |   |
|--|--|--|---|--|---|
| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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TITLE: **Wattle Valley Quarry**

PROJECT NO:  
**30012451**

TEST DATE:  
**6/4/2016**

INCLINATION:  
**-90°**

CORED LENGTH:  
**0.6m – 9.65m**

DRILL RIG:  
**P160**

CONTRACTOR:  
**NCD**

LOGGED BY:  
**BD**

CHECKED BY:  
**NP**

### BH07



# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH09

PROJECT : WATTLE VALE QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
 SHEET : 1 OF 5

POSITION : E: 365372.000, N: 6710619.000 (56 MGA94)

SURFACE ELEVATION : 1182.124 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

DRILLER : DALE

DATE STARTED : 5/4/16

DATE COMPLETED : 5/4/16

DATE LOGGED : 5/4/16

LOGGED BY : BD

CHECKED BY : SB

| DRILLING                   |         |                      |                     |   | MATERIAL  |             |   |  |                             |  |                               |                                |
|----------------------------|---------|----------------------|---------------------|---|---|-------------|---|--|-----------------------------|--|-------------------------------|--------------------------------|
| DRILLING & CASING          | SAMPLES | DRILLING PENETRATION | GROUND WATER LEVELS | FIELD TESTS                               | ELEVATION (RL) DEPTH (m)  | GRAPHIC LOG | CLASSIFICATION SYMBOL                                 | MATERIAL DESCRIPTION<br>Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components   | MOISTURE CONDITION          | CONSISTENCY  | RELATIVE DENSITY              | STRUCTURE & Other Observations |
| ADIT<br>HQ Casing<br>1.00m |         |                      |                     |   | 1182.0<br>1181.5<br>1181.0<br>1180.5<br>2.0                     |             | ML<br>0.50m<br>CI-CH<br>1.00m<br>CL<br>1.70m<br>2.00m | Clayey SILT<br>low plasticity, dark grey-brown, with subrounded fine to medium gravel<br><br>Silty CLAY<br>grey-brown to brown, trace fine grained sand<br><br>Sandy CLAY<br>grey-brown, fine grained sand<br><br>BASALT<br>dark grey-brown<br>extremely low strength, extremely weathered, remoulds to gravelly/sandy clay, | F<br><br><br>M<br>St to Vst | TOPSOIL<br><br>RESIDUAL SOIL<br>0.70: HP In-situ =400 kPa<br><br>1.20: HP In-situ =350 kPa<br><br>EXTREMELY WEATHERED ROCK | Continued as Cored Drill Hole |                                |
|                            |         |                      |                     | 1.00m SPT<br>4, 6, 9<br>N=15<br><br>1.45m | 1180.0<br>1179.5<br>1179.0<br>1178.5<br>1178.0<br>1177.5<br>5.0 |             |   |  |                             |  |                               |                                |

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



# CORED DRILL HOLE LOG

**HOLE NO : BH09**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 2 OF 5

POSITION : E: 365372.000, N: 6710619.000 (56 MGA94)

SURFACE ELEVATION : 1182.124 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 5/4/16

DATE LOGGED : 5/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING          |                  |                         |                         | MATERIAL                 |             |   |            | ROCK MASS                 |             |         |                     |  |
|-------------------|------------------|-------------------------|-------------------------|--------------------------|-------------|---|------------|---------------------------|-------------|---------|---------------------|--|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS (DRILL DEPTH) | SAMPLES & FIELD TESTS   | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable) | Weathering | ESTIMATED STRENGTH Is(50) |             | RQD (%) | DEFECT SPACING (mm) | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|                   |                  |                         |                         |                          |             |   |            | ● Axial                   | ○ Diametral |         |                     |  |
|                   |                  |                         |                         | 0.0                      |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1182.0                   |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 0.5                      |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1181.5                   |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1.0                      |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1181.0                   |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1.5                      |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1180.5                   |             |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 2.0                      |             | 2.00m START CORING AT 2.00m   |            |                           |             |         |                     |  |
|                   |                  |                         | 2.05m Is(50) d=2.39 MPa | 1180.0                   | ▼           | BASALT<br>fine grained, dark grey and pale orange<br>iron stained, healed fractures 20-40mm spacing   | MW - SW    |                           |             |         |                     | 2.10-2.50: JT, 10-25°, PR, RF, FE SN, =100 mm  |
|                   |                  |                         |                         | 2.5                      | ▼           |   |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 1179.5                   | ▼           | 2.85m<br>dark grey, some subvertical joints, healed fractures less frequent   | SW - FR    |                           |             | 60      |                     | 2.54-2.85: JT, 80-90°, UN, RF, FE SN   |
|                   |                  |                         |                         | 3.0                      | ▼           |   |            |                           |             |         |                     | 2.90: JT, 40°, PR, RF, FE SN   |
|                   |                  |                         |                         | 1179.0                   | ▼           |   |            |                           |             |         |                     | 3.00: JT, 5°, PR, RF, FE SN  |
|                   |                  |                         |                         | 3.5                      | ▼           | 3.50m<br>partially open iron stained, healed fractures, 20-40mm spacing   |            |                           |             |         |                     | 3.20-3.50: JT, 80-90°, UN, RF, FE SN   |
|                   |                  |                         |                         | 1178.5                   | ▼           |   |            |                           |             |         |                     | 3.53: JT, 15°, PR, RF, FE SN   |
|                   |                  |                         |                         | 4.0                      | ▼           |   |            |                           |             |         |                     | 3.60: JT, 50°, PR, RF, FE SN   |
|                   |                  |                         |                         | 1178.0                   | ▼           |   |            |                           |             |         |                     | 3.67: SM, 40°, UN, FILLED, =10 mm  |
|                   |                  |                         |                         | 4.5                      | ▼           |   |            |                           |             |         |                     | 4.27: JT, 10°, PR, RF, Clay CT, =3 mm  |
|                   |                  |                         |                         | 1177.5                   | ▼           |   |            |                           |             |         |                     | 4.38: JT, 65°, PR, RF, Clay CT, =3 mm  |
|                   |                  |                         |                         | 5.0                      | ▼           |   |            |                           |             |         |                     | 4.70: JT, 45°, PR, S, FE SN  |

