

Appendix 15.

SLR Consulting Australia (2020f) *Rum Jungle Rehabilitation – Stage 2A- Geotechnical Investigation Waste Storage Facilities and Borrow Areas*. Report to the Department of Mines and Energy, Northern Territory. PART F.



Base and Pit Walls



Southern and Eastern Pit Walls



Spoil Pile



Looking South



Laterite Cobble

Title:	SLR-HR-SLR-TP04 Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Version:	1.0
Status:	Design	Datum:	AHD
Date:	03/10/2019		



TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP05

PROJECT : Rum Jungle

LOCATION : Former Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 03/10/19

POSITION : E: 717637.97, N: 8562796.91 (52 AM(SURFACE ELEVATION : 80m (AHD)

LOGGED BY : FC

DATE COMPLETED : 03/10/19

RIG TYPE : 20T Tracked Komatsu Excavator ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 03/10/19

DRILLER : C. McGregor

STABILITY : Stable

DRILLING				MATERIAL								OBSERVATION	
METHOD & BUCKET TYPE	PENETRATION	WATER	SAMPLES TESTS REMARKS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL/ROCK TYPE; colour, grain characteristics, structure, minor components	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DCP RESULTS	ORIGIN	STRUCTURE & Other Observations
<div>Excavator</div> <div>600mm Toothed Bucket</div>	<div>VE</div> <div>600mm</div> <div>VE</div>	Groundwater Not Encountered	1.30m (B)	79	1	<div></div>	SP	SP gravelly SAND with silt, poorly graded, fine to medium grained, grey brown; gravel, fine to coarse grained, rounded to sub-angular, meta-sediment and ironstone.	D	D - VD	<div>5</div> <div>10</div> <div>15</div> <div>20</div>	Topsoil	
						SW	SW - gravelly SAND trace silt, well graded, fine to coarse grained, orange brown with red mottle; gravel, fine to coarse grained, rounded to sub-angular, weathered granite, quartz and meta-sediment						
						GW	GW sandy GRAVEL, well graded, fine to coarse grained, rounded to sub-angular, red brown; sand, fine to coarse grained; occasional lenses of clay.						
						EOH: 2.00m - Target depth							
				78	2								
				77	3								
				76	4								
				75	5								



Looking East



Northern Pit Wall



Looking North



Spoil Pile



Spoil Pile



TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP06A

PROJECT : Rum Jungle

LOCATION : Former Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 08/10/19

POSITION : E: 717621.7, N: 8563003.41 (52 AMG SURFACE ELEVATION : 80m (AHD)

LOGGED BY : FC

DATE COMPLETED : 08/10/19

RIG TYPE : 20T Tracked Komatsu Excavator ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 08/10/19

DRILLER : C. McGregor

STABILITY : Stable

DRILLING				MATERIAL								OBSERVATION	
METHOD & BUCKET TYPE	PENETRATION	WATER	SAMPLES TESTS REMARKS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL/ROCK TYPE; colour, grain characteristics, structure, minor components	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DCP RESULTS	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered		79	1		SM	SM - silty SAND with gravel, fine to medium grained, red brown; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, conglomerate, quartz and ironstone.	D	St - VSt		Alluvium	
							GP	GP - sandy GRAVEL with clay, fine to coarse grained, poorly graded, rounded to sub-angular, shale, sandstone, ironstone and quartz, orange brown with grey and red mottle; sand, fine to coarse grained; occasional sub-rounded to sub-angular cobbles of quartzite and shale.					
					2		SM	SM - silty SAND with clay, fine grained, red brown; clay, medium plasticity. 1.9m: Boulder of shale present.					
					3		SM	SM - silty SAND with gravel, fine grained, red brown; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, conglomerate, quartz and ironstone.					
					4		GM	GM - sandy GRAVEL with silt, fine to coarse grained, rounded to sub-angular, siltstone, ironstone and quartz, red brown; sand, fine to coarse grained.					
								EOH: 4.30m - Machine Limit					
				75	5								



Western Pit Wall



Western Pit Wall



Exposed Borehole to the East of the Test Pit



Looking South



Spoil Pile



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AUSTRALIA
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Title:	SLR-HR-SLR-TP06a Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Version:	1.0
Status:	Design	Datum:	AHD
Date:	08/10/2019		





TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP06B

PROJECT : Rum Jungle Geotechnical Investigation

LOCATION : Rum Jungle Mine FILE / JOB NO.: 680.10421

DATE STARTED : 03/10/19	POSITION : E: 717608.4, N: 8563079.43 (52 MGA94)	SURFACE ELEVATION : 80m (AHD)	LOGGED BY : FC
DATE COMPLETED : 03/10/19	RIG TYPE : 20T Tracked Komatsu Excavator	ANGLE FROM HORIZONTAL : 90°	CHECKED BY : BT
DATE LOGGED : 03/10/19	DRILLER : C. McGregor	STABILITY : Stable	

DRILLING				MATERIAL				OBSERVATION					
METHOD & BUCKET TYPE	PENETRATION	WATER	SAMPLES TESTS REMARKS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DCP RESULTS	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	0.50m (D) 										



Rum Jungle Geotechnical Investigation



5 Foelsche Street, Darwin, NT 0800

File Location: \\U:\SLR\Local\Corporate\Projects\SLR\



Northern Pit Wall



Looking East



Spoil Pile



Spoil Pile



Looking South East



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Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Version:	1.0
Status:	Design	Datum:	AHD
Date:	03/10/2019		



HOLE NO.: HR-SLR-TP07

PROJECT : Rum Jungle

LOCATION : Former Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 03/10/19

POSITION : E: 717619.83, N: 8563248.97 (52 AM) SURFACE ELEVATION : 80m (AHD)

LOGGED BY : FC

DATE COMPLETED : 03/10/19

RIG TYPE : 20T Tracked Komatsu Excavator | ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 03/10/19

DRILLER : C. McGregor

STABILITY : Stable

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Rum Jungle



5 Foelsche Street, Darwin,
NT 0800



Southern Pit Wall - Gravel Drainage Bed



Looking West



Spoil Pile



Spoil Pile



Spoil Pile - Waste Rock

HOLE NO.: HR-SLR-TP08

PROJECT : Rum Jungle

LOCATION : Former Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 07/10/19

POSITION : E: 717610.23, N: 8563532.21 (52 AM) SURFACE ELEVATION : 80m (AHD)

LOGGED BY : FC

DATE COMPLETED : 07/10/19

RIG TYPE : 20T Tracked Komatsu Excavator | ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 07/10/19

DRILLER : C. McGregor

STABILITY : Stable

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Looking North



Spoil Pile



Eastern Pit Wall



Looking North



Spoil Pile



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Title:	SLR-HR-SLR-TP08 Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Version:	1.0
Status:	Design	Datum:	AHD
Date:	07/10/2019		



HOLE NO.: HR-SLR-TP09A

LOCATION : Rum Jungle Mine FILE / JOB NO.: 680.10421

LOGGED BY : FC

CHECKED BY : BT

STABILITY : Flooding

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Looking North - Water filled base



Eastern Pit Wall



Looking North



Spoil Pile



Spoil Pile



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Title:	SLR-HR-SLR-TP09a Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Version:	1.0
Status:	Design	Datum:	AHD
Date:	07/10/2019		





TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP09B

PROJECT : Rum Jungle Geotechnical Investigation

LOCATION : Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 08/10/19

POSITION : E: 716961.66, N: 8563078.54 (52 MGA94)

SURFACE ELEVATION : 80m (AHD)

LOGGED BY : FC

DATE COMPLETED : 08/10/19

RIG TYPE : 20T Tracked Komatsu Excavator

ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 08/10/19

DRILLER : C. McGregor

STABILITY : Stable

DRILLING					MATERIAL					OBSERVATION			
METHOD & BUCKET TYPE	PENETRATION	WATER	SAMPLES TESTS REMARKS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL/ROCK TYPE; colour, grain characteristics, structure, minor components	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DCP RESULTS	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered		79	1		ML	ML - sandy SILT trace gravel, low to medim plasticity, greyish brown; sand, fine to medium grained; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, ironstone and quartz; frequent rootlets (<2mm diameter)	D	VSt		Topsoil	
							SP	SP - gravelly SAND with clay, poorly sorted, fine to coarse grained, orangish brown mottled red; gravel, fine to coarse grained, rounded to sub-angular, shale, sandstone, mudstone, ironstone and meta sediment; occasional sub-rounded cobbles of shale and frequent lenses of sandy CLAY					
					2		CI - CH	CI - CH - gravelly CLAY with sandy, medium to high plasticity, orangish brown mottled red; gravel, fine to coarse grained, rounded to sub-angular, shale, sandstone, mudstone, ironstone and meta sediment; sand, fine to coarse grained; occasional sub-rounded cobbles of shale and frequent lenses of clayey SAND					
							SP	SP - gravelly SAND with clay, poorly sorted, fine to coarse grained, purplish brown mottled black, white and red; gravel, fine to coarse grained, rounded to sub-angular, shale, sandstone, mudstone, ironstone and meta sediment; occasional lenses of organic matter and frequent lenses of gravelly CLAY					
							EOH: 5.00m - Target depth						
				75	5								



Looking South



Looking South



Western Pit Wall



Eastern Pit Wall



Spoil Pile



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Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Version:	1.0
Status:	Design	Datum:	AHD
Date:	08/10/2019		



HOLE NO.: HR-SLR-TP10

PROJECT : Rum Jungle

LOCATION : Former Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 03/10/19

POSITION : E: 718216.77, N: 8563552.66 (52 AM) SURFACE ELEVATION : 73m (AHD)

LOGGED BY : FC

DATE COMPLETED : 03/10/19

RIG TYPE : 20T Tracked Komatsu Excavator | ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 03/10/19

DRILLER : C. McGregor

STABILITY : Stable

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Rum Jungle



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NT 0800



Looking West



Northern Pit Wall



Spoil Pile



Spoil Pile



TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP11

PROJECT : Rum Jungle

LOCATION : Former Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 03/10/19

POSITION : E: 718534.65, N: 8563501.9 (52 AMG SURFACE ELEVATION : 87m (AHD)

LOGGED BY : FC

DATE COMPLETED : 03/10/19

RIG TYPE : 20T Tracked Komatsu Excavator ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 03/10/19

DRILLER : C. McGregor

STABILITY : Stable

DRILLING				MATERIAL								OBSERVATION	
METHOD & BUCKET TYPE	PENETRATION	WATER	SAMPLES TESTS REMARKS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DCP RESULTS	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket	VE UL												





TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP12

PROJECT : Rum Jungle Geotechnical Investigation

LOCATION : Rum Jungle Mine Site

FILE / JOB NO.: 680.10421

DATE STARTED : 02/10/19

POSITION : E: 716739, N: 8561781 (52 MGA94)

SURFACE ELEVATION : 80m (AHD)

LOGGED BY : FC

DATE COMPLETED : 02/10/19

RIG TYPE : 20T Tracked Komatsu Excavator

ANGLE FROM HORIZONTAL : 90°

CHECKED BY : BT

DATE LOGGED : 02/10/19

DRILLER : C. McGregor

STABILITY : Stable

DRILLING				MATERIAL					OBSERVATION					
METHOD & BUCKET TYPE	PENETRATION	WATER	SAMPLES TESTS REMARKS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION SOIL/ROCK TYPE; colour, grain characteristics, structure, minor components	MOISTURE CONDITION	CONSISTENCY / RELATIVE DENSITY	DCP RESULTS	ORIGIN	STRUCTURE & Other Observations	
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	0.80m (B)	79	1		ML	ML sandy SILT trace gravel, low plasticity, pale greyish brown mottled orange; sand, fine to medium grained; gravel, fine to coarse grained, rounded to sub-angular, ironstone, weathered granite, quartz and meta-sediment.	D	S VSt		Topsoil		
								GP - sandy GRAVEL with silt, poorly sorted, fine to medium grained, rounded to sub-rounded, ironstone, weathered granite, quartz and meta-sediment, reddish brown mottled grey; sand, fine to medium grained.				VD		Residual Soil
								MIXTURE OF SOIL AND COBBLES/BOULDERS (MATRIX SUPPORTED) GP sandy GRAVEL, poorly graded, fine to coarse grained, rounded to sub-angular, red brown and mottled grey; sand, fine to medium grained; weathered granite. EOH: 2.00m - Target depth						Extremely Weathered Bedrock
				78	2									
				77	3									
				76	4									
				75	5									



Rum Jungle Geotechnical Investigation



5 Foelsche Street, Darwin, NT 0800



Looking North



Western Pit Wall



Spoil Pile



Looking North

















Looking East

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION

PARTICLE SIZE DEFINITIONS*

Fraction	Components	Subdivision	Size (mm)
Oversize	BOULDERS		>200
	COBBLES		63-200
Coarse grained soil	GRAVEL	Coarse	19-63
		Medium	6.7-19
		Fine	2.36-6.7
	SAND	Coarse	0.6-2.36
		Medium	0.21-0.6
		Fine	0.075-0.21
Fine grained soil	SILT		0.002-0.075
	CLAY		<0.002

GRAPHIC LOG

	PEAT		TOPSOIL
	CLAY		FILL
	SILT		BASALT
	SAND		GREYWACKE
	GRAVEL		METAMORPHIC
	COBBLES		LIMESTONE
	BOULDERS		CORAL

MOISTURE CONDITION*

Term	Description
Dry (D)	- Non-cohesive and free-running
Moist (M)	- Soil feels cool, darkened in colour. - Soil tends to stick together.
Wet (W)	- Soil feels cool, darkened in colour. - Soil tends to stick together, free water forms when handling.

For Fine Grained Soils*





'Moist, dry of plastic limit'	- Hard and friable or powdery, or ('w < PL').
'Moist, near plastic limit'	- Soils can be moulded at a moisture content approximately equal to the plastic limit, or ('w ≈ PL').
'Moist, wet of plastic limit'	- Soils usually weakened and free water forms on hands when handling, or ('w > PL').
'Wet, near liquid limit'	- Or ('w ≈ LL').
'Wet, wet of liquid limit'	- Or ('w > LL').

USCS SOIL CLASSIFICATION CODES

GW - well graded gravel	ML - silt, low plasticity
GP - poorly graded gravel	CL - clay, low plasticity
GM - silt gravel	CI - clay, medium plasticity
GC - clayey gravel	OL - organic silt / organic clay
SW - well graded sand	MH - silt, high plasticity
SP - poorly graded sand	CH - clay, high plasticity
SM - silty sand	OH - organic silt / organic clay, high plasticity
SC - clayey sand	Pt - peat

G= Gravel, S= Sand, M= Silt, C= Clay

WATER

	- Level (date observed)
	- Inflow
	- Partial Loss
	- Complete Loss

CONSISTENCY*

Term	Field guide to consistency	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	Exudes between the fingers when squeezed in hand	≤12
Soft (S)	Can be moulded by light finger pressure	>12 and ≤25
Firm (F)	Can be moulded by strong finger pressure	>25 and ≤50
Stiff (St)	Cannot be moulded by fingers	>50 and ≤100
Very Stiff (VSt)	Can be indented by thumbnail	>100 and ≤200
Hard (H)	Can be indented with difficulty by thumbnail	>200
Friable (Fr)	Can be easily crumbled or broken into small pieces by hand	-

RELATIVE DENSITY*

Term	Density index %
Very Loose (VL)	≤15
Loose (L)	>15 and ≤35
Medium Dense (MD)	>35 and ≤65
Dense (D)	>65 and ≤85
Very Dense (VD)	>85

PLASTICITY (fine grained soil)*

Term	Range of liquid limit for silt	Range of liquid limit for clay
Non-Plastic (NP)	Not applicable	Not applicable
Low Plasticity (LP)	≤50	≤35
Medium Plasticity (IP)	Not applicable	35 and ≤50
High Plasticity (HP)	>50	>50

GRADING (coarse grained soil)*

Term	Description
Well Graded (WG)	Having good representation of all particle sizes from the largest to the smallest.
Poorly Graded (PG)	With one or more intermediate sizes poorly represented.
Gap Graded (GG)	With one or more intermediate sizes absent.
Uniform (UG)	Essentially of one size.

Notes

* AS1726:2017

** AGS3.1 RTA

CLASSIFICATION SYMBOLS AND ROCK DESCRIPTION

MOISTURE CONDITION*

Term	Description
Dry (D)	Looks and feels dry.
Moist (M)	Feels cool, darkened in colour, but no water is visible on the surface.
Wet (M)	Feels cool, darkened in colour, water film or droplets visible on the surface.

ALTERATION*

XA - Extremely Altered
 HA - Highly Altered
 MA - Moderately Altered
 DA - Distinctly Altered
 SA - Slightly Altered

STRENGTH*

Term	Uniaxial Compressive Strength MPa	Point load strength index $I_s(50)$ MPa
Extremely Low Strength (EL) **	-	-
Very Low Strength (VL)	0.6 to 2	0.03 to 0.1
Low Strength (L)	2 to 6	0.1 to 0.3
Medium Strength (M)	6 to 20	0.3 to 1
High Strength (H)	20 to 60	1 to 3
Very High Strength (VH)	60 to 200	3 to 10
Extremely High Strength (EH)	more than 200	more than 10

WEATHERING**

RS - Residual Soil*
 EW - Extremely Weathered (XW *)
 HW - Highly Weathered
 MW - Moderately Weathered
 DW - Distinctly Weathered *
 SW - Slightly Weathered
 F - Fresh (FR *)

TEXTURE*

Term	Description
Bedding	Layering produced by changes in sedimentation, which may be defined by grain size, colour, or other features.
Lamination	Similar to bedding but developed in layer thicknesses of less than 20 mm.
Foliation	The parallel arrangement of minerals due to metamorphic processes.
Cleavage	A type of foliation developed in fine grained metamorphic rocks such as slates.
Flow Banding	A layering produced during flow of a partially solidified igneous rock that causes crystals to become oriented. Sometimes called a trachytic fabric.


















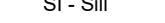





FABRIC*

Term	Description
Indistinct fabric	There is little effect on strength properties.
Distinct fabric	The rock may break more easily parallel to the fabric.

BLOCK SHAPE*

Term	Description
Polyhedral blocks	Irregular discontinuities without arrangement into distinct sets, and of small persistence.
Tabular blocks	One dominant set of parallel discontinuities (1), for example bedding planes, with other noncontinuous joints; thickness of blocks much less than length or width.
Prismatic blocks	Two dominant sets of discontinuities (1 and 2), approximately orthogonal and parallel, with a third irregular set; thickness of blocks much less than length or width.
Equidimensional blocks	Three dominant sets of discontinuities (1, 2 and 3), approximately orthogonal, with occasional irregular joints, giving equidimensional blocks.
Rhomboidal blocks	Three (or more) dominant, mutually oblique, sets of joints (1, 2 and 3) giving oblique-shaped, equidimensional blocks.
Columnar blocks	Several, usually more than three sets of continuous, parallel joints (1, 2, 3, 4, 5) usually crossed by irregular joints; lengths much greater than other dimensions.

DISCONTINUITY SYMBOLS

 BD - Bedding	 CS - Crushed Seam	 DK - Dyke	 FC - Fracture	 JT - Joint	 SZ - Shear Zone
 CL - Cleavage	 DZ - Decomposed Zone	 FL - Fault	 FZ - Fracture Zone	 SH - Schistosity	 SI - Sill
 CO - Contact	 DB - Drilling Break	 VN - Vein	 HB - Handling Break	 SM - Seam	 VO - Void
 CZ - Crush Zone	 DL - Drilling Lift	 FL - Foliation	 IS - Infilled Seam	 SS - Shear Seam	

Notes

* AS1726:2017

** AGS3.1 RTA


DRILLING / EXCAVATION METHOD


AD/T - Auger Drilling with TC-bit
 AD/V - Auger Drilling with V-bit
 AS - Auger Screwing
 AT - Air Track
 B - Dozer Blade
 BH - Backhoe Bucket
 CT - Cable Tool
 DB - Washbore Drag Bit
 DT - Diatube

E - Excavator
 EH - Excavator with Hammer
 HA - Hand Auger
 HMLC - HMLC Core Barrel
 HQ3 - HQ3 Core Barrel
 MZ - Mazier
 N - Natural Exposure
 NMLC - NMLC Core Barrel
 NQ3 - NQ3 Core Barrel


PQ3 - PQ3 Core Barrel
 Pushed SPT - Pushed SPT
 PT - Push Tube
 R - Ripper
 RR - Rock Roller
 SPT - Driven SPT
 WB - Washbore
 X - Existing Excavation


BACKFILL TYPES


 Bituminous Material (BITUBKFL)


 Sand (SANDBKFL)

 Cuttings (CUTTBKFL)

 Concrete (CONCBKFL)


 Bentonite (BENTBKFL)

 Gravel (GRAVBKFL)

 Grout (GROUBKFL)


SAMPLES & TESTS **


 B - Bulk Disturbed Sample


 BLK - Block Sample

 C - Core Sample (general)


 CBR - CBR Mould Sample

 D - Small Disturbed Sample

 ES - Soil Sample for Environmental Testing

 EW - Water Sample for Environmental Testing

 G - Gas Sample


 LB - Large Bulk Disturbed Sample (earthworks testing)

 M - Mazier Type Sample


 P - Piston Sample


 U - Undisturbed Sample - Open Drive


 W - Water Sample


 SPT - Standard Penetration Test - No Liner


TEST TYPE **


 BH - Borehole


 CPT - Core Penetration Test


 DCP - Dynamic Cone Penetrometer

 EXP - Logged Exposure


 ICBR - In Situ CBR Test


 INST - Instrument

 IRDX - In Situ Redox Test

 IVAN - In Situ Vane Test

 OP - Observation Pit/ Trench


 PM - Pressuremeter Test Hole

 S - Shaft

 SRAL - Seismic Refraction Line

 TP - Trial Pit/ Trench

 IDEN - In Situ Density Test

 TRAV - Linear Logging, Traverse, or Scanline Survey

TOTAL CORE RECOVERY*

Total core recovery (TCR) is defined as:

$$TCR = \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100\%$$

PIEZOMETER TYPE

EPIE - Electronic Piezometer
 HPIE - Hydraulic Piezometer
 PPIE - Pneumatic Piezometer
 SPIE - Standpipe Piezometer

Notes

* AS1726:2017

** AGS3.1 RTA

APPENDIX F

Geotechnical Laboratory Results

RUM JUNGLE MINE SITE

LABORATORY RESULTS

SLR INVESTIGATION LABORATORY RESULTS

SLR-WRTP LABORATORY RESULTS

SLR **JULY 2019** INVESTIGATION LABORATORY RESULTS

Material Test Report

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
 Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027B
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 18/09/2019
Sampling Method: Sampled by Client
 The results apply to the sample as received
Sample Location: WRTP-06 (0.70 - 1.00m)
Material: Clayey Gravel. Resid



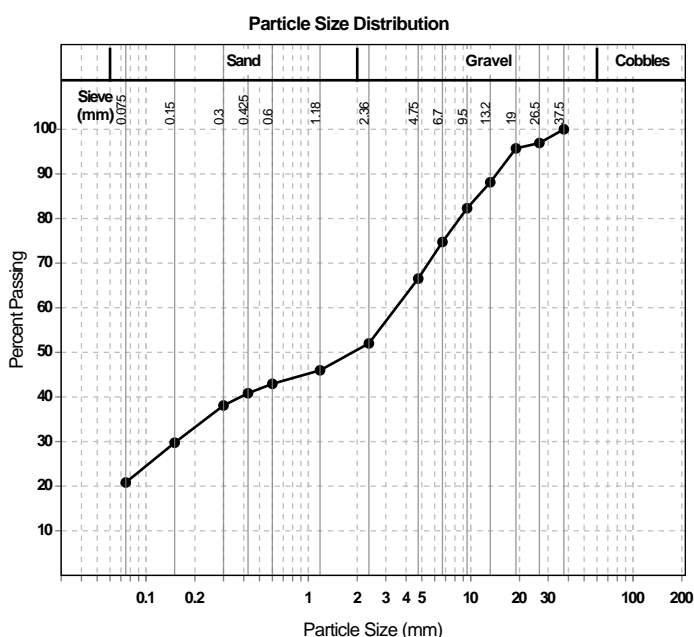

Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
37.5 mm	100	
26.5 mm	97	
19 mm	96	
13.2 mm	88	
9.5 mm	82	
6.7 mm	75	
4.75 mm	67	
2.36 mm	52	
1.18 mm	46	
0.6 mm	43	
0.425 mm	41	
0.3 mm	38	
0.15 mm	30	
0.075 mm	21	

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Clayey Gravel. Resid		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Material Test Report



(Signature)

Approved Signatory: Clare Whelan

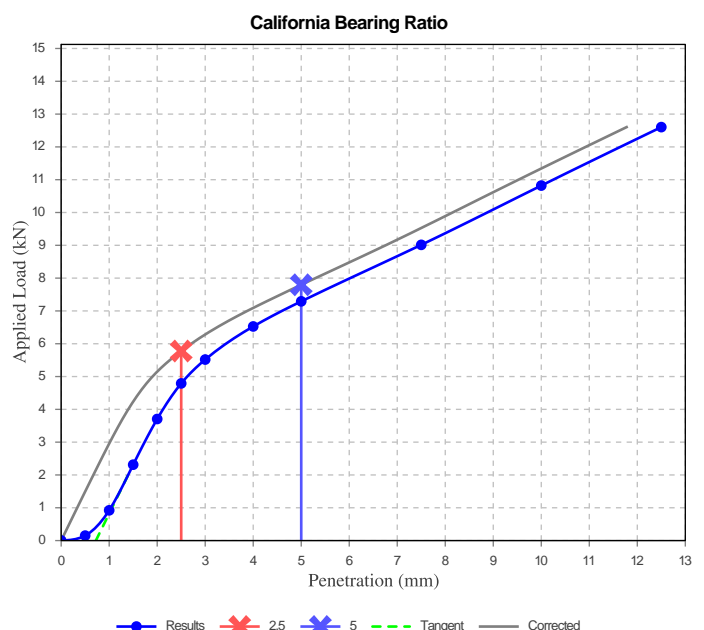
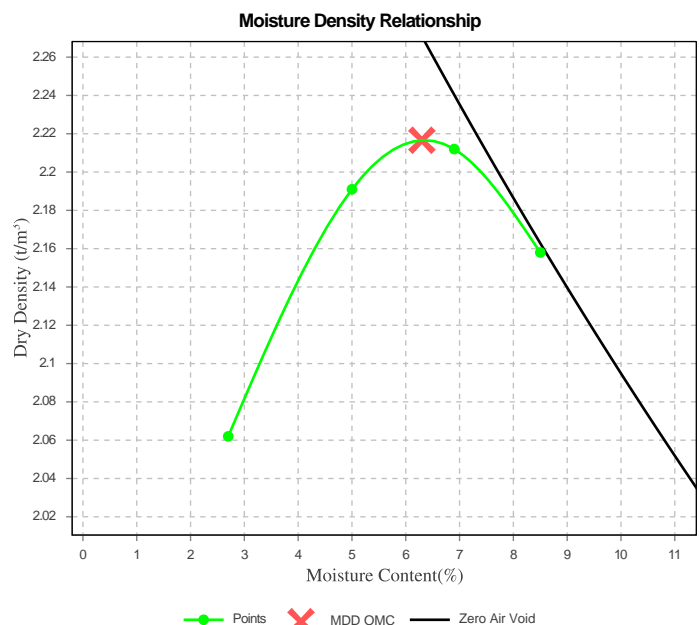
Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027B
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRTP-06 (0.70 - 1.00m)
Material: Clayey Gravel. Resid

Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	2.22
Optimum Moisture Content (%)	6.5
Retained on 19mm (%)	9.6
Oversize Sieve (mm)	19
Oversize Material Wet (%)	7.3
Oversize Material Dry (%)	7.4
Dry Oversize density (t/m^3)	2.50
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	45		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	2.22		
Optimum Moisture Content (%)	6.5		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	2.10		
Field Moisture Content (%)	6.1		
Moisture Content at Placement (%)	6.3		
Moisture Content Top 30mm (%)	11.9		
Moisture Content Rest of Sample (%)	9.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	7.3		



Material Test Report



(Signature)

Approved Signatory: Clare Whelan

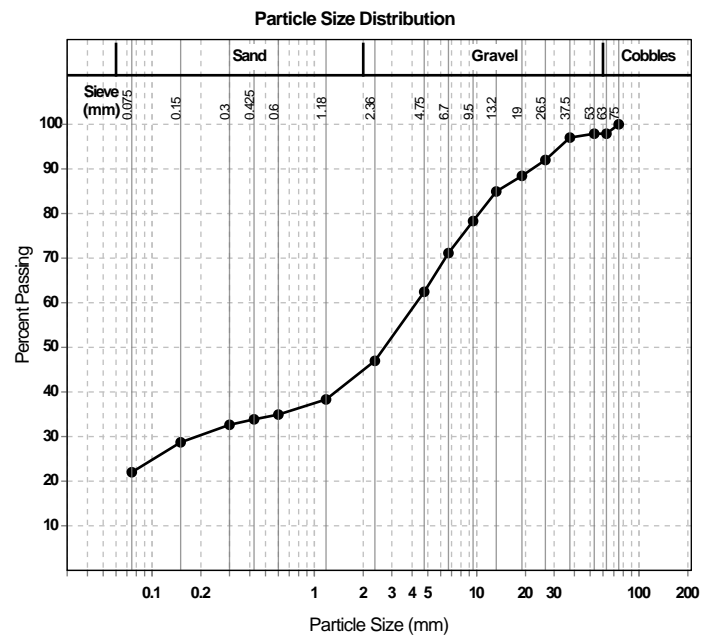
Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027D
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 18/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRTP-08 (0.40 - 1.10m)
Material: Cobb/Bould. Sandy Gravel w/Clay. Ex Weath

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
75 mm	100	
63 mm	98	
53 mm	98	
37.5 mm	97	
26.5 mm	92	
19 mm	88	
13.2 mm	85	
9.5 mm	78	
6.7 mm	71	
4.75 mm	62	
2.36 mm	47	
1.18 mm	38	
0.6 mm	35	
0.425 mm	34	
0.3 mm	33	
0.15 mm	29	
0.075 mm	22	

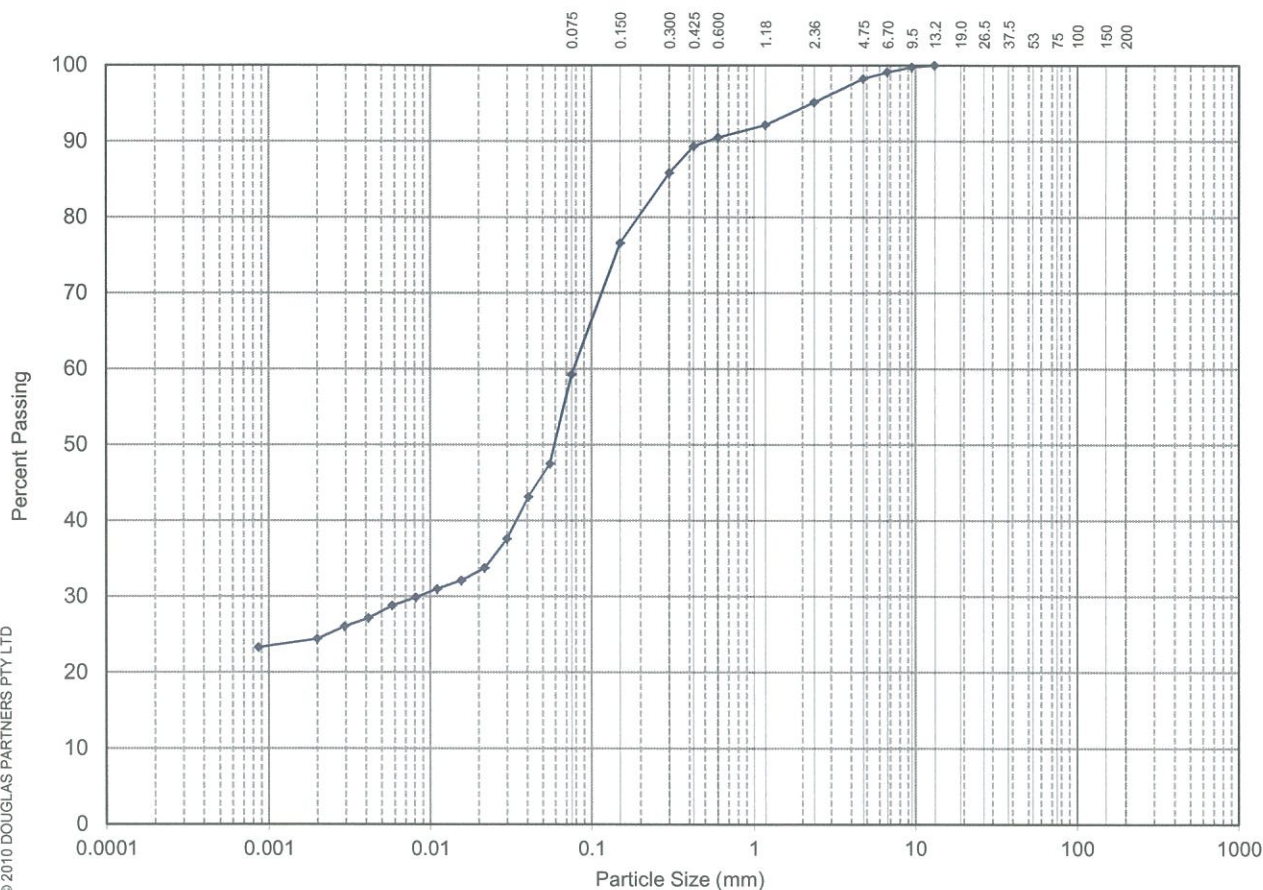
Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Cobb/Bould. Sandy Gravel w/Clay. Ex Weath		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136027
Location :	Rum Jungle, Batchelor, NT	Report Date :	20.11.2019
Test Location:	19-2027F/WRTP-14	Date Sampled:	-
Depth / Layer:	1.70-2.00(m)	Date of Test:	8/11/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	100%
6.7	99%
4.75	98%
2.36	95%
1.18	92%
0.600	90%
0.425	89%
0.300	86%
0.150	77%
0.075	59%
0.041	43%
0.030	38%
0.022	34%
0.016	32%
0.011	31%
0.008	30%
0.006	29%
0.004	27%
0.003	26%
0.002	24%
0.001	23%

CLAY FRACTION		SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
		0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Sandy silty CLAY, trace gravel

Test Method(s): AS 1289.3.6.1, AS 1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.71 t/m³

Type of Hydrometer: g/l

Material Test Report

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027F
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WTRP-14 (1.70 - 2.00m)
Material: Sandy Silty Clay. Lat



