

# GROUNDWATER



RESOURCE MANAGEMENT

PO Box 2310 Kardinya WA 6163  
 23 Parry Street  
 Fremantle WA 6160  
 Ph: +61 8 9433 2222 Fx: +61 8 9433 2322  
 Email: water@g-r-m.com.au

ID:	<b>WNWE013</b>		JOB NUMBER:	<b>J080028</b>	
CLIENT:	<b>Minemakers</b>		PROJECT:	<b>Wonarah Feasibility</b>	
COMMENCED:	15-Mar-09	EASTING:	636070	INCLINATION:	60 degrees
COMPLETED:	16-Mar-09	NORTHING:	7767130	AZIMUTH:	305 degrees
DRILLED BY:	Tom Browne Drilling	ELEVATION:	260	SWL (date):	ND mbrp ( )
LOGGED BY:	SMW	GRID SYSTEM:	MGA 94 - Zone 53		

Depth (m bgl)	Graphic + Stratigraphy	Lithological Description	Field Notes	Bore Construction
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0		SAND, red-brown, fine grained, some silt, ALLUVIUM/COLLUVIUM		0-6m 165mm diameter open hole
10		Clayey GRAVEL, red-brown, ironstone gravels		0-6m 150mm Class 9 PVC Casing
20		SILTSTONE, white, soft, laminated, moderately weathered		
30		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
40		SILTSTONE, white and grey, soft, laminated, moderately weathered, interlayered with dolomite, minor chert bands. 24-26m: zone with limonite staining and is highly weathered		
50		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
60		SILTSTONE, dark grey to brown, minor dolomite layers with 5% manganese, dolomite layers are sub metre in thickness, moderately weathered ranging to highly weathered through some siltstone layers. 73-74m: Highly weathered zone of dark grey to yellow-brown clay.		
78			78m:Wet on rod change	
80		CLAY, pale brown, moderate plasticity, completely weathered SILTSTONE		6-150m 152mm diameter open hole
90		DOLOMITE, black to dark grey, massive, 15% manganese		
96		SILTSTONE, white, soft, laminated, moderately weathered	96m:First continuous water,Q'0.2 L/s	
99		QUARTZITE+CLAY, brown to translucent, predominantly clay with zones of rubbly quartzite (not infill, but in-situ based on the angular fragments and the way it drilled), common chert fragments.	99-102m:Very problematic drilling, can not clear hole.Q'2 L/s. Water has a high proportion of suspended clay	
114		SILTSTONE, dark grey to black, carbonaceous, laminated, slightly weathered.	114m:Q=2L/s, EC=1.4mS/cm @ 38C, pH=8.5	
120		DOLOMITE, grey to pale brown, massive, slight reaction to acid, very siliceous in parts		
132			132m:Q=1.8L/s, EC=1.4mS/cm @ 38C, pH=8.5	
140		BASALT, black, fine grained, massive, fresh, hard, very weak haematite alteration.		
150			150m:Q=1.3L/s, EC=1.5mS/cm @ 38C, pH=8.5 Water has a high proportion of suspended clay. Will be difficult to establish a bore in this aquifer. Dust from cyclone while drilling	EOH 150m
160				
170				

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ID:	<b>WNWE014</b>	JOB NUMBER:	<b>J080028</b>
CLIENT:	<b>Minemakers</b>	PROJECT:	<b>Wonarah Feasibility</b>
COMMENCED:	17-Mar-09	EASTING:	636133
COMPLETED:	17-Mar-09	NORTHING:	7767089
DRILLED BY:	Tom Browne Drilling	ELEVATION:	260
LOGGED BY:	SMW	GRID SYSTEM:	MGA 94 - Zone 53
		INCLINATION:	60 degrees
		AZIMUTH:	305 degrees
		SWL (date):	ND mbrp ( )