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| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH09**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 3 OF 5

POSITION : E: 365372.000, N: 6710619.000 (56 MGA94)

SURFACE ELEVATION : 1182.124 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 5/4/16

DATE LOGGED : 5/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING   |                |                       |                       | MATERIAL                 |             |  |            | ROCK MASS                 |                   |                  |                |         |  |  |
|--|----------------|-----------------------|-----------------------|--------------------------|-------------|--|------------|---------------------------|-------------------|------------------|----------------|---------|--|--|
| DRILLING & CASING  | WATER RETURN % | CORE LOSS DRILL DEPTH | SAMPLES & FIELD TESTS | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)                      | Weathering | ESTIMATED STRENGTH Is(50) |                   |                  |                | RQD (%) | DEFECT SPACING (mm)  | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|  |                |                       |                       |                          |             |  |            | EH <sub>0.03</sub>        | VL <sub>0.1</sub> | L <sub>0.3</sub> | M <sub>1</sub> |         |  |  |
| NMLC<br>100% RETURN<br>0% LOSS<br>07/04/16<br>5.80m Is(50) d=3.53 MPa<br>6.30<br>7.20m Is(50) d=7.7 MPa<br>0% LOSS<br>0% LOSS<br>0% LOSS |                |                       |                       | 5.0                      |             | BASALT<br>fine grained, dark grey and pale orange (continued)<br>partially open iron stained, healed fractures, 20-40mm spacing<br>occasional amygdalae and vughs up to 30mm | SW<br>FR   |                           |                   |                  |                | 30      | 4.44-5.80: JT, 20-40°, PR, RF, FE SN, 40-100mm spacing<br><br>5.90: JT, 65°, UN, RF, FE SN<br><br>6.06: JT, 20°, PR, S, FE SN<br><br>6.16: JT, 15°, PR, S, FE SN   |  |
|  |                |                       |                       | 5.30m                    |             |  |            |                           |                   |                  |                |         |  |  |
|  |                |                       |                       | 5.5                      |             | partially open iron stained, healed fractures, 20-40mm spacing   | MW<br>SW   |                           |                   |                  |                | 55      | 6.30-6.66: JT, 10-35°, PR, RF, FE SN, 100-300mm spacing  |  |
|  |                |                       |                       | 5.80m                    |             |  |            |                           |                   |                  |                |         |  |  |
|  |                |                       |                       | 6.0                      |             | occasional amygdalae and vughs up to 20mm  | SW<br>FR   |                           |                   |                  |                | 55      | 6.80-8.04: JT, 15-40°, PR, RF, Fe Sn, 100-300mm spacing<br><br>8.04: JT, 35°, PR, S, FE SN<br><br>8.10-8.36: JT, 10-35°, PR, S, FE SN, 40-100mm spacing<br><br>8.50: JT, 45°, PR, RF, FE SN<br><br>8.79: JT, 10°, PR, S, MU VR |  |
|  |                |                       |                       | 6.30m                    |             |  |            |                           |                   |                  |                |         |  |  |
|  |                |                       |                       | 6.5                      |             | rare infilled vesicles and vughs   |            |                           |                   |                  |                | 55      | 9.10: JT, 10°, PR, S, MU VR<br><br>9.30: JT, 15°, PR, RF, CN<br><br>9.40: CS, 10°, 0-10mm<br><br>9.47: JT, 20°, PR, S, CN<br><br>9.56: JT, 20°, PR, S, CN  |  |
|  |                |                       |                       | 6.80m                    |             |  |            |                           |                   |                  |                |         |  |  |
|  |                |                       |                       | 7.0                      |             |  |            |                           |                   |                  |                | 55      | 9.80: JT, 10°, IR, RF, CN  |  |
|  |                |                       |                       | 7.5                      |             |  |            |                           |                   |                  |                |         |  |  |
| 8.0  |                |                       |                       |                          |             |  |            |                           |                   |                  |                |         |  |  |
| 8.5  |                |                       |                       |                          |             |  |            |                           |                   |                  |                |         |  |  |
| 9.0  |                |                       |                       |                          |             |  |            |                           |                   |                  |                |         |  |  |
| 9.5  |                |                       |                       |                          |             |  |            |                           |                   |                  |                |         |  |  |
| 10.0   |                |                       |                       |                          |             |  |            |                           |                   |                  |                |         |  |  |
| 10.9   |                |                       |                       |                          |             |  |            |                           |                   |                  |                |         |  |  |

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| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH09**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 4 OF 5

POSITION : E: 365372.000, N: 6710619.000 (56 MGA94)

SURFACE ELEVATION : 1182.124 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 5/4/16