Approved Signatory: Clare Whelan

Lab Manager

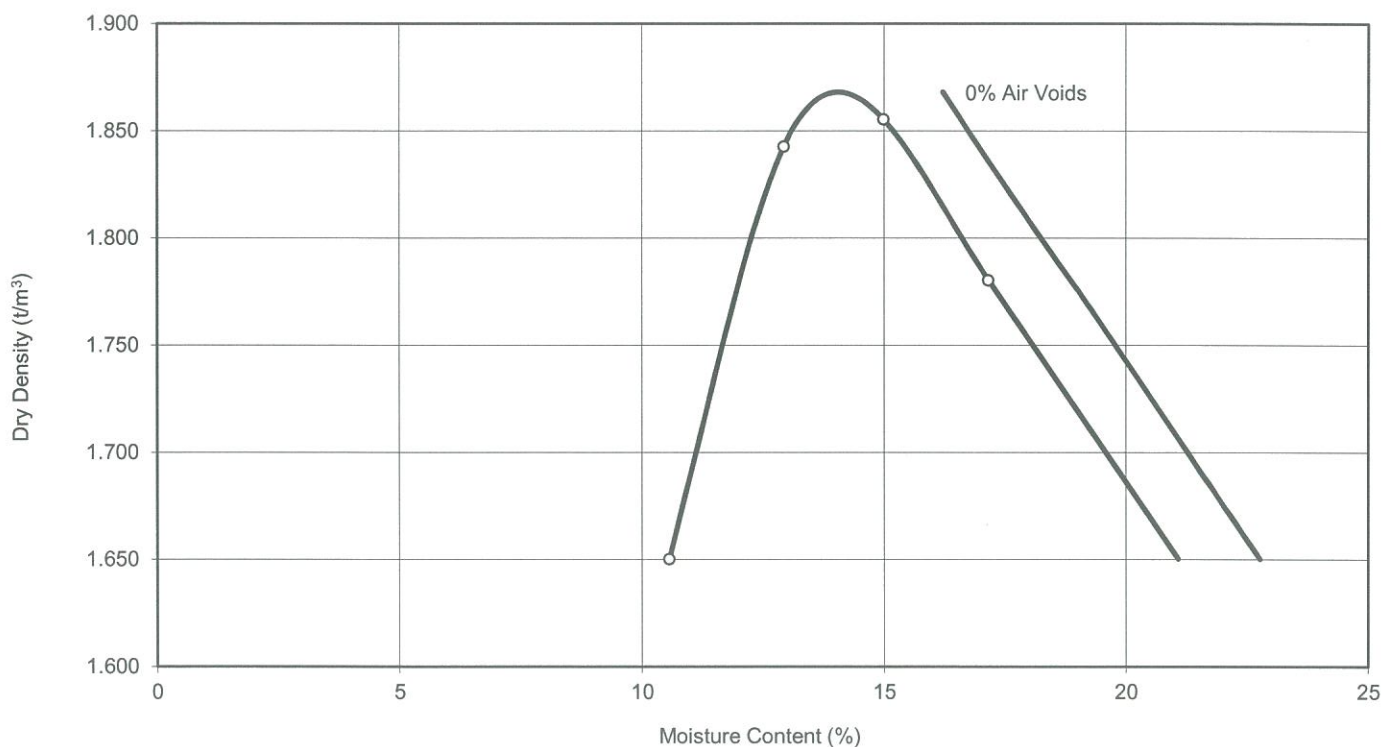
NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	34		
Plastic Limit (%)	18		
Plasticity Index (%)	16		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	9.0		
Cracking Crumbling Curling	Cracking		

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136029
Location :	Rum Jungle, Batchelor, NT	Report Date :	9/11/2019
		Date of Test:	8/11/2019
		Page:	1 of 1



Sample Details: Location: 19-2027F/WRTP-14
Depth: 1.70-2.00(m)

Particles > 19mm: 0%

Description: Sandy silty CLAY, trace gravel

Maximum Dry Density:	1.87 t/m³
Optimum Moisture Content:	14.0 %

Remarks:

Test Methods: AS 1289.2.1.1, AS 1289. 5.1.1

Sampling Methods: Sampled by Client



NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested:	SP
Checked:	AG

Arveendra Gounder
Arveendra Gounder
Laboratory Manager

Results of Falling Head Permeability Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136030
		Report Date:	20-Nov-2019
Location:	Rum Jungle, Batchelor, NT	Date Sampled:	-
		Date of Test:	09-Nov-2019
		Page:	1 of 1

Location:	19-2027F/WRTP-14
Depth	1.70-2.00(m)
Sample Description:	Sandy silty CLAY, trace gravel
Sample Preparation:	Remoulded to 100% Standard Maximum Dry Density @ 101% Optimum Moisture Content
Placement Dry Density:	1.87 t/m ³
Placement Moisture Content:	14.2 %
Final Moisture Content:	15.5 %
Maximum Hydraulic Gradient:	10
Minimum Hydraulic Gradient:	8
Coefficient of Permeability:	2x10⁻¹⁰ m/sec

Test Method(s): AS 1289.6.7.2, AS 1289.2.1.1

Sampling Method(s): Sampled by Client

Remarks:



Peter Chan
Associate

Material Test Report

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027G
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 19/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **WRTP-16 (0.60 - 1.40m)**
Material: Sandy Clay. Sap



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	67		
Plastic Limit (%)	24		
Plasticity Index (%)	43		

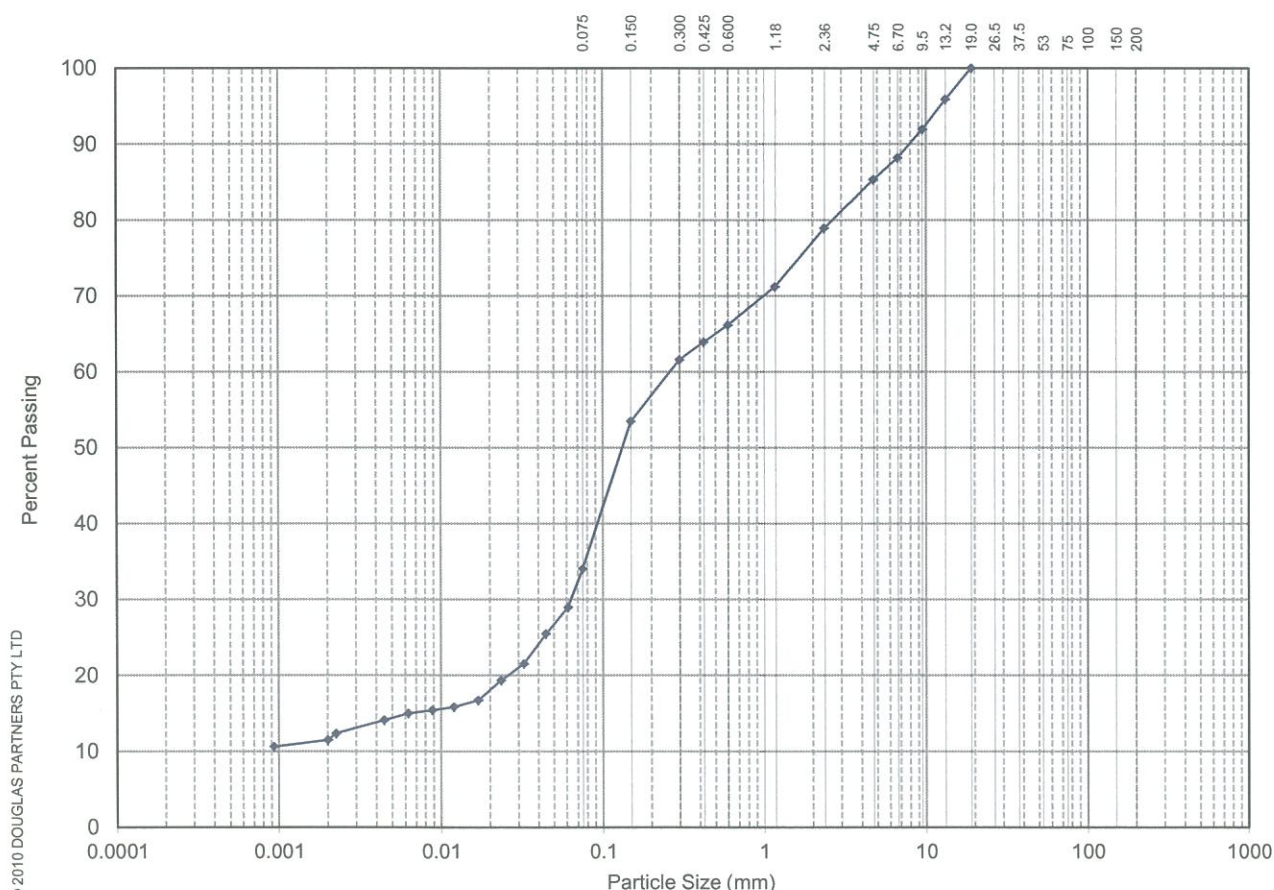
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	6.0		
Cracking Crumbling Curling	Cracking & Curling		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Distilled		
Nature of Water	Natural		
Temperature of Water (°C)	29.6		
* Mineral Present	Carbonate and Gypsum		

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136028
Location :	Rum Jungle, Batchelor, NT	Report Date :	20.11.2019
Test Location:	19-2027H/WRTP-17	Date Sampled:	-
Depth / Layer:	0.80-1.20(m)	Date of Test:	8/11/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	96%
9.5	92%
6.7	88%
4.75	85%
2.36	79%
1.18	71%
0.600	66%
0.425	64%
0.300	62%
0.150	53%
0.075	34%
0.044	25%
0.032	22%
0.023	19%
0.017	17%
0.012	16%
0.009	15%
0.006	15%
0.004	14%
0.002	12%
0.002	11%
0.001	11%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty SAND, with gravel and clay

Test Method(s): AS 1289.3.6.1, AS 1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.70 t/m³

Type of Hydrometer: g/l

Material Test Report

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
 Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027H
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 18/09/2019
Sampling Method: Sampled by Client
 The results apply to the sample as received
Sample Location: WRTP-17 (0.80 - 1.20m)
Material: Clayey Sand w Gravel - Resid



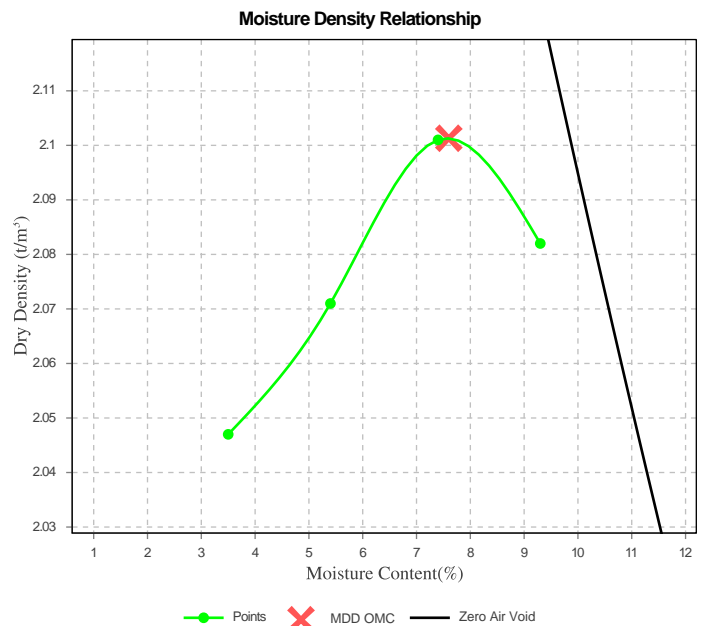

Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m ³)	2.10
Optimum Moisture Content (%)	7.5
Retained on 19mm (%)	0.0
Oversize Sieve (mm)	19
Oversize Material Wet (%)	0
Oversize Material Dry (%)	0
Dry Oversize density (t/m ³)	
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Clayey Sand w Gravel - Resid		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Material Test Report



(Signature)

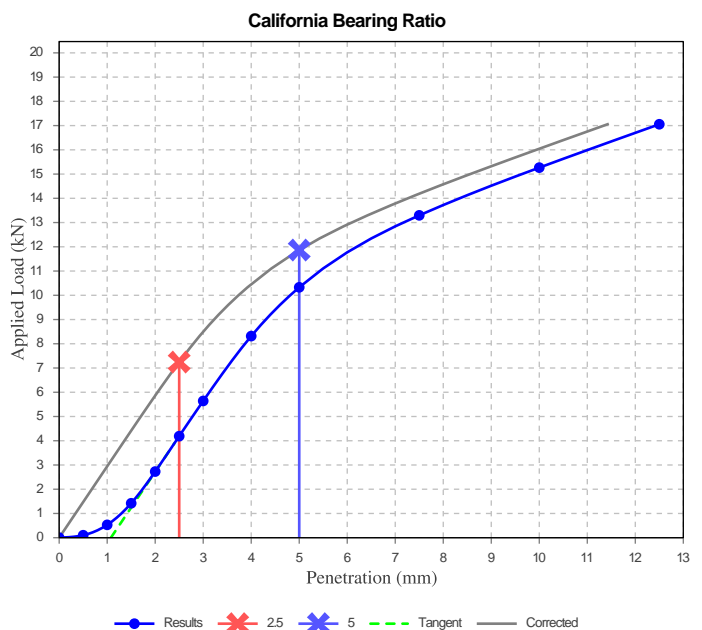
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
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Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027H
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRTP-17 (0.80 - 1.20m)
Material: Clayey Sand w Gravel - Resid

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	60		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.10		
Optimum Moisture Content (%)	7.5		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	2.00		
Field Moisture Content (%)	7.4		
Moisture Content at Placement (%)	7.6		
Moisture Content Top 30mm (%)	11.8		
Moisture Content Rest of Sample (%)	10.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report



(Signature)

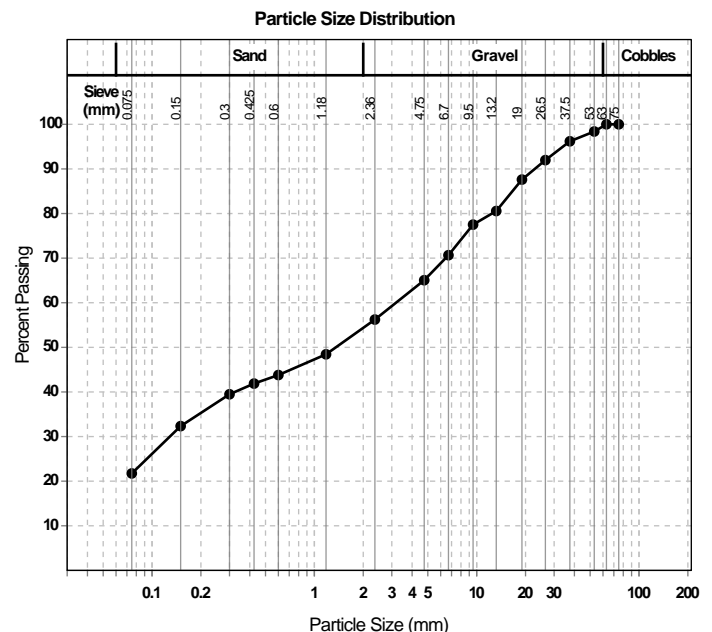
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027I
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 20/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRTP-17 (3.10 - 3.20m)
Material: Ex Weath Metasand / Sandstone

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
75 mm	100	
63 mm	100	
53 mm	98	
37.5 mm	96	
26.5 mm	92	
19 mm	88	
13.2 mm	81	
9.5 mm	78	
6.7 mm	71	
4.75 mm	65	
2.36 mm	56	
1.18 mm	48	
0.6 mm	44	
0.425 mm	42	
0.3 mm	39	
0.15 mm	32	
0.075 mm	22	



Material Test Report



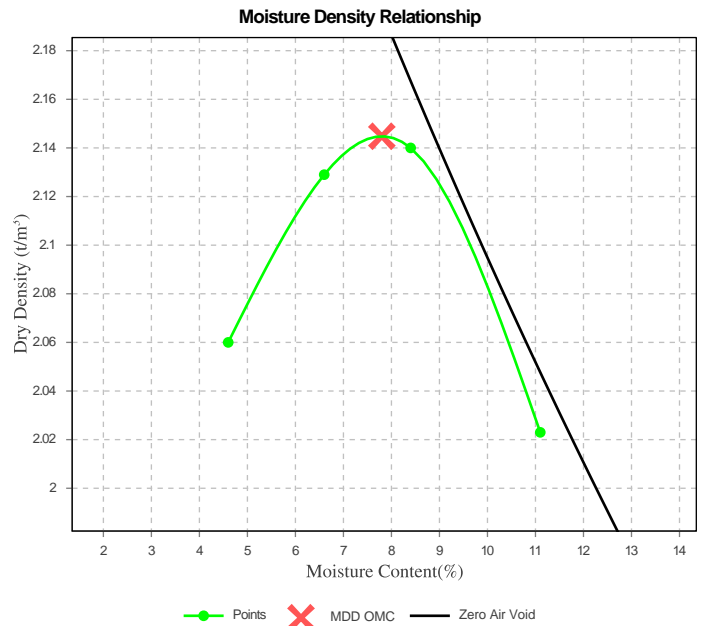
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-2027I
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 18/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRTP-17 (3.10 - 3.20m)
Material: Ex Weath Metasand / Sandstone

Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	2.14
Optimum Moisture Content (%)	8.0
Retained on 19mm (%)	0.0
Oversize Sieve (mm)	19
Oversize Material Wet (%)	0
Oversize Material Dry (%)	0
Dry Oversize density (t/m^3)	
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24



Material Test Report



(Signature)

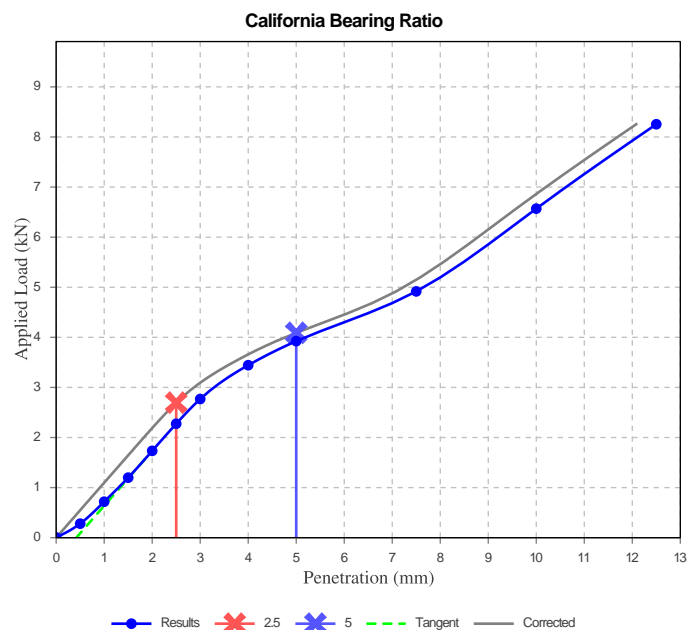
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Sample Number: 19-20271
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRTP-17 (3.10 - 3.20m)
Material: Ex Weath Metasand / Sandstone

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	20		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.14		
Optimum Moisture Content (%)	8.0		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	2.03		
Field Moisture Content (%)	6.9		
Moisture Content at Placement (%)	7.8		
Moisture Content Top 30mm (%)	10.3		
Moisture Content Rest of Sample (%)	10.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report



Geotechnics | Environment | Groundwater

Douglas Partners Pty Ltd

Darwin Laboratory

Unit 2/14 Caryota Circuit Coconut Grove NT 0810

Phone: (08) 8948 6800

Fax: (08) 8948 6899

Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

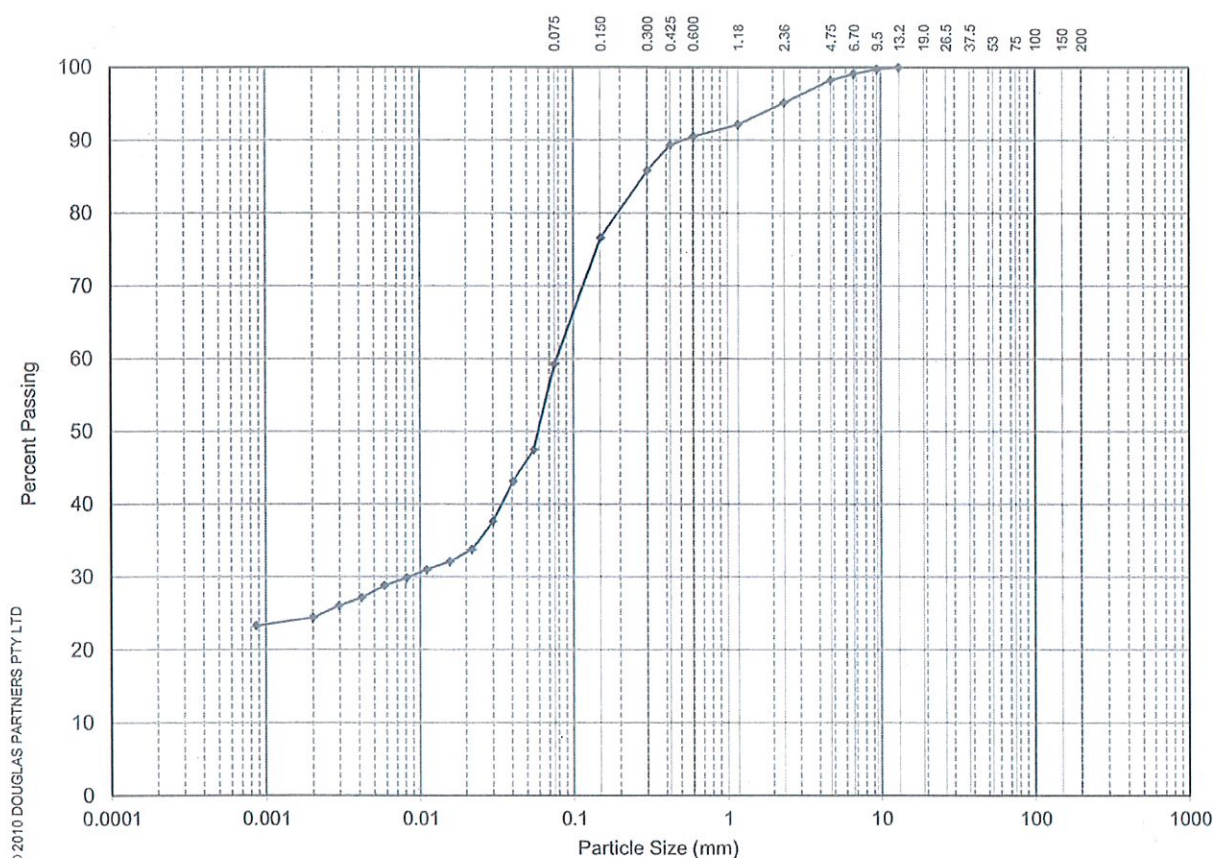
Report Number: 677659.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2027
Date Sampled: 17/07/2019
Dates Tested: 04/09/2019 - 25/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received

Moisture Content AS 1289 2.1.1			
Sample Number	Sample Location	Moisture Content (%)	Material
19-2027B	WRTP-06 (0.70 - 1.00m)	6.1 %	Clayey Gravel. Resid
19-2027D	WRTP-08 (0.40 - 1.10m)	9.6 %	Cobb/Bould. Sandy Gravel w/Clay. Ex Weath
19-2027E	WRTP-13 (1.00 - 1.40m)	18.4 %	Sandy Clay w Silt. Resid
19-2027F	WTRP-14 (1.70 - 2.00m)	12.7 %	Sandy Silty Clay. Lat
19-2027H	WRTP-17 (0.80 - 1.20m)	7.4 %	Clayey Sand w Gravel - Resid
19-2027I	WRTP-17 (3.10 - 3.20m)	7.0 %	Ex Weath Metasand / Sandstone

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136027
Location :	Rum Jungle, Batchelor, NT	Report Date :	20.11.2019
Test Location:	19-2027F/WRTP-14	Date Sampled:	-
Depth / Layer:	1.70-2.00(m)	Date of Test:	8/11/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	100%
6.7	99%
4.75	98%
2.36	95%
1.18	92%
0.600	90%
0.425	89%
0.300	86%
0.150	77%
0.075	59%
0.041	43%
0.030	38%
0.022	34%
0.016	32%
0.011	31%
0.008	30%
0.006	29%
0.004	27%
0.003	26%
0.002	24%
0.001	23%

CLAY FRACTION			SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
			Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
			0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Sandy silty CLAY, trace gravel

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.71 t/m³

Type of Hydrometer: g/l

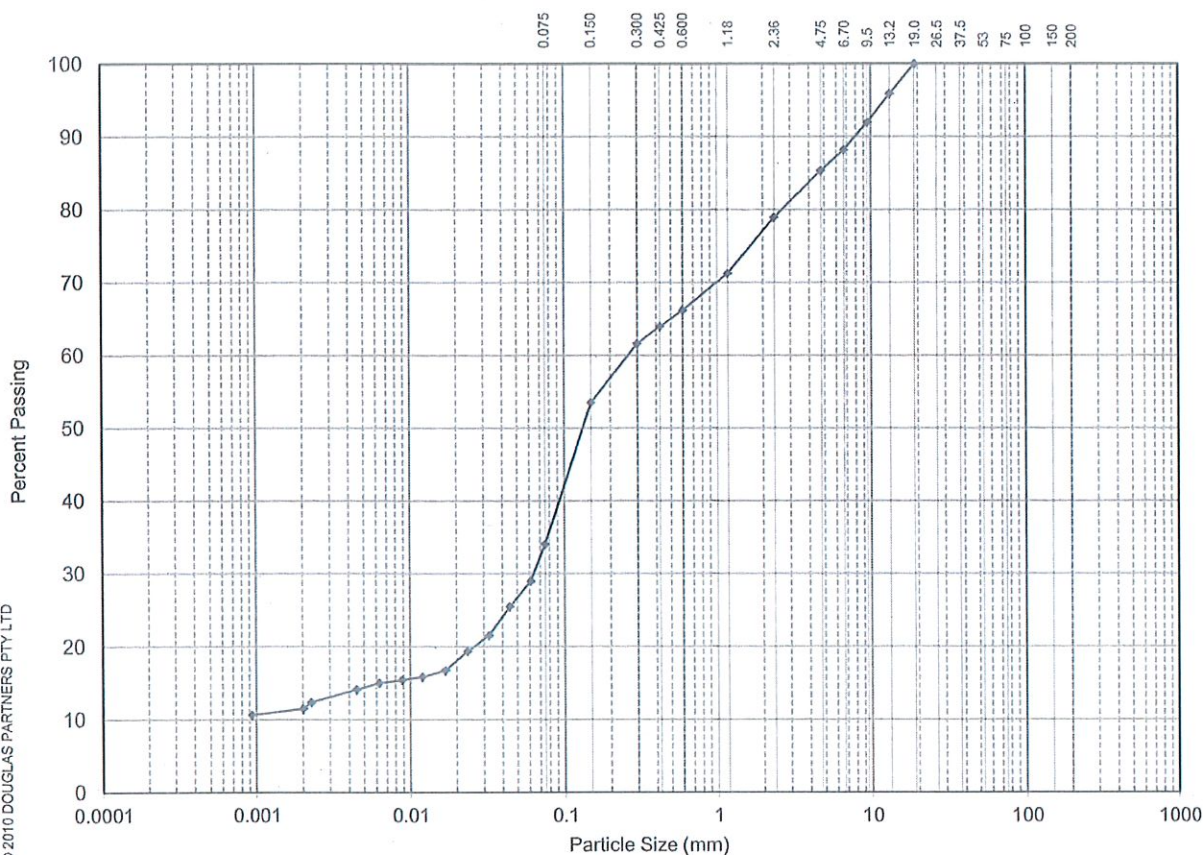
Results of Particle Size Distribution (Hydrometer)

Client : SLR Consulting Australia Pty Ltd
Project : BATCHELOR - Rum Jungle Rehabilitation
Location : Rum Jungle, Batchelor, NT
Test Location: 19-2027H/WRTP-17
Depth / Layer: 0.80-1.20(m)

Project No. : 677659.00
Report No. : M19136028
Report Date : 20.11.2019

Date Sampled: -
Date of Test: 8/11/2019
Page: 1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	96%
9.5	92%
6.7	88%
4.75	85%
2.36	79%
1.18	71%
0.600	66%
0.425	64%
0.300	62%
0.150	53%
0.075	34%
0.044	25%
0.032	22%
0.023	19%
0.017	17%
0.012	16%
0.009	15%
0.006	15%
0.004	14%
0.002	12%
0.002	11%
0.001	11%

CLAY FRACTION			SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
			Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
			0.002	0.005	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty SAND, with gravel and clay
Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1
Sampling Method(s): Sampled by Client
Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.70 t/m³

Loss in pretreatment: 0%
Type of Hydrometer: g/l

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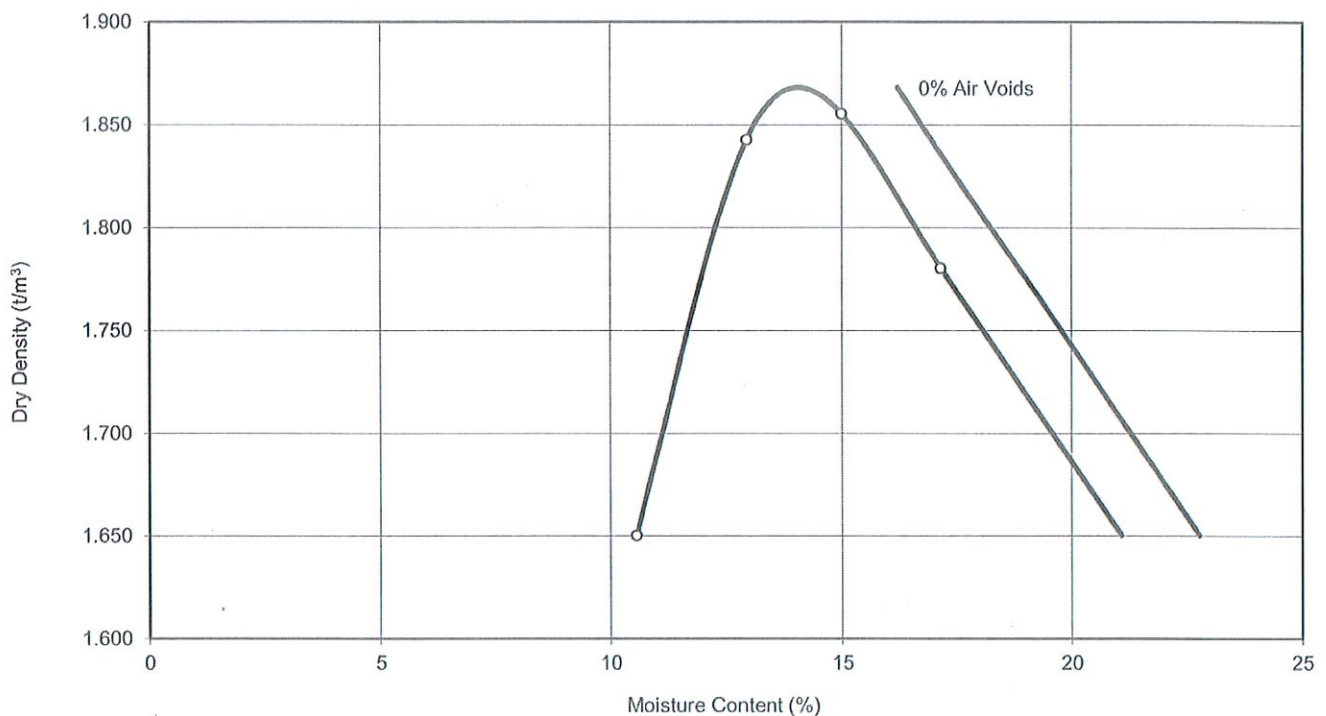
NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tested: CP
Checked: AG

P. Chan
Peter Chan
Associate

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136029
Location :	Rum Jungle, Batchelor, NT	Report Date :	9/11/2019
		Date of Test:	8/11/2019
		Page:	1 of 1



Sample Details: Location: 19-2027F/WRTP-14
Depth: 1.70-2.00(m)

Particles > 19mm: 0%

Description: Sandy silty CLAY, trace gravel

Maximum Dry Density:	1.87 t/m³
Optimum Moisture Content:	14.0 %

Remarks:

Test Methods: AS 1289.2.1.1, AS 1289. 5.1.1

Sampling Methods: Sampled by Client



NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested:	SP
Checked:	AG

Arveendra Gounder
Arveendra Gounder
Laboratory Manager

Results of Falling Head Permeability Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136030
Location:	Rum Jungle, Batchelor, NT	Report Date:	20-Nov-2019
		Date Sampled:	-
		Date of Test:	09-Nov-2019
		Page:	1 of 1

Location:	19-2027F/WRTP-14
Depth	1.70-2.00(m)
Sample Description:	Sandy silty CLAY, trace gravel
Sample Preparation:	Remoulded to 100% Standard Maximum Dry Density @ 101% Optimum Moisture Content
Placement Dry Density:	1.87 t/m ³
Placement Moisture Content:	14.2 %
Final Moisture Content:	15.5 %
Maximum Hydraulic Gradient:	10
Minimum Hydraulic Gradient:	8
Coefficient of Permeability:	2×10^{-10} m/sec

Test Method(s): AS 1289.6.7.2, AS 1289.2.1.1

Sampling Method(s): Sampled by Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: TT
Checked: AG



