



90 View to SW



90 View to E



90 Creek to S



90 Pan to SW



91 Shale o/c



93 Sandstone / Shale Contact



95 Sandstone / Shale Contact



100 Sandstone o/c



100 Sandstone curved discontinuities



101 Shale o/c



103 Sandstone Bedding



103 Sandstone cliff



BH 2A-02A alternate position
710406,7654350



Water table daylighting at N creek edge



105 Sandstone o/c



107 Sandstone at abutment



109 View to NE abutment



110 Sandstone o/c



112 Sandstone in creek



130 Silicified Chert Band on ridge



130 View to W abutment



131 Sandstone spillway chute



132 Spillway creek



133 Spillway creek



133 Sandstone LHS spillway creek



134 Spillway creek



134 Sandstone in Spillway creek



135 Sandstone/Shale contact RHS creek



137 Shale with interbedded siltstone RHS creek



138 Creek bed in embankment footprint

SOIL DESCRIPTION AND CLASSIFICATION NOTES AND ABBREVIATIONS USED ON LOGS

FIGURE B1

IDENTIFICATION AND CLASSIFICATION

GW		Well graded gravels, gravel sand mixtures, less than 5% fines
GP		Poorly graded gravels, gravel sand mixtures, less than 5% fines
GM		Silty gravels, gravel sand silt mixtures, 12 -35% non-plastic fines
GC		Clayey gravels, gravel sand clay mixture, 12 -35% plastic fines
SW		Well graded sands, gravelly sands, less than 5% fines
SP		Poorly graded sands, gravelly sands, less than 5% fines
SM		Silty sand, sand silt mixtures, 12 -35% non-plastic fines
SC		Clayey sand, sand clay mixtures, 12 -35% plastic fines
ML		Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
CL-ML CL CL		Inorganic clays of low to medium plasticity, gravelly, sandy or silty clays, lean clays
OL		Organic silts and silty clays of low plasticity
MH		Inorganic silts, micaceous or diatomaceous fine sands or silts, plastic silts
CH		Inorganic clays of high plasticity, fat clays
OH		Organic clays of medium to high plasticity
Pt		Peat, highly organic soils
-		Fill
-		Topsoil

PARTICLE SIZE

Clay	Silt	Sand	Gravel	Cobbles	Boulders
0.002	0.06	2	60	200	
Particle size (mm)					

NOTE: 0.06 mm is about the smallest particle size visible to the naked eye. The 0.075mm sieve is used to represent this size in the laboratory.

CONSISTENCY OF COHESIVE SOILS

Classification	Undrained shear strength (kPa)
Very soft	Less than 12.5
Soft	12.5 - 25
Firm	25 - 50
Stiff	50 - 100
Very stiff	100 - 200
Hard	More than 200

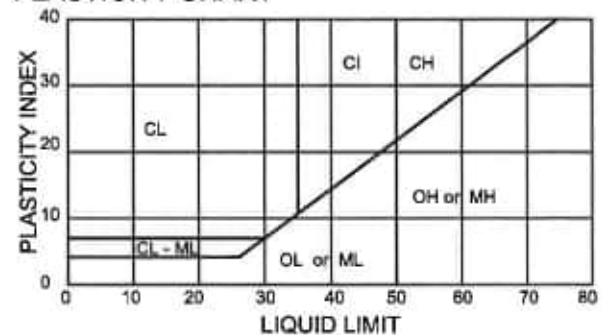
CONSISTENCY OF COHESIONLESS SOILS

Classification	Relative density (%)
Very loose	Less than 15
Loose	15 - 35
Medium dense	35 - 65
Dense	65 - 85
Very dense	More than 85

MOISTURE CONDITION OF COHESIVE SOILS

Symbol	Description
W	Field moisture content
W _p	Plastic limit

PLASTICITY CHART



NOTE: If in-situ tests and/or laboratory tests are not shown on the borelogs, classifications and descriptions are based on field identification procedures (AS 1726, Appendix A) including the use of pocket penetrometer for fine grained soils, and on the ease and stability of drill holes or excavations in coarse grained soils.

NOTES AND ABBREVIATIONS

Sample Type	AS	Auger sample taken from the auger bit after withdrawal of the auger string, not from the auger flights at the surface.
	BS	Bulk sample from excavation eg. Test pit.
	SPT	Standard Penetration Test sample. Open split tube, 51mm outside diameter.
	TO	Open tube sample.
	NMLC	Core from a triple tube barrel, 52mm diameter.
	RC	Rock core.
Field Tests	SPT	N = the number of blows of a 63.5 kg hammer dropping 760mm required to drive the split tube sampler 300mm. If less than 300mm can be driven the blows and penetration achieved are noted.
	SDP	Scale Dynamic Probe. A 19mm pointed rod driven into the ground by a 9 kg hammer falling 508mm. The number of blows per 50mm penetration is recorded.
Sample Condition		Undisturbed
		Disturbed
		Sample lost. (For core runs it may not be clear where the loss occurred in the run. In these cases the total loss is shown at the bottom of the run.)
Groundwater		Observed groundwater level.
		Groundwater not observed means that the natural standing groundwater level was not or could not be measured, possibly due to a caving hole or to the use of wash water during the drilling operations.
		Groundwater not encountered means that the hole was dry after drilling.