DATE LOGGED : 5/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING          |                  |                         |                          | MATERIAL                 |             |   |            | ROCK MASS                 |             |         |                     |   |
|-------------------|------------------|-------------------------|--------------------------|--------------------------|-------------|---|------------|---------------------------|-------------|---------|---------------------|---|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS (DRILL DEPTH) | SAMPLES & FIELD TESTS    | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable) | Weathering | ESTIMATED STRENGTH Is(50) |             | RQD (%) | DEFECT SPACING (mm) | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other                      |
|                   |                  |                         |                          |                          |             |   |            | ● Axial                   | ○ Diametral |         |                     |   |
| NMLC              |                  |                         |                          |                          |             |   | SW         |                           |             | 55      |                     | 10.06: JT, 20°, PR, RF, MU SN<br>10.00-10.18: JT, 75°, PR, S, Fe VR<br>10.20-10.32: JT, 15-20°, PR, RF  |
|                   |                  | 0% LOSS                 | 10.50m Is(50) d=7.03 MPa | 10.00                    | V           | BASALT<br>fine grained, dark grey and pale orange (continued)<br>some sub vertical fractures  | FR         |                           |             |         |                     | 10.59: JT, 20-30°, IR, RF, CN<br>10.64-10.69: JT, 0-25°, PR, RF, CN, 20mm<br>10.80-10.98: FC, 80-90°, Un, RF, CN<br>10.98: JT, 20°, PR, S, MU CT, =3mm      |
|                   |                  | 0% LOSS                 | 11.26m Is(50) d=7.22 MPa | 10.50                    | V           | 11.00m<br>iron stained healed fractures, some unidentified mineral veneers in fractures   |            |                           |             | 50      |                     | 11.30: JT, 25°, PR, S, CN<br>11.30-11.46: FC, 80-90°, Un, RF, MU VR<br>11.60: JT, 20°, PR, S, CN<br>11.65: JT, 15°, PR, S, CN<br>11.75: JT, 10°, CN, 0-10mm |
|                   |                  | 0% LOSS                 |                          | 11.00                    | V           | 12.00m<br>dark grey, massive  |            |                           |             |         |                     | 12.05: JT, 60°, UN, RF, CN<br>12.27-12.31: JT, 10-40°, PR, S, CN  |
|                   |                  | 0% LOSS                 |                          | 11.50                    | V           |   |            |                           |             | 85      |                     | 13.34: JT, 45°, PR, S, CN<br>13.56-13.76: FC, 80-90°, UN, RF, CN<br>13.82: JT, 60°, IR, RF, CN<br>13.96: JT, 60°, PR, S, CN<br>14.06: JT, 10°, IR, RF, CN   |
|                   |                  | 0% LOSS                 |                          | 12.00                    | V           | 14.00m<br>brown-grey  | MW         |                           |             |         |                     | 14.60: JT, 25°, PR, RF, FE SN<br>14.79: JT, 20°, IR, RF, FE SN<br>14.86: JT, 40°, PR, S, FE SN  |
|                   |                  | 0% LOSS                 | 14.70m Is(50) d=0.2 MPa  | 12.50                    | V           |   | HW         |                           |             | 90      |                     |   |

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| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>OZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH09**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 5 OF 5

POSITION : E: 365372.000, N: 6710619.000 (56 MGA94)

SURFACE ELEVATION : 1182.124 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 5/4/16

DATE LOGGED : 5/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING          |                  |                       |                          | MATERIAL                 |             |  |            | ROCK MASS                 |    |   |   |         |                     |   |
|-------------------|------------------|-----------------------|--------------------------|--------------------------|-------------|--|------------|---------------------------|----|---|---|---------|---------------------|---|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS DRILL DEPTH | SAMPLES & FIELD TESTS    | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>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)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|                   |                  |                       |                          |                          |             |  |            | EH                        | VL | L | M |         |                     |   |
| NMLC              | 100 % RETURN     | 0% LOSS               | 15.10m Is(50) d=1.37 MPa | 15.0                     | [V-pattern] | BASALT<br>fine grained, dark grey and pale orange (continued)<br>dark grey stained brown around defects, occasional infilled vughs up to 20mm        | MW<br>HW   |                           |    |   |   | 90      |                     | 15.07-15.13: FZ, FE SN, 20-40mm   |
|                   |                  | 15.35                 |                          | 15.5                     |             | 15.65m<br>dark grey, some amygdales and vughs, infilled with calcite   | FR         |                           |    |   |   |         | 85                  |   |
|                   |                  | 0% LOSS               | 15.90m Is(50) d=3.09 MPa | 16.0                     | [V-pattern] | 16.36m<br>thin calcite veins at 100-200mm spacing  |            |                           |    |   |   |         |                     | 15.60-15.76: FZ, CA VR, 20-40mm<br>15.91: JT, 20°, PR, RF, FE SN  |
|                   |                  |                       |                          | 16.5                     |             |  |            |                           |    |   |   |         |                     |   |
|                   |                  |                       | 17.06m Is(50) d=3.91 MPa | 17.0                     | [V-pattern] |  |            |                           |    |   |   |         |                     | 16.62: JT, 20-30°, PR, RF, Fe SN  |
|                   |                  |                       |                          | 17.5                     |             |  |            |                           |    |   |   |         |                     |   |
|                   |                  |                       |                          | 18.00                    |             | BOREHOLE BH09 TERMINATED AT 18.00 m<br>Target depth  |            |                           |    |   |   |         |                     |   |

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|--|--|--|---|--|---|
| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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GINT - WATTLE VALE QUARRY LIBRARY.GLB Log - WATTLE VALE QUARRY.GPJ <DrawingFiles> 27/04/2016 14:02 8:30:00Z