Peter Chan
Associate

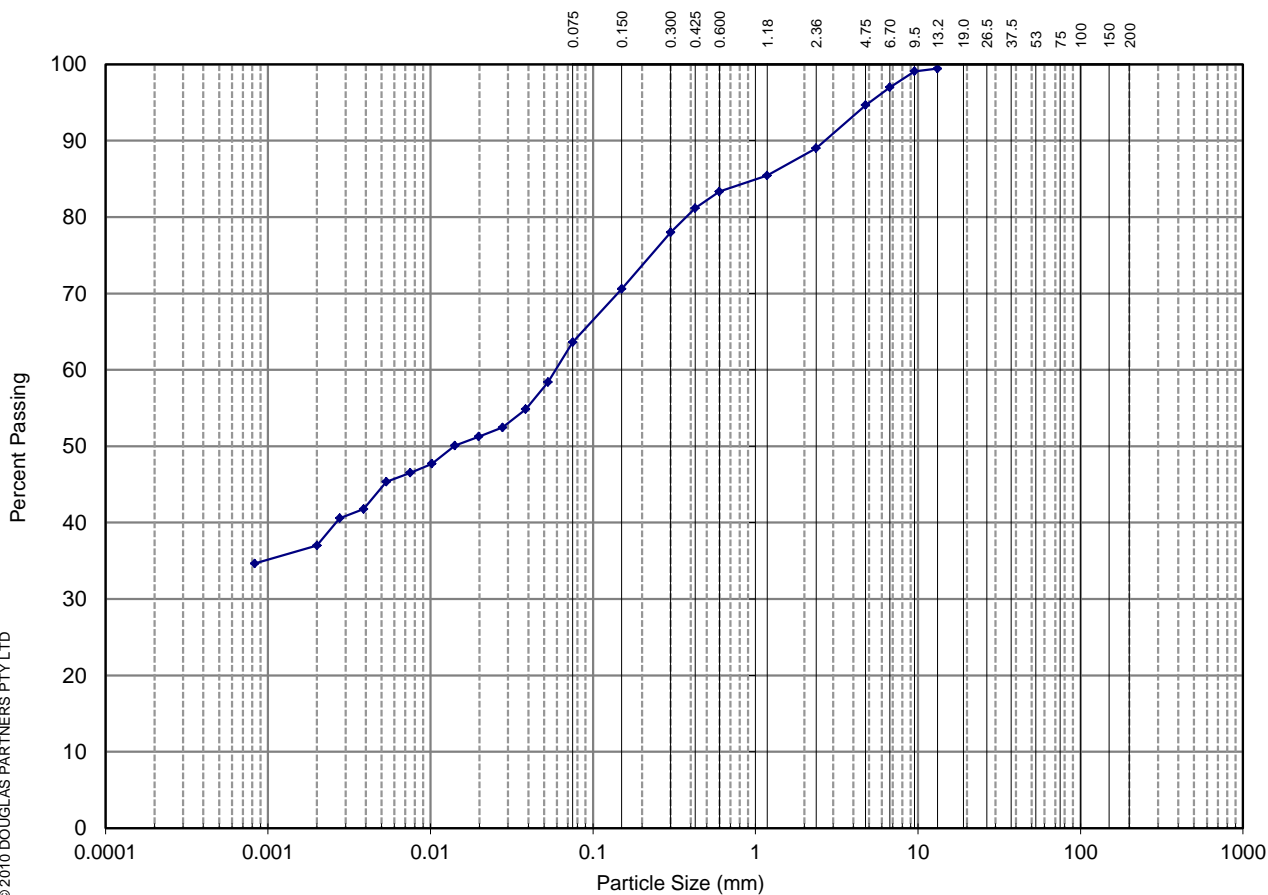
WRD-SLR-TP LABORATORY RESULTS

SLR **OCTOBER 2019** INVESTIGATION LABORATORY RESULTS

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005001A
Location :	Rum Jungle Mine	Report Date :	29.01.2020
Test Location:	WRD-SLR-TP01	Date Sampled:	-
Depth / Layer:	2.0-3.0(m)	Date of Test:	17/01/2020
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	99%
9.5	99%
6.7	97%
4.75	95%
2.36	89%
1.18	85%
0.600	83%
0.425	81%
0.300	78%
0.150	71%
0.075	64%
0.038	55%
0.028	52%
0.020	51%
0.014	50%
0.010	48%
0.007	47%
0.005	45%
0.004	42%
0.003	41%
0.002	37%
0.001	35%

CLAY FRACTION			SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
			Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
			0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY, with sand, trace gravel

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.67 t/m³

Type of Hydrometer: g/l

This amended report replaces M20005001

Material Test Report

Report Number: 677667.00-3B
Issue Number: 1
Date Issued: 28/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177D
Date Sampled: 07/10/2019
Dates Tested: 17/10/2019 - 27/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRD-SLR-TP01 (2.0 - 3.0m)
Material: Clay



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	39		
Plastic Limit (%)	21		
Plasticity Index (%)	18		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	10.0		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Clay		
Nature of Water	Demineralised water		
Temperature of Water (°C)			

Material Test Report

Report Number: 677667.00-3
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Falling Head Permeability DW-2177N Added
Date Issued: 06/02/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300
(Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177N
Date Sampled: 05/10/2019
Dates Tested: 17/10/2019 - 28/01/2020
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRD-SLR-TP08 (3.4 - 3.7m)



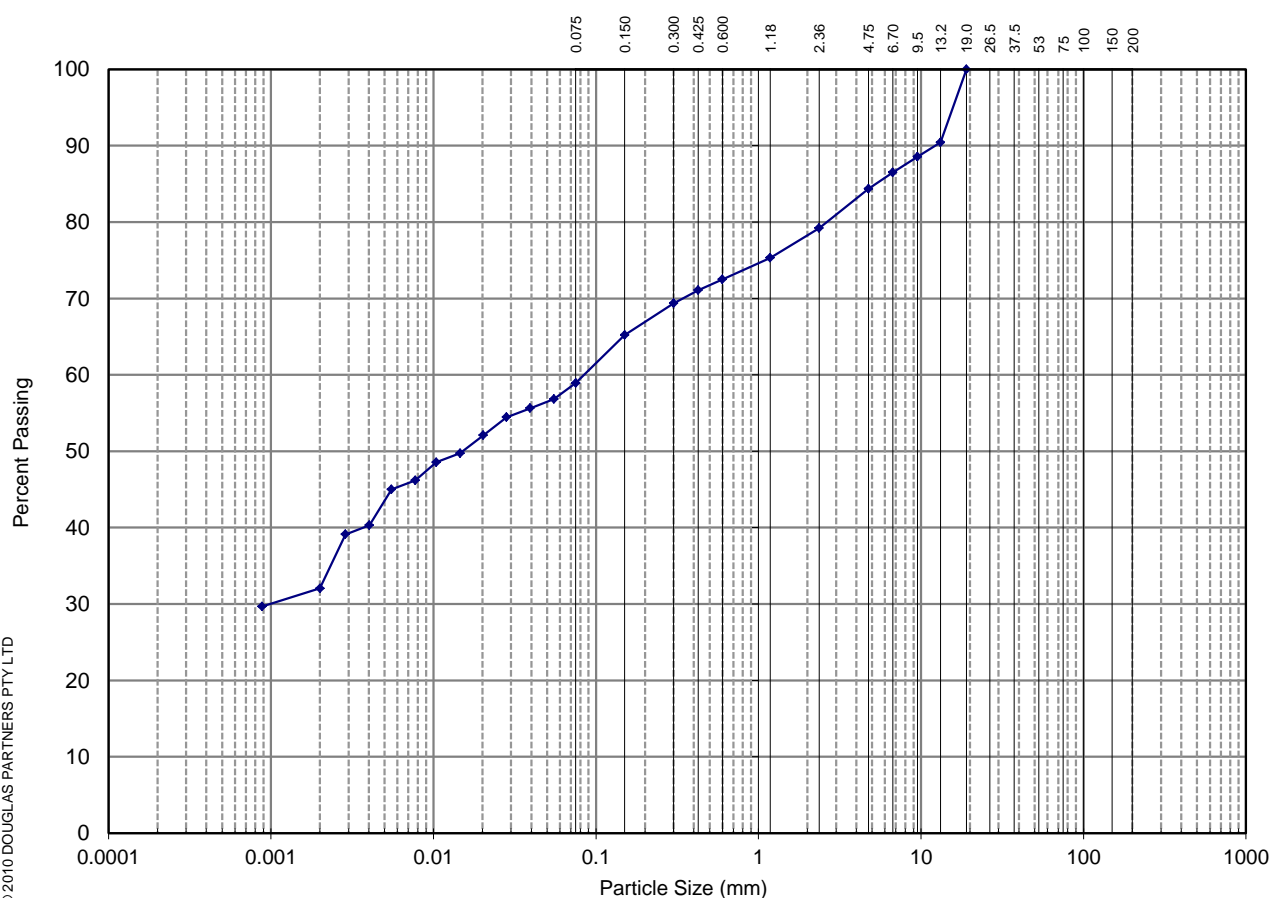
Approved Signatory: Andrew Sykes
Senior Geotechnician
NATA Accredited Laboratory Number: 828

Falling Head Permeability (AS 1289 6.7.2 & 2.1.1)	
Coefficient of Permeability (m/sec)	2×10^{-9}
Method of Compactive Effort	Standard
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1
Maximum Dry Density (t/m^3)	1.711
Optimum Moisture Content (%)	19.8
Field Moisture Content (%)	20.0
Sieve for Oversize (mm)	19
Oversize Material (%)	0
Laboratory Density Ratio (%)	100.0
Laboratory Moisture Ratio (%)	100.5
Surcharges and Pressure Applied	4.95

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005002A
Location :	Rum Jungle Mine	Report Date :	29.01.2020
Test Location:	WRD-SLR-TP09	Date Sampled:	-
Depth / Layer:	4.0-4.4(m)	Date of Test:	17/01/2020
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	90%
9.5	89%
6.7	86%
4.75	84%
2.36	79%
1.18	75%
0.600	72%
0.425	71%
0.300	69%
0.150	65%
0.075	59%
0.039	56%
0.028	54%
0.020	52%
0.015	50%
0.010	49%
0.008	46%
0.006	45%
0.004	40%
0.003	39%
0.002	32%
0.001	30%

CLAY FRACTION			SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
			Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
			0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY, with gravel and sand

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.58 t/m³

Type of Hydrometer: g/l

This amended report replaces M20005002

Results of Moisture Content, Plasticity and Linear Shrinkage Tests

Client:	SLR Consulting Australia Pty Ltd	Project No:	677667.00
Project:	BATCHELOR - Rum Jungle Rehabilitation #3	Report No:	M20005005A
Location:	Rum Jungle Mine	Report Date:	13-Feb-2020
		Date Sampled:	-
		Date of Test:	17-Jan-2020
		Page:	1 of 1

Test Location	Depth (m)	Description	Code	W _F %	W _L %	W _P %	PI %	*LS %
WRD-SLR-TP09	4.0-4.4	Silty CLAY, with gravel and sand	2,5	20.1	62	23	39	14.0 CU

Legend:

W_F Field Moisture Content
 W_L Liquid limit
 W_P Plastic limit
 PI Plasticity index
 LS Linear shrinkage from liquid limit condition (Mould length 254mm)

Test Methods:

Moisture Content: AS 1289 2.1.1
 Liquid Limit: AS 1289 3.1.2
 Plastic Limit: AS 1289 3.2.1
 Plasticity Index: AS 1289 3.3.1
 Linear Shrinkage: AS 1289 3.4.1

Code:

Sample history for plasticity tests

1. Air dried
2. Low temperature (<50°C) oven dried
3. Oven (105°C) dried
4. Unknown

Method of preparation for plasticity tests

5. Dry sieved
6. Wet sieved
7. Natural

*Specify if sample crumbled CR or curled CU

Sampling Methods: Sampled by Client

Remarks: This amended report replaces M20005005

Results of Moisture Content Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677667.00
Project:	BATCHELOR - Rum Jungle Rehabilitation #3	Report No:	M20005004A
Location:	Rum Jungle Mine	Report Date:	01-Apr-2020
		Date Sampled:	-
		Date of Test:	13-Jan-2020
		Page:	1 of 1

TEST LOCATION	DEPTH (m)	DESCRIPTION	MOISTURE CONTENT (%)
WRD-SLR-TP09	4.0-4.4	Silty CLAY, with gravel and sand	20.1

Test Method(s): AS1289.2.1.1-2005

Sampling Method(s): Sampled by Client

Remarks: This amended report replaces M20005004



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: KB
Checked: AG


Peter Chan
 Associate

Determination of Emerson Class Number of Soil

Client:	SLR CONSULTING AUSTRALIA PTY LTD	Project No:	677667.00
Project:	BATCHELOR - Rum Jungle Rehabilitation #3	Report No:	M20005006A
		Report Date:	13-FEB-2020
Location:	Rum Jungle Mine	Date of Test:	29-JAN-2020
		Page:	1 of 1

Sample No.	Depth (m)	Description	Water Type	Water Temp	Class No.
WRD-SLR-TP09	4.0-4.4	Silty CLAY, with gravel and sand	Distilled	22	5

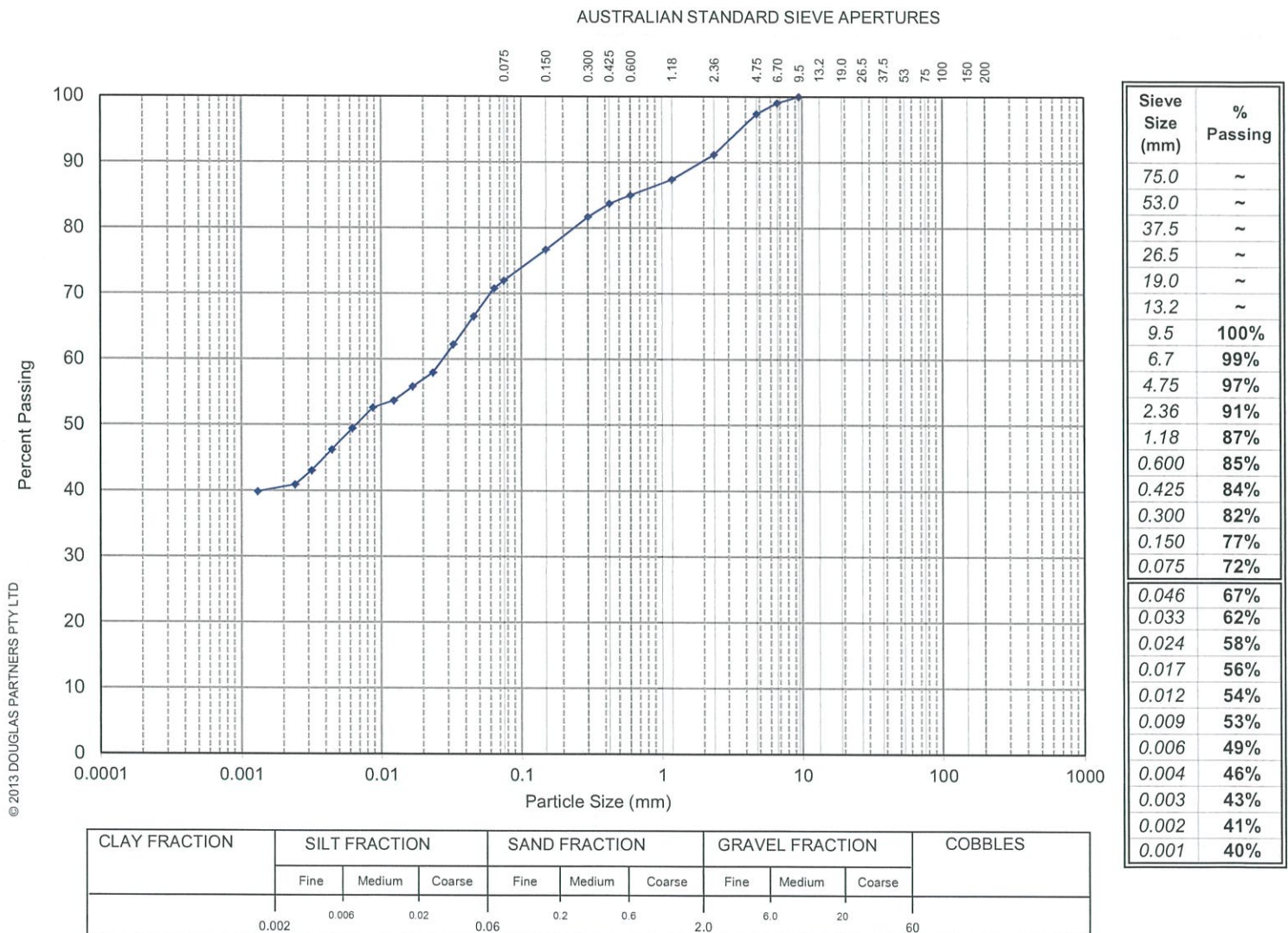
Test Methods: AS 1289 3.8.1

Sampling Methods: Sampled by Client

Remarks: This amended report replaces M20005006

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667
Project :	Rum Jungle Rehabilitation	Report No. :	BO19-0117 Rev 1
Location :	Rum Jungle Mine, Batchelor	Report Date :	08.01.2020
Test Location:	WRD-SLR-TP11	Date Sampled:	05/10/2019
Depth / Layer:	2.00 - 2.20 m	Date of Test:	18/12/2019
		Page:	1 of 1



Description: Sandy Silty CLAY with Gravel

Test Method(s): AS 1289.3.6.1, 3.6.3

Sampling Method(s): Sampled By Others

Remarks: This report replaces report BO19-0117 dated 19/12/2019

Loss in pretreatment: 0%

Type of Hydrometer: g/l

Material Test Report

Report Number: 677667.00-3
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Falling Head Permeability Testing Added
Date Issued: 17/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177J
Date Sampled: 04/10/2019
Dates Tested: 17/10/2019 - 13/01/2020
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677667.00-3 and 677667.00-3B
Sample Location: WRD-SLR-TP14 (3.0 - 3.2m)
Material: Clay



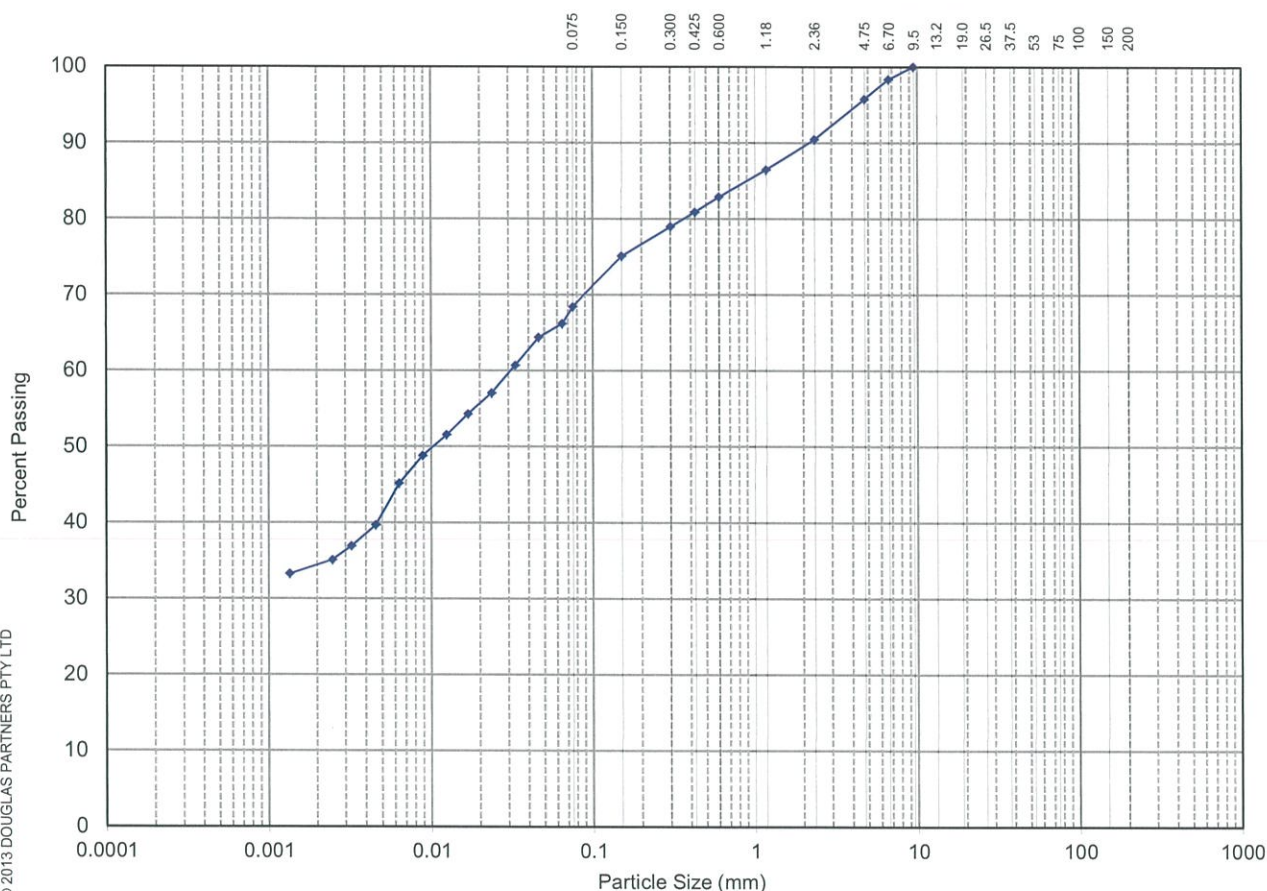
Approved Signatory: Andrew Sykes
Senior Geotechnician
NATA Accredited Laboratory Number: 828

Falling Head Permeability (AS 1289 6.7.2 & 2.1.1)	
Coefficient of Permeability (m/sec)	5×10^{-9}
Method of Compactive Effort	Standard
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1
Maximum Dry Density (t/m^3)	2.132
Optimum Moisture Content (%)	8.2
Field Moisture Content (%)	6.8
Sieve for Oversize (mm)	19
Oversize Material (%)	0
Laboratory Density Ratio (%)	95.0
Laboratory Moisture Ratio (%)	100.0
Surcharges and Pressure Applied	4.95

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667
Project :	Rum Jungle Rehabilitation	Report No. :	BO20-0000
Location :	Rum Jungle Mine, Batchelor	Report Date :	17.01.2020
Test Location:	WRD-SLR-TP15	Date Sampled:	Unknown
Depth / Layer:	1.30 - 1.50 m	Date of Test:	14.01.2020
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	~
9.5	100%
6.7	98%
4.75	96%
2.36	90%
1.18	86%
0.600	83%
0.425	81%
0.300	79%
0.150	75%
0.075	68%
0.046	64%
0.033	61%
0.024	57%
0.017	54%
0.012	52%
0.009	49%
0.006	45%
0.005	40%
0.003	37%
0.002	35%
0.001	33%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Sandy Silty CLAY with Gravel

Test Method(s): AS 1289.3.6.1, 3.6.3

Sampling Method(s): Sampled by others

Loss in pretreatment: 0%

Remarks:

Type of Hydrometer: g/l

Material Test Report



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3D
Issue Number: 1
Date Issued: 17/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177O
Date Sampled: 04/10/2019
Dates Tested: 17/10/2019 - 13/01/2020
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677667.00-3 and 677667.00-3B
Sample Location: WRD-SLR-TP15 (1.3 - 1.5m)

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	55		
Plastic Limit (%)	23		
Plasticity Index (%)	32		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	12.0		
Cracking Crumbling Curling	Cracking		

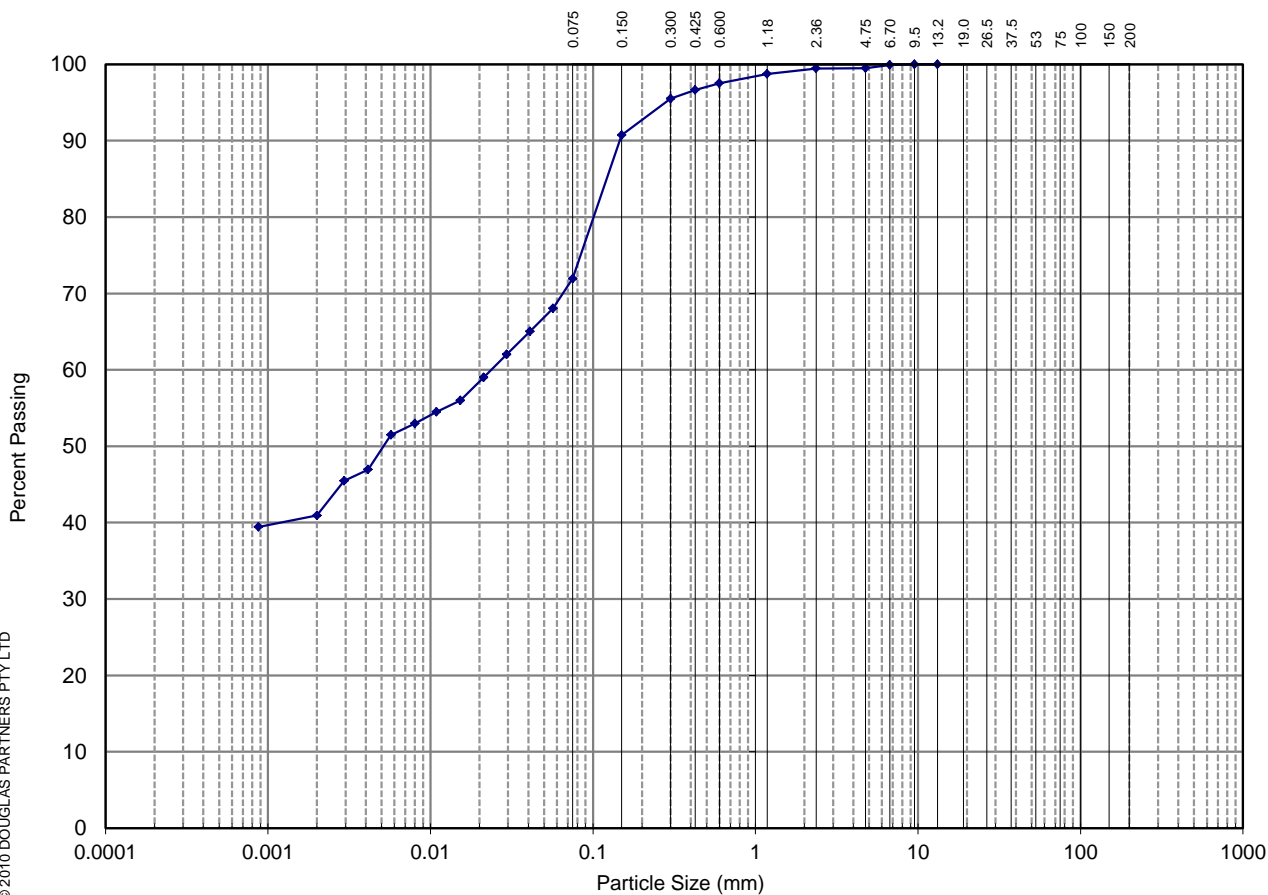
Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Clayey, gravelly		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		
* Mineral Present	Carbonate		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	14.9

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005003A
Location :	Rum Jungle Mine	Report Date :	29.01.2020
Test Location:	WRD-SLR-TP16	Date Sampled:	-
Depth / Layer:	1.9-2.1(m)	Date of Test:	17/01/2020
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	100%
6.7	100%
4.75	99%
2.36	99%
1.18	99%
0.600	98%
0.425	97%
0.300	96%
0.150	91%
0.075	72%
0.041	65%
0.029	62%
0.021	59%
0.015	56%
0.011	54%
0.008	53%
0.006	51%
0.004	47%
0.003	45%
0.002	41%
0.001	39%

CLAY FRACTION			SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
			Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
			0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY, with sand, trace gravel

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.57 t/m³

Type of Hydrometer: g/l

This amended report replaces M20005003



NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.
Accredited for compliance with ISO/IEC 17025

Tested: KB
Checked: AG

Peter Chan
Peter Chan
Associate

Material Test Report

Report Number: 677667.00-3B
Issue Number: 1
Date Issued: 28/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177K
Date Sampled: 04/10/2019
Dates Tested: 17/10/2019 - 27/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: WRD-SLR-TP16 (1.9 - 2.1m)



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	47		
Plastic Limit (%)	22		
Plasticity Index (%)	25		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	8.0		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Clay		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		

BORROW AREA A

LABORATORY RESULTS

SLR INVESTIGATION LABORATORY RESULTS

Material Test Report

Report Number: 677637.00-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Pls added
Date Issued: 18/07/2019
Client: SLR Consulting Australia Pty Ltd
 5 Foelsche Street, Darwin NT 0800
Contact: Danielle O'Toole
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421 - PO 25590
Work Request: 1721
Sample Number: 19-1721A
Date Sampled: 17/05/2019
Dates Tested: 23/05/2019 - 13/06/2019
Sampling Method: Sampled by Client
 The results apply to the sample as received
Sample Location: DPIR-TP01 (4.40 - 4.60m)
Material: Sandy Clay / Clayey Sand




Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

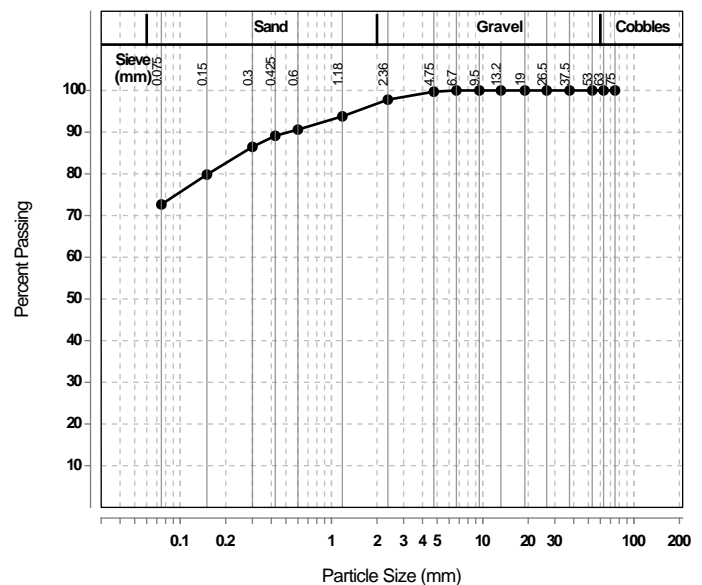
Particle Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	98	
1.18 mm	94	
0.6 mm	91	
0.425 mm	89	
0.3 mm	86	
0.15 mm	80	
0.075 mm	73	

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	5		
Soil Description	Sandy Clay, Clayey Sand		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	73		
Plastic Limit (%)	31		
Plasticity Index (%)	42		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	14.0		
Cracking Crumbling Curling	None		

Particle Size Distribution



Material Test Report



(Signature)

Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

Report Number: 677637.00-3
Issue Number: 1
Date Issued: 16/08/2019
Client: SLR Consulting Australia Pty Ltd
5 Foelsche Street, Darwin NT 0800
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421
Work Request: 3801
Sample Number: 19-3801A
Date Sampled: 17/05/2019
Dates Tested: 20/06/2019 - 20/06/2019
Sampling Method: Sampled by Engineering Department
Remarks: AS1289.3.6.1 grading data down to 0.075mm supplied by Douglas Partners Darwin Laboratory.
Sample Location: DPIP-TP01, Depth: 4.40 - 4.60m
Material: Clayey Sandy SILT

Fine Analysis using a Hydrometer (AS 1289 3.6.3)

Method of Dispersion	Air Jet Dispersion Cup
Loss in Pretreatment	0

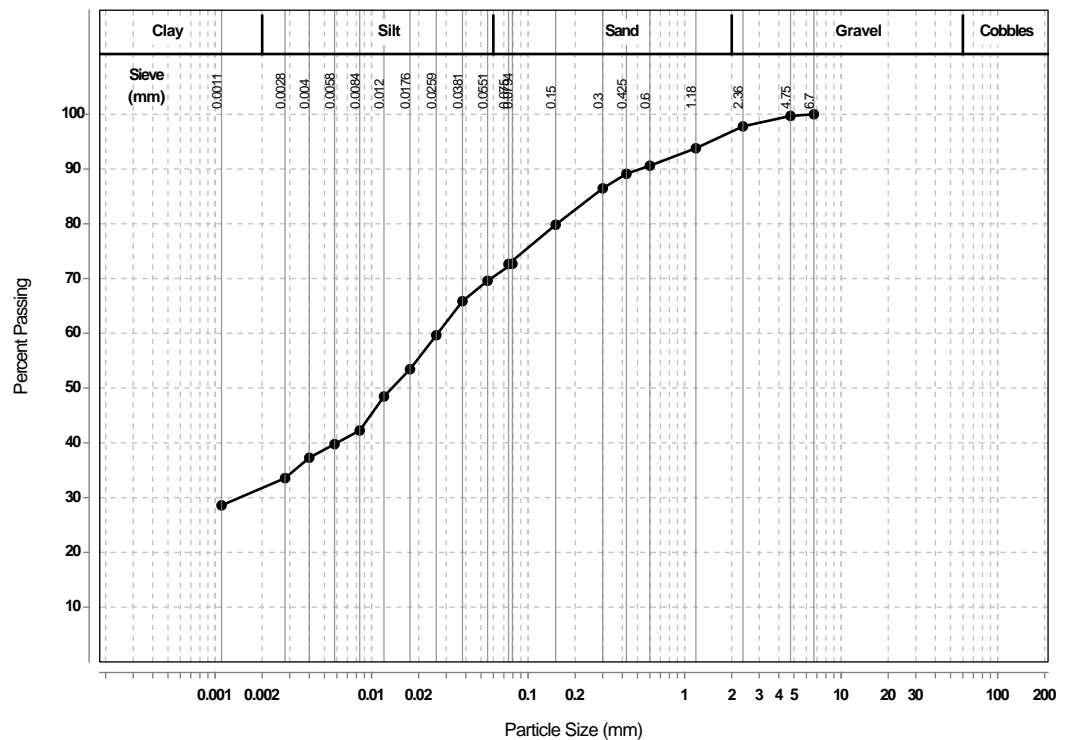
Particle Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
6.7 mm	100	
4.75 mm	100	
2.36 mm	98	
1.18 mm	94	
0.6 mm	91	
0.425 mm	89	
0.3 mm	86	
0.15 mm	80	
0.075 mm	73	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.075	72.7
0.055	69.6
0.038	65.9
0.025	59.7
0.018	53.4
0.012	48.5
0.008	42.3
0.006	39.8
0.004	37.3
0.002	33.6
0.001	28.6

Particle Size Distribution



Material Test Report

Report Number: 677637.00-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Pls added
Date Issued: 18/07/2019
Client: SLR Consulting Australia Pty Ltd
 5 Foelsche Street, Darwin NT 0800
Contact: Danielle O'Toole
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421 - PO 25590
Work Request: 1721
Sample Number: 19-1721B
Date Sampled: 17/05/2019
Dates Tested: 23/05/2019 - 29/05/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: DPIR-TP03 (1.00 - 1.20m)
Material: Clayey Sand