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 710602E 7653858N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness							
									0	4	8	12	16	20		
not encountered					GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry										
						SANDSTONE Highly to moderately weathered, grey, high strength										
			0.5			REFUSAL Test pit TP2A-02 terminated at 0.35m										
			1.0													
			1.5													
			2.0													
			2.5													
			3.0													



TP02



TP02

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 710481E 7654159N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Permeability	MDD	OMC	Particle Density	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness	
					SM	TOPSOIL Dense, fine and medium, pale brown silty sand, with rootlets, dry												
			0.5		SW	SAND Very dense, fine to coarse, pale brown and brown, with rounded cobbles and gravel, dry												
							BS		1.7	2	29		3.10E-4	1.827	11.9	2.73		
			1.0															
			1.5															
			2.0															
						SANDSTONE Highly to moderately weathered, grey and pale grey, high strength												
			2.5			Test pit TP2A-03 terminated at 2.4m												
			3.0															

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18

not encountered



TP03







TP03

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 710510E 7654258N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered					SM	TOPSOIL Dense, fine and medium, red brown and dark grey silty sand, with rootlets, dry	BS							
					SC	CLAYEY SAND Very dense, fine to coarse, red brown, with gravel, dry								
						SANDSTONE Highly to moderately weathered, grey, high strength								
			0.5			REFUSAL Test pit TP2A-03A terminated at 0.4m								
			1.0											
			1.5											
			2.0											
			2.5											
			3.0											



TP03A







TP03A

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 710684E 7654479N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
															0	4	8	12	16	20
not encountered			0.5		SM	TOPSOIL Dense, fine and medium, brown with dark grey silty sand, with rootlets, dry														
					SC	CLAYEY SAND Very dense, fine to coarse, red brown, with gravel, dry	BS		2.6	34	28	13	15	6.7						
						SANDSTONE Extremely to highly weathered, pale yellow brown and grey, low to medium strength														
			1.0			REFUSAL Test pit TP2A-04 terminated at 0.8m														
			1.5																	
			2.0																	
			2.5																	
			3.0																	



TP04



TP04



TP05





TP05

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 710867E 7654232N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry	BS							
			0.5		GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with cobbles, trace silt, dry (rounded gravel and cobbles)								
	not encountered		1.0				BS		1.9	3	25	0		
			1.5											
			2.0											
			2.5			SANDSTONE Highly to moderately weathered, grey, medium to high strength								
						REFUSAL Test pit TP2A-06 terminated at 2.6m								
			3.0											

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP06



TP06



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JOB NAME North Star Magnetite Project


JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**

EQUIPMENT 25t Excavator **LOCATION** 710926E 7654059N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
	not encountered		0.5		GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry			0 4 8 12 16 20
						SHALE Highly weathered, pale grey, medium to high strength			
						REFUSAL Test pit TP2A-07 terminated at 0.5m			



TP07



TP07

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711419E 7653644N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					GM	TOPSOIL Dense, fine and medium, brown silty gravel, with rootlets, dry	BS		0 4 8 12 16 20
	not encountered		0.5		GW	SANDY GRAVEL Dense becoming very dense, fine to coarse, red brown and brown, with trace silt, dry (rounded gravel and cobbles)			
			1.0						
			1.5						
			2.0			Test pit TP2A-08 terminated at 1.75m			
			2.5						
			3.0						

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TP08



TP08



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JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711693E 7652376N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered					GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry								
						SANDSTONE Moderately weathered, grey and pale grey, high strength								
			0.5			REFUSAL Test pit TP2A-09 terminated at 0.3m								
			1.0											
			1.5											
			2.0											
			2.5											
			3.0											



TP09



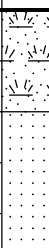

TP09

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711565E 7652573N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered			0.5		GM	TOPSOIL Dense, fine to coarse, red brown with dark grey silty gravel, with rootlets, dry	BS							
						SANDSTONE Extremely to highly weathered, grey and white, high strength								
						REFUSAL Test pit TP2A-11 terminated at 0.5m								



TP11



TP11



TP12 & TP13



TP12 & TP13



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711654E 7652808N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness						
									0	4	8	12	16	20	
not encountered			0.0		GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry			0	4	8	12	16	20	
						SHALE Moderately weathered, layers of grey white and pale grey, high strength									
						REFUSAL Test pit TP2A-15 terminated at 0.3m									
			0.5												
			1.0												
			1.5												
			2.0												
			2.5												
			3.0												



TP15



TP15

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project


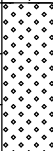

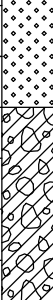


JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**

EQUIPMENT 25t Excavator **LOCATION** 711527E 7652916N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _L)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Permeability	MDD	OMC	Particle Density	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness	
not encountered			0.0		SM	TOPSOIL Dense, fine and medium, brown silty sand, with rootlets, dry													0	
			0.5		SW	SAND Very dense, fine to coarse, brown, with clay, moist	BS		5	8	25	15	11	3.6	6.00E-10	1.95	11.52	81	4	
			1.0		GC	CLAYEY GRAVEL Very dense, fine to coarse, pale brown and pale grey, moist	BS		12.3	13	52	28	24	10.4					8	
			1.1			SANDSTONE Extremely weathered, white, low to medium strength														12
			1.5			REFUSAL Test pit TP2A-16 terminated at 1.1m														16
			2.0																	20
			2.5																	
			3.0																	