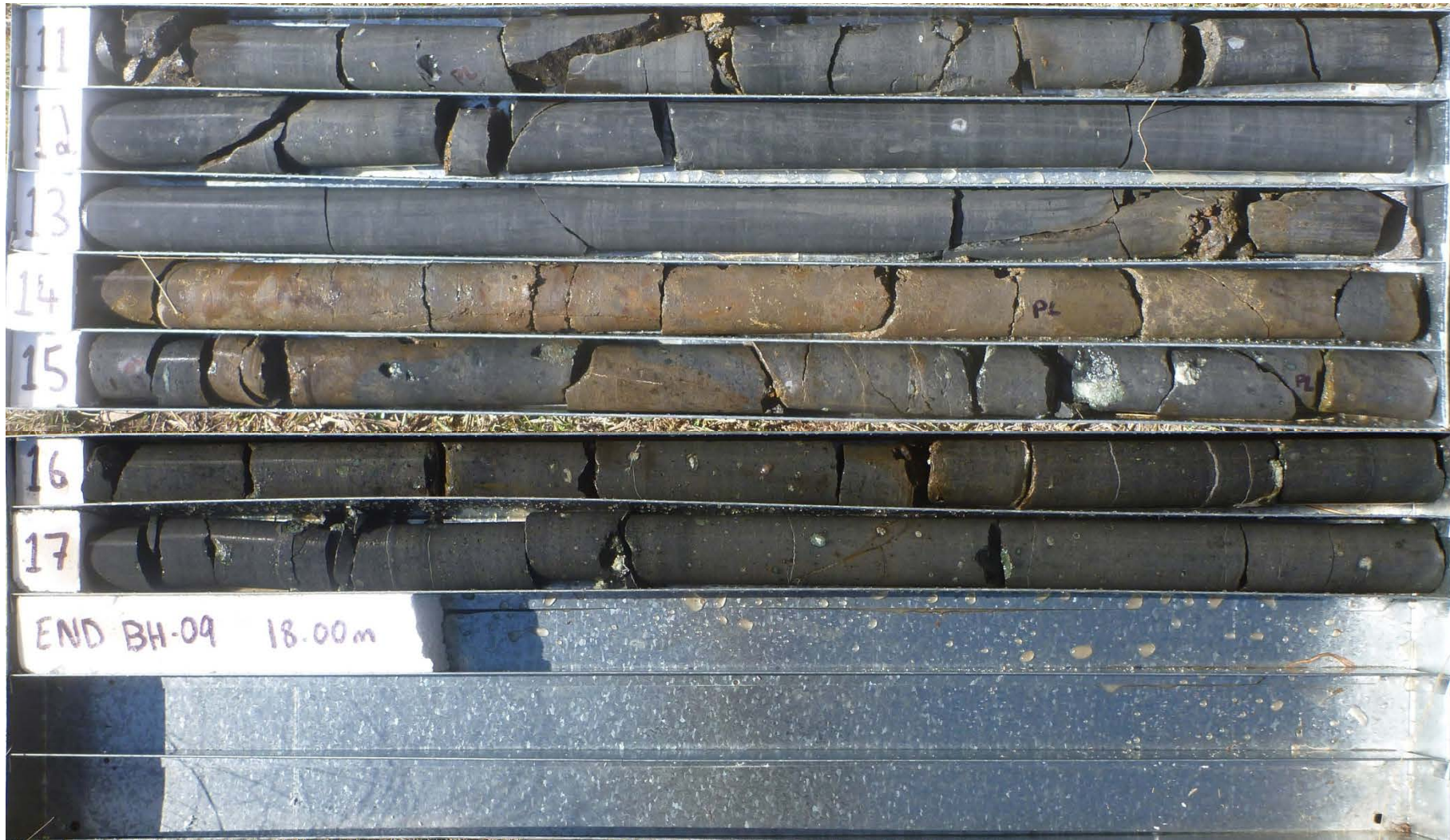


|                                    |                               |                             |                                  |
|------------------------------------|-------------------------------|-----------------------------|----------------------------------|
| TITLE: <b>Wattle Valley Quarry</b> |                               |                             |                                  |
| PROJECT NO:<br><b>30012451</b>     | TEST DATE:<br><b>5/4/2016</b> | INCLINATION:<br><b>-90°</b> | CORED LENGTH:<br><b>2m – 18m</b> |
| DRILL RIG:<br><b>P160</b>          | CONTRACTOR:<br><b>NCD</b>     | LOGGED BY:<br><b>BD</b>     | CHECKED BY:<br><b>NP</b>         |

**BH09**







# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH10

PROJECT : WATTLE VALE QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
 SHEET : 1 OF 5

POSITION : E: 365367.000, N: 6710665.000 (56 MGA94)

SURFACE ELEVATION : 1181.304 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