Approved Signatory: Clare Whelan

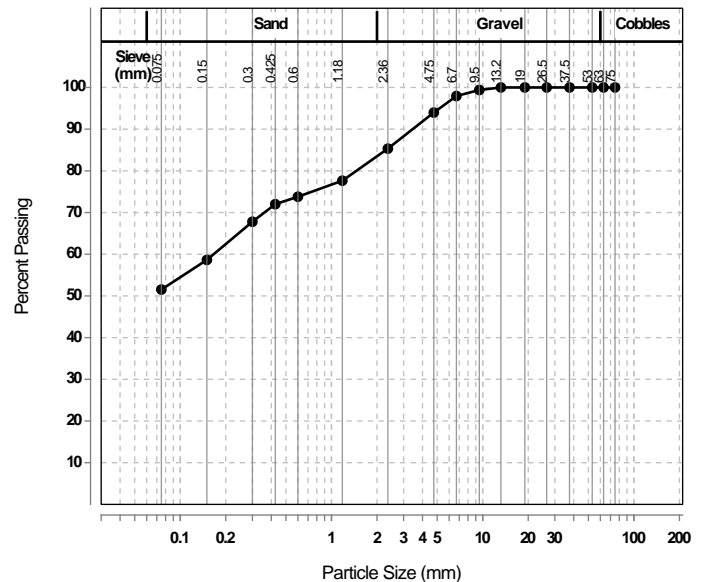
Lab Manager

NATA Accredited Laboratory Number: 828

Particle Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	99	
6.7 mm	98	
4.75 mm	94	
2.36 mm	85	
1.18 mm	78	
0.6 mm	74	
0.425 mm	72	
0.3 mm	68	
0.15 mm	59	
0.075 mm	52	

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Clayey Sand		
Nature of Water	Demineralised Water		
Temperature of Water (°C)	26		
* Mineral Present	Carbonate		

Particle Size Distribution



Material Test Report

Report Number: 677637.00-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Pls added
Date Issued: 18/07/2019
Client: SLR Consulting Australia Pty Ltd
 5 Foelsche Street, Darwin NT 0800
Contact: Danielle O'Toole
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421 - PO 25590
Work Request: 1721
Sample Number: 19-1721C
Date Sampled: 17/05/2019
Dates Tested: 23/05/2019 - 13/06/2019
Sampling Method: Sampled by Client
 The results apply to the sample as received
Sample Location: DPIR-TP04 (2.80 - 3.00m)
Material: Clay




Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Particle Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	97	
1.18 mm	94	
0.6 mm	92	
0.425 mm	90	
0.3 mm	89	
0.15 mm	85	
0.075 mm	82	

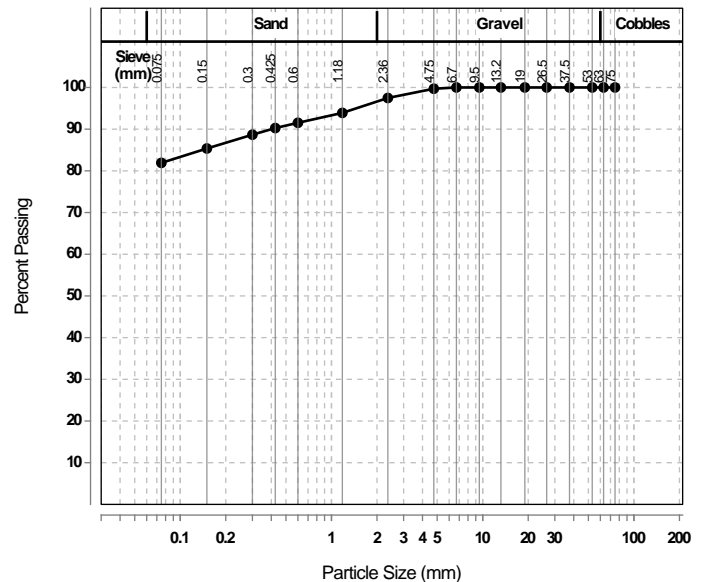
Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)

		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	59		
Plastic Limit (%)	21		
Plasticity Index (%)	38		

Linear Shrinkage (AS1289 3.4.1)

		Min	Max
Linear Shrinkage (%)	14.0		
Cracking Crumbling Curling	Cracking		

Particle Size Distribution



Material Test Report



Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

Report Number: 677637.00-3
Issue Number: 1
Date Issued: 16/08/2019
Client: SLR Consulting Australia Pty Ltd
5 Foelsche Street, Darwin NT 0800
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421
Work Request: 3801
Sample Number: 19-3801B
Date Sampled: 17/05/2019
Dates Tested: 20/06/2019 - 20/06/2019
Sampling Method: Sampled by Engineering Department
Remarks: AS1289.3.6.1 grading data down to 0.075mm supplied by Douglas Partners Darwin Laboratory.
Sample Location: DPIP-TP04, Depth: 2.80 - 3.00m
Material: Silty CLAY

Fine Analysis using a Hydrometer (AS 1289 3.6.3)

Method of Dispersion	Air Jet Dispersion Cup
Loss in Pretreatment	0

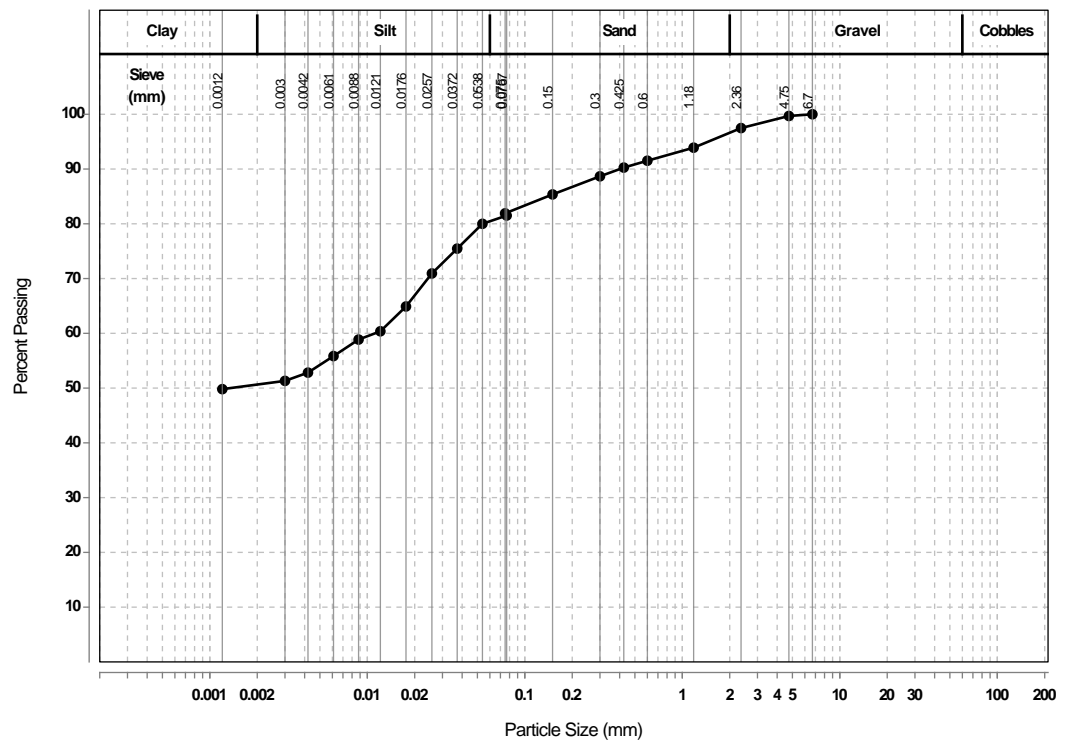
Particle Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
6.7 mm	100	
4.75 mm	100	
2.36 mm	97	
1.18 mm	94	
0.6 mm	92	
0.425 mm	90	
0.3 mm	89	
0.15 mm	85	
0.075 mm	82	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.075	81.5
0.0538	80.0
0.0372	75.5
0.0257	70.9
0.0176	64.9
0.0121	60.4
0.0088	58.9
0.0061	55.8
0.0042	52.8
0.0030	51.3
0.0012	49.8

Particle Size Distribution



Material Test Report

Report Number: 677637.00-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Pls added
Date Issued: 18/07/2019
Client: SLR Consulting Australia Pty Ltd
 5 Foelsche Street, Darwin NT 0800
Contact: Danielle O'Toole
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421 - PO 25590
Work Request: 1721
Sample Number: 19-1721D
Date Sampled: 17/05/2019
Dates Tested: 23/05/2019 - 13/06/2019
Sampling Method: Sampled by Client
 The results apply to the sample as received
Sample Location: DPIR-TP05 (0.80 - 1.00m)
Material: Clayey Sand




Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

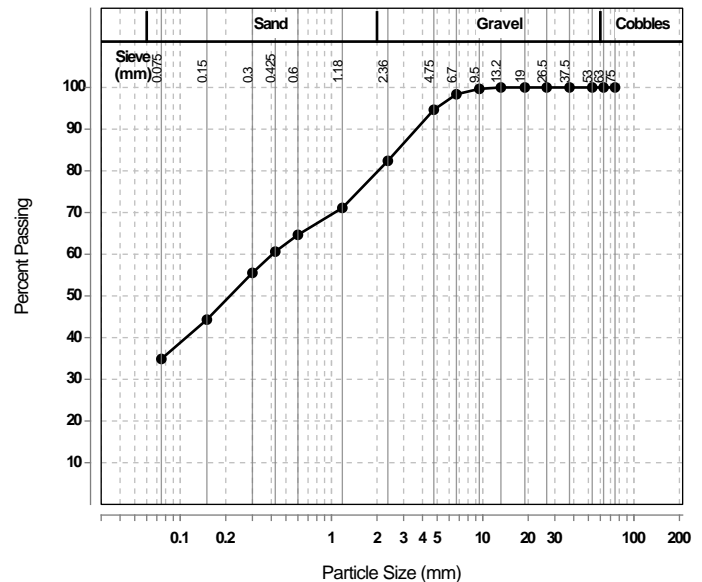
Particle Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	98	
4.75 mm	95	
2.36 mm	82	
1.18 mm	71	
0.6 mm	65	
0.425 mm	61	
0.3 mm	56	
0.15 mm	44	
0.075 mm	35	

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Clayey Sand		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	44		
Plastic Limit (%)	20		
Plasticity Index (%)	24		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	11.0		
Cracking Crumbling Curling	None		

Particle Size Distribution



Material Test Report

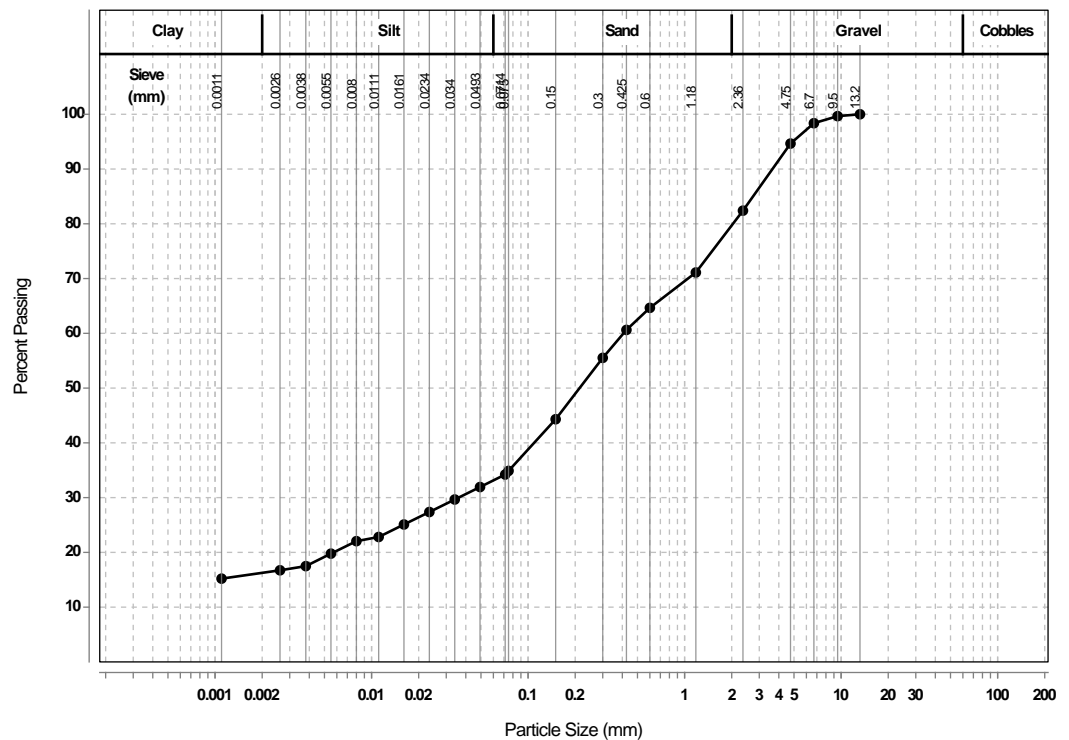


[Signature]

Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

Report Number: 677637.00-3
Issue Number: 1
Date Issued: 16/08/2019
Client: SLR Consulting Australia Pty Ltd
5 Foelsche Street, Darwin NT 0800
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421
Work Request: 3801
Sample Number: 19-3801C
Date Sampled: 17/05/2019
Dates Tested: 20/06/2019 - 20/06/2019
Sampling Method: Sampled by Engineering Department
Remarks: AS1289.3.6.1 grading data down to 0.075mm supplied by Douglas Partners Darwin Laboratory.
Sample Location: DPIP-TP05, Depth: 0.80 - 1.00m
Material: Gravelly Silty SAND

Particle Size Distribution



Fine Analysis using a Hydrometer (AS 1289 3.6.3)

Method of Dispersion	Air Jet Dispersion Cup
Loss in Pretreatment	0

Particle Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
13.2 mm	100	
9.5 mm	100	
6.7 mm	98	
4.75 mm	95	
2.36 mm	82	
1.18 mm	71	
0.6 mm	65	
0.425 mm	61	
0.3 mm	56	
0.15 mm	44	
0.075 mm	35	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.0714	34.2
0.0493	31.9
0.0340	29.7
0.0234	27.4
0.0161	25.1
0.0111	22.8
0.0080	22.0
0.0055	19.8
0.0038	17.5
0.0026	16.7
0.0011	15.2

Material Test Report

Report Number: 677637.00-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Pls added
Date Issued: 18/07/2019
Client: SLR Consulting Australia Pty Ltd
 5 Foelsche Street, Darwin NT 0800
Contact: Danielle O'Toole
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421 - PO 25590
Work Request: 1721
Sample Number: 19-1721E
Date Sampled: 17/05/2019
Dates Tested: 23/05/2019 - 13/06/2019
Sampling Method: Sampled by Client
 The results apply to the sample as received
Sample Location: DPIR-TP06 (3.80 - 4.00m)
Material: Sandy Clay




Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

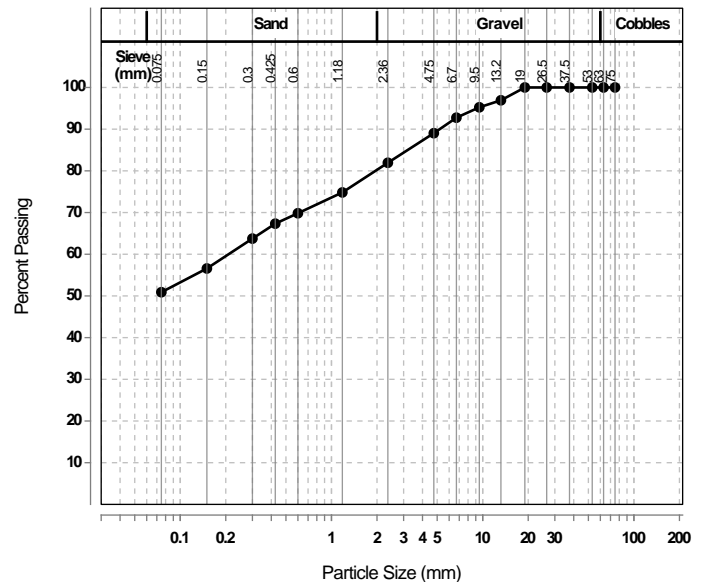
Particle Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	97	
9.5 mm	95	
6.7 mm	93	
4.75 mm	89	
2.36 mm	82	
1.18 mm	75	
0.6 mm	70	
0.425 mm	67	
0.3 mm	64	
0.15 mm	57	
0.075 mm	51	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	72		
Plastic Limit (%)	34		
Plasticity Index (%)	38		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	14.5		
Cracking Crumbling Curling	None		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Sandy Clay		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		
* Mineral Present	Carbonate		

Particle Size Distribution



Material Test Report



[Signature]

Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

Report Number: 677637.00-3
Issue Number: 1
Date Issued: 16/08/2019
Client: SLR Consulting Australia Pty Ltd
5 Foelsche Street, Darwin NT 0800
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421
Work Request: 3801
Sample Number: 19-3801D
Date Sampled: 17/05/2019
Dates Tested: 20/06/2019 - 20/06/2019
Sampling Method: Sampled by Engineering Department
Remarks: AS1289.3.6.1 grading data down to 0.075mm supplied by Douglas Partners Darwin Laboratory.
Sample Location: DPIR-TP06 , Depth: 3.80 - 4.00m
Material: Clayey Gravelly SAND

Fine Analysis using a Hydrometer (AS 1289 3.6.3)

Method of Dispersion	Air Jet Dispersion Cup
Loss in Pretreatment	0

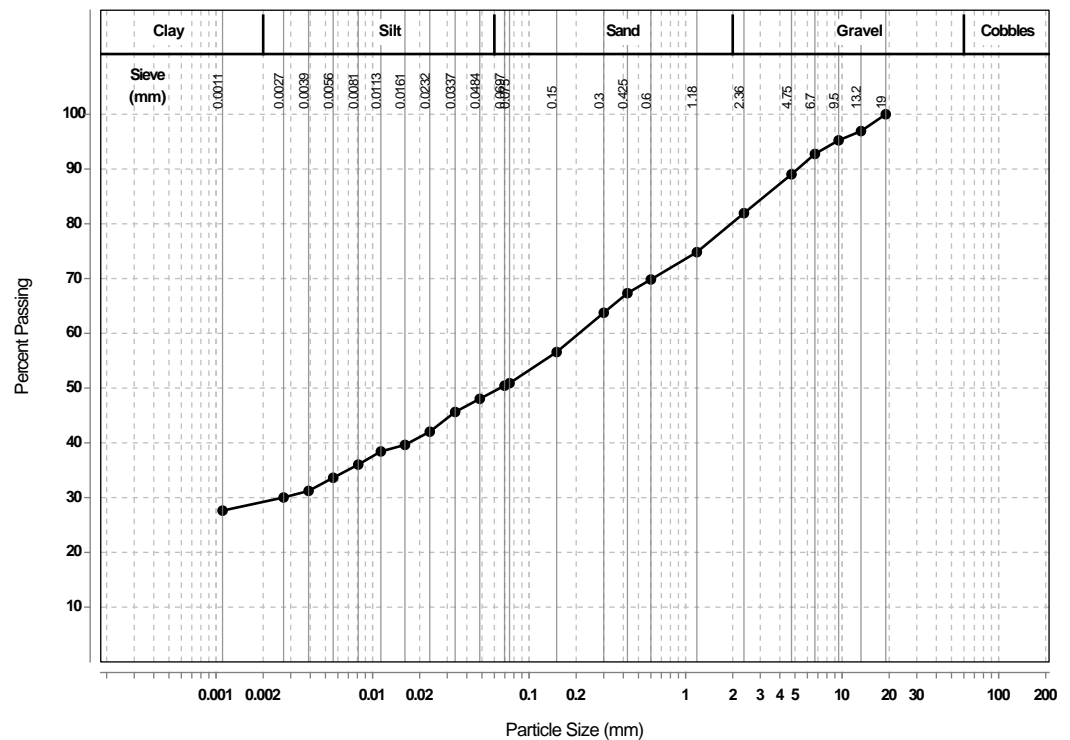
Particle Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	97	
9.5 mm	95	
6.7 mm	93	
4.75 mm	89	
2.36 mm	82	
1.18 mm	75	
0.6 mm	70	
0.425 mm	67	
0.3 mm	64	
0.15 mm	57	
0.075 mm	51	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.0697	50.4
0.0484	48.0
0.0337	45.6
0.0232	42.0
0.0161	39.6
0.0113	38.4
0.0081	36.0
0.0056	33.6
0.0039	31.2
0.0027	30.0
0.0011	27.6

Particle Size Distribution



Results of Pinhole Dispersion Tests

Client: SLR CONSULTING AUSTRALIA PTY LTD		Project No: 677637.00	
Project: CLAY BORROW ASSESSMENT - PROJECT REF: 680.10241		Report No: 677637.00-1a	
Location: RUM JUNGLE MINE, BATCHELOR		Report Date:	
		Date Sampled: 17.05.2019	
		Date of Test: 17.07.2019	
		Page: 1 of 1	

Test Location	Depth (m)	FMC %	Description	MC of Sample before Testing (%)	Density of Sample before Testing (t/m ³)	Pinhole Dispersion Classification
TP04	2.8-3.0	17.0	Silty CLAY	19.5	-	ND2

Dispersion Classification:

D1 Highly dispersive

D2 Dispersive

PD1 Potentially dispersive

PD2 Potentially dispersive (intermediate)

ND1 Non-dispersive

ND2 Completely erosion resistant

Legend

FMC = Field Moisture Content

MC = Moisture Content

Test Method(s): AS 1289.3.8.3

Sampling Method(s): Sampled by Client

Remarks: Sample moulded at plastic limit moisture content


NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: SER
Checked: SER


 Peter Gorseski
 Laboratory Manager

Material Test Report



Geotechnics | Environment | Groundwater

Douglas Partners Pty Ltd

Darwin Laboratory

Unit 2/14 Caryota Crt COCONUT GROVE NT 0810

Phone: (08) 8948 6800

Fax: (08) 8948 6899

Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677637.00-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Pls added
Date Issued: 18/07/2019
Client: SLR Consulting Australia Pty Ltd
5 Foelsche Street, Darwin NT 0800
Contact: Danielle O'Toole
Project Number: 677637.00
Project Name: Clay Borrow Assessment - Project Ref: 680.10421
Project Location: Rum Jungle Mine, Batchelor
Client Reference: 680.10421 - PO 25590
Work Request: 1721
Date Sampled: 17/05/2019
Dates Tested: 23/05/2019 - 24/05/2019
Sampling Method: Sampled by Client
The results apply to the sample as received

Moisture Content AS 1289 2.1.1

Sample Number	Sample Location	Moisture Content (%)	Material
19-1721A	TP01 (4.40 - 4.60m)	36.5 %	Sandy Clay / Clayey Sand
19-1721B	TP03 (1.00 - 1.20m)	17.9 %	Clayey Sand
19-1721C	TP04 (2.80 - 3.00m)	17.1 %	Clay
19-1721D	TP05 (0.80 - 1.00m)	17.5 %	Clayey Sand
19-1721E	TP06 (3.80 - 4.00m)	25.0 %	Sandy Clay

Client SLR Consulting Australia Pty Ltd
Project Rum Jungle Rehabilitation - Project Ref 680.10421
Project No: 677659.00
WR No: 1967 & 2384

Summary of Reports Issued:

Report Number	Laboratory	Content
677659.00-1C	Darwin	Emerson, Atterbergs, MDD & CBR + Moisture Content
M19136001	Melbourne	Moisture Content
M19136002	Melbourne	PSD incl Hydro for Sample 19-1967C / NTP-02 (0.80 - 1.1m)
M19136003	Melbourne	PSD incl Hydro for Sample 19-1967D / NTP-02 (4.40- 4.80m)
M19136004	Melbourne	PSD incl Hydro for Sample 19-1967E / NTP-06 (1.80 - 2.00m)
M19136005	Melbourne	PSD incl Hydro for Sample 19-1967F / NTP-06 (4.20 - 4.60m)
M19136006	Melbourne	PSD incl Hydro for Sample 19-1967G / NTP-07 (1.10 - 1.70m)
M19136007	Melbourne	PSD incl Hydro for Sample 19-1967H / NTP-07 (3.70 - 4.00m)
M19136008	Melbourne	PSD incl Hydro for Sample 19-1967I / NTP-08 (3.10 - 3.30m)
M19136009	Melbourne	SMDD - Compaction for Sample 19-1967C / NTP-02 (0.80 - 1.1m)
M19136010	Melbourne	SMDD - Compaction for Sample 19-1967G / NTP-07 (1.10 - 1.70m)
M19136011	Melbourne	SMDD - Compaction for Sample 19-1967H / NTP-07 (3.70 - 4.00m)
M19136012	Melbourne	Falling Head Permeability for Sample 19-1967C / NTP-02 (0.80 - 1.1m)
M19136013	Melbourne	Falling Head Permeability for Sample 19-1967E / NTP-06 (1.80 - 2.00m)
M19136014	Melbourne	Falling Head Permeability for Sample 19-1967G / NTP-07 (1.10 - 1.70m)
M19136015	Melbourne	Triaxial Compression Test Results for Sample 19-1967E / NTP-06 (1.80 - 2.00m)
M19136016	Melbourne	Triaxial Compression Test Results for Sample 19-1967G / NTP-07 (1.10 - 1.70m)
M19136017	Melbourne	Triaxial Compression Test Results for Sample 19-1967H / NTP-07 (3.70 - 4.00m)
Additional NTP Sample Tested - WR 2384		
BO20-0027	Brisbane	PSD incl Hydro for Sample 19-1967G / NTP-01 (4.00 - 4.30m)

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967A
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 05/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-01 (0.40 - 0.80m)
Material: Sandy Clay

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Sandy clay		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967B
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 05/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-01 (5.20 - 5.40m)
Material: Silty Clay

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Silty clay		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Material Test Report

Report Number: 677659.00-4
Issue Number: 1
Date Issued: 01/04/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2384
Sample Number: DW-2384A
Date Sampled: 10/07/2019
Dates Tested: 21/01/2020 - 12/03/2020
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: NTP01 (4.0 - 4.3m)



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	42		
Plastic Limit (%)	24		
Plasticity Index (%)	18		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	8.0		
Cracking Crumbling Curling	Cracking		
Moisture Content (AS 1289 2.1.1)			
Moisture Content (%)		18.4	

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967C
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 29/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-02 (0.80 - 1.10m)
Material: Sandy Clay

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	58		
Plastic Limit (%)	31		
Plasticity Index (%)	27		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	10.5		
Cracking Crumbling Curling	Cracking		
Moisture Content (AS 1289 2.1.1)			
Moisture Content (%)		14.7	



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967D
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-02 (4.40 - 4.60m)
Material: Sandy Clay



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	64		
Plastic Limit (%)	33		
Plasticity Index (%)	31		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	11.5		
Cracking Crumbling Curling	Cracking		
Moisture Content (AS 1289 2.1.1)			
Moisture Content (%)		27.5	

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
 Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967E
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-06 (1.80 - 2.00m)
Material: Clayey Gravel




Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	32		
Plastic Limit (%)	15		
Plasticity Index (%)	17		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	8.5		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Clayey gravel		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		
* Mineral Present	Carbonate		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	8.7

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
 Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967E
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-06 (1.80 - 2.00m)
Material: Clayey Gravel




Approved Signatory: Clare Whelan

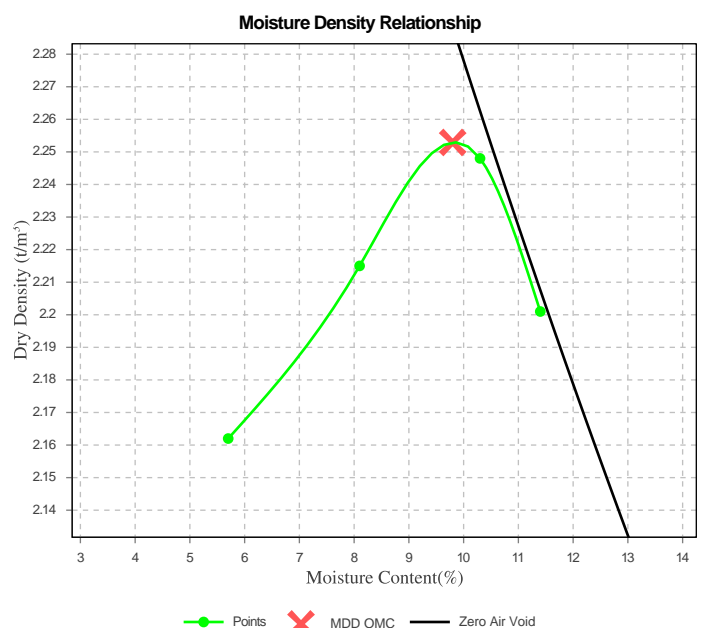
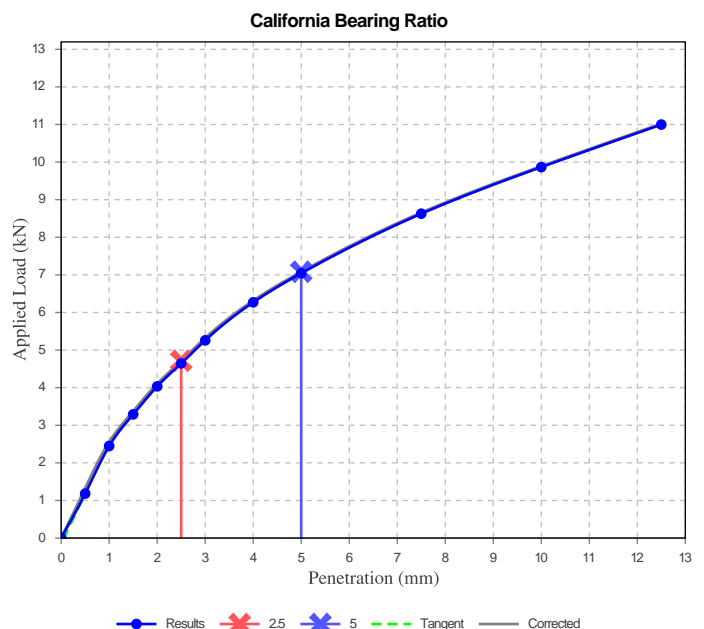
Lab Manager

NATA Accredited Laboratory Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	35		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.25		
Optimum Moisture Content (%)	10.0		
Laboratory Density Ratio (%)	94.5		
Laboratory Moisture Ratio (%)	102.0		
Dry Density after Soaking (t/m ³)	2.13		
Field Moisture Content (%)	8.7		
Moisture Content at Placement (%)	10.0		
Moisture Content Top 30mm (%)	14.4		
Moisture Content Rest of Sample (%)	12.3		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		

Dry Density - Moisture Relationship (AS 1289 5.1.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Standard
No. Layers	3
No. Blows / Layer	25
Maximum Dry Density (t/m ³)	2.25
Optimum Moisture Content (%)	10.0
Oversize Sieve (mm)	19
Oversize Material (%)	0
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	7.3



Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967F
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-06 (4.20 - 4.60m)
Material: Sandy Clay

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	61		
Plastic Limit (%)	27		
Plasticity Index (%)	34		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	11.0		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	18.7



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967G
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-07 (1.10 - 1.70m)
Material: Sandy Clay



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	34		
Plastic Limit (%)	13		
Plasticity Index (%)	21		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	9.0		
Cracking Crumbling Curling	Cracking		
Moisture Content (AS 1289 2.1.1)			
Moisture Content (%)		14.1	

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967H
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-07 (3.70 - 4.00m)
Material: Silty Sandy Clay



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	55		
Plastic Limit (%)	18		
Plasticity Index (%)	37		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	11.0		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Silty sandy clay		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		
* Mineral Present	Gypsum		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	19.7

Material Test Report

Report Number: 677659.00-1C
Issue Number: 1
Date Issued: 20/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 1967
Sample Number: 19-1967I
Date Sampled: 17/07/2019
Dates Tested: 21/08/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: This Report Supersedes reports 677659.00-1 and 677659.00-1B
Sample Location: NTP-08 (3.10 - 3.30m)
Material: Silty Clay

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	63		
Plastic Limit (%)	29		
Plasticity Index (%)	34		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	10.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	17.0



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Results of Moisture Content Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136001
		Report Date:	13-Nov-2019
Location:	Rum Jungle, Batchelor, NT	Date Sampled:	-
		Date of Test:	30-Oct-2019
		Page:	1 of 1

TEST LOCATION	DEPTH (m)	DESCRIPTION	MOISTURE CONTENT (%)
NTP-02	0.80-1.1	Silty CLAY, with sand, trace gravel	15.2
NTP-02	4.40-4.80	Silty CLAY, with sand, trace gravel	30.1
NTP06	1.80-2.00	Silty clayey GRAVEL, with sand	8.7
NTP06	4.20-4.60	Silty CLAY, trace gravel and sand	21.2
NTP-07	1.10-1.70	Silty CLAY, with gravel and sand	14.7
NTP-07	3.70-4.00	Silty CLAY, trace gravel and sand	24.1
NTP-08	3.10-3.30	Silty CLAY, trace gravel and sand	23.2

Test Method(s): AS1289.2.1.1

Sampling Method(s): Sampled By Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