TP16



TP16



TP17



TP17



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711507E 7652998N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.5		GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with trace clay, dry			0 4 8 12 16 20
						SANDSTONE Extremely to highly weathered, grey, high strength			
						REFUSAL Test pit TP2A-18 terminated at 0.5m			



TP18



TP18



FIGURE A14
TEST PIT NUMBER TP2A-19
 SHEET 1 OF 1

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711552E 7653126N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered					GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry	BS							
						SHALE Extremely to highly weathered, pale grey, medium to high strength								
			0.5			REFUSAL Test pit TP2A-19 terminated at 0.4m								
			1.0											
			1.5											
			2.0											
			2.5											
			3.0											

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP19



TP19



FIGURE A15
TEST PIT NUMBER TP2A-20
 SHEET 1 OF 1

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711635E 7653324N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness				
									0	4	8	12	16
not encountered					SM	TOPSOIL Dense, fine and medium, brown with dark brown silty sand, with rootlets, dry							
						SANDSTONE Highly weathered, white with quartz, medium to high strength							
			0.5			REFUSAL Test pit TP2A-20 terminated at 0.4m							
			1.0										
			1.5										
			2.0										
			2.5										
			3.0										

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP20



TP20



TP21



TP21



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711844E 7653340N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					GM	TOPSOIL Dense, fine to coarse, brown with dark brown silty gravel, with rootlets, dry	BS		0 4 8 12 16 20
	not encountered		0.5			SHALE Extremely to highly weathered, pale grey, high strength			
			1.0			REFUSAL Test pit TP2A-22 terminated at 0.8m			
			1.5						
			2.0						
			2.5						
			3.0						



TP22




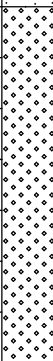



TP22

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712012E 7653362N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.0 - 0.2		GM	TOPSOIL Dense, fine to coarse, brown with dark brown silty gravel, with rootlets, dry									0
			0.2 - 0.5		SW	SAND Very dense, fine to coarse, pale grey/white, with clay and gravel, dry	BS		2.3	21	28	22	6	2	4
			0.5 - 1.0			SANDSTONE Highly to moderately weathered, grey, high strength									8
			1.0 - 1.5			REFUSAL Test pit TP2A-23 terminated at 1.5m									12
			1.5 - 2.0												16
			2.0 - 2.5												20
			2.5 - 3.0												



TP23



TP23

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP

CHECKED ZK

R.L. SURFACE

DATUM

EQUIPMENT 25t Excavator

LOCATION 711987E 7653527N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					GM	TOPSOIL Dense, fine to coarse, brown with dark brown silty gravel, with rootlets, dry									
			0.5		SC	CLAYEY SAND Very dense, fine to coarse, red brown, dry									
	not encountered				BS		BS		5	22	23	14	9	1.2	
			1.0		GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with cobbles, trace clay, dry									
			1.5			SANDSTONE Highly to moderately weathered, pale grey, low to medium strength									
			2.0			REFUSAL Test pit TP2A-24 terminated at 1.7m									
			2.5												
			3.0												

MPAW/ATC/BORHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP24



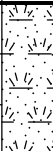


TP24

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712236E 7653500N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.0		GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry			0
			0.5		GW	SANDY GRAVEL Dense, fine to coarse, red brown, with cobbles, trace clay, dry			4
			1.0			SHALE Moderately weathered, layers of grey and pale red brown, high strength			8
			1.2			REFUSAL Test pit TP2A-25 terminated at 1.2m			12
			1.5						16
			2.0						20
			2.5						
			3.0						



TP25



TP25



TP26



TP26



TP27



TP27



FIGURE A21
TEST PIT NUMBER TP2A-28
 SHEET 1 OF 1

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712339E 7653343N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness				
									0	4	8	12	16
not encountered					GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry							
						SANDSTONE Highly weathered, grey, medium to high strength							
			0.5			REFUSAL Test pit TP2A-28 terminated at 0.4m							
			1.0										
			1.5										
			2.0										
			2.5										
			3.0										

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP28




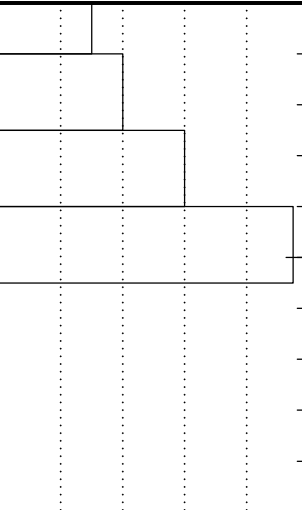


TP28

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 11-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712068E 7651775N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition
not encountered			0.0		SM	TOPSOIL Dense, fine and medium, brown silty sand, with rootlets, dry		Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness 
			0.5		SW	SAND Very dense, fine to coarse, red brown, with trace clay, dry		
			1.0			SANDSTONE Highly to moderately weathered, grey, medium strength		
			1.0			REFUSAL Test pit TP2A-30 terminated at 1m		
			1.5					
			2.0					
			2.5					
			3.0					



TP30




TP30

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 11-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711808E 7651935N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered			0.5		GW	SANDY GRAVEL Dense becoming very dense, fine to coarse, pale brown, with trace clay, silt, dry								
						SANDSTONE Extremely to highly weathered, grey with mottled red, medium strength								
			1.0			REFUSAL Test pit TP2A-31 terminated at 0.9m								
			1.5											
			2.0											
			2.5											
			3.0											