DRILLER : DALE

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

| DRILLING          |         |                      |                     |                                  | MATERIAL                 |                     |                       |  |                    |             |                  |   |
|-------------------|---------|----------------------|---------------------|----------------------------------|--------------------------|---------------------|-----------------------|--|--------------------|-------------|------------------|---|
| DRILLING & CASING | SAMPLES | DRILLING PENETRATION | GROUND WATER LEVELS | FIELD TESTS                      | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG         | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY | RELATIVE DENSITY | STRUCTURE & Other Observations                                |
| ADT<br>HQ Casing  |         |                      |                     |                                  | 0.0                      | [Diagonal Hatching] | CL                    | Silty CLAY<br>dark grey  |                    | st          |                  | TOPSOIL   |
|                   | 1.00m   |                      |                     |                                  | 1181.0                   |                     |                       | 0.40m  |                    |             |                  | RESIDUAL SOIL   |
|                   |         |                      |                     | 1.00m<br>SPT<br>3, 5, 10<br>N=15 | 1180.5                   | [Diagonal Hatching] | Cl-CH                 | Silty CLAY<br>grey brown   |                    | Vst         |                  | 0.50: HP In-situ =350 kPa<br>0.70: HP In-situ =350 - =400 kPa |
|                   |         |                      |                     | 1.45m                            | 1180.0                   | [V-shape Hatching]  |                       | Basalt<br>grey-brown, orange<br><i>extremely low strength, extremely weathered, remoulds to silty gravel.</i>    | M                  |             |                  | EXTREMELY WEATHERED ROCK                                      |
|                   |         |                      |                     |                                  | 1179.5                   |                     |                       |  |                    |             |                  | 2.10: Auger Refusal   |
|                   |         |                      |                     |                                  | 2.0                      |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 2.20m                    |                     |                       | Continued as Cored Drill Hole  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 1179.0                   |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 1178.5                   |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 3.0                      |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 1178.0                   |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 1177.5                   |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 4.0                      |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 1177.0                   |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 1176.5                   |                     |                       |  |                    |             |                  |   |
|                   |         |                      |                     |                                  | 5.0                      |                     |                       |  |                    |             |                  |   |

GINT - WATTLE VALE QUARRY LIBRARY.GLB Log SMEC NON-CORE DRILL HOLE GINT - WATTLE VALE QUARRY.GPJ <-DrawingFiles> 27/04/2016 14:04 8.30002

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

SMEC AUSTRALIA





# CORED DRILL HOLE LOG

**HOLE NO : BH10**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 2 OF 5

POSITION : E: 365367.000, N: 6710665.000 (56 MGA94)

SURFACE ELEVATION : 1181.304 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING          |                  |                           |                       | MATERIAL                 |             |  |            | ROCK MASS                 |             |         |                     |   |
|-------------------|------------------|---------------------------|-----------------------|--------------------------|-------------|--|------------|---------------------------|-------------|---------|---------------------|---|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS DRILL DEPTH (%) | SAMPLES & FIELD TESTS | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>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)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |
|                   |                  |                           |                       |                          |             |  |            | ● Axial                   | ○ Diametral |         |                     |   |
|                   |                  |                           |                       | 0.0                      |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1181.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1180.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1180.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1179.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 2.20m                    |             | 2.20m START CORING AT 2.20m  |            |                           |             |         |                     | 2.20: Rock Roller Refusal   |
|                   |                  |                           |                       | 1179.0                   |             | BASALT<br>fine grained, dark grey to black<br>stained with iron, generally fragmented, traces of clay in defects                                     | MW<br>HW   |                           |             |         |                     |   |
|                   |                  |                           |                       | 2.70                     |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1178.5                   |             |  |            |                           |             |         |                     | 2.82-2.88: SM, CY FILLED  |
|                   |                  |                           |                       | 3.00                     |             |  |            |                           |             |         |                     | 2.20-3.60: FZ, FE SN, 0-20mm  |
|                   |                  |                           |                       | 1178.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 3.40                     |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1177.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 3.60m                    |             | 3.60m CORE LOSS 0.12m (3.60-3.72)  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 3.72                     |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1177.0                   |             | dark grey, iron stained on defects, traces of clay in fractures  | SW         |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.00                     |             |  |            |                           |             |         |                     | 3.20: JT, 80°, PR, S, FE SN   |
|                   |                  |                           |                       | 1176.5                   |             |  |            |                           |             |         |                     | 3.37: JT, 80°, PR, S, FE SN   |
|                   |                  |                           |                       | 4.05m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1176.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.25m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1175.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.40                     |             |  |            |                           |             |         |                     | 3.78: JT, 30°, PR, RF, FE SN  |
|                   |                  |                           |                       | 1175.0                   |             |  |            |                           |             |         |                     | 3.85: JT, 10-30°, CU, RF, FE SN   |
|                   |                  |                           |                       | 4.50                     |             |  |            |                           |             |         |                     | 3.90-4.00: FZ, FE SN, 0-10mm  |
|                   |                  |                           |                       | 1174.5                   |             |  |            |                           |             |         |                     | 4.05-4.07: CS, FE SN, 0-10mm  |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     | 4.18-4.23: FZ, Clay CT, 0-20mm  |
|                   |                  |                           |                       | 1174.0                   |             |  |            |                           |             |         |                     | 4.35-4.37: SM, Clay FILLED  |
|                   |                  |                           |                       | 1173.5                   |             |  |            |                           |             |         |                     | 4.30-4.44: FZ, FE SN, 20-40mm   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     | 4.44: JT, 10°, PR, RF, Clay CT  |
|                   |                  |                           |                       | 1173.0                   |             |  |            |                           |             |         |                     | 4.56-4.58: CS, FE SN, 0-10mm  |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     | 4.62-4.72: FZ, FE SN, 0-20mm  |
|                   |                  |                           |                       | 1172.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1172.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1171.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1171.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1170.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1170.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1169.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1169.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1168.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1168.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1167.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1167.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1166.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1166.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1165.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1165.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1164.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1164.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1163.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1163.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1162.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1162.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1161.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1161.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1160.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1160.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1159.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1159.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1158.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1158.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1157.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1157.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1156.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1156.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1155.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1155.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1154.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1154.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1153.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1153.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1152.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1152.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1151.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1151.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1150.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1150.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1149.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1149.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1148.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1148.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1147.5                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 4.95m                    |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       | 1147.0                   |             |  |            |                           |             |         |                     |   |
|                   |                  |                           |                       |                          |             |  |            |                           |             |         |                     |   |