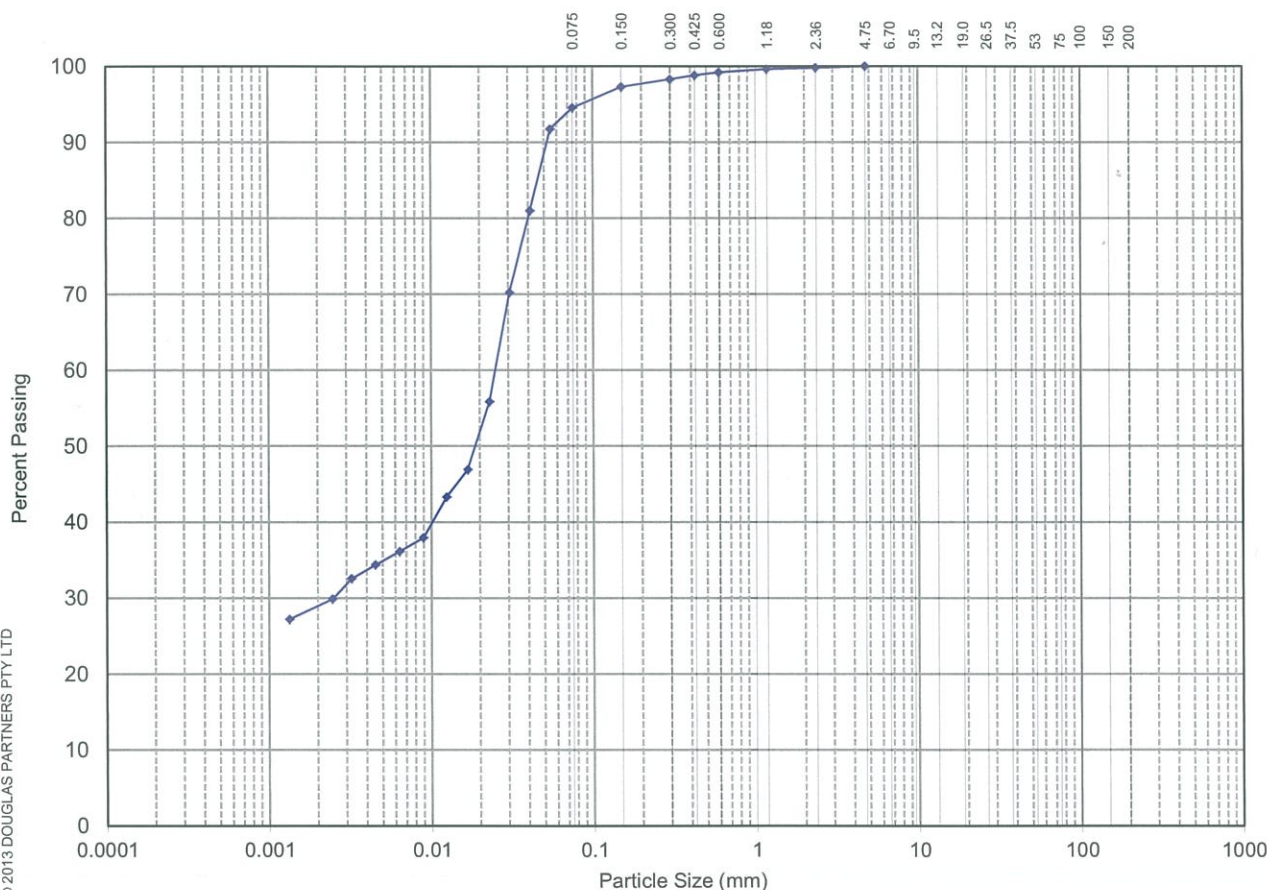
Tested: SP
Checked: AG


 Arveendra Gounder
 Laboratory Manager

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659
Project :	Rum Jungle Rehabilitation	Report No. :	BO20-0022
Location :	Rum Jungle, Batchelor	Report Date :	24.01.2020
Test Location:	NTP01	Date Sampled:	10.07.2019
Depth / Layer:	4.00 - 4.30 m	Date of Test:	23.01.2020
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	~
9.5	~
6.7	~
4.75	100%
2.36	100%
1.18	100%
0.600	99%
0.425	99%
0.300	98%
0.150	97%
0.075	95%
0.041	81%
0.030	70%
0.023	56%
0.017	47%
0.012	43%
0.009	38%
0.006	36%
0.005	34%
0.003	33%
0.002	30%
0.001	27%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Clayey SILT with Sand

Test Method(s): AS 1289.3.6.1, 3.6.3

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks:

Type of Hydrometer: g/l



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

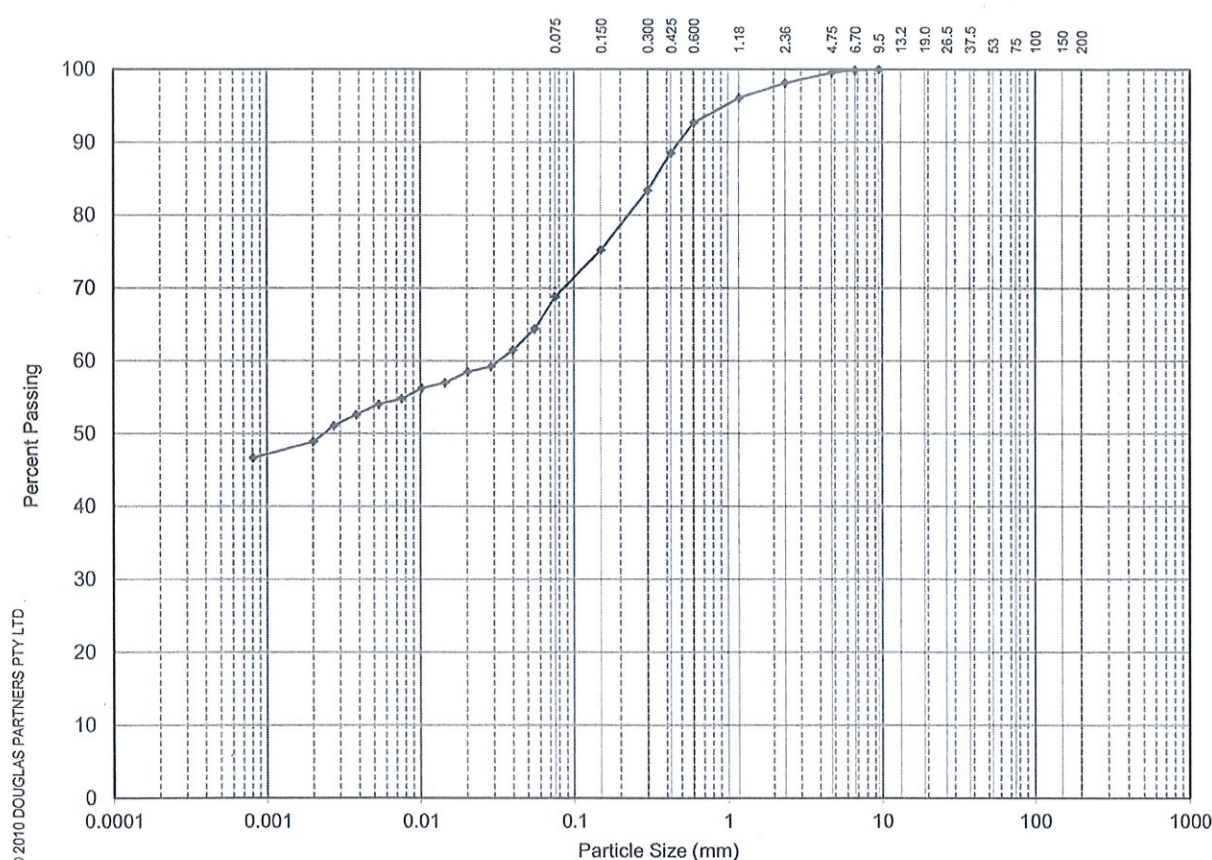
Tested: HW
Checked: AC

Aimee Cartwright
Laboratory Technician

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136002
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967C/ NTP-02	Date Sampled:	-
Depth / Layer:	0.80-1.1(m)	Date of Test:	30/10/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	~
9.5	100%
6.7	100%
4.75	100%
2.36	98%
1.18	96%
0.600	93%
0.425	88%
0.300	83%
0.150	75%
0.075	69%
0.040	61%
0.028	59%
0.020	58%
0.014	57%
0.010	56%
0.008	55%
0.005	54%
0.004	53%
0.003	51%
0.002	49%
0.001	47%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.005	0.02	0.06	0.2	0.6	2.0	6.0	20	60

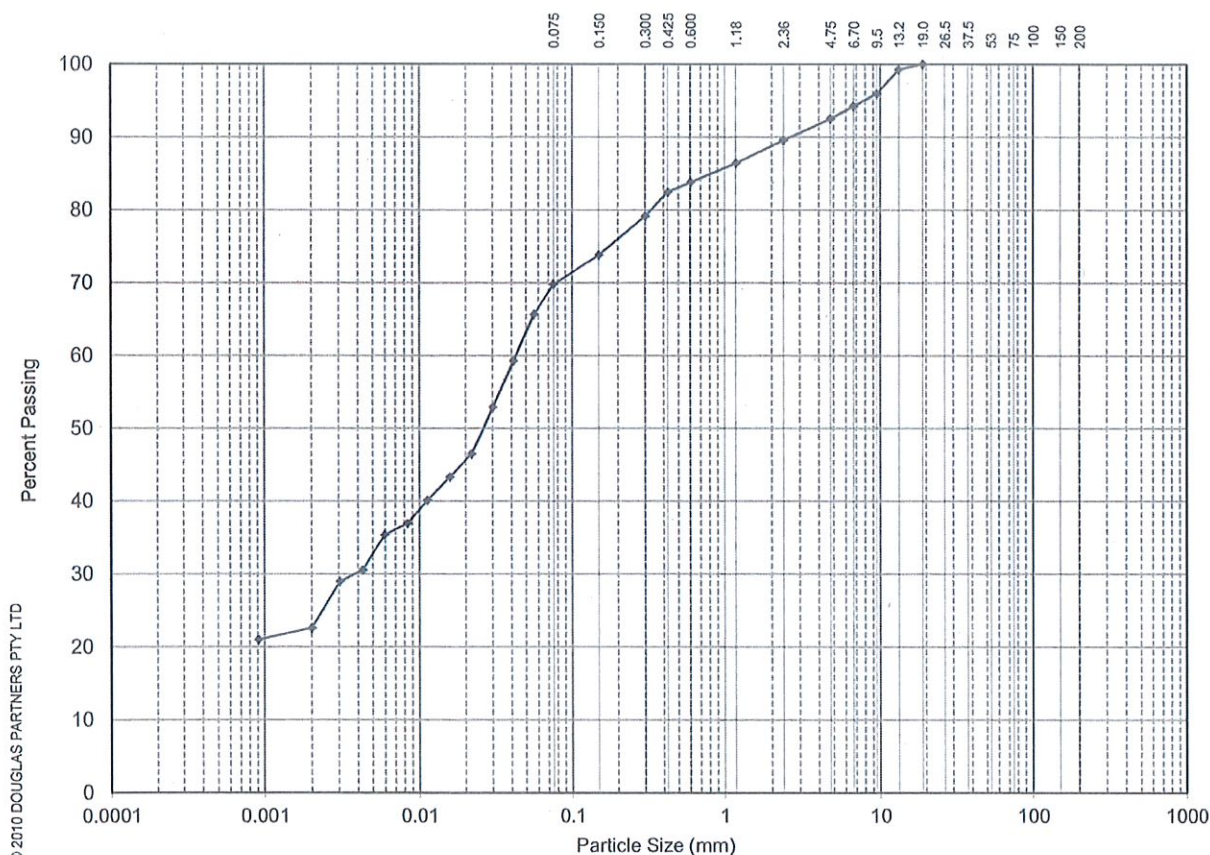
Description: Silty CLAY with sand trace gravel
 Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1
 Sampling Method(s): Sampled by Client
 Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.75 t/m³

Loss in pretreatment: 0%
 Type of Hydrometer: g/l

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136003
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967D/ NTP-02	Date Sampled:	-
Depth / Layer:	4.40-4.80(m)	Date of Test:	30/10/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	99%
9.5	96%
6.7	94%
4.75	93%
2.36	90%
1.18	86%
0.600	84%
0.425	82%
0.300	79%
0.150	74%
0.075	70%
0.041	59%
0.030	53%
0.022	46%
0.016	43%
0.011	40%
0.008	37%
0.006	35%
0.004	31%
0.003	29%
0.002	23%
0.001	21%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY with sand trace gravel

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

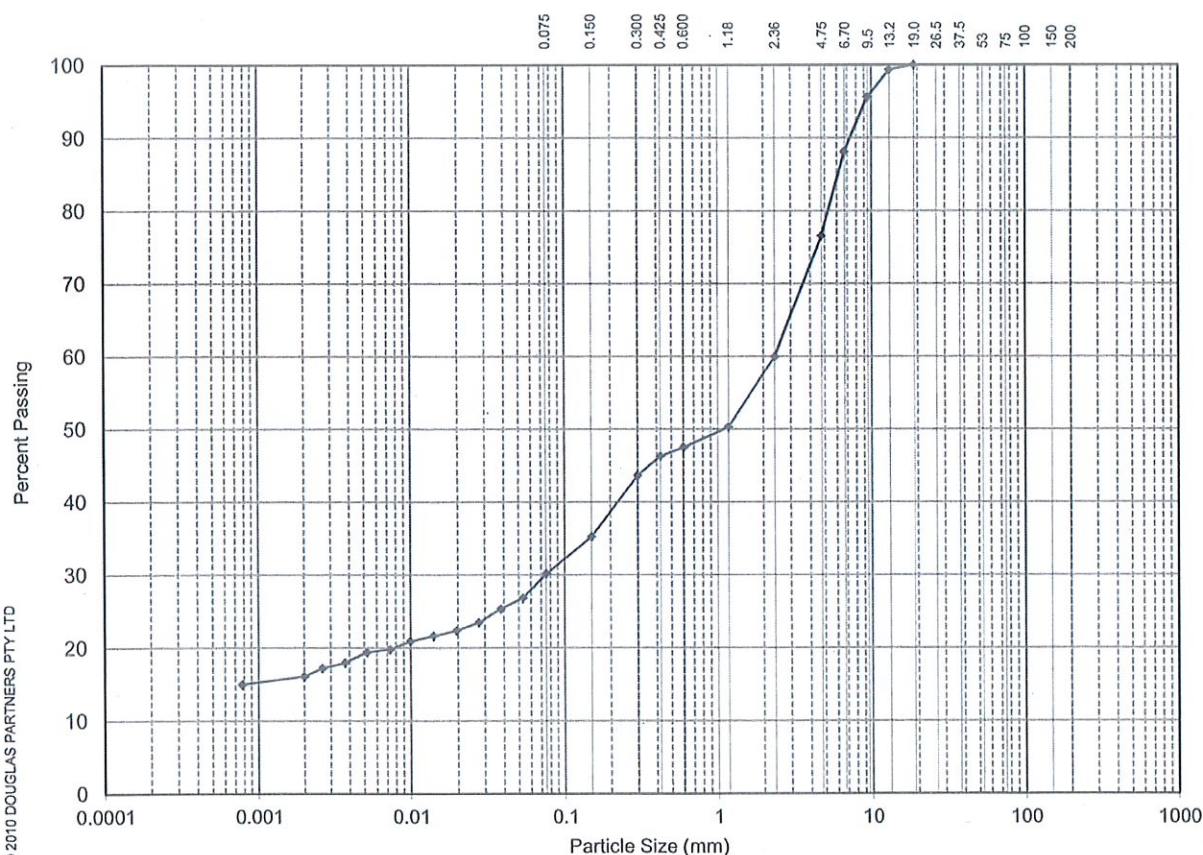
Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.74 t/m³

Type of Hydrometer: g/l

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136004
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967E/ NTP06	Date Sampled:	-
Depth / Layer:	1.80-2.00(m)	Date of Test:	30/10/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	99%
9.5	96%
6.7	88%
4.75	76%
2.36	60%
1.18	50%
0.600	47%
0.425	46%
0.300	44%
0.150	35%
0.075	30%
0.038	25%
0.027	23%
0.020	22%
0.014	22%
0.010	21%
0.007	20%
0.005	19%
0.004	18%
0.003	17%
0.002	16%
0.001	15%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty clayey GRAVEL, with sand

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.86 t/m³

Type of Hydrometer: g/l



NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

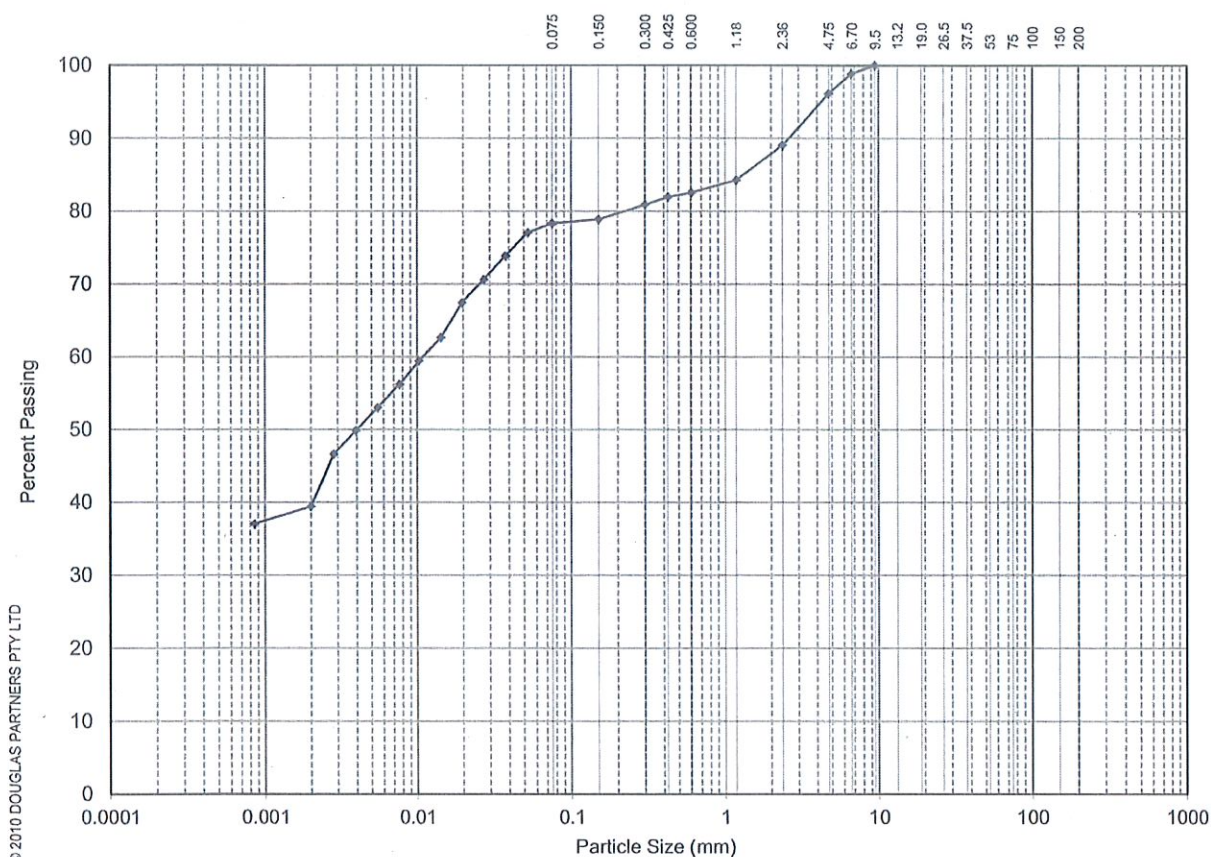
Tested: CP
Checked: AG

P. Chan
Peter Chan
Associate

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136005
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967F/ NTP06	Date Sampled:	-
Depth / Layer:	4.20-4.60(m)	Date of Test:	30/10/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	~
9.5	100%
6.7	99%
4.75	96%
2.36	89%
1.18	84%
0.600	83%
0.425	82%
0.300	81%
0.150	79%
0.075	78%
0.038	74%
0.027	71%
0.020	67%
0.014	63%
0.010	59%
0.008	56%
0.005	53%
0.004	50%
0.003	47%
0.002	39%
0.001	37%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY trace gravel and sand

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.73 t/m³

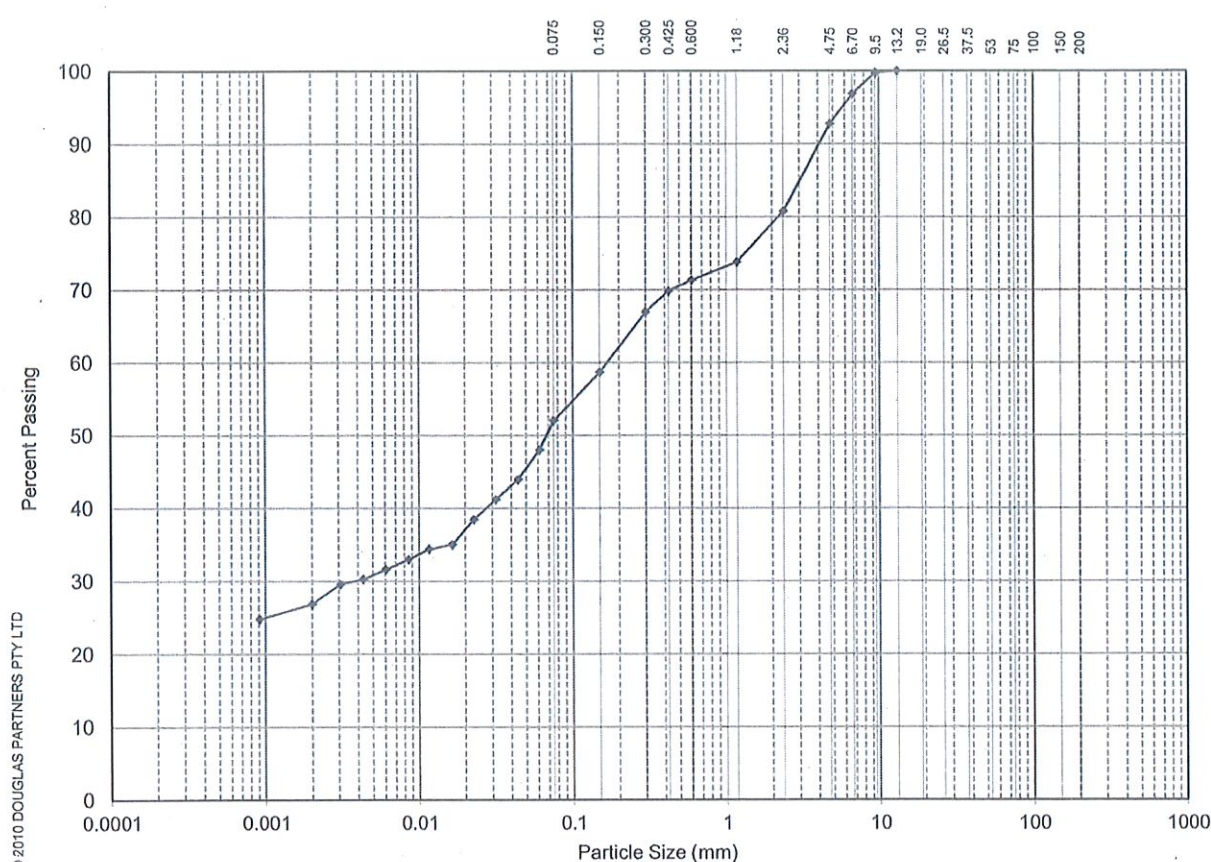
Loss in pretreatment: 0%

Type of Hydrometer: g/l

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136006
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967G/ NTP-07	Date Sampled:	-
Depth / Layer:	1.10-1.70(m)	Date of Test:	30/10/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	100%
6.7	97%
4.75	93%
2.36	81%
1.18	74%
0.600	71%
0.425	70%
0.300	67%
0.150	59%
0.075	52%
0.044	44%
0.032	41%
0.023	38%
0.016	35%
0.012	34%
0.009	33%
0.006	32%
0.004	30%
0.003	30%
0.002	27%
0.001	25%

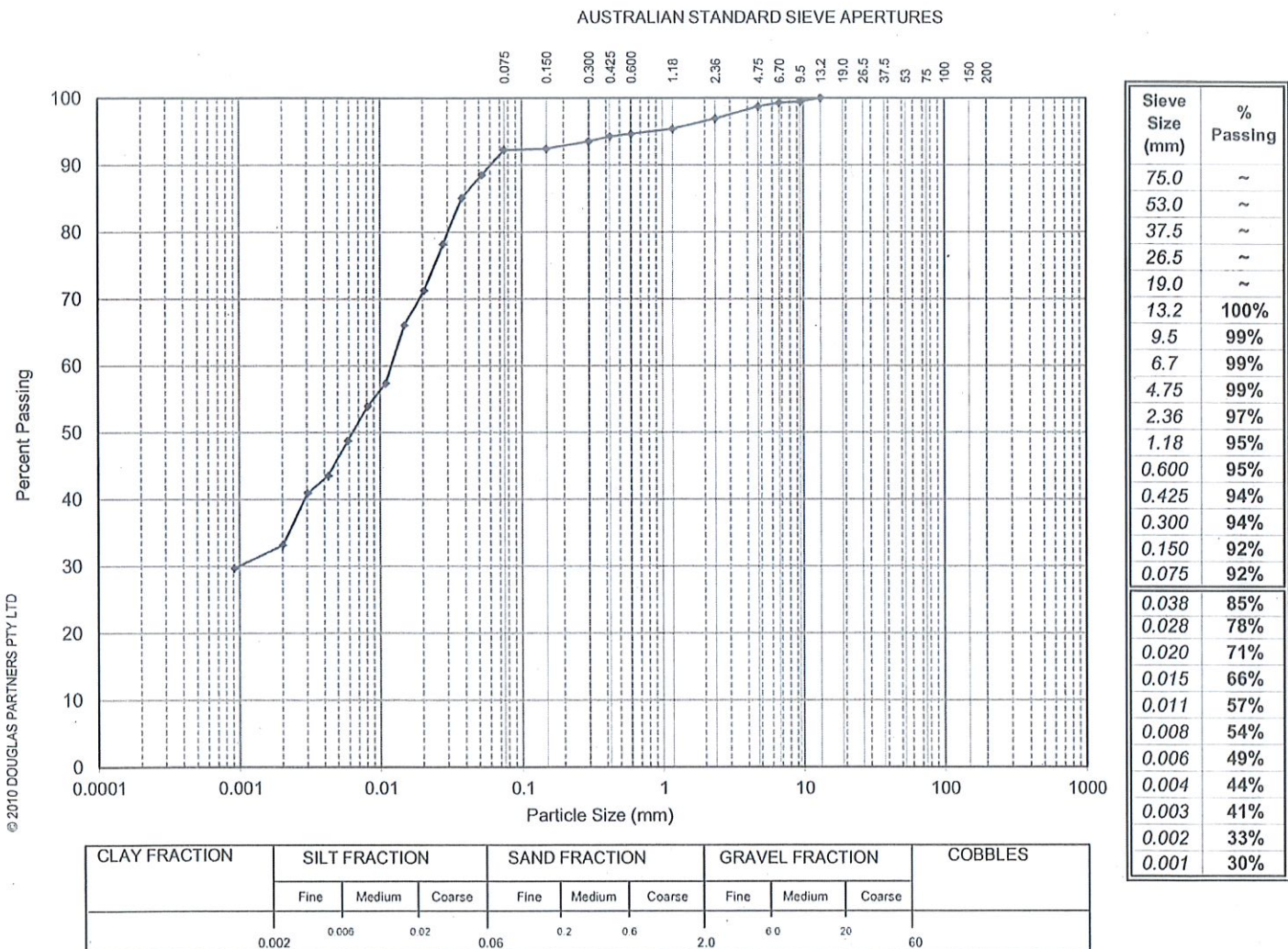
CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY with gravel and sand
Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1
Sampling Method(s): Sampled by Client
Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.63 t/m³

Loss in pretreatment: 0%
Type of Hydrometer: g/l

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136007
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967H/ NTP-07	Date Sampled:	-
Depth / Layer:	3.70-4.00(m)	Date of Test:	30/10/2019
		Page:	1 of 1



Description: Silty CLAY trace gravel and sand

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

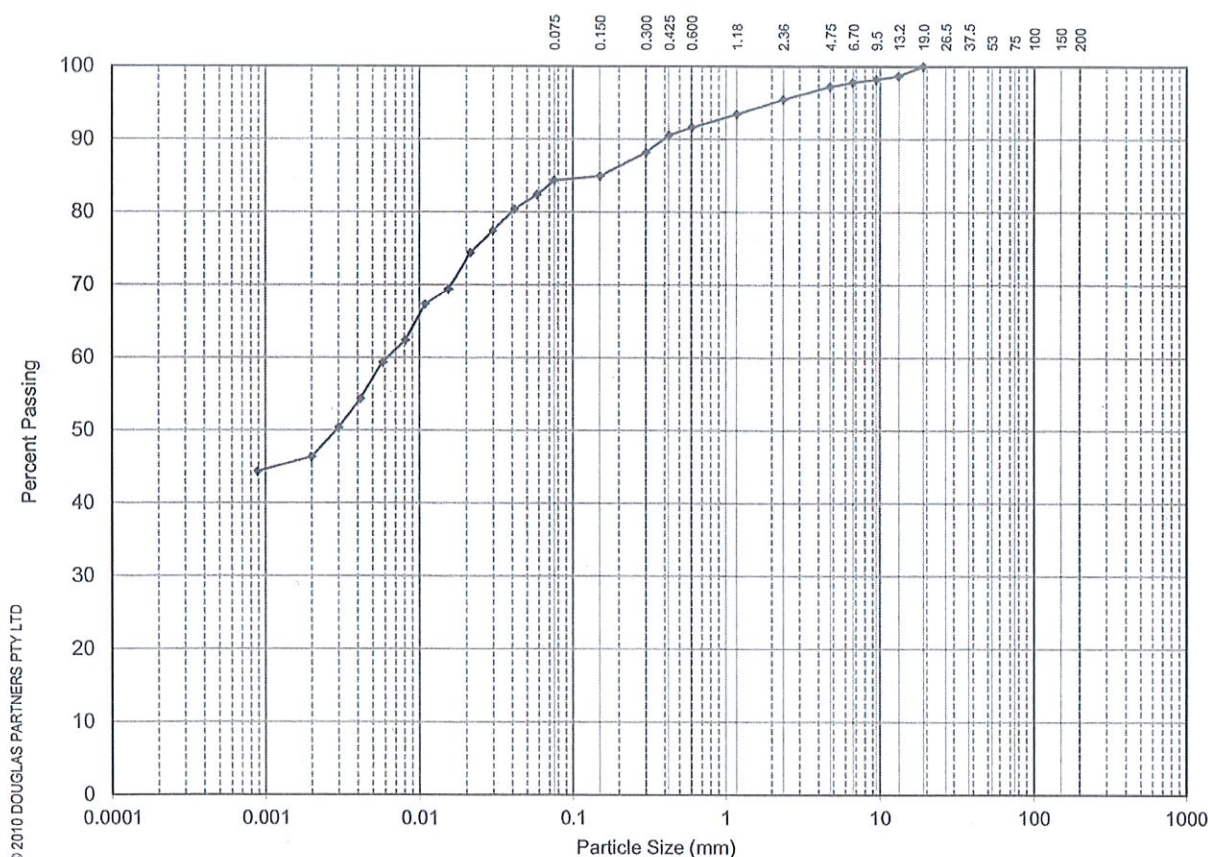
Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.61 t/m³

Type of Hydrometer: g/l

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136008
Location :	Rum Jungle, Batchelor, NT	Report Date :	13.11.2019
Test Location:	19-1967I/ NTP-08	Date Sampled:	-
Depth / Layer:	3.10-3.30(m)	Date of Test:	30/10/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	99%
9.5	98%
6.7	98%
4.75	97%
2.36	95%
1.18	93%
0.600	92%
0.425	91%
0.300	88%
0.150	85%
0.075	84%
0.041	80%
0.030	77%
0.021	74%
0.015	69%
0.011	67%
0.008	62%
0.006	59%
0.004	54%
0.003	50%
0.002	46%
0.001	44%

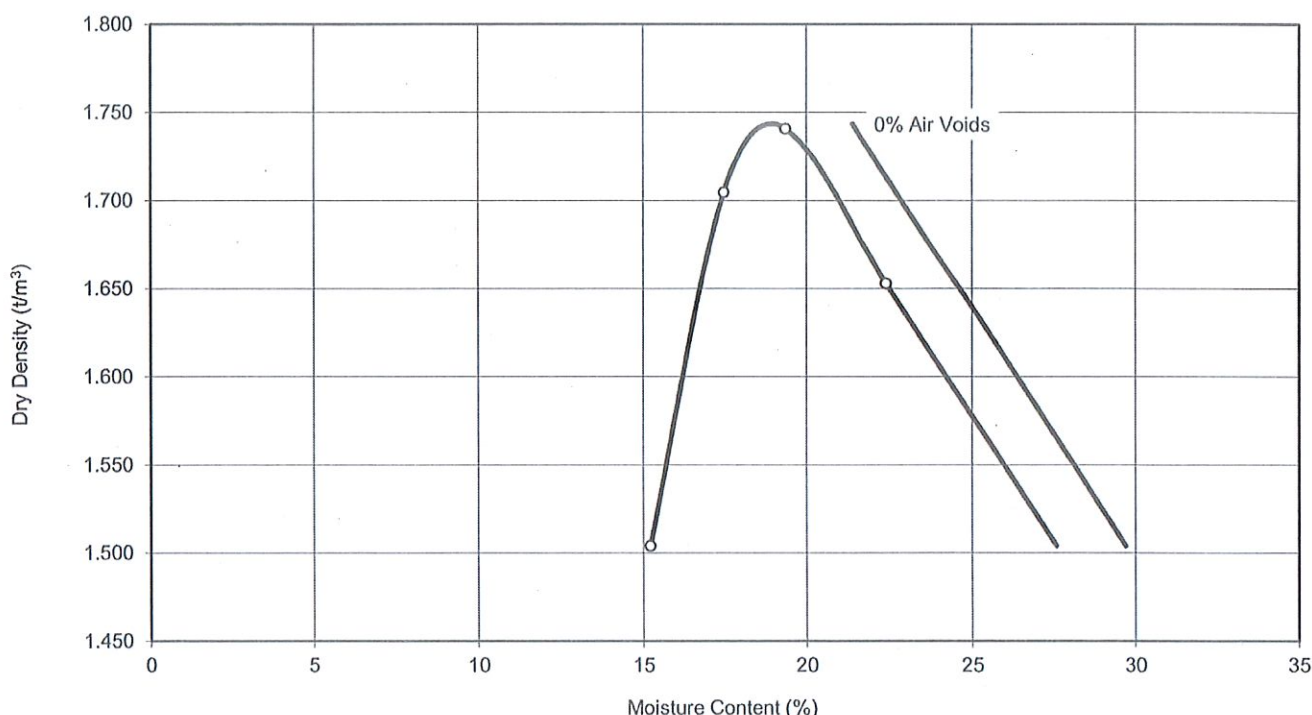
CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty CLAY trace gravel and sand
Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1
Sampling Method(s): Sampled by Client
Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.62 t/m³

Loss in pretreatment: 0%
Type of Hydrometer: g/l

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136009
Location :	Rum Jungle, Batchelor, NT	Report Date :	31/10/2019
		Date of Test:	30/10/2019
		Page:	1 of 1



Sample Details: Location: 19-1967C/ NTP-02
Depth: 0.80-1.1(m)

Particles > 19mm: 0%

Description: Silty CLAY, with sand, trace gravel

Maximum Dry Density:	1.74 t/m³
Optimum Moisture Content:	19.0 %

Remarks:

Test Methods: AS 1289.2.1.1, AS 1289. 5.1.1

Sampling Methods: Sampled by Client



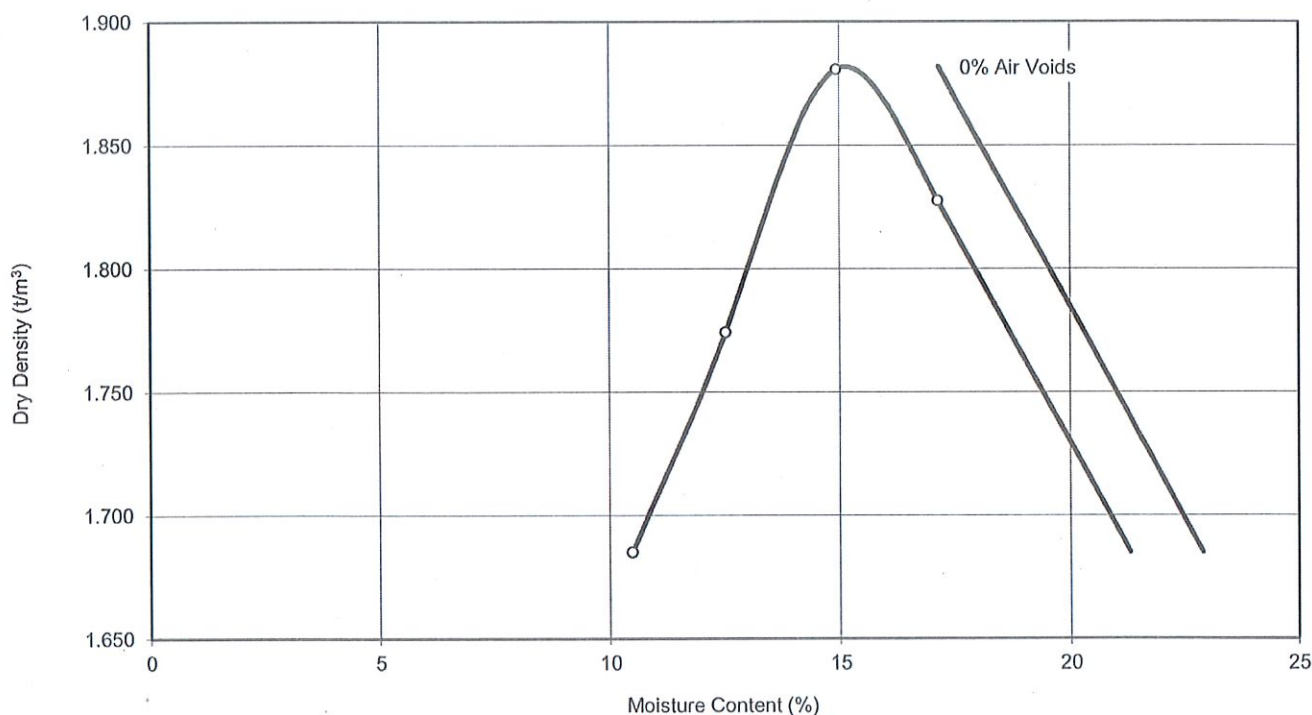
NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested:	SP
Checked:	AG

Arveendra Gounder
Arveendra Gounder
Laboratory Manager

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136010
Location :	Rum Jungle, Batchelor, NT	Report Date :	31/10/2019
		Date of Test:	30/10/2019
		Page:	1 of 1



Sample Details: Location: 19-1967G/ NTP-07
Depth: 1.10-1.70(m)

Particles > 19mm: 0%

Description: Silty CLAY, with gravel and sand

Maximum Dry Density:	1.88 t/m³
Optimum Moisture Content:	15.0 %

Remarks:

Test Methods: AS 1289.2.1.1, AS 1289. 5.1.1

Sampling Methods: Sampled by Client



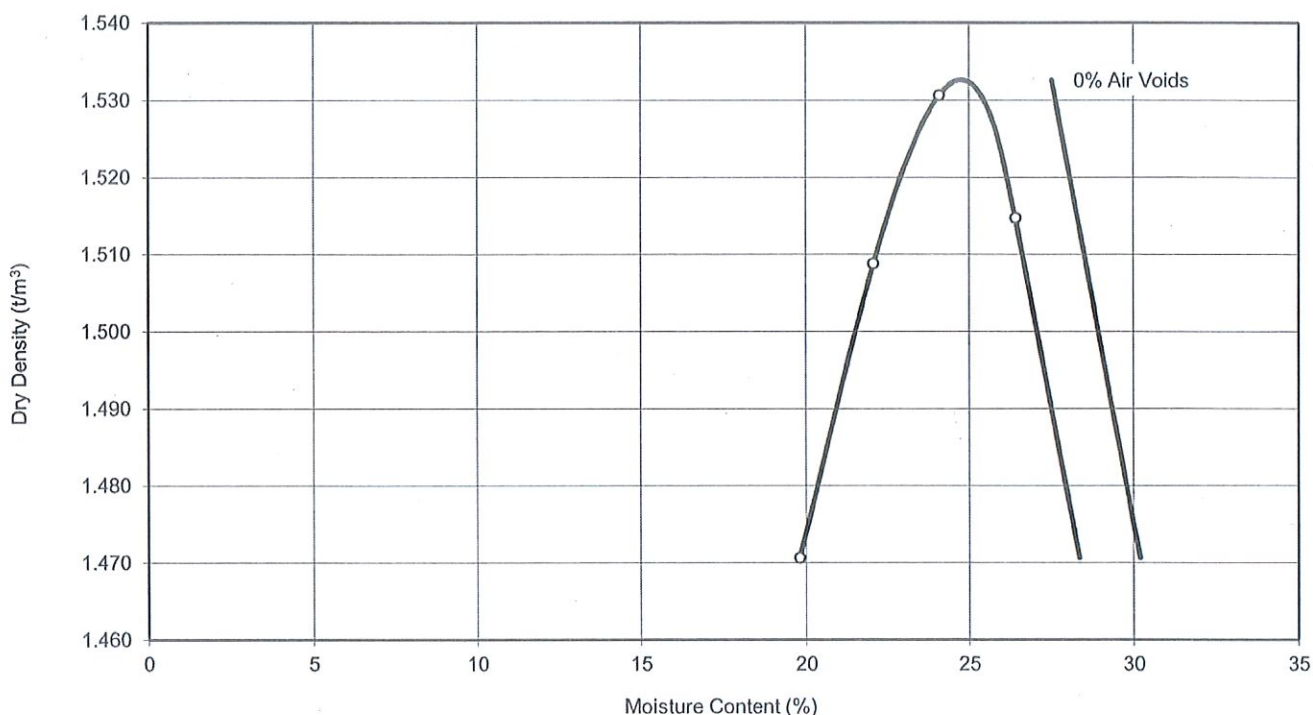
NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested:	TT
Checked:	AG

Arveendra Gounder
Arveendra Gounder
Laboratory Manager

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136011
Location :	Rum Jungle, Batchelor, NT	Report Date :	31/10/2019
		Date of Test:	30/10/2019
		Page:	1 of 1



Sample Details: Location: 19-1967H/ NTP-07
Depth: 3.70-4.00(m)

Particles > 19mm: 0%

Description: Silty CLAY, trace gravel and sand

Maximum Dry Density: 1.53 t/m³
Optimum Moisture Content: 25.0 %

Remarks:

Test Methods: AS 1289.2.1.1, AS 1289. 5.1.1

Sampling Methods: Sampled by Client



NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: SP
Checked: AG

Arveendra Gounder
Arveendra Gounder
Laboratory Manager

Results of Falling Head Permeability Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136012
Location:	Rum Jungle, Batchelor, NT	Report Date:	13-Nov-2019
		Date Sampled:	-
		Date of Test:	04-Nov-2019
		Page:	1 of 1

Location:	19-1967C/ NTP-02
Depth	0.80-1.1(m)
Sample Description:	Silty CLAY, with sand, trace gravel
Sample Preparation:	Remoulded to 100% Standard Maximum Dry Density @ 100% Optimum Moisture Content
Placement Dry Density:	1.74 t/m ³
Placement Moisture Content:	18.9 %
Final Moisture Content:	21.2 %
Maximum Hydraulic Gradient:	8
Minimum Hydraulic Gradient:	4
Coefficient of Permeability:	7x10 ⁻¹⁰ m/sec

Test Method(s): AS 1289.6.7.2, AS 1289.2.1.1

Sampling Method(s): Sampled By Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: SR
Checked: AG



Peter Chan
Associate

Results of Falling Head Permeability Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136013
Location:	Rum Jungle, Batchelor, NT	Report Date:	13-Nov-2019
		Date Sampled:	-
		Date of Test:	04-Nov-2019
		Page:	1 of 1

Location:	19-1967E/ NTP06
Depth	1.80-2.00(m)
Sample Description:	Silty clayey GRAVEL, with sand
Sample Preparation:	Remoulded to 100% Standard Maximum Dry Density @ 99% Optimum Moisture Content
Placement Dry Density:	2.25 t/m ³
Placement Moisture Content:	9.9 %
Final Moisture Content:	12.4 %
Maximum Hydraulic Gradient:	8
Minimum Hydraulic Gradient:	3
Coefficient of Permeability:	2x10 ⁻⁸ m/sec

Test Method(s): AS 1289.6.7.2, AS 1289.2.1

Sampling Method(s): Sampled by Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: SR
Checked: AG


 Peter Chan
 Associate

Results of Falling Head Permeability Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136014
		Report Date:	13-Nov-2019
Location:	Rum Jungle, Batchelor, NT	Date Sampled:	-
		Date of Test:	04-Nov-2019
		Page:	1 of 1

Location:	19-1967G/ NTP-07
Depth	1.10-1.70(m)
Sample Description:	Silty CLAY, with gravel and sand
Sample Preparation:	Remoulded to 100% Standard Maximum Dry Density @ 99% Optimum Moisture Content
Placement Dry Density:	1.88 t/m ³
Placement Moisture Content:	14.9 %
Final Moisture Content:	17.4 %
Maximum Hydraulic Gradient:	8
Minimum Hydraulic Gradient:	3
Coefficient of Permeability:	7x10 ⁻⁹ m/sec

Test Method(s): AS 1289.6.7.2, AS 1289.2.1.1

Sampling Method(s): Sampled by Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: SR
Checked: AG



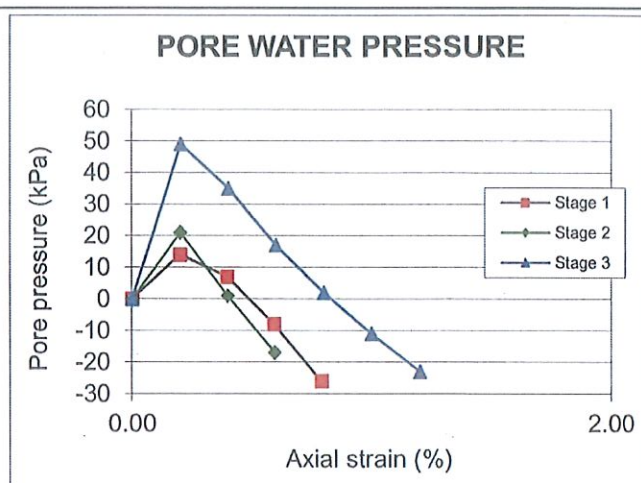
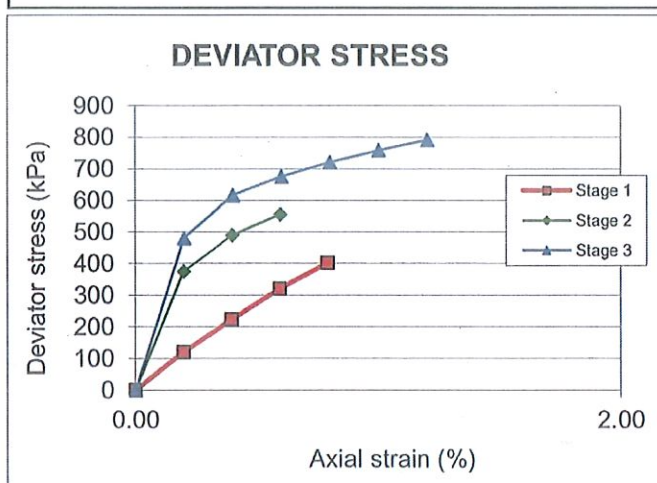
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client : SLR Consulting Australia Pty Ltd
Project : BATCHELOR - Rum Jungle Rehabilitation
Location : Rum Jungle, Batchelor, NT
Test Location : 19-1967E/ NTP06
Depth / Layer : 1.80-2.00(m)
Sample Description: Silty clayey GRAVEL, with sand

Project No. : 677659.00
Report No. : M19136015
Report Date : 13 Nov 2019
Date Sampled : -
Date of Test: 01 Nov 2019
Sample Type: Remoulded
Page: 1



STAGE DETAILS

STAGE

	1	2	3
Cell pressure (kPa)	550	600	700
Back pressure (kPa)	500	500	500
Volume change (%)	0.4	0.6	0.8
Strain rate (mm/min)	0.036	0.036	0.036

AT FAILURE

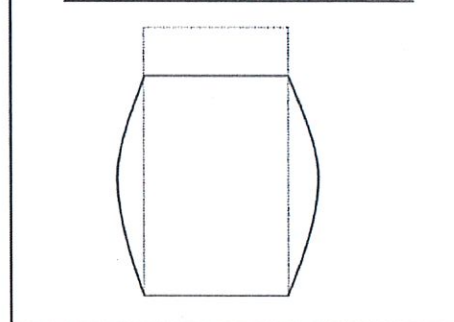
	0.6	0.4	0.4
Strain (%)	0.6	0.4	0.4
Deviator Stress (kPa)	321	490	617
Pore pressure (kPa)	492	501	535
Stress ratio	6.5	5.9	4.7

SPECIMEN DETAILS

	Initial	Final
Moisture content (%)	10.2	13.5
Dry density (t/m ³)	2.22	
B' value after saturation	0.98	

Sample Type	Remoulded
Initial Sample Dimensions	Length(mm) Diameter(mm)
	126 63
	126 63

MODE OF FAILURE DIAGRAM



NOTES

1. Test technique : multi-staged.
2. Failure criteria : maximum stress ratio.
3. Specimen was fitted with side drains.
4. Specimen was saturated with an applied cell pressure of 507 kPa and an applied back pressure of 500 kPa
5. Membrane corrections were applied to the deviator stress according to figure 4 of BS 1377 : Part 8 : 1990.
6. Consolidation pore pressure was completely dissipated prior to testing
7. Water used for testing was not deaired prior to use.

Test Method(s): AS 1289.6.4.2, AS1289.2.1.1

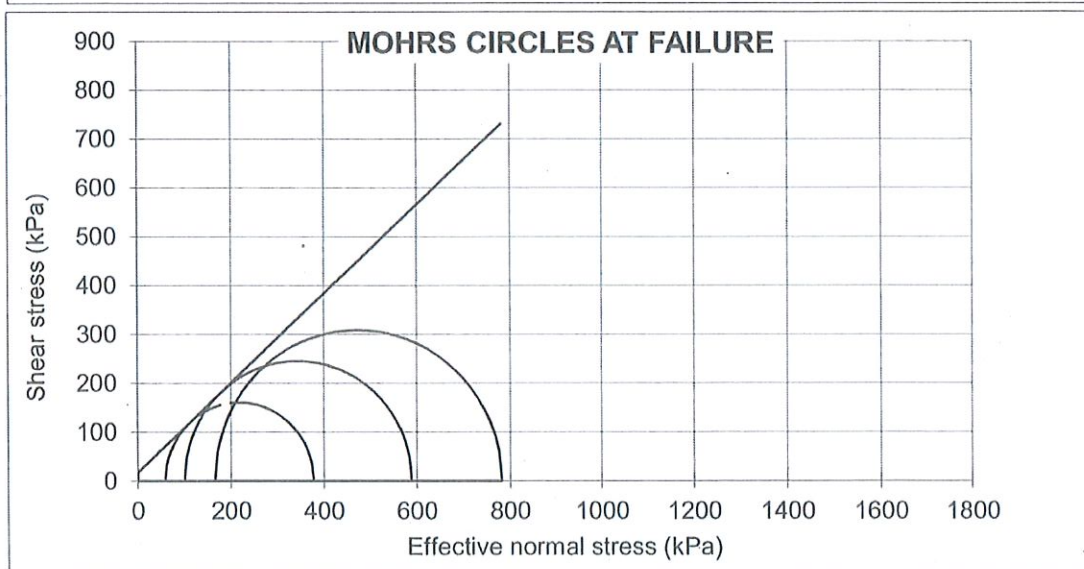
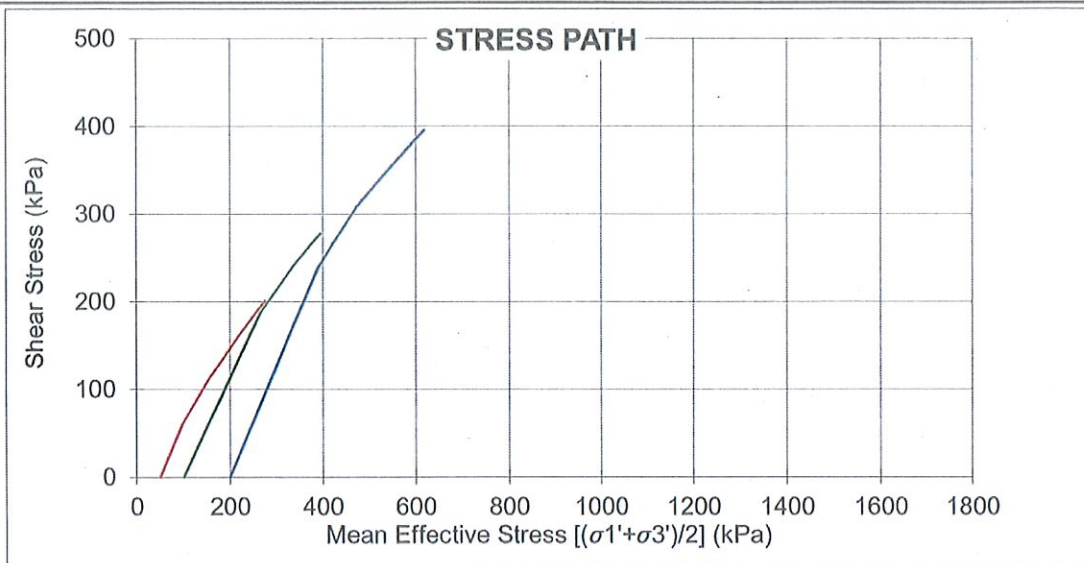
Tested: CP
Checked: AG

Peter Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136015
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967E/ NTP06		
Depth / Layer :	1.80-2.00(m)	Page:	2 (Optional)



Cohesion, c' 18 kPa

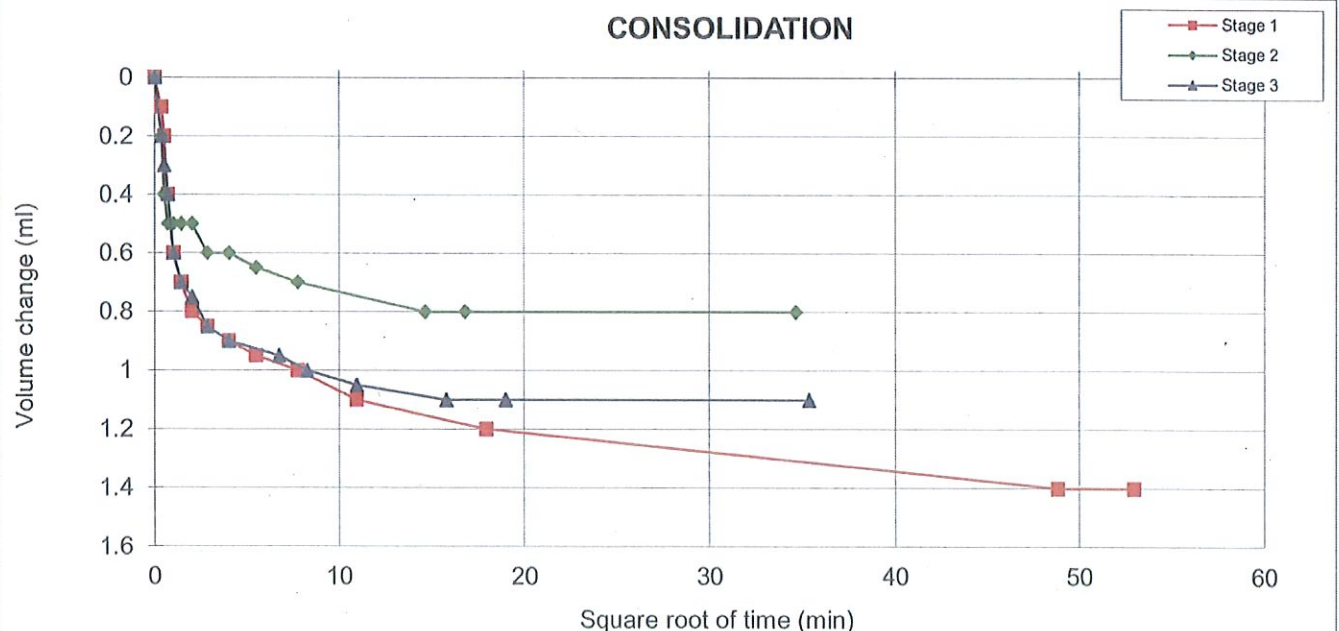
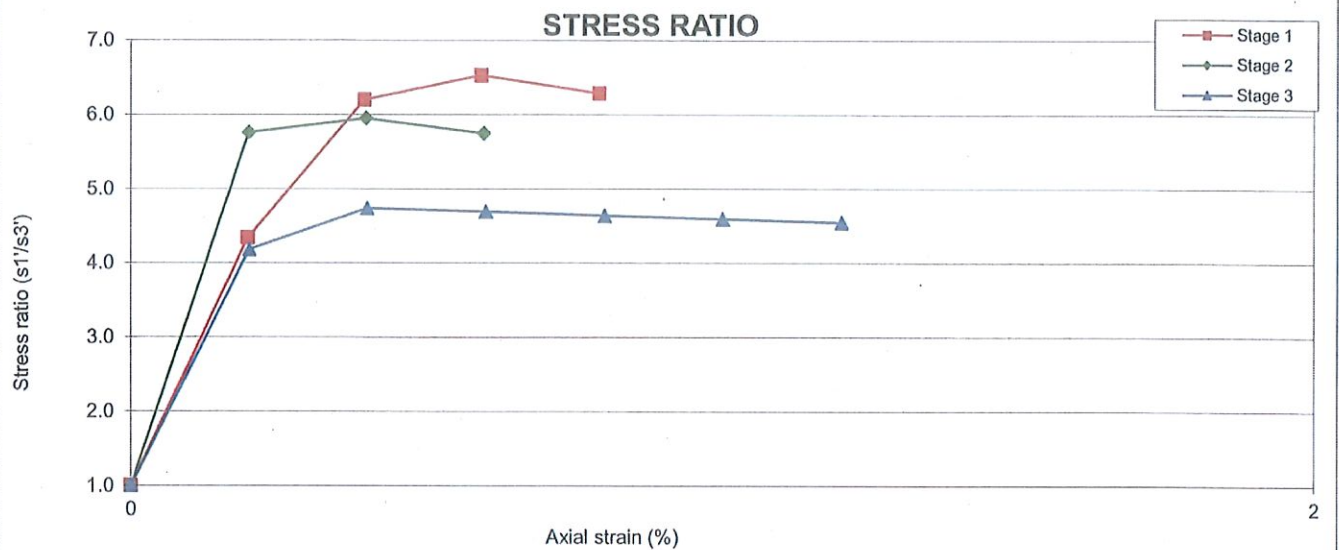
Angle of Internal Friction, ϕ' 42°

Test Method(s): AS 1289.6.4.2, AS1289.2.1.1

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136015
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967E/ NTP06		
Depth / Layer :	1.80-2.00(m)	Page:	3 (Optional)



Test Method(s): AS 1289.6.4.2, AS1289.2.1.1



NATA Accredited Laboratory Number: 828
Accredited for compliance with ISO/IEC 17025 - Testing

Tested: CP
Checked: AG

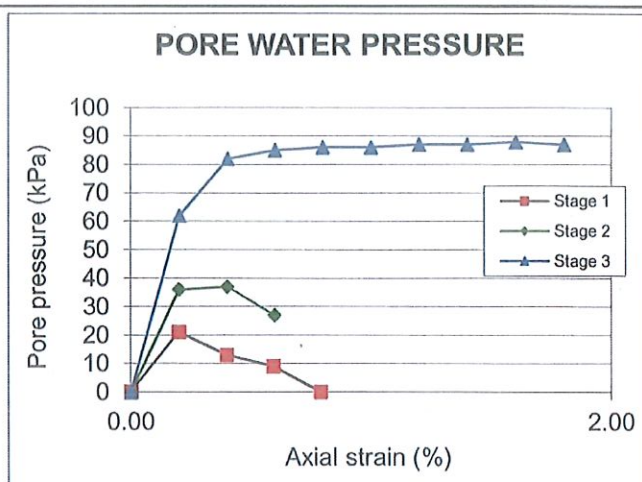
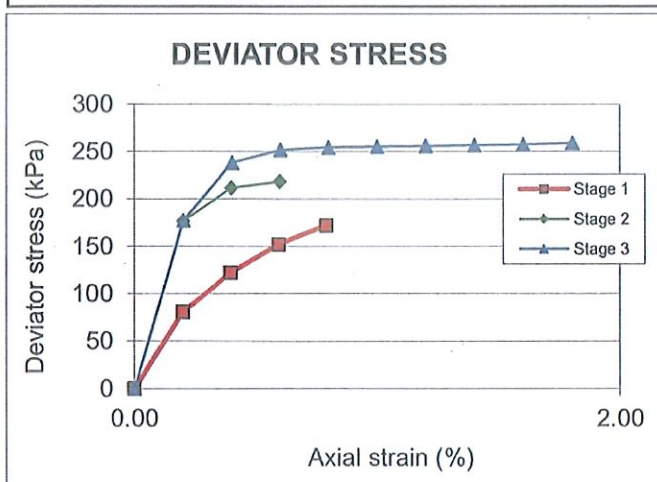
P. Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client : SLR Consulting Australia Pty Ltd
Project : BATCHELOR - Rum Jungle Rehabilitation
Location : Rum Jungle, Batchelor, NT
Test Location : 19-1967G/ NTP-07
Depth / Layer : 1.10-1.70(m)
Sample Description: Silty CLAY, with gravel and sand

Project No. : 677659.00
Report No. : M19136016
Report Date : 13 Nov 2019
Date Sampled : -
Date of Test: 01 Nov 2019
Sample Type: Remoulded
Page: 1



STAGE DETAILS

	1	2	3
Cell pressure (kPa)	550	600	700
Back pressure (kPa)	500	500	500
Volume change (%)	0.4	0.6	1.0
Strain rate (mm/min)	0.036	0.036	0.036

AT FAILURE

Strain (%)	0.6	0.4	1.6
Deviator Stress (kPa)	152	212	257
Pore pressure (kPa)	509	537	585
Stress ratio	4.7	4.4	3.2

SPECIMEN DETAILS

	Initial	Final
Moisture content (%)	14.9	16.9
Dry density (t/m ³)	1.88	
B' value after saturation	0.98	

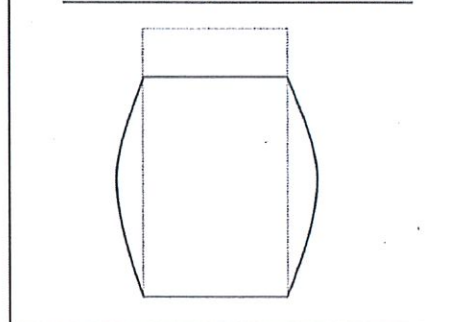
Sample Type

Remoulded

Initial Sample Dimensions

Length(mm)	Diameter(mm)
126	63
126	63

MODE OF FAILURE DIAGRAM



NOTES

1. Test technique : multi-staged.
2. Failure criteria : maximum stress ratio.
3. Specimen was fitted with side drains.
4. Specimen was saturated with an applied cell pressure of 510 kPa and an applied back pressure of 500 kPa
5. Membrane corrections were applied to the deviator stress according to figure 4 of BS 1377 : Part 8 : 1990.
6. Consolidation pore pressure was completely dissipated prior to testing
7. Water used for testing was not deaired prior to use.

Test Method(s): AS 1289.6.4.2, AS1289.2.1.1



NATA Accredited Laboratory Number: 828
Accredited for compliance with ISO/IEC 17025 - Testing

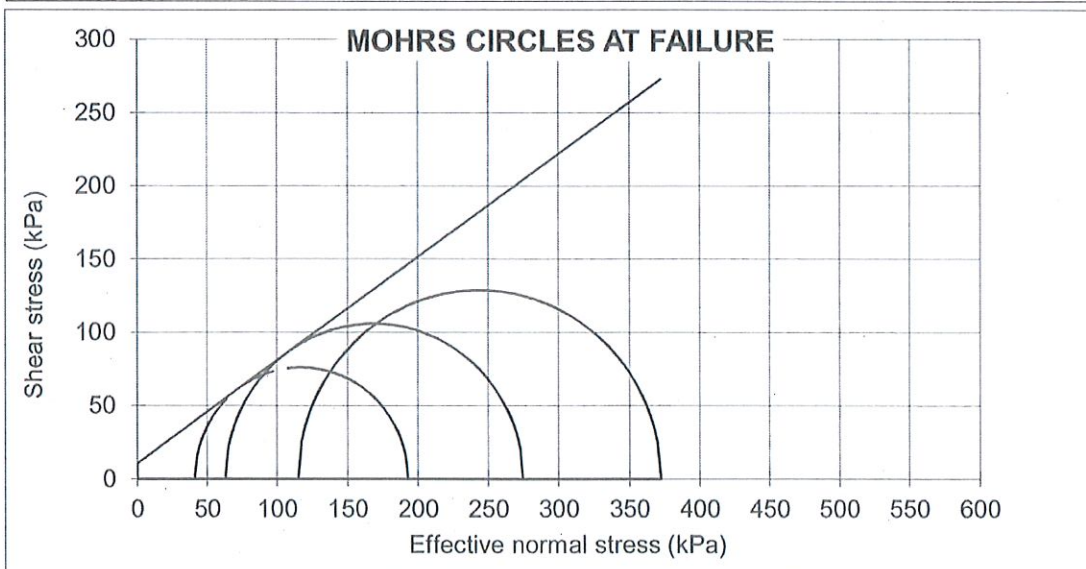
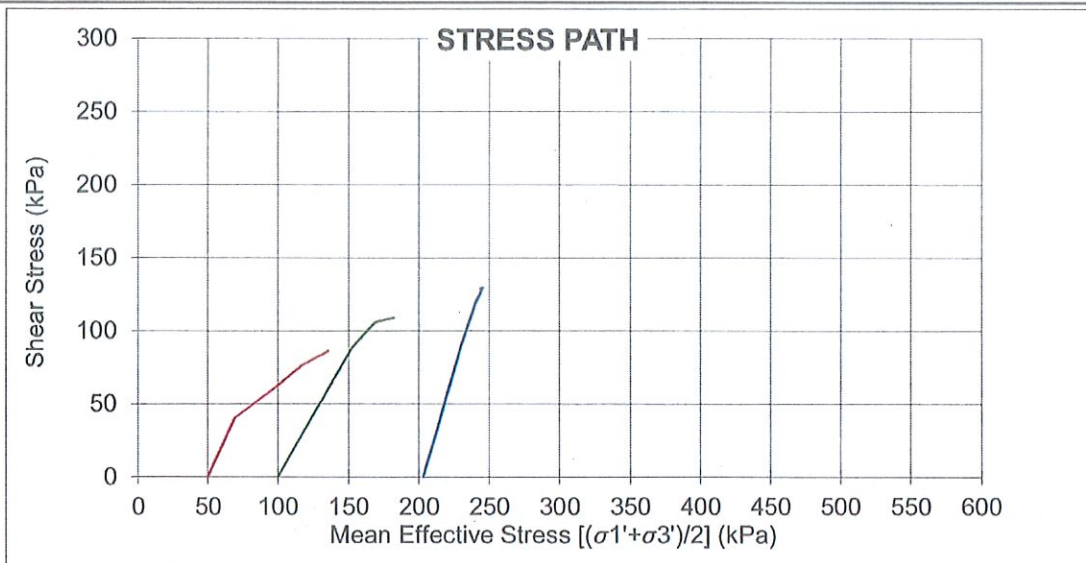
Tested: CP
Checked: AG

P. Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136016
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967G/ NTP-07		
Depth / Layer :	1.10-1.70(m)	Page:	2 (Optional)



Cohesion, c' 11 kPa

Angle of Internal Friction, ϕ' 35°

Test Method(s): AS 1289.6.4.2, AS1289.2.1.1



NATA Accredited Laboratory Number: 828
Accredited for compliance with ISO/IEC 17025 - Testing