TP31



TP31



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 11-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712000E 7651896N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness				
									0	4	8	12	16
not encountered					GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with trace rootlets, dry	BS						
						SANDSTONE Highly to moderately weathered, grey and brown, medium to high strength							
			0.5			REFUSAL Test pit TP2A-32 terminated at 0.4m							
			1.0										
			1.5										
			2.0										
			2.5										
			3.0										



TP32



TP32



TP33



TP33



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 11-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711967E 7651986N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness						
									0	4	8	12	16	20	
not encountered					GM	TOPSOIL Very dense, fine and medium, red brown silty gravel, with trace clay, rootlets, dry									
						SANDSTONE Highly to moderately weathered, grey and brown, medium to high strength									
			0.5			REFUSAL Test pit TP2A-34 terminated at 0.3m									
			1.0												
			1.5												
			2.0												
			2.5												
			3.0												

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP034




TP034

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 13-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 711868E 7652058N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.5		GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry			0
					GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with trace clay, silt, dry			4
						SANDSTONE Extremely to highly weathered, grey, medium to high strength			8
			1.0			REFUSAL Test pit TP2A-35 terminated at 0.6m			12
			1.5						16
			2.0						20
			2.5						
			3.0						



TP35



TP35



TP36



TP36



TP37



TP37



TP38



TP38



TP39 & TP40



TP39 & TP40

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP

CHECKED ZK

R.L. SURFACE

DATUM

EQUIPMENT 25t Excavator

LOCATION 712404E 7652743N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry	BS		0 4 8 12 16 20
			0.5		GC	CLAYEY GRAVEL Very dense, fine to coarse, red brown, with rounded cobbles and boulders, dry			
	not encountered		1.0						
			1.5			SANDSTONE Highly to moderately weathered, grey, medium to high strength			
			2.0			REFUSAL Test pit TP2A-41 terminated at 1.5m			
			2.5						
			3.0						



TP41



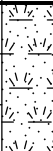
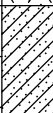


TP41

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712563E 7652988N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.0 - 0.2		GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry									0 - 4
			0.2 - 0.5		SC	CLAYEY SAND Dense becoming very dense, fine to coarse, red brown, with gravel, dry									4 - 12
			0.5 - 1.2			SANDSTONE Highly weathered, white, medium to high strength	BS		4.3	13	28	13	15	6.4	12 - 16
			1.2 - 1.5			REFUSAL Test pit TP2A-42 terminated at 1.2m									



TP42





TP42

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712746E 7652840N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.5		GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry			0
					GC	CLAYEY GRAVEL Very dense, fine to coarse, red brown, dry			4
						SHALE Highly to moderately weathered, grey, medium to high strength			8
			1.0			REFUSAL Test pit TP2A-43 terminated at 1m			12
			1.5						16
			2.0						20
			2.5						
			3.0						



TP43



TP43

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 15-12-17 LOGGED BY AP

CHECKED ZK

R.L. SURFACE

DATUM

EQUIPMENT 25t Excavator

LOCATION 712775E 7653252N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					SM	TOPSOIL Dense, fine and medium, brown silty sand, with rootlets, dry	BS								
			0.5		GW	SANDY GRAVEL Dense becoming very dense, fine to coarse, brown, with gravel and cobbles, trace silt, dry									
			1.0												
			1.5												
			2.0		GC	CLAYEY GRAVEL Very dense, fine to coarse, red brown and white, dry	BS		10.1	13	47	21	27	12	
						SHALE Extremely to highly weathered, purple and grey, medium strength									
			2.5			REFUSAL Test pit TP2A-45 terminated at 2.2m									
			3.0												

MPAW/ATC/BORHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18

not encountered



TP45



TP45

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 15-12-17 LOGGED BY AP

CHECKED ZK

R.L. SURFACE

DATUM

EQUIPMENT 25t Excavator

LOCATION 712850E 7652620N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _l)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
					SM	TOPSOIL Dense, fine and medium, brown/ dark brown silty sand, with rootlets, dry									
			0.5		GC	CLAYEY GRAVEL Very dense, fine to coarse, red brown, with cobbles, dry	BS		2.8	16	22	15	7	2.4	
			1.0		GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with cobbles, dry									
			1.5												
			2.0												
			2.5			SANDSTONE Highly to moderately weathered, grey, medium to high strength									
			3.0			REFUSAL Test pit TP2A-46 terminated at 2.5m									

MPAW/ATC/BORHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18

not encountered



TP46




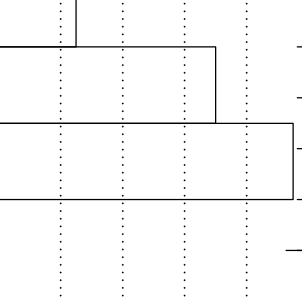
TP46

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713048E 7652671N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness				
									0	4	8	12	16
not encountered			0.5		GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry							
					GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with clay, dry							
						SANDSTONE Highly to moderately weathered, grey, medium to high strength							
						Test pit TP2A-47 terminated at 0.6m							
			1.0										
			1.5										
			2.0										
			2.5										
			3.0										