# CORED DRILL HOLE LOG

**HOLE NO : BH10**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 3 OF 5

POSITION : E: 365367.000, N: 6710665.000 (56 MGA94)

SURFACE ELEVATION : 1181.304 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING          |                  |                         |                         | MATERIAL                 |             |  |            | ROCK MASS                 |             |         |                     |  |
|-------------------|------------------|-------------------------|-------------------------|--------------------------|-------------|--|------------|---------------------------|-------------|---------|---------------------|--|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS (DRILL DEPTH) | SAMPLES & FIELD TESTS   | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | DESCRIPTION<br>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)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other  |
|                   |                  |                         |                         |                          |             |  |            | ● Axial                   | ○ Diametral |         |                     |  |
|                   |                  | 0% LOSS                 | d=3.45 MPa              | 5.0                      | ▽           | 20-40mm  | SW         |                           |             | 25      | 20-40mm             | 40-80mm  |
|                   |                  | 5.50                    |                         | 5.5                      | ▽           |  |            |                           |             |         |                     | 5.15-5.19: SM, 25°, Clay FILLED<br>5.28: JT, 10°, PR, RF, Clay CT, 3 mm<br>5.36: JT, 10°, PR, RF, Clay CT, 3 mm<br>5.46: FC, 80°, PR, FE SN, partly open<br>5.65: JT, 70°, PR, RF, FE SN               |
|                   |                  | 6.00                    | 5.70m Is(50) d=1.18 MPa | 6.0                      | ▽           | 6.05m  | MW         |                           |             | 0       |                     | 5.50-6.00: FZ, FE SN, 20-40mm  |
|                   |                  | 6.70                    | 6.10m Is(50) d=0.37 MPa | 6.0                      | ▽           | BASALT BRECCIA<br>fine grained, dark grey angular clasts up to 40mm, cemented with iron  | SW         |                           |             | 65      |                     | 6.05: JT, 10-25°, PR, RF, FE SN<br>6.25: VN, 30°, PR, MU FILLED, 10 mm<br>6.30-6.62: FC, 80°, Un, RF, FE SN  |
|                   |                  | 7.45                    | 6.50m Is(50) d=0.58 MPa | 6.5                      | ▽           | 6.70m  |            |                           |             |         |                     | 6.78-6.79: FZ, 10-15°, FE SN, 0-20mm<br>6.85: JT, 10°, PR, RF, Clay CT, 3 mm<br>7.00: JT, 75°, PR, RF, FE SN   |
|                   |                  | 8.00                    |                         | 7.0                      | ▽           | BASALT<br>fine grained, dark grey iron stained, healed fractures 40-100mm spacing  |            |                           |             | 35      |                     | 7.22-7.45: FZ, FE SN, 20-40mm<br>7.45-7.65: FZ, Fe Sn, 20-40mm<br>7.67: JT, 10°, PR, RF, Clay Ct, 3 mm   |
|                   |                  | 8.80                    |                         | 7.5                      | ▽           |  |            |                           |             | 35      |                     | 7.87-8.00: FZ, Fe Sn, 20-40mm  |
|                   |                  | 9.50                    | 8.75m Is(50) d=4.78 MPa | 8.0                      | ▽           |  | SW         |                           |             | 50      |                     | 8.12: JT, 10°, PR, RF, FE SN<br>8.14: JT, 10°, PR, S, FE SN<br>8.20-8.23: SM, 10-60°, S, Clay FILLED<br>8.25: JT, 10°, PR, RF, Clay VR<br>8.30: JT, 70°, PR, RF, FE SN<br>8.46: JT, 10°, PR, RF, FE VR |
|                   |                  |                         |                         | 8.5                      | ▽           |  |            |                           |             |         |                     | 8.64-8.66: SM, 0°, PR, S, Clay FILLED<br>8.73: JT, 10°, PR, RF, FE SN<br>8.82: JT, 10°, PR, RF, FE SN  |
|                   |                  |                         |                         | 9.0                      | ▽           |  |            |                           |             |         |                     |  |
|                   |                  |                         |                         | 9.5                      | ▽           |  |            |                           |             |         |                     | 9.54: JT, 15°, PR, RF, FE SN   |
|                   |                  |                         |                         | 10.0                     | ▽           |  |            |                           |             |         |                     |  |

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| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>OZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH10**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 4 OF 5

POSITION : E: 365367.000, N: 6710665.000 (56 MGA94)

SURFACE ELEVATION : 1181.304 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m

BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING          |                  |                           | MATERIAL                          |   |             |  | ROCK MASS                                       |   |         |                     |   |  |
|-------------------|------------------|---------------------------|-----------------------------------|---|-------------|--|---|---|---------|---------------------|---|--|
| DRILLING & CASING | WATER RETURN (%) | CORE LOSS DRILL DEPTH (%) | SAMPLES & FIELD TESTS             | ELEVATION (RL) DEPTH (m)  | GRAPHIC LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable) | Weathering                                      | ESTIMATED STRENGTH Is(50)<br>● Axial<br>○ Diametral | RQD (%) | DEFECT SPACING (mm) | DEFECTS (joints, partings, seams, zones, etc)<br>Description, orientation, infilling or coating, shape, roughness, thickness, other |  |
|                   |                  |                           |                                   |   |             |  |   |   |         |                     |   | EL <sub>0-03</sub>                     |
|                   |                  | 0% LOSS                   | 10.14m<br>Is(50)<br>d=2.25<br>MPa | 10.0  |             | BASALT<br>fine grained, dark grey (continued)  | SW  |   | 50      |                     | 10.19-10.21: SM, 10°, EW FILLED   |  |
|                   |                  | 0% LOSS                   |                                   | 10.45   |             |  |   |   |         | 20                  |   | 10.45-10.70: FZ, CN, 20-40mm           |
|                   |                  | 0% LOSS                   |                                   | 11.00   |             |  |   |   |         |                     |   | 10.70-11.00: JT, 80-90°, UN, RF, FE SN |
|                   |                  |                           |                                   | 11.48m<br>Is(50)<br>a=0<br>MPa                                  |             | 11.0   |   |   |         |                     |   | 11.05: JT, 50°, PR, RF, FE SN          |
|                   |                  |                           |                                   | 11.70   |             |  | 11.25m<br>massive occasional thin calcite veins | SW - FR   |         |                     |   | 11.25: JT, 20°, UN, RF, FE SN          |
|                   |                  |                           |                                   | 11.70   |             |  |   |   |         |                     |   | 11.53: JT, 20°, IR, RF, FE SN          |
|                   |                  |                           |                                   | 11.89.5   |             |  |   |   |         |                     |   |  |
|                   |                  |                           |                                   | 12.37m<br>Is(50)<br>d=0.16<br>MPa                               |             | 11.5   |   |   |         |                     |   |  |
|                   |                  |                           |                                   | 12.5  |             |  |   |   |         | 75                  |   |  |
|                   |                  |                           |                                   | 12.5  |             |  |   |   |         |                     |   |  |
|                   |                  |                           |                                   | 13.10m<br>Is(50)<br>d=5.12<br>a=7.78<br>MPa                     |             | 13.0   | 13.23m<br>brown-grey stained orange             | HW  |         |                     |   |  |
|                   |                  |                           |                                   | 13.5  |             |  | 13.60m<br>dark brown-grey                       |   |         |                     |   |  |
|                   |                  |                           |                                   | 13.80m<br>mottled orange, remoulds to low plasticity sandy clay |             | 13.5   |   |   |         |                     |   |  |
|                   |                  |                           |                                   | 14.25m<br>dark grey, some thin calcite veins                    |             | 14.0   |   |   |         |                     |   |  |
|                   |                  |                           |                                   | 14.42m<br>Is(50)<br>d=3.6<br>MPa                                |             | 14.5   |   |   |         |                     |   | 14.37: JT, 6°, PR, Clay FILLED, 9 mm   |
|                   |                  |                           |                                   | 14.5  |             |  |   |   |         |                     | 14.20-15.16: JT, 10-30°, PR, RF, FE SN, 50-150mm  |  |

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| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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

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# CORED DRILL HOLE LOG

**HOLE NO : BH10**

PROJECT : WATTLE VALE QUARRY  
LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
SHEET : 5 OF 5

POSITION : E: 365367.000, N: 6710665.000 (56 MGA94)

SURFACE ELEVATION : 1181.304 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

HOLE DIA : 96mm

DATE STARTED : 5/4/16

DATE COMPLETED : 6/4/16

DATE LOGGED : 6/4/16

LOGGED BY : BD

CHECKED BY : SB

CASING DIAMETER : HQ

BARREL (Length) : 3.00 m BIT : DIAMOND IMPREG S10-S12

BIT CONDITION : GOOD

| DRILLING             |                     |                            |                                   | MATERIAL   |                |  |            | ROCK MASS                    |           |         |   |  |
|----------------------|---------------------|----------------------------|-----------------------------------|--|----------------|--|------------|------------------------------|-----------|---------|---|--|
| PROGRESS             |                     | CORE LOSS<br>DRILL RUN (%) | SAMPLES &<br>FIELD TESTS          | ELEVATION<br>(RL)<br>DEPTH (m)   | GRAPHIC<br>LOG | DESCRIPTION<br>ROCK TYPE : Colour, Grain size, Structure<br>(texture, fabric, mineral composition, hardness<br>alteration, cementation, etc as applicable) | Weathering | ESTIMATED STRENGTH<br>Is(50) |           | RQD (%) | DEFECT<br>SPACING<br>(mm)   | DEFECTS<br>(joints, partings, seams, zones, etc)<br>Description, orientation, infilling<br>or coating, shape, roughness,<br>thickness, other |
| DRILLING<br>& CASING | WATER<br>RETURN (%) |                            |                                   |  |                |  |            | AXIAL<br>DIAMETRAL           | DIAMETRAL |         |   |  |
| NMLC                 | 100% RETURN         | 0% LOSS                    | 15.69m<br>Is(50)<br>d=4.7<br>MPa  | 15.0<br>1186.0<br>15.5<br>1185.5   | V              | BASALT<br>fine grained, dark grey (continued)  | FR         | VL                           | 65        | 20-1000 | 15.14: JT, 75°, PR, S, CA VR  |  |
|                      |                     | 0% LOSS                    | 16.40m<br>Is(50)<br>d=4.86<br>MPa | 15.90m<br>1185.0<br>16.0<br>1185.0<br>16.5<br>1184.5                                     | V              | some calcite filled vesicles   |            | L                            |           |         | 15.51: JT, 20°, PR, S, CA VR  |  |
|                      |                     | 16.80                      | 17.10m<br>Is(50)<br>d=8.16<br>MPa | 16.70m<br>1184.0<br>17.0<br>1184.5<br>17.5<br>1184.0<br>18.0<br>1183.5                   | V              | some green mineral infill in fractures   |            | L                            | 60        |         | 16.70: JT, 45°, PR, CA<br>FILLED, 9 mm<br>16.80-17.00: JT, 30-60°, PR,<br>S, CA VR, 20-40mm spacing |  |
|                      |                     | 0% LOSS                    |                                   | 18.00m<br>1183.0<br>18.5<br>1182.5<br>19.0<br>1182.0<br>19.5<br>1181.5<br>20.0<br>1181.0 | V              | BOREHOLE BH10 TERMINATED AT 18.00 m<br>Target depth  |            | L                            |           |         | 17.70-17.87: JT, 70-80°, UN,<br>RF, CN  |  |