Depth (m bgl)	Graphic + Stratigraphy	Lithological Description	Field Notes	Bore Construction
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0		SAND, red-brown, fine grained, some silt, ALLUVIUM/COLLUVIUM		0-6m 165mm diameter open hole
10		Clayey GRAVEL, red-brown, ironstone gravels, weak cementation		0-6m 150mm Class 9 PVC Casing
20		SILTSTONE, white, soft, laminated, moderately weathered		
30		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
40		SILTSTONE, white, soft, laminated, moderately weathered		
50		SILTSTONE, white and grey, soft, laminated, moderately weathered, interlayered with dolomite, minor chert bands.		
60		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
70		SILTSTONE, white and grey, soft, laminated, moderately weathered, interlayered with dolomite, minor chert bands.		
80		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		6-150m 152mm diameter open hole
90		SILTSTONE, white and grey, soft, laminated, moderately weathered, interlayered with dolomite, minor chert bands.	84m:Wet on rod change	
100		DOLOMITE, dark grey to yellow-brown, highly weathered, very common moderate plasticity clay, 5-10% manganese		
110		SILTSTONE, white and grey, soft, laminated, moderately weathered, interlayered with dolomite, minor chert bands.	102m:First continuous water,Q0.5 L/s	
120		CLAY, brown, moderate plasticity, completely weathered SILTSTONE	108m:Q=1L/s, EC=1.4mS/cm @ 38C, pH=8.7	
130		QUARTZITE+CLAY, brown to translucent, predominantly clay with zones of rubbly quartzite (not infill, but in-situ based on the angular fragments and the way it drilled), common chert fragments.		
140		SILTSTONE, dark grey to black, carbonaceous, laminated, minor quartz veins.		
150		DOLOMITE, grey to pale brown, massive, slight reaction to acid, very siliceous in parts		
160		BASALT, black, fine grained, massive, fresh, hard, very weak haematite alteration.	150m:Q=1L/s, EC=1.4mS/cm @ 38C, pH=8.7	EOH 150m
170				

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ID:	<b>WNWE015</b>		JOB NUMBER:	<b>J080028</b>	
CLIENT:	<b>Minemakers</b>		PROJECT:	<b>Wonarah Feasibility</b>	
COMMENCED:	18-Mar-09	EASTING:	636196	INCLINATION:	60 degrees
COMPLETED:	20-Mar-09	NORTHING:	7767048	AZIMUTH:	305 degrees
DRILLED BY:	Tom Browne Drilling	ELEVATION:	260	SWL (date):	ND mbrp ( )
LOGGED BY:	SMW	GRID SYSTEM:	MGA 94 - Zone 53		

Depth (m bgl)	Graphic + Stratigraphy	Lithological Description	Field Notes	Bore Construction
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0		SAND, red-brown, fine grained, some silt, ALLUVIUM/COLLUVIUM		0-6m 165mm diameter open hole
10		Clayey GRAVEL, red-brown, ironstone gravels, weak cementation		0-6m 150mm Class 9 PVC Casing
20		SILTSTONE, white to pale pink, soft, laminated, moderately weathered		
30		SILTSTONE, white, soft, laminated, moderately weathered		
40		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
50		SILTSTONE, white, soft, laminated, moderately weathered		
60		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
70		SILTSTONE, yellow-brown, soft, laminated, common limonite staining, moderate to highly weathered		
80		SILTSTONE, white and grey, soft, laminated, moderately weathered, interlayered with dolomite, minor chert bands.	84m: Wet on rod change	6-150m 152mm diameter open hole
90		CLAY, brown, moderate plasticity, completely weathered SILTSTONE	90m: First continuous water, Q <sub>0.5</sub> L/s	
100		QUARTZITE+CLAY, brown to translucent, predominantly clay with zones of rubbly quartzite (not infill, but in-situ based on the angular fragments and the way it drilled), common chert fragments.	102m: First continuous water, Q <sub>1</sub> L/s, EC=1.4mS/cm @ 36, pH=8.7	
110		DOLOMITE, grey to pale brown, massive, slight reaction to acid, very siliceous in parts		
120		QUARTZITE+CLAY, brown to translucent, predominantly clay with zones of rubbly quartzite (not infill, but in-situ based on the angular fragments and the way it drilled), common chert fragments.	120m: Q <sub>1</sub> L/s, dust from cyclone while drilling	
130		DOLOMITE, grey to pale brown, massive, slight reaction to acid, very siliceous in parts		
140		BASALT, grey-brown to purple-brown, fine grained, massive, moderately weathered, some haematitic alteration		
150		BASALT, grey-black, fine grained, massive, fresh, hard, weak haematite alteration.	149m: Minor fracture	
160			156m: Q=1L/s, EC=1.4mS/cm @ 36C, pH=8.7	EOH 156m
170				