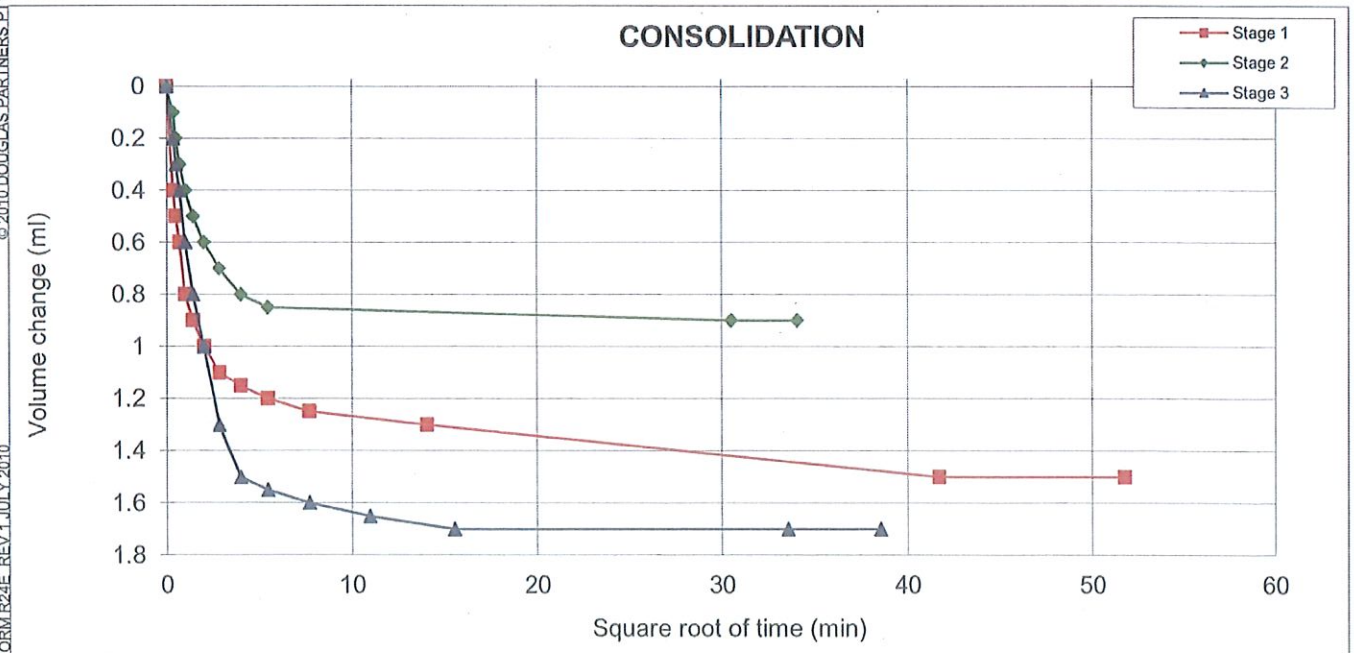
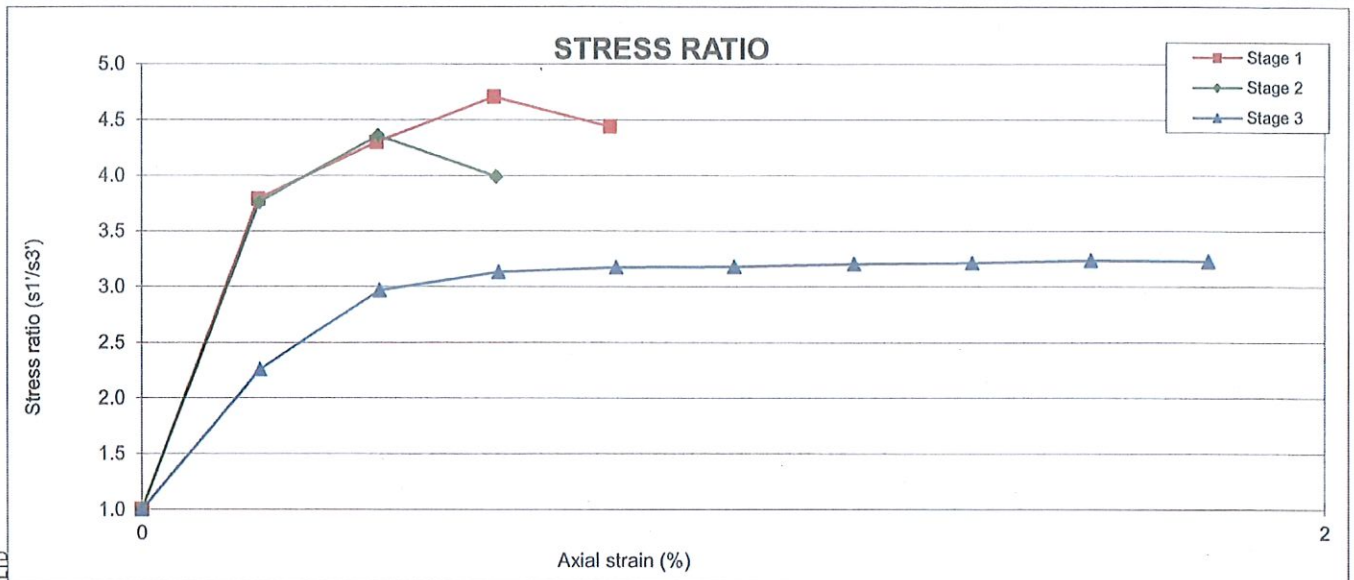
Tested: CP
Checked: AG

P. Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136016
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967G/ NTP-07		
Depth / Layer :	1.10-1.70(m)	Page:	3 (Optional)



Test Method(s): AS 1289.6.4.2, AS1289.2.1.1



NATA Accredited Laboratory Number: 828
Accredited for compliance with ISO/IEC 17025 - Testing

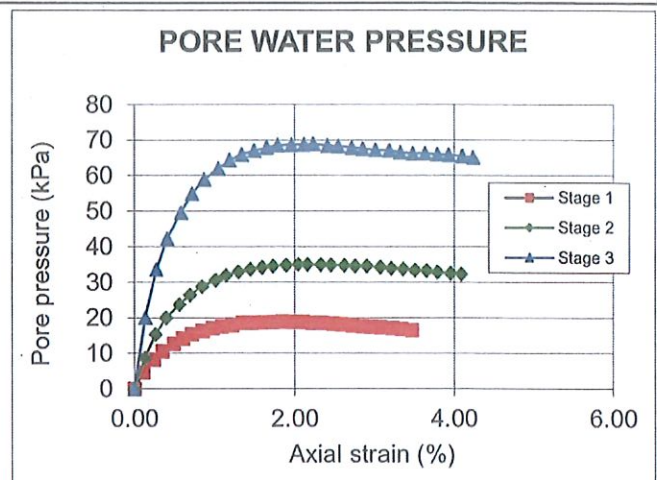
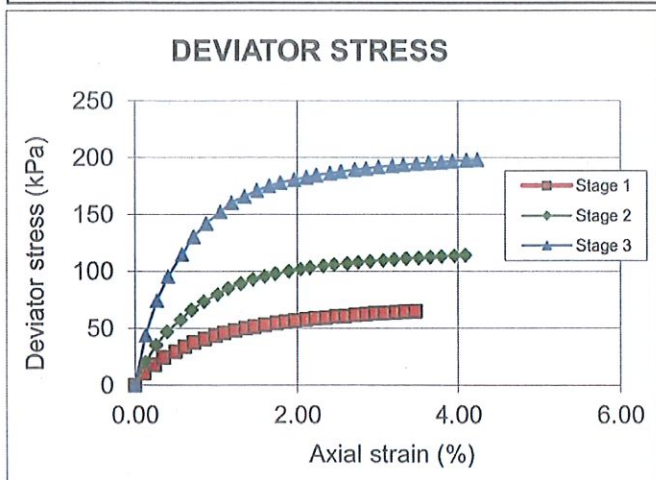
Tested: CP
Checked: AG

P. Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136017
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967H/ NTP-07	Date Sampled :	-
Depth / Layer :	3.70-4.00(m)	Date of Test:	06 Nov 2019
Sample Description:	Silty CLAY, trace gravel and sand	Sample Type:	Remoulded
		Page:	1



STAGE DETAILS

	1	2	3
Cell pressure (kPa)	550	600	700
Back pressure (kPa)	500	500	500
Volume change (%)	2.2	4.4	6.6
Strain rate (mm/min)	0.020	0.020	0.020

AT FAILURE

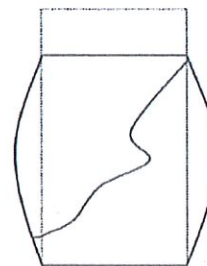
	1	2	3
Strain (%)	3.3	4.1	4.1
Deviator Stress (kPa)	65	114	197
Pore pressure (kPa)	517	533	568
Stress ratio	3.0	2.7	2.5

SPECIMEN DETAILS

	Initial	Final
Moisture content (%)	24.9	27.2
Dry density (t/m ³)	1.53	
B' value after saturation	0.99	

Sample Type	Remoulded
Initial Sample Dimensions	Length(mm) Diameter(mm)
	125 63
	125 63

MODE OF FAILURE DIAGRAM



NOTES

1. Test technique : multi-staged.
2. Failure criteria : maximum stress ratio.
3. Specimen was fitted with side drains.
4. Specimen was saturated with an applied cell pressure of 509 kPa and an applied back pressure of 499 kPa
5. Membrane corrections were applied to the deviator stress according to figure 4 of BS 1377 : Part 8 : 1990.
6. Consolidation pore pressure was completely dissipated prior to testing
7. Water used for testing was not deaired prior to use.

Test Method(s): AS 1289.6.4.2, AS1289.2.1.1

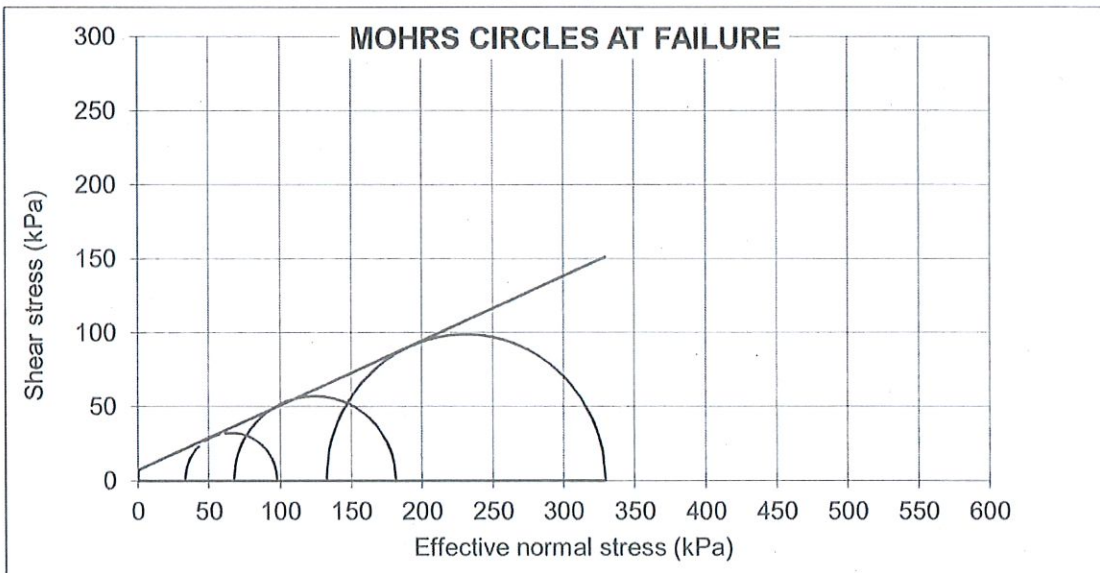
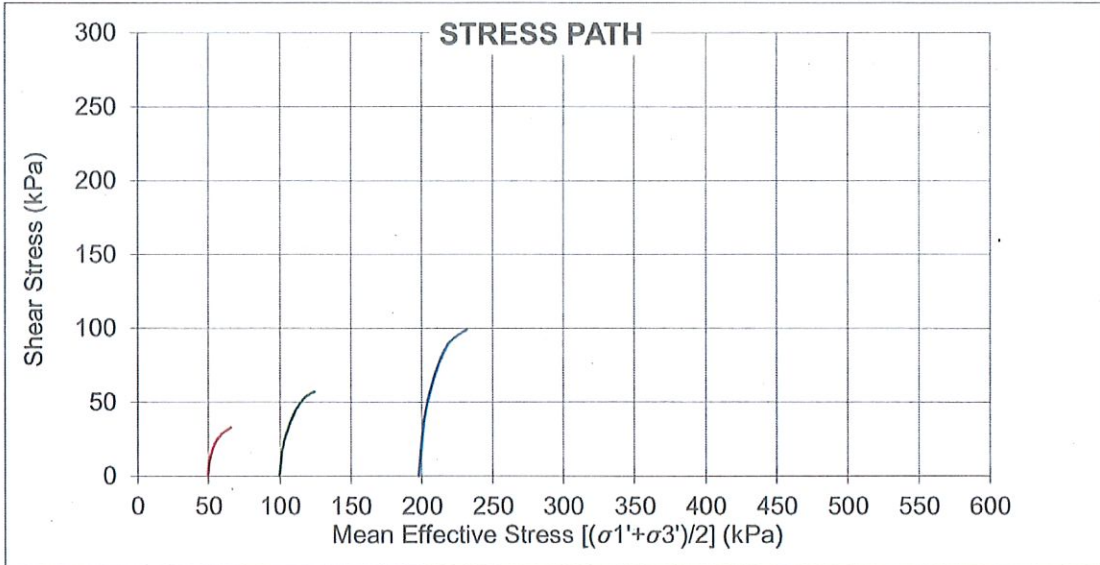
Tested: CP
Checked: AD

P. Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136017
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967H/ NTP-07		
Depth / Layer :	3.70-4.00(m)	Page:	2 (Optional)



Cohesion, c' **7 kPa**

Angle of Internal Friction, ϕ' **24°**

Test Method(s): AS 1289.6.4.2, AS1289.2.1.1



NATA Accredited Laboratory Number: 828
Accredited for compliance with ISO/IEC 17025 - Testing

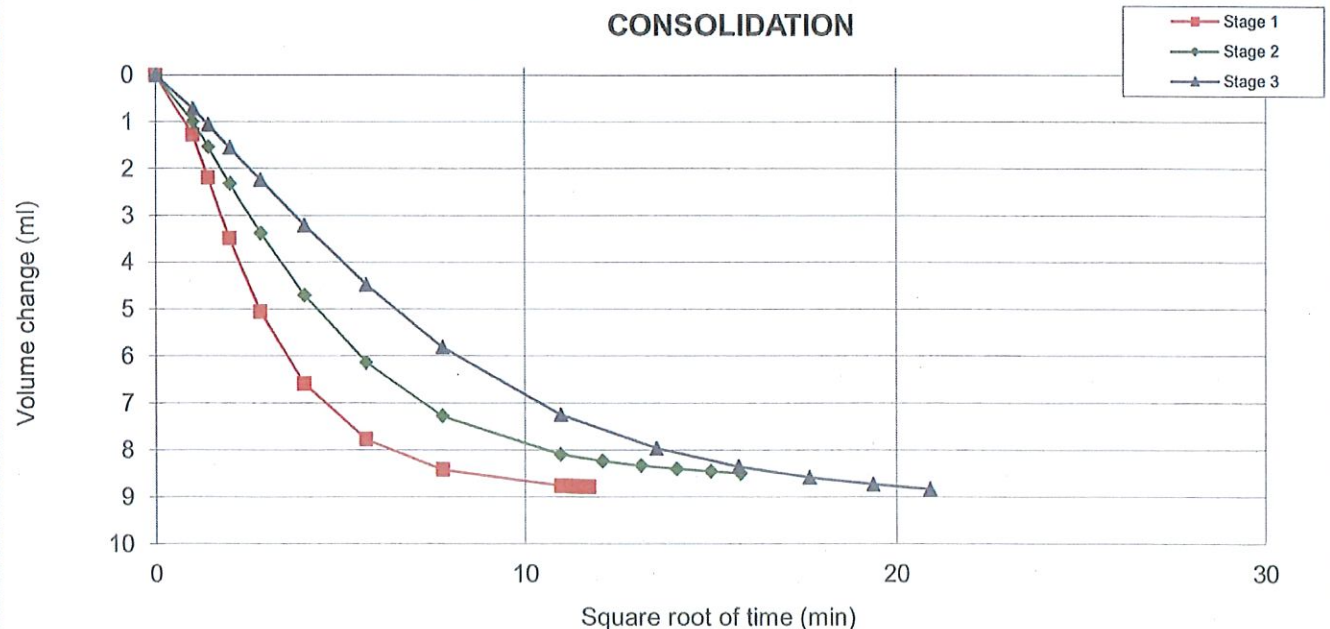
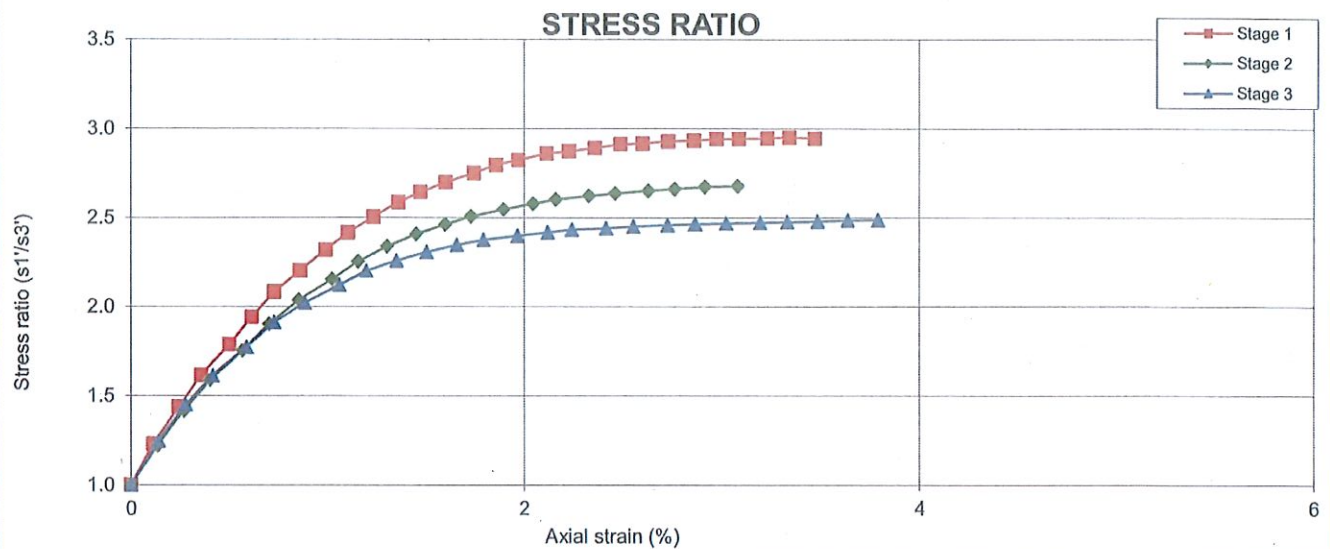
Tested: CP
Checked: AD

P. Chan
Peter Chan
Associate

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136017
Location :	Rum Jungle, Batchelor, NT	Report Date :	13 Nov 2019
Test Location :	19-1967H/ NTP-07		
Depth / Layer :	3.70-4.00(m)	Page:	3 (Optional)



Test Method(s): AS 1289.6.4.2, AS1289.2.1.1



NATA Accredited Laboratory Number: 828
Accredited for compliance with ISO/IEC 17025 - Testing

Tested: CP
Checked: AD

P. Chan
Peter Chan
Associate

BORROW AREA B

LABORATORY RESULTS

SLR INVESTIGATION LABORATORY RESULTS

Client SLR Consulting Australia Pty Ltd
Project Rum Jungle Rehabilitation - Project Ref 680.10421
Project No: 677659.00
WR No: 2023

Summary of Reports Issued:

Report Number	Laboratory	Content
677659.00-2 - Issue 2	Darwin	PSD, Emerson, Atterbergs, MDD & CBR + Moisture Content
MSPD	Melbourne	Soil Particle Density for Sample 19-2023C / STP-02 (1.40 - 1.60m)
M19136019	Melbourne	PSD incl Hydro for Sample 19-2023B / STP-02 (0.3 - 0.60m)
M19136020	Melbourne	PSD incl Hydro for Sample 19-2023D / STP-03 (1.00 - 1.20m)
M19136021	Melbourne	PSD incl Hydro for Sample 19-2023H / STP-07 (1.60 - 1.70m)
M19136022	Melbourne	SMDD - Compaction for Sample 19-2023C / STP-02 (1.40 - 1.60m)
M19136023	Melbourne	Falling Head Permeability for Sample 19-2023C / STP-02 (1.40 - 1.60m)
M19136024	Melbourne	Emerson Class for Sample 19-2023D / STP-03 (1.00 - 1.20m)
M19136025	Melbourne	Atterbergs & Moisture Content for Sample 19-2023D / STP-03 (1.00 - 1.20m)

Material Test Report



(Signature)

Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

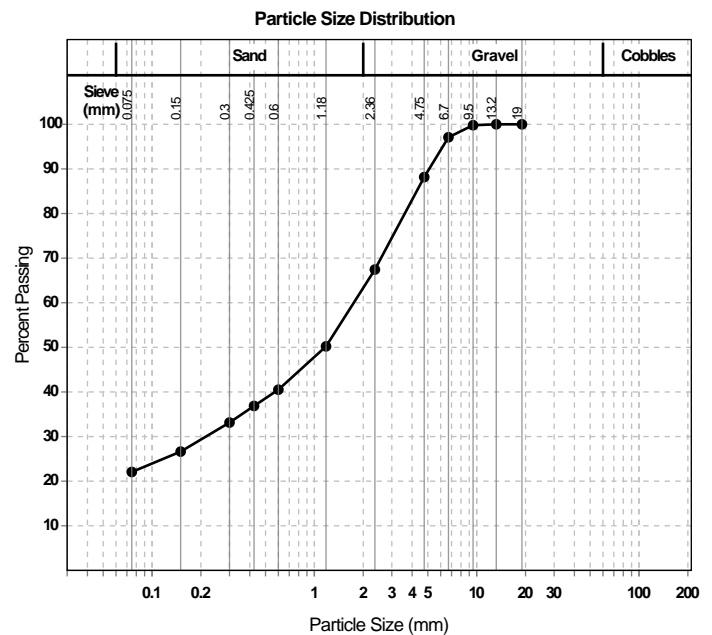
Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023A
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 20/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-01 (0.70 - 1.00m)
Material: Clayey Sand, Resid.

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	97	
4.75 mm	88	
2.36 mm	67	
1.18 mm	50	
0.6 mm	41	
0.425 mm	37	
0.3 mm	33	
0.15 mm	27	
0.075 mm	22	

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Clayey Sand, Resid.		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	34		
Plastic Limit (%)	22		
Plasticity Index (%)	12		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	6.0		
Cracking Crumbling Curling	Cracking		



Material Test Report



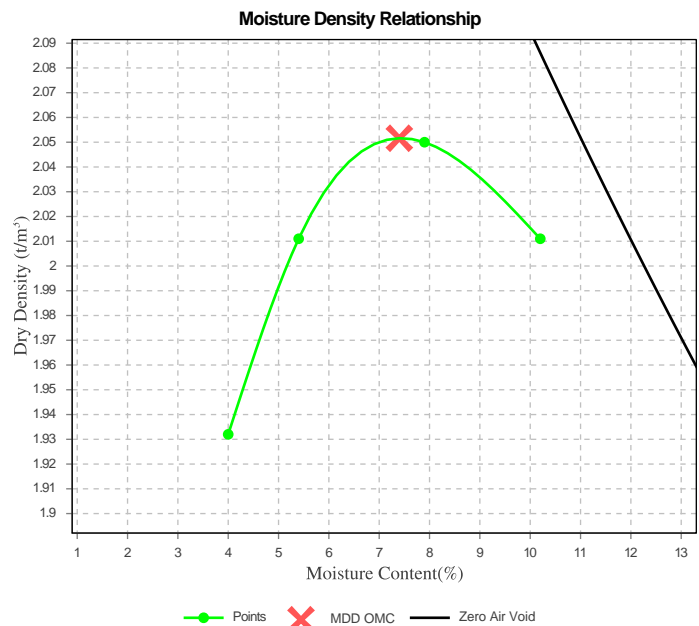
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023A
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 18/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-01 (0.70 - 1.00m)
Material: Clayey Sand, Resid.

Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	2.05
Optimum Moisture Content (%)	7.5
Retained on 19mm (%)	0.0
Oversize Sieve (mm)	19
Oversize Material Wet (%)	0
Oversize Material Dry (%)	0
Dry Oversize density (t/m^3)	
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24



Material Test Report



(Signature)

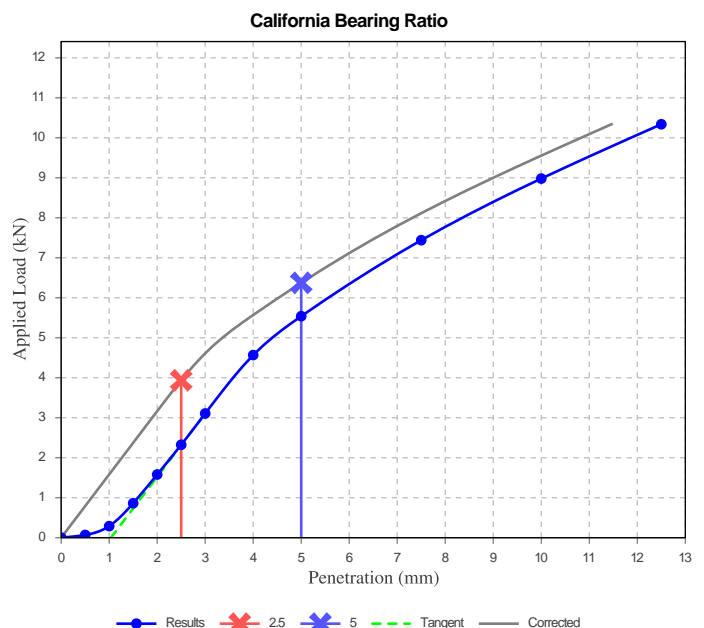
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023A
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-01 (0.70 - 1.00m)
Material: Clayey Sand, Resid.

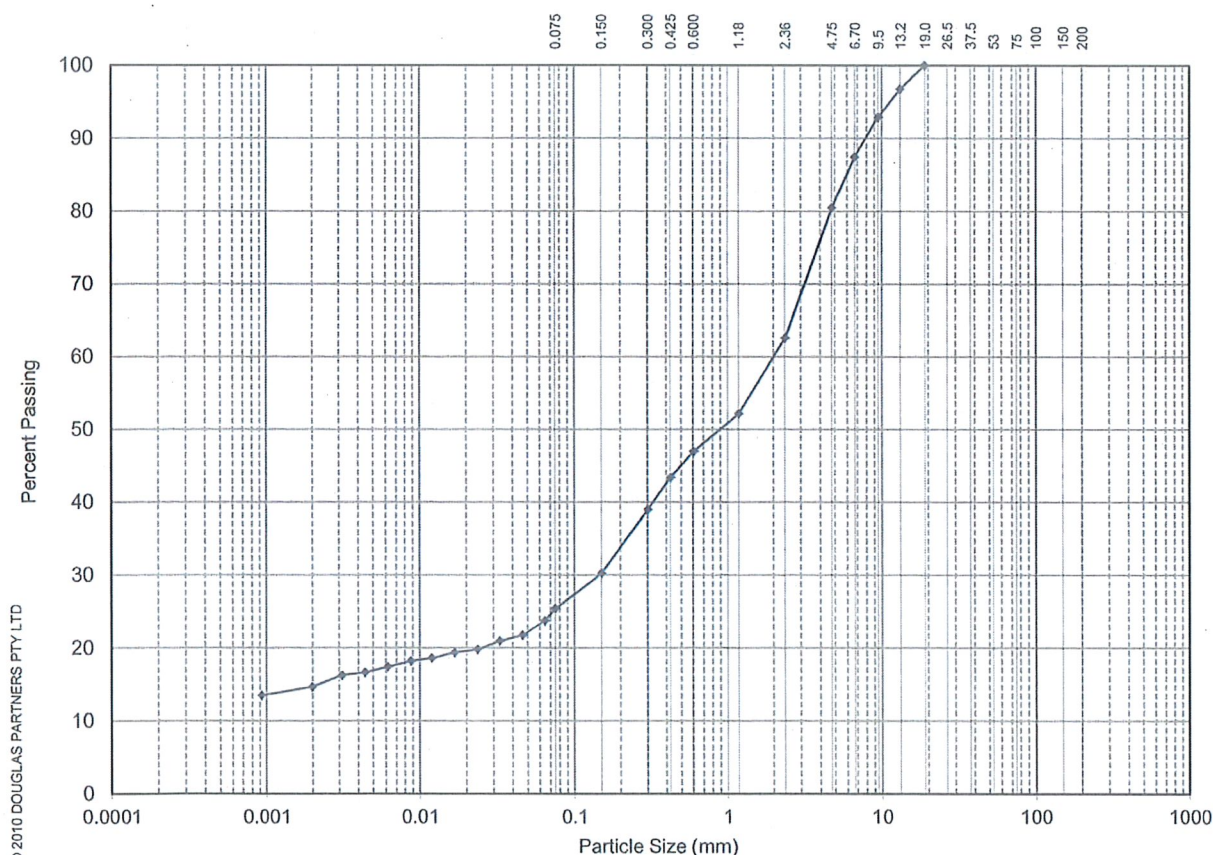
California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	30		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.05		
Optimum Moisture Content (%)	7.5		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.94		
Field Moisture Content (%)	7.4		
Moisture Content at Placement (%)	7.4		
Moisture Content Top 30mm (%)	13.5		
Moisture Content Rest of Sample (%)	10.8		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136019
		Report Date :	26.11.2019
Location :	Rum Jungle, Batchelor, NT	Date Sampled:	-
Test Location:	19-2023B/STP-02	Date of Test:	7/11/2019
Depth / Layer:	0.3-0.60(m)	Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	100%
13.2	97%
9.5	93%
6.7	87%
4.75	80%
2.36	63%
1.18	52%
0.600	47%
0.425	43%
0.300	39%
0.150	30%
0.075	25%
0.046	22%
0.033	21%
0.024	20%
0.017	19%
0.012	19%
0.009	18%
0.006	17%
0.004	17%
0.003	16%
0.002	15%
0.001	13%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Gravelly silty clayey SAND

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.59 t/m³

Type of Hydrometer: g/l

Material Test Report

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023B
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 05/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-02 (0.30 - 0.60m)
Material: Gravelly Sand. Alluv.



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Gravelly sand. Alluvium.		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		
* Mineral Present	Gypsum		

Material Test Report



(Signature)

Approved Signatory: Clare Whelan

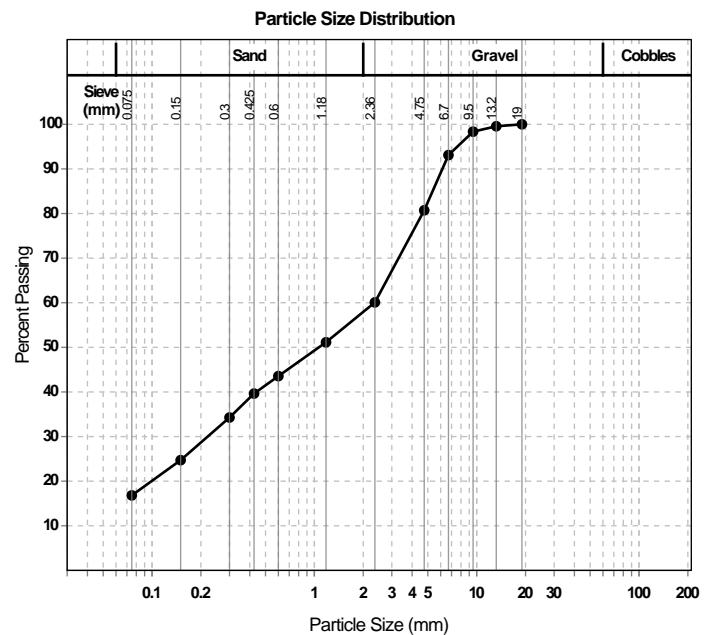
Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023C
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-02 (1.40 - 1.60m)
Material: Gravelly Sand Resid

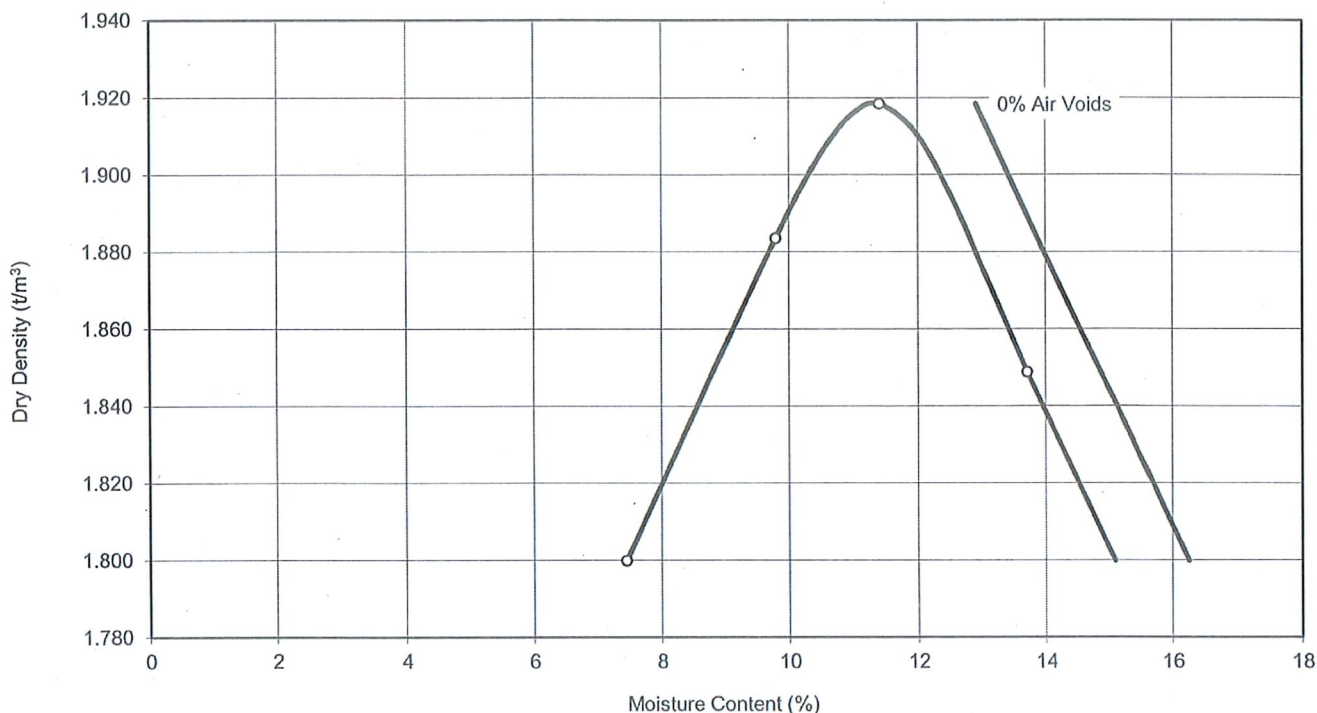
Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	98	
6.7 mm	93	
4.75 mm	81	
2.36 mm	60	
1.18 mm	51	
0.6 mm	44	
0.425 mm	40	
0.3 mm	34	
0.15 mm	25	
0.075 mm	17	

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Gravelly sand. Residual		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136022
Location :	Rum Jungle, Batchelor, NT	Report Date :	8/11/2019
		Date of Test:	7/11/2019
		Page:	1 of 1



Sample Details: Location: 19-2023C/STP-02
Depth: 1.40-1.60(m)

Particles > 19mm: 0%

Description: Gravelly SAND, with clay

Maximum Dry Density:	1.92 t/m³
Optimum Moisture Content:	11.5 %

Remarks:

Test Methods: AS 1289.2.1.1, AS 1289. 5.1.1

Sampling Methods: Sampled by Client



NATA Accredited Laboratory Number: 828
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested:	SP
Checked:	AG

Arveendra Gounder
Arveendra Gounder
Laboratory Manager

Results of Falling Head Permeability Test

Client:	SLR Consulting Australia Pty Ltd	Project No:	677659.00
Project:	BATCHELOR - Rum Jungle Rehabilitation	Report No:	M19136023
Location:	Rum Jungle, Batchelor, NT	Report Date:	26-Nov-2019
		Date Sampled:	-
		Date of Test:	08-Nov-2019
		Page:	1 of 1

Location:	19-2023C/STP-02
Depth	1.40-1.60(m)
Sample Description:	Gravelly SAND, with clay
Sample Preparation:	Remoulded to 98% Standard Maximum Dry Density @ 99% Optimum Moisture Content
Placement Dry Density:	1.88 t/m ³
Placement Moisture Content:	11.3 %
Final Moisture Content:	13.4 %
Maximum Hydraulic Gradient:	7
Minimum Hydraulic Gradient:	5
Coefficient of Permeability:	4x10 ⁻⁷ m/sec