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| <b>DRILLING</b><br>AD/T Auger Drilling with TC Bit<br>AD/V Auger Drilling with V Bit<br>AS Auger Screwing<br>DB Washbore with Drag Bit<br>DT Diatube<br>HMLC HMLC Core Barrel<br>HQ3 HQ3 Core Barrel<br>NMLC NMLC Core Barrel<br>NQ3 NQ3 Core Barrel<br>PQ3 PQ3 Core Barrel<br>R Rock Roller | <b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow<br><br><b>WEATHERING</b><br>FR Fresh<br>SW Slightly Weathered<br>MW Moderately Weathered<br>HW Highly Weathered<br>EW Extremely Weathered | <b>STRENGTH</b><br>EH Extremely High<br>VH Very High<br>H High<br>M Medium<br>L Low<br>VL Very Low<br>EL Extremely Low<br><br><b>ROUGHNESS</b><br>POL Polished<br>RF Rough<br>S Smooth<br>SL Slickensided<br>VR Very Rough | <b>DEFECT TYPE</b><br>BP Bedding Plane<br>CL Cleavage<br>CS Crushed Seam<br>CZ Crushed Zone<br>DB Drilling Break<br>FC Fracture<br>HB Handling Break<br>IS Infilled Seam<br>JT Joint<br>SM Seam<br>SS Shear Seam<br>SZ Shear Zone<br>VN Vein<br>VO Void<br>FA Fault | <b>COATING</b><br>CN Clean<br>CT Coating (>= 1.0m)<br>FILLED Filled<br>SN Stained<br>VR Veneer (< 1.0mm)<br><br><b>PLANARITY</b><br>CU Curved<br>DIS Discontinuous<br>IR Irregular<br>PR Planar<br>ST Stepped<br>UN Undulose | <b>INFILL</b><br>CA Calcite<br>CLAY Clay<br>FE Iron Oxide<br>FE Iron Oxide Clay<br>CLAY Clay<br>KT Chlorite<br>MS Secondary Mineral<br>MU Unidentified Mineral<br>QZ Quartz<br>X Carbonaceous |
|--|--|--|---|--|---|

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





TITLE: **Wattle Valley Quarry**

PROJECT NO:  
**30012451**

TEST DATE:  
**6/4/2016**

INCLINATION:  
**-90°**

CORED LENGTH:  
**2.2m – 18m**

DRILL RIG:  
**P160**

CONTRACTOR:  
**NCD**

LOGGED BY:  
**BD**

CHECKED BY:  
**NP**

### BH10









# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH11

PROJECT : WATTLE VALE QUARRY  
 LOCATION : MATHESON NSW

CLIENT : GLEN INNES SEVERN COUNCIL  
 FEATURE : PROPOSED QUARRY SITE 5

FILE / JOB NO : 30012451  
 SHEET : 1 OF 7

POSITION : E: 365316.000, N: 6710604.000 (56 MGA94)

SURFACE ELEVATION : 1181.324 (AHD)

ANGLE FROM HORIZONTAL : 90°

RIG TYPE : P160

MOUNTING : Track

CONTRACTOR : NCD

DRILLER : DALE

DATE STARTED : 7/4/16

DATE COMPLETED : 7/4/16

DATE LOGGED : 7/4/16

LOGGED BY : BD

CHECKED BY : SB

| DRILLING                   |         |                      |                     |                                | MATERIAL                 |             |                       |  |                    |             |                  |                                |
|----------------------------|---------|----------------------|---------------------|--------------------------------|--------------------------|-------------|-----------------------|--|--------------------|-------------|------------------|--------------------------------|
| DRILLING & CASING          | SAMPLES | DRILLING PENETRATION | GROUND WATER LEVELS | FIELD TESTS                    | ELEVATION (RL) DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Plasticity or Particle Characteristic, Colour, Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY | RELATIVE DENSITY | STRUCTURE & Other Observations |
| AD/T<br>HQ Casing<br>1.00m |         |                      |                     |                                | 0.0                      | [Symbol]    | CL                    | Silty CLAY<br>low plasticity, dark brown   |                    |             |                  | TOPSOIL                        |
|                            |         |                      |                     |                                | 1181.0                   | [Symbol]    | CI-CH                 | Silty CLAY<br>dark grey brown  |                    |             |                  | RESIDUAL SOIL                  |
|                            |         |                      |                     |                                | 1180.5                   | [Symbol]    |                       | Basalt<br>grey brown mottled orange<br><i>remolds to silty clay</i>  |                    |             |                  | EXTREMELY WEATHERED ROCK       |
| 2.50m                      |         |                      |                     | SPT<br>5, 6, 7<br>N=13         | 1.00m                    |             |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1180.0                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1.45m                    |             |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1179.5                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 2.00m                    | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1179.0                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 2.50m                    | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     | SPT<br>25/70mm<br>N=8<br>2.57m | 3.00m                    |             |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1178.5                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 3.20m                    | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1178.0                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1177.5                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 4.00m                    | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1177.0                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 1176.5                   | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                | 5.00m                    | [Symbol]    |                       |  |                    |             |                  |                                |
|                            |         |                      |                     |                                |                          |             |                       | Continued as Cored Drill Hole  |                    |             |                  |                                |

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