TP47



TP47



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713068E 7652895N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.5		GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry			0 4 8 12 16 20
						SANDSTONE Moderately weathered, pale grey, high strength			
						REFUSAL Test pit TP2A-48 terminated at 0.6m			
			1.0						
			1.5						
			2.0						
			2.5						
			3.0						



TP48



TP48



CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**

EQUIPMENT 25t Excavator **LOCATION** 713153E 7652511N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness						
									0	4	8	12	16	20	
not encountered			0.0		SM	TOPSOIL Dense, fine and medium, brown silty sand with rootlets, dry	BS								
			0.5		GC	CLAYEY GRAVEL Very dense, fine to coarse, red brown, dry									
			1.5			SANDSTONE Highly to moderately weathered, pale grey, high strength									
			2.0			REFUSAL Test pit TP2A-50 terminated at 1.6m									
			2.5												
			3.0												

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP50



TP50



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713481E 7652471N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered			0.5		GM	TOPSOIL Dense, fine to coarse, red brown silty gravel, with rootlets, dry								
						SANDSTONE Highly to moderately weathered, grey, medium to high strength, with trace red brown clay								
			1.0			REFUSAL Test pit TP2A-51 terminated at 0.6m								
			1.5											
			2.0											
			2.5											
			3.0											

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP51



TP51



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713543E 7652153N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness				
									0	4	8	12	16
not encountered			0.5		SM	TOPSOIL Dense, fine and medium, brown silty sand, with rootlets, dry							
						SANDSTONE Extremely to highly weathered, pale grey, medium to high strength							
			1.0			REFUSAL Test pit TP2A-54 terminated at 0.7m							
			1.5										
			2.0										
			2.5										
			3.0										



TP54



TP54

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project



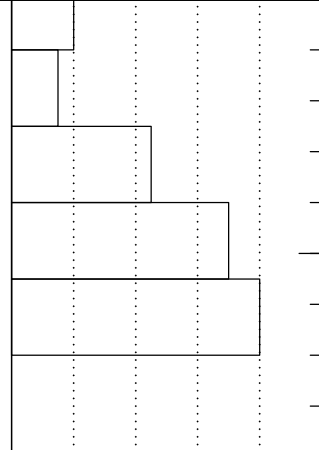
JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 15-12-17 LOGGED BY AP CHECKED ZK R.L. SURFACE DATUM

EQUIPMENT 25t Excavator LOCATION 713617E 7652102N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Natural moisture (w)	% Finer than 0.075mm	Liquid limit (w _L)	Plastic limit (w _p)	Plasticity Index	Linear Shrinkage	Permeability	MDD	OMC	Particle Density	Modified MMDD	Modified OMC	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness	
not encountered			0.5		SM	TOPSOIL Medium dense, fine and medium, brown silty sand, with rootlets, dry	BS		4.6	29	25	12	14	4	1.00E-9	2.023	9.7	2.682	1.44	7.7		
					SC	CLAYEY SAND Dense, fine to coarse, red brown, with trace gravel, dry																
						SANDSTONE Highly to moderately weathered, pale grey, medium to high strength Test pit TP2A-54A terminated at 0.9m																
			1.0																			
			1.5																			
			2.0																			
			2.5																			
			3.0																			



TP54A



TP54A



TP56



TP56



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713709E 7651931N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered					GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry	BS		0
						SHALE Moderately weathered, pale grey, high strength, with trace clay between 0.2 and 0.35 m			4
			0.5			REFUSAL Test pit TP2A-57 terminated at 0.5m			8
			1.0						12
			1.5						16
			2.0						20
			2.5						
			3.0						



TP57



TP57



TP60



TP60



CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 15-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713951E 7651740N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered					GM	TOPSOIL Dense, fine to coarse, brown silty gravel, with rootlets, dry								
						SANDSTONE Moderately weathered, pale grey, high strength								
			0.5			REFUSAL Test pit TP2A-61 terminated at 0.4m								
			1.0											
			1.5											
			2.0											
			2.5											
			3.0											

MPAW/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 12-11-18



TP61



TP61



TP63






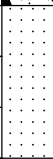
TP63

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 712797E 7653615N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness					
									0	4	8	12	16	20
not encountered					SM	TOPSOIL Dense, fine and medium, brown silty sand, with rootlets, dry	BS							
					GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with clay, dry								
			0.5			SANDSTONE Highly to moderately weathered, grey, medium to high strength								
			1.0			REFUSAL Test pit TP2A-69 terminated at 0.7m								
			1.5											
			2.0											
			2.5											
			3.0											



TP69




TP69

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 14-12-17 **LOGGED BY** AP **CHECKED** ZK **R.L. SURFACE** **DATUM**
EQUIPMENT 25t Excavator **LOCATION** 713022E 7653574N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Dynamic Cone Penetrometer No. of blows for depth indicated by bar thickness
not encountered			0.5		SM	TOPSOIL Dense, fine and medium, brown silty sand, with rootlets, dry			0 4 8 12 16 20
					GW	SANDY GRAVEL Very dense, fine to coarse, red brown, with clay, dry			
					SC	CLAYEY SAND Dense, fine to coarse, yellow brown, dry			
						SANDSTONE Extremely to highly weathered, yellow brown and grey, low to medium strength			
			1.5			REFUSAL Test pit TP2A-70 terminated at 1.3m			
			2.0						
			2.5						
			3.0						



TP70



TP70



TP71



TP71

CLIENT Iron Bridge Operations Pty Ltd


JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710383E 7654257N

REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5			SANDSTONE Extremely weathered, red brown and pale green-grey. Excavated As: COBBLES & BOULDERS: Boulders to 0.7 m diameter, with gravel and sand and trace silt, dry.			
			1.0			SANDSTONE Extremely / Highly weathered, medium and coarse, green-grey with red oxide staining, closely jointed, medium strength, dry. (Very hard to excavate).			
			1.5			Test pit TP2A-R01 terminated at 1m Bucket refusal - hard excavation			
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R01



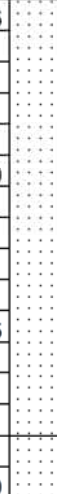



TP2A-R01

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710400E 7654265N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.0		GC GP	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
			0.5			GRAVEL Dense, fine to coarse angular gravel of siltstone and dolerite, red brown and grey, with cobbles, sand and trace clay, dry. (Colluvium)			
			2.0			SANDSTONE Extremely weathered, red brown and pale green- grey. Excavated As: Sandy GRAVEL: Dense/ very dense, fine to coarse gravel with cobbles and clay fines, dry.			
			2.0			SANDSTONE Extremely / Highly weathered, medium and coarse, green-grey with red oxide staining, closely jointed, medium strength, dry. (Very hard to excavate).			
			2.5			Test pit TP2A-R02 terminated at 2m Bucket refusal - hard excavation			
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R02




TP2A-R02

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710415E 7654275N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC GP	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry. GRAVEL Dense, fine to coarse angular gravel of siltstone and dolerite, red brown and grey, with cobbles, sand and trace clay, dry. (Colluvium)			
			0.55			SANDSTONE Extremely / Highly weathered, medium and coarse, green-grey with red oxide staining, closely jointed, medium and high strength, dry. (Very hard to excavate). Test pit TP2A-R03 terminated at 0.55m Bucket refusal - hard excavation			



TP2A-R03




TP2A-R03

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710429E 7654288N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GP-GC	GRAVEL Loose, fine to coarse angular gravel, red brown, with sand and clay fines, dry (Colluvium)/ SANDSTONE Extremely weathered, red brown and grey. Excavated As: COBBLES/BOULDERS: Dense, red brown and grey boulders to 0.4 m dia, with gravel and sand, dry.			
			0.5			SANDSTONE Extremely / Highly weathered, medium and coarse, green-grey with red oxide staining, closely jointed, medium strength, dry. (Very hard to excavate). Test pit TP2A-R04 terminated at 0.5m Bucket refusal - hard excavation			
			1.0						
			1.5						
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R04



TP2A-R04

CLIENT Iron Bridge Operations Pty Ltd

JOB NAME North Star Magnetite Project






JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 2-8-18 LOGGED BY CJ CHECKED JPL R.L. SURFACE DATUM

EQUIPMENT 20t Excavator, 1 m wide bucket LOCATION 710443E 7654300N

REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
	not encountered		0.0		GC GP	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry. GRAVEL Dense, fine to coarse angular gravel of siltstone and dolerite, red brown and grey, with cobbles, sand and trace clay, dry. (Colluvium)			
			0.5						
			1.0						
			1.5						
			2.0			SILTSTONE Highly weathered, green grey with red brown banding, laminated texture, low / medium strength, dry			
			2.1			Test pit TP2A-R05 terminated at 2.1m Bucket refusal - hard excavation			
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R05




TP2A-R05

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710448E 7654303N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
					GP	GRAVEL Medium dense, fine to coarse, angular, red brown and grey, with cobbles, sand and trace silt, dry. (Colluvium)			
					GP-GC	SHALE/SILTSTONE Extremely weathered. Excavated As : GRAVEL: Very dense/dense, fine to coarse, grey, red brown, with sand and clay fines, dry SHALE/SILTSTONE Highly weathered, grey and red brown, interbedded shale and siltstone layers, very low / low strength, dry			
			1.5 2.0 2.5 3.0 3.5 4.0 4.5			Test pit TP2A-R06 terminated at 1.2m Bucket refusal - hard excavation			



TP2A-R06





TP2A-R06

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710454E 7654308N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
	not encountered		0.5		GW	Sandy GRAVEL Medium dense, medium and coarse, rounded gravel of siltstone, ironstone and dolerite, fine to coarse sand, with cobbles, trace silt. (Alluvium)			
			1.0			SANDSTONE Extremely weathered / highly weathered, medium and coarse, green-grey with red oxide staining, medium texture, closely jointed, low/medium strength, wet.			
			1.5						
			2.0						
			2.5			Test pit TP2A-R07 terminated at 2.2m Bucket refusal - hard excavation			
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R07






TP2A-R07

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

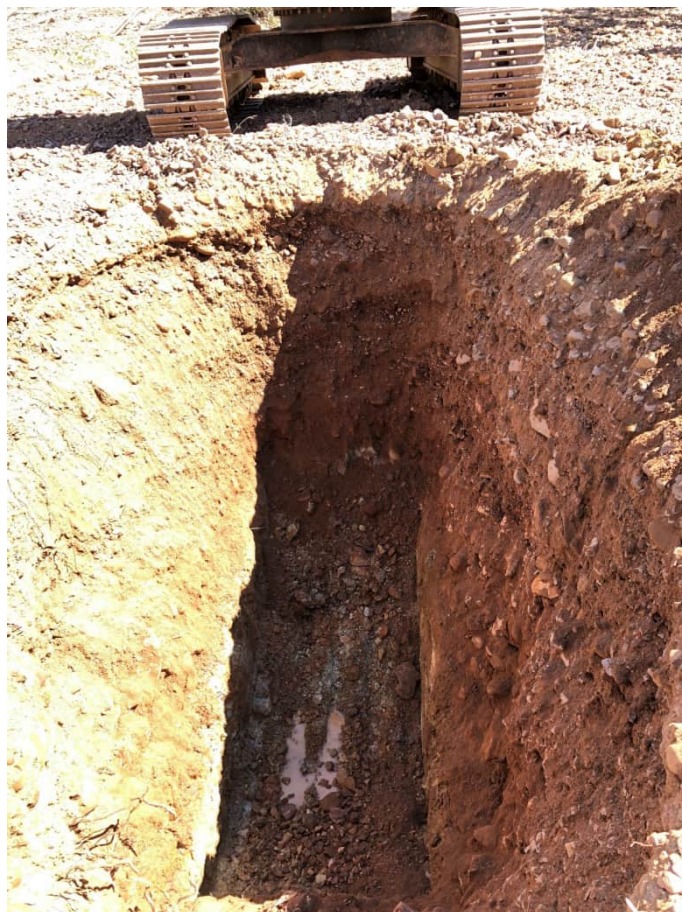
DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710463E 7654317N Creek channel
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	% Finer than 0.075mm	Additional Observations
			0.5		GP	GRAVEL Medium dense, medium and coarse, rounded gravel of siltstone, ironstone and dolerite, fine to coarse sand, with cobbles, trace silt. (Alluvium)				
			1.0						BK	
			1.5			SANDSTONE Extremely weathered, green grey. Excavated As: Clayey GRAVEL: very dense, fine to coarse lithorelicts, green grey, low plasticity, with sand and cobbles, moist/wet, dry				
			2.0					2.0 m grading to cobbles moderate seepage emerging at 2.2m, upstream side of excavation		
			2.5							
			3.0			Test pit TP2A-R08 terminated at 2.8m Test pit terminated				
			3.5							
			4.0							
			4.5							

MPAWI/ATCW BOREHOLE / TEST PIT 114185.10.GPJ GINT AUSTRALIA.GDT 9-11-18



TP2A-R08




TP2A-R08

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710468E 7654323N Creek channel

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
	Seepage 1.65 m		0.5 1.0 1.5 2.0		GP	<p>GRAVEL Medium dense, medium and coarse, rounded gravel of siltstone, ironstone and dolerite, fine to coarse sand, with cobbles, trace silt. (Alluvium)</p> <p>slight seepage @ 1.65 m</p> <p>SANDSTONE Extremely weathered, green grey. Excavated As: Clayey GRAVEL: very dense, fine to coarse lithorelicts, green grey, low plasticity, with sand and cobbles, moist/wet, dry</p>			
			2.5 3.0 3.5 4.0 4.5			<p>Test pit TP2A-R09 terminated at 2.1m Bucket refusal - hard excavation</p>			



TP2A-R09




TP2A-R09

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710578E 7654420N

REMARKS

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC GP-GM	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
						GRAVEL Medium dense, fine to coarse, grey brown with sand and silt fines, dry (Colluvium)			
						SANDSTONE Extremely to highly weathered, pale grey with red oxide staining, medium grained, closely jointed, low / medium strength, dry 0.5 m becoming highly weathered Test pit TP2A-R10 terminated at 0.6m Bucket refusal - hard excavation			
			1.0						
			1.5						
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



T2A-R10





TP2A-R10

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710595E 7654435N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0		GC GP-GC GP-GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry. GRAVEL Loose, fine to coarse angular gravel, red brown, with sand and clay fines, dry (Colluvium) SHALE/SILTSTONE Extremely weathered. Excavated As : Very dense/dense, fine to coarse GRAVEL, grey, red brown, with sand and clay fines, dry SHALE/SILTSTONE Highly weathered, grey and red brown, interbedded shale and siltstone layers, extremely low / very low strength, dry			
			0.5						
			1.0			contact with sandstone exposed at south face of test pit. Test pit TP2A-R11 terminated at 0.7m Bucket refusal - hard excavation			
			1.5						
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R11



TP2A-R11

CLIENT Iron Bridge Operations Pty Ltd

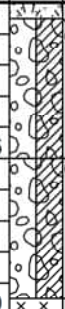

JOB NAME North Star Magnetite Project

JOB NUMBER 114185.10

JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L. SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710612E 7654453N

REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
					GP-GC	GRAVEL Medium dense, fine to coarse, gravel, red brown, with fine to coarse sand and clay fines, dry (Colluvium)			
					GP-GC	GRAVEL Dense, fine to coarse, white, grey and red brown, with cobbles and sand, with clay fines, dry.			
			1.0			SILTSTONE Highly weathered, grey, thinly interbedded, medium strength, dry Test pit TP2A-R12 terminated at 1m Bucket refusal - hard excavation			
			1.5						
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R12


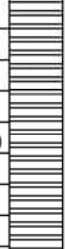


TP2A-R12

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710622E 7654476N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
					GP-GC	GRAVEL Medium dense, fine to coarse, red brown with sand and silt, trace cobbles, dry.			
					GP-GC	SHALE Extremely weathered. Excavated As : GRAVEL: Very dense/dense, fine to coarse, grey, red brown, with sand and clay fines, dry			
			1.0		SHALE Highly weathered, grey, thinly bedded/cleaved (20 mm - 30 mm spacings), extremely low / low strength, dry.				
			1.5			Test pit TP2A-R13 terminated at 1.4m Bucket refusal - hard excavation			
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R13

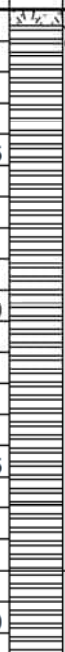


TP2A-R13

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710639E 7654496N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
	not encountered		0.0		GC GP-GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry. SHALE Extremely weathered. Excavated As : GRAVEL: Very dense/dense, fine to coarse, grey, red brown, with sand and clay fines, dry			
			2.0			SHALE Highly weathered, grey, thinly interbedded/cleaved (20 - 30 mm spacings), extremely low / low strength, dry hard to excavate			
			2.1			Test pit TP2A-R14 terminated at 2.1m Bucket refusal - hard excavation			
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						




TP2A-R14

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710650E 7654515N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.0		GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
			GP-GC		SHALE/SILTSTONE Extremely weathered. Excavated As : GRAVEL: Very dense/dense, fine to coarse, grey, red brown, with sand and clay fines, dry				
					SHALE/SILTSTONE Extremely / highly weathered, grey, thinly interbedded (20 - 30 mm spacings), extremely low / low strength, dry.				
			1.5			hard to excavate, becoming very low/low strength Test pit TP2A-R15 terminated at 1.7m Bucket refusal - hard excavation			
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R15




TP2A-R15

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710658E 7654543N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC GP-GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
						SHALE/SILTSTONE Extremely weathered. Excavated As : GRAVEL: Very dense/dense, fine to coarse, grey, red brown, with sand and clay fines, dry			
			1.0			SHALE/SILTSTONE Highly weathered, grey and pale grey, thinly interbedded siltstone and shale (20 - 50 mm spacings), 70 - 80 dip to west, very low / low strength, dry. Test pit TP2A-R16 terminated at 1m Bucket refusal - hard excavation			
			1.5						
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R16

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710593E 7654559N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0		GC GP-GC	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry. SANDY GRAVEL Loose, fine to coarse, red brown with cobbles and clay fines, dry. SANDSTONE Highly weathered, green-grey with red oxide staining, medium grained, massive, closely jointed, medium strength, dry. (Very hard to excavate).			
			0.5			Test pit TP2A-R17 terminated at 0.45m Bucket refusal - hard excavation			
			1.0						
			1.5						
			2.0						
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						



TP2A-R17





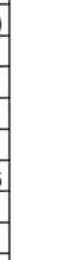

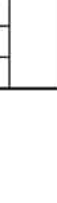


TP2A-R17

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710707E 7654517N
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
not encountered			0.5		GC GP-GM	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry.			
						GRAVEL Loose /medium dense, fine to coarse, red brown with sand and silt fines, dry.			
						SANDSTONE Extremely weathered, red brown and pale green- grey. Excavated As: Clayey GRAVEL: Very dense, fine to coarse, red brown and grey with cobbles, sand and trace silt, dry.			
not encountered			1.0			SANDSTONE Extremely / Highly weathered, medium and coarse, green-grey with red oxide staining, closely jointed, low and medium strength, dry. (Very hard to excavate). note highly weathered shale exposed east side of test pit.			
not encountered			1.5			Test pit TP2A-R18 terminated at 1.2m Bucket refusal - hard excavation			
not encountered			2.0						
not encountered			2.5						
not encountered			3.0						
not encountered			3.5						
not encountered			4.0						
not encountered			4.5						



TP2A-R18







TP2A-R18

CLIENT Iron Bridge Operations Pty Ltd
JOB NUMBER 114185.10

JOB NAME North Star Magnetite Project
JOB LOCATION Pilbara, WA

DATE 2-8-18 **LOGGED BY** CJ **CHECKED** JPL **R.L SURFACE** **DATUM**
EQUIPMENT 20t Excavator, 1 m wide bucket **LOCATION** 710457E 7654233N Creek channel
REMARKS Groundwater not encountered

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description: Soil: type, USCS symbol, strength, plasticity or particle size, colour, secondary components, moisture condition	Sample Type	Sample condition	Additional Observations
	not encountered		0.0		GC GP	TOPSOIL: CLAYEY GRAVEL Medium dense, fine to coarse gravel, red brown, with sand and rootlets, dry. Sandy GRAVEL Medium dense, medium and coarse, rounded gravel of siltstone, ironstone and dolerite, fine to coarse sand, with cobbles, trace silt. (Alluvium)			
			0.5						
			1.0						
			1.5			SANDSTONE Extremely / Highly weathered, green-grey with red oxide staining, medium and coarse grained, medium to high strength, dry. (Very hard to excavate).			
			2.0			Test pit TP2A-R19 terminated at 1.9m Bucket refusal - hard excavation			
			2.5						
			3.0						
			3.5						
			4.0						
			4.5						