Test Method(s): AS 1289.6.7.2, AS 1289.2.1.1

Sampling Method(s): Sampled by Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: TT
Checked: AG

P. Chan
 Peter Chan
 Associate

Results of Soil Particle Density Test

Client: SLR Consulting Australia Pty Ltd		Project No: 677659.00	
Project: BATCHELOR - Rum Jungle Rehabilitation		Report No: MSPD	
Location: Rum Jungle, Batchelor, NT		Report Date: 26-Nov-2019	
		Date Sampled: -	
		Date of Test: 14-Nov-2019	
		Page: 1 of 1	

Bore / Pit	Depth (m)	Sample Description	Average Apparent Particle Density			Particle Density of Total Sample P_{st} (g/cm ³)
			Retained 2.36 mm \bar{P}_c (g/cm ³)	Passing 2.36 mm \bar{P}_f (g/cm ³)	Temp °C	
19-2023C/STP-02	1.40-1.60	Gravelly SAND, with clay	2.64	2.62	20	2.63

Test Method(s): AS 1289.3.5.1

Sampling Method: Sampled By Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

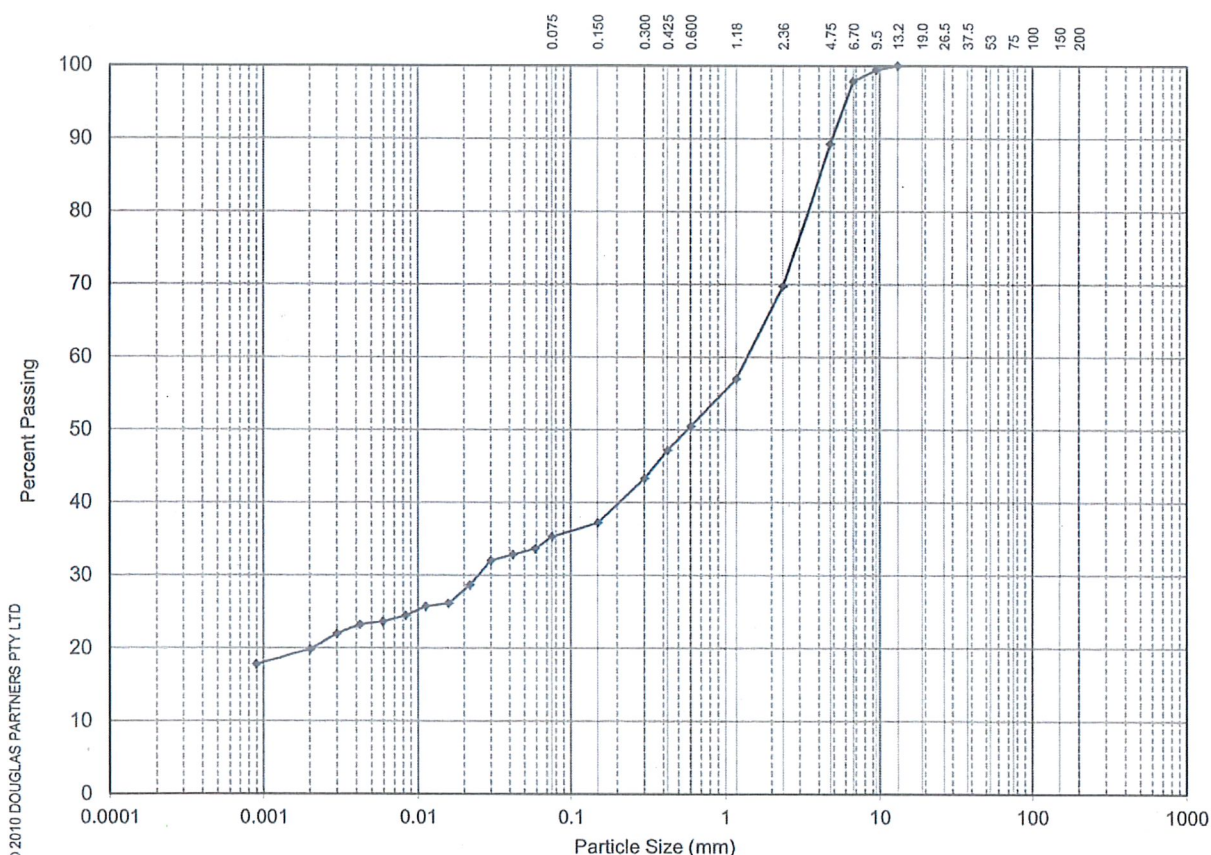
Tested: DC
Checked: AG


 Peter Chan
 Associate

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136020
Location :	Rum Jungle, Batchelor, NT	Report Date :	26.11.2019
Test Location:	19-2023D/STP-03	Date Sampled:	-
Depth / Layer:	1.00-1.20(m)	Date of Test:	7/11/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	99%
6.7	98%
4.75	89%
2.36	70%
1.18	57%
0.600	50%
0.425	47%
0.300	43%
0.150	37%
0.075	35%
0.042	33%
0.030	32%
0.022	29%
0.016	26%
0.011	26%
0.008	24%
0.006	24%
0.004	23%
0.003	22%
0.002	20%
0.001	18%

CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
	0.002	0.005	0.02	0.06	0.2	0.6	2.0	6.0	20	60

Description: Silty clayey SAND, with gravel

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.61 t/m³

Type of Hydrometer: g/l

Results of Moisture Content, Plasticity and Linear Shrinkage Tests

Client: SLR Consulting Australia Pty Ltd		Project No: 677659.00	
Project: BATCHELOR - Rum Jungle Rehabilitation		Report No: M19136025	
Location: Rum Jungle, Batchelor, NT		Report Date: 26-Nov-2019	
		Date Sampled: -	
		Date of Test: 12-Nov-2019	
		Page: 1 of 1	

Test Location	Depth (m)	Description	Code	W _F %	W _L %	W _P %	PI %	*LS %
19-2023D/STP-03	1.00-1.20	Silty clayey SAND, with gravel	2,5	6.8	36	17	19	7.0

Legend:

W_F Field Moisture Content
 W_L Liquid limit
 W_P Plastic limit
 PI Plasticity index
 LS Linear shrinkage from liquid limit condition (Mould length 254mm)

Test Methods:

Moisture Content: AS 1289 2.1.1
 Liquid Limit: AS 1289 3.1.2
 Plastic Limit: AS 1289 3.2.1
 Plasticity Index: AS 1289 3.3.1
 Linear Shrinkage: AS 1289 3.4.1

Code:

Sample history for plasticity tests

1. Air dried
2. Low temperature (<50°C) oven dried
3. Oven (105°C) dried
4. Unknown

Method of preparation for plasticity tests

5. Dry sieved
6. Wet sieved
7. Natural

*Specify if sample crumbled CR or curled CU

Sampling Methods: Sampled by Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: SR
 Checked: AG



Arveendra Gounder
Laboratory Manager

Determination of Emerson Class Number of Soil

Client:	SLR CONSULTING AUSTRALIA PTY LTD		Project No:	677659.00	
Project:	BATCHELOR - Rum Jungle Rehabilitation		Report No:	M19136024	
			Report Date:	26-NOV-2019	
Location:	Rum Jungle, Batchelor, NT		Date of Test:	23-NOV-2019	
			Page:	1 of 1	

Sample No.	Depth (m)	Description	Water Type	Water Temp	Class No.
19-2023D/STP-03	1.00-1.20	Silty clayey SAND, with gravel	Distilled	22	6

Test Methods: AS 1289 3.8.1

Sampling Methods: Sampled by Client

Remarks:



NATA Accredited Laboratory Number: 828

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

Tested: CP
Checked: AG


 Peter Chan
 Associate

Material Test Report



Douglas Partners Pty Ltd

Darwin Laboratory

Unit 2/14 Caryota Circuit Coconut Grove NT 0810

Phone: (08) 8948 6800

Fax: (08) 8948 6899

Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



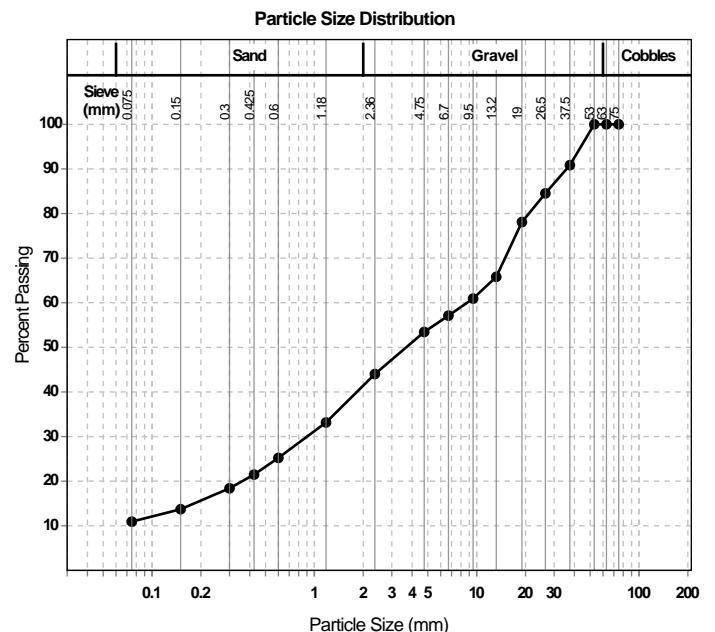
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
 Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023E
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 11/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-04 (0.30 - 0.60m)
Material: Cobb / Bould + Sandy Gravel. Resid

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
53 mm	100	
37.5 mm	91	
26.5 mm	85	
19 mm	78	
13.2 mm	66	
9.5 mm	61	
6.7 mm	57	
4.75 mm	53	
2.36 mm	44	
1.18 mm	33	
0.6 mm	25	
0.425 mm	21	
0.3 mm	18	
0.15 mm	14	
0.075 mm	11	



Material Test Report



(Signature)

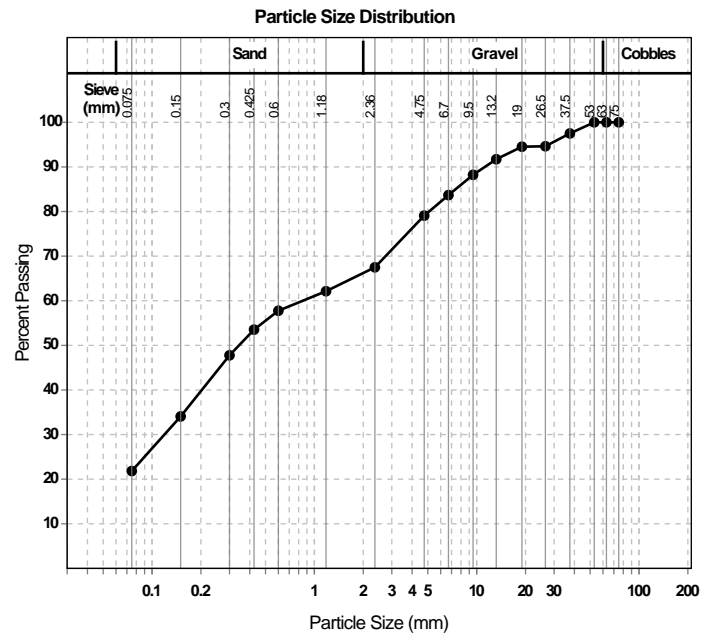
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023G
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 21/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-06 (0.70 - 1.00m)
Material: Cobb/bould + Gravelly Sand with Clay Lat

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
53 mm	100	
37.5 mm	98	
26.5 mm	95	
19 mm	95	
13.2 mm	92	
9.5 mm	88	
6.7 mm	84	
4.75 mm	79	
2.36 mm	67	
1.18 mm	62	
0.6 mm	58	
0.425 mm	54	
0.3 mm	48	
0.15 mm	34	
0.075 mm	22	



Material Test Report

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023G
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 18/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-06 (0.70 - 1.00m)
Material: Cobb/bould + Gravelly Sand with Clay Lat

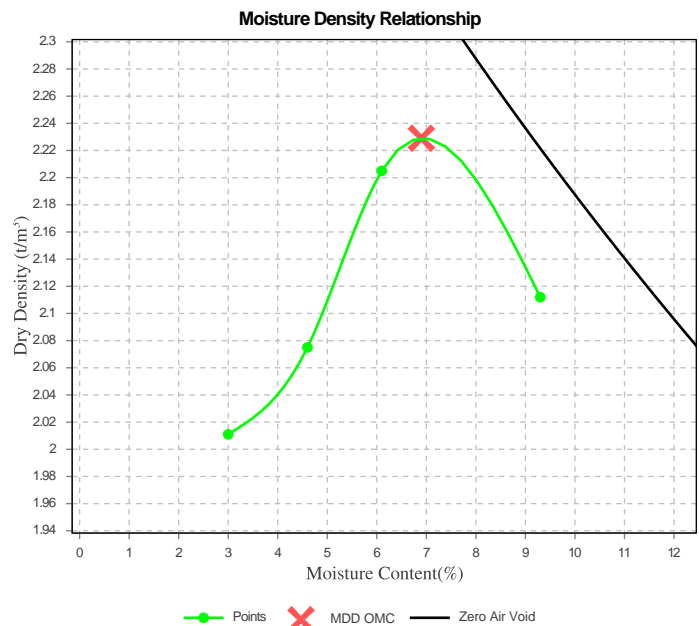


Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	2.23
Optimum Moisture Content (%)	7.0
Retained on 19mm (%)	0.0
Oversize Sieve (mm)	19
Oversize Material Wet (%)	0
Oversize Material Dry (%)	0
Dry Oversize density (t/m^3)	
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24



Material Test Report



(Signature)

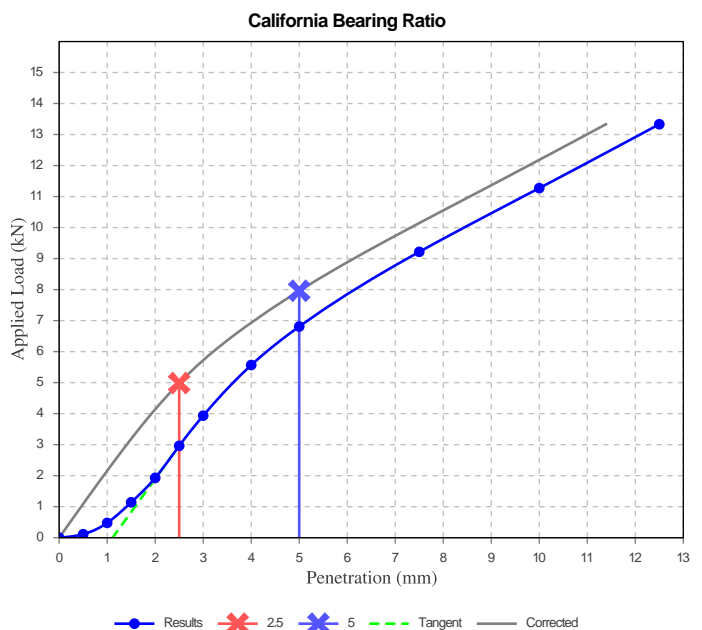
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023G
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-06 (0.70 - 1.00m)
Material: Cobb/bould + Gravelly Sand with Clay Lat

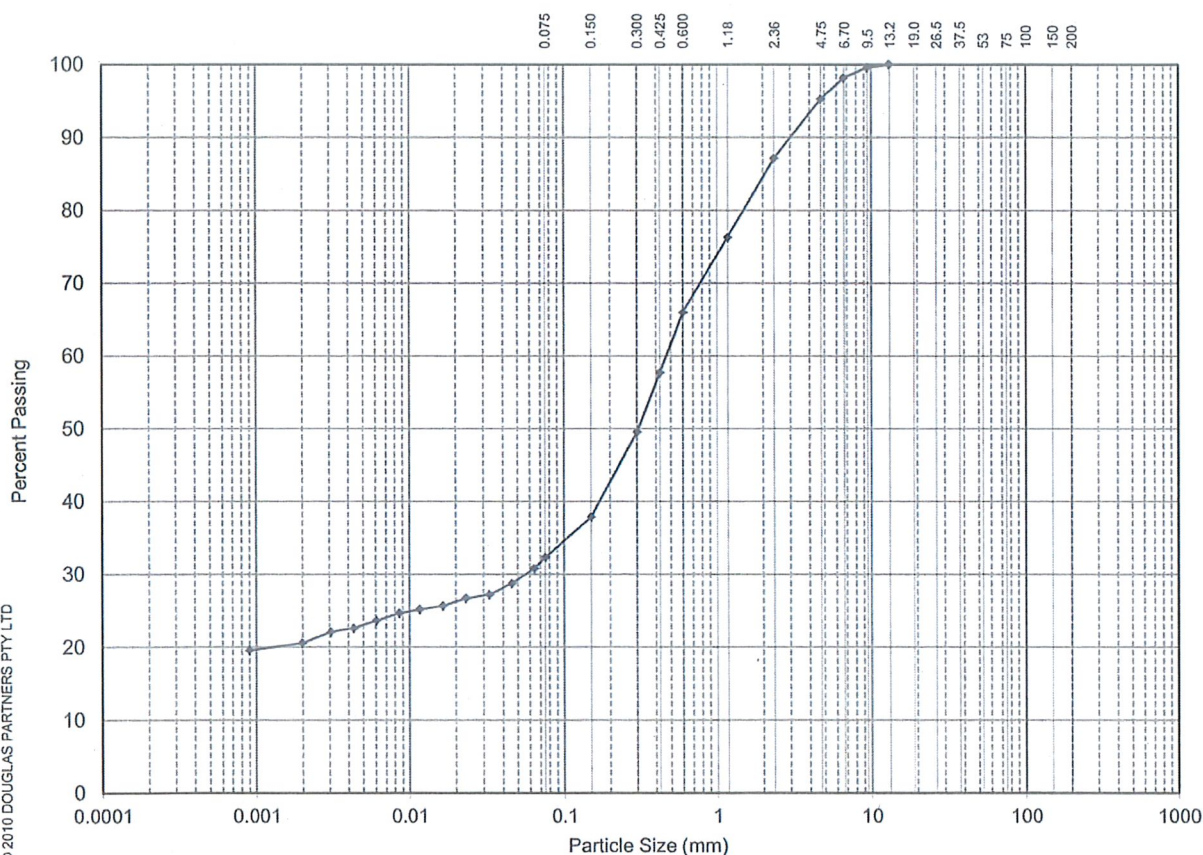
California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	40		
Method of Compactive Effort	Modified		
Method used to Determine MDD	1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.23		
Optimum Moisture Content (%)	7.0		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	2.13		
Field Moisture Content (%)	4.4		
Moisture Content at Placement (%)	6.9		
Moisture Content Top 30mm (%)	10.0		
Moisture Content Rest of Sample (%)	9.4		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677659.00
Project :	BATCHELOR - Rum Jungle Rehabilitation	Report No. :	M19136021
Location :	Rum Jungle, Batchelor, NT	Report Date :	26.11.2019
Test Location:	19-2023H/STP-07	Date Sampled:	-
Depth / Layer:	1.60-1.70(m)	Date of Test:	7/11/2019
		Page:	1 of 1

AUSTRALIAN STANDARD SIEVE APERTURES



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	100%
6.7	98%
4.75	95%
2.36	87%
1.18	76%
0.600	66%
0.425	58%
0.300	50%
0.150	38%
0.075	32%
0.045	29%
0.033	27%
0.023	27%
0.016	26%
0.012	25%
0.009	25%
0.006	24%
0.004	23%
0.003	22%
0.002	21%
0.001	20%

CLAY FRACTION	SILT FRACTION	SAND FRACTION	GRAVEL FRACTION	COBBLES
	Fine Medium Coarse	Fine Medium Coarse	Fine Medium Coarse	
	0.002 0.006 0.02 0.06	0.2 0.6	2.0 6.0 20 60	

Description: Silty clayey SAND, trace gravel

Test Method(s): AS 1289.3.6.1, AS1289.3.6.3, AS 1289.3.5.1

Sampling Method(s): Sampled by Client

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.63 t/m³

Type of Hydrometer: g/l

Material Test Report

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023H
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 05/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-07 (1.60 - 1.70m)
Material: Sandy gravel. Alluvium

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	6		
Soil Description	Sandy gravel. Alluvium		
Nature of Water	Demineralised water		
Temperature of Water (°C)	26		



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Material Test Report

Report Number: 677659.00-2
Issue Number: 1
Date Issued: 25/09/2019
Client: SLR Consulting Australia Pty Ltd
 Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023H
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 23/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-07 (1.60 - 1.90m)
Material: Sandy gravel. Alluvium

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	20		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	2.03		
Optimum Moisture Content (%)	10.5		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.93		
Field Moisture Content (%)	9.8		
Moisture Content at Placement (%)	10.5		
Moisture Content Top 30mm (%)	11.8		
Moisture Content Rest of Sample (%)	11.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



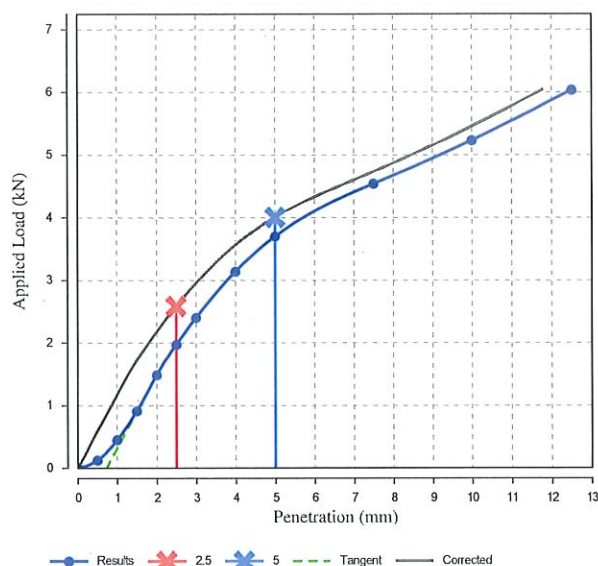
(Signature)

Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

California Bearing Ratio



Material Test Report



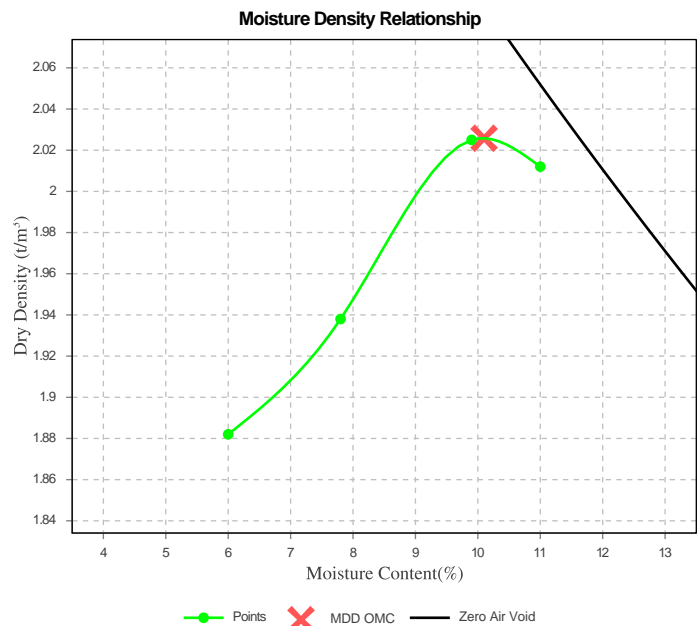
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Sample Number: 19-2023H
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 14/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: STP-07 (1.60 - 1.70m)
Material: Sandy gravel. Alluvium

Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m ³)	2.03
Optimum Moisture Content (%)	10.0
Retained on 19mm (%)	0.0
Oversize Sieve (mm)	19
Oversize Material Wet (%)	0
Oversize Material Dry (%)	0
Dry Oversize density (t/m ³)	
Method used to Determine Plasticity	Visual Assessment
Curing Hours	24



Material Test Report



Douglas Partners Pty Ltd

Darwin Laboratory

Unit 2/14 Caryota Circuit Coconut Grove NT 0810

Phone: (08) 8948 6800

Fax: (08) 8948 6899

Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Dry Density Reports Added
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location: Rum Jungle, Batchelor
Work Request: 2023
Date Sampled: 17/07/2019
Dates Tested: 03/09/2019 - 04/09/2019
Sampling Method: Sampled by Client
The results apply to the sample as received

Moisture Content AS 1289 2.1.1			
Sample Number	Sample Location	Moisture Content (%)	Material
19-2023A	STP-01 (0.70 - 1.00m)	7.4 %	Clayey Sand, Resid.
19-2023B	STP-02 (0.30 - 0.60m)	4.1 %	Gravelly Sand. Alluv.
19-2023C	STP-02 (1.40 - 1.60m)	4.8 %	Gravelly Sand Resid
19-2023D	STP-03 (1.00 - 1.20m)	7.7 %	Clayey Gravelly Sand Resid
19-2023E	STP-04 (0.30 - 0.60m)	2.9 %	Cobb / Bould + Sandy Gravel. Resid
19-2023F	STP-05 (0.60 - 1.00m)	7.1 %	Clayey Sand. Resid
19-2023G	STP-06 (0.70 - 1.00m)	4.4 %	Cobb/bould + Gravelly Sand with Clay Lat
19-2023H	STP-07 (1.60 - 1.70m)	9.8 %	Sandy gravel. Alluvium

HAUL ROAD

LABORATORY RESULTS

SLR INVESTIGATION LABORATORY RESULTS

Material Test Report



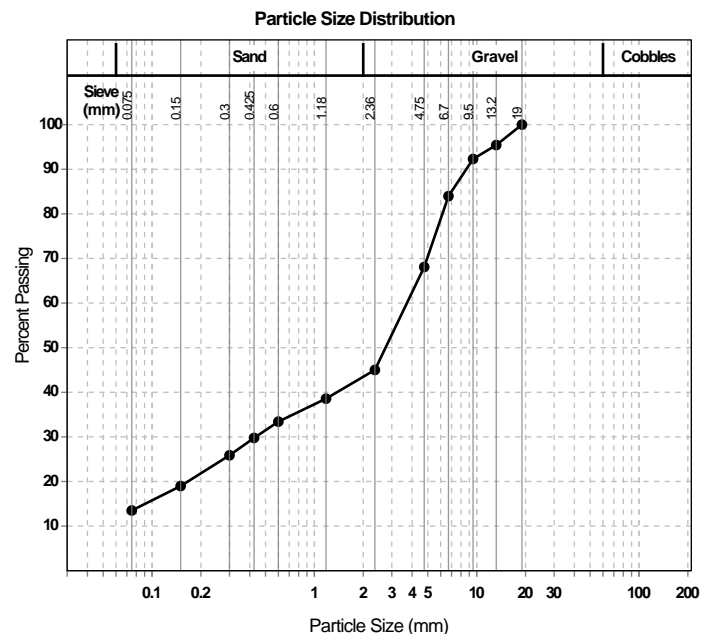
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3
Issue Number: 1
Date Issued: 26/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177A
Date Sampled: 03/10/2019
Dates Tested: 17/10/2019 - 29/10/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: HR-SLR-TP04 (0.6 - 0.8m)
Material: Silty Sandy Gravel

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	95	
9.5 mm	92	
6.7 mm	84	
4.75 mm	68	
2.36 mm	45	
1.18 mm	39	
0.6 mm	33	
0.425 mm	30	
0.3 mm	26	
0.15 mm	19	
0.075 mm	14	



Material Test Report



Arveendra Gounder

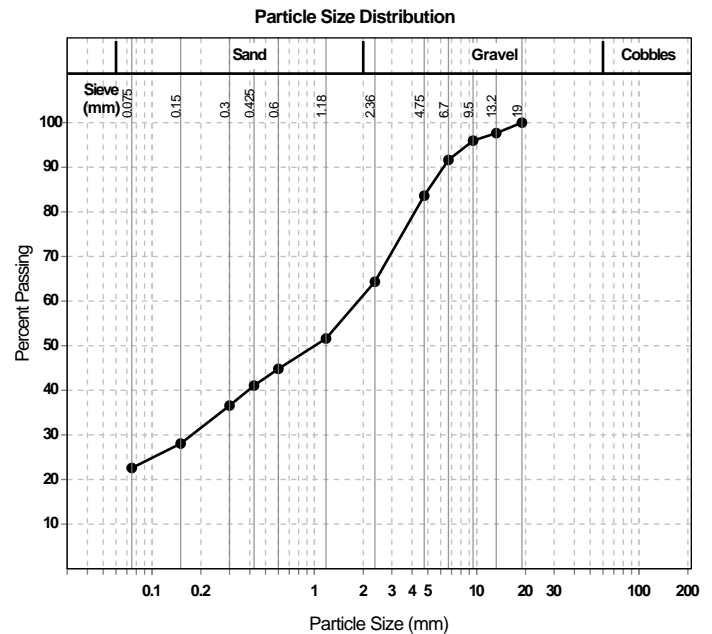
Approved Signatory: Arveendra Gounder

dp-arveendra.gounder

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-5
Issue Number: 1
Date Issued: 20/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 263
Sample Number: ME-263A
Date Sampled: 17/01/2020
Dates Tested: 17/01/2020 - 17/01/2020
Sampling Method: Sampled by Client
The results apply to the sample as received
Remarks: Blended from 0.8-1.0(m) and 1.0-1.3(m) samples
Sample Location: HR-SLR-TP02, Depth: 0.8-1.3(m)
Material: Silty gravelly SAND

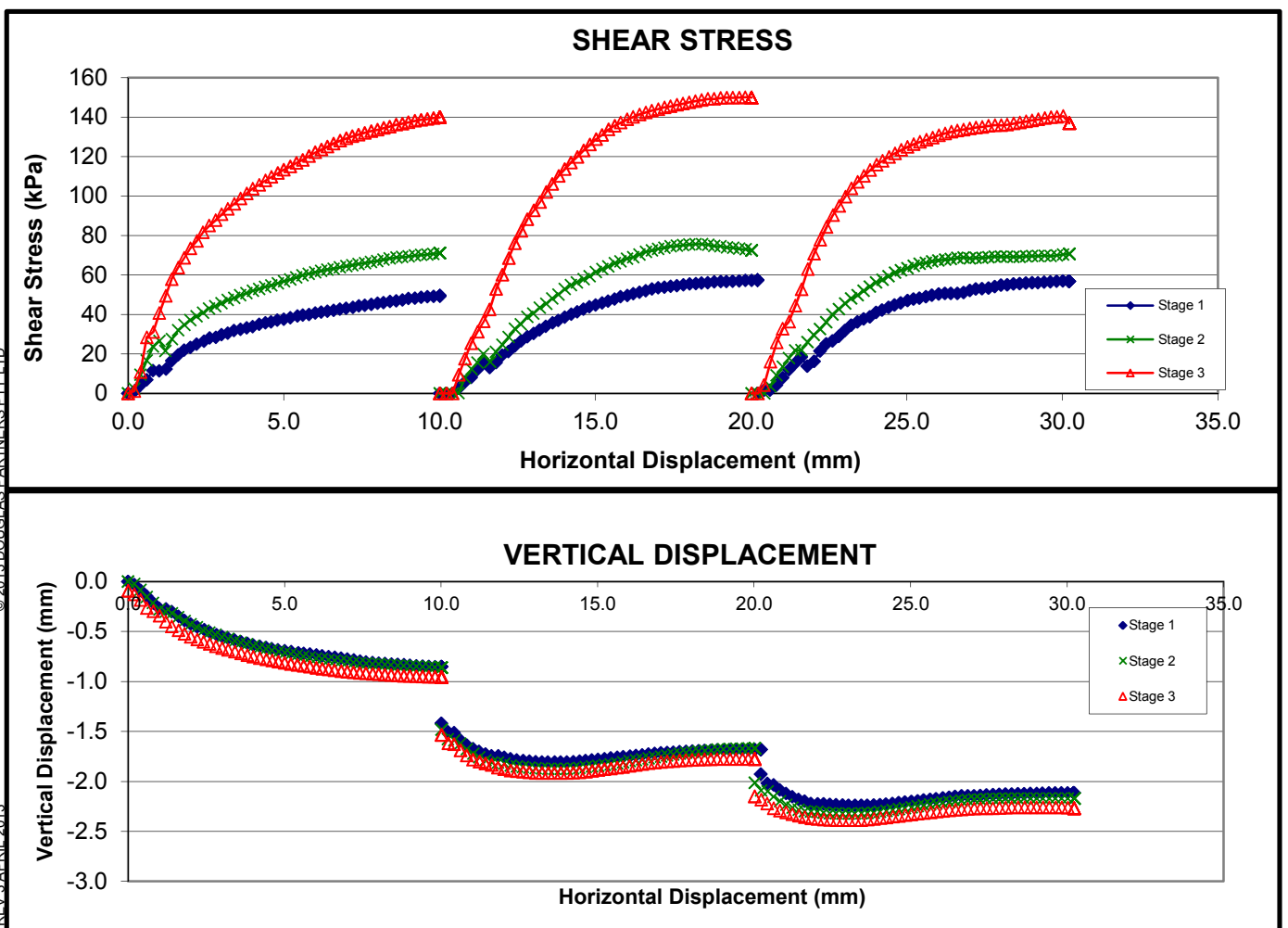
Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	98	
9.5 mm	96	
6.7 mm	92	
4.75 mm	84	
2.36 mm	64	
1.18 mm	52	
0.6 mm	45	
0.425 mm	41	
0.3 mm	37	
0.15 mm	28	
0.075 mm	23	



Direct Shear Test Results

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005008
Location :	Rum Jungle Mine, Batchelor, NT	Report Date :	07 Feb 2020
Test Location :	HR-SLR-TP02	Date Sampled :	-
Depth / Layer :	0.8-1.3 (m)	Date of Test:	04 Feb 2020
Sample Description:	Silty gravelly SAND (Blended 0.8-1.0 & 1.0-1.3)	Sample State:	Loose, Saturated
		Page:	1 of 2

STAGE DETAILS	1	2	3	SPECIMEN DETAILS	1	2	3
Normal Stress (kPa)	50	75	150	Initial Dry Density (t/m ³)	1.18	1.12	1.11
Strain rate (mm/min)	0.5	0.5	0.5	Initial Height (mm)	24	28	28
				Initial Length/Diameter (mm)	60.05	60.05	60.05
Condition	Loose, Saturated			Moisture Content Initial	5.2	5.2	5.2
				(%) After Test	19.6	18.4	17.1



NOTES

Test Method(s): AS 1289.6.2.2, AS 1289.2.1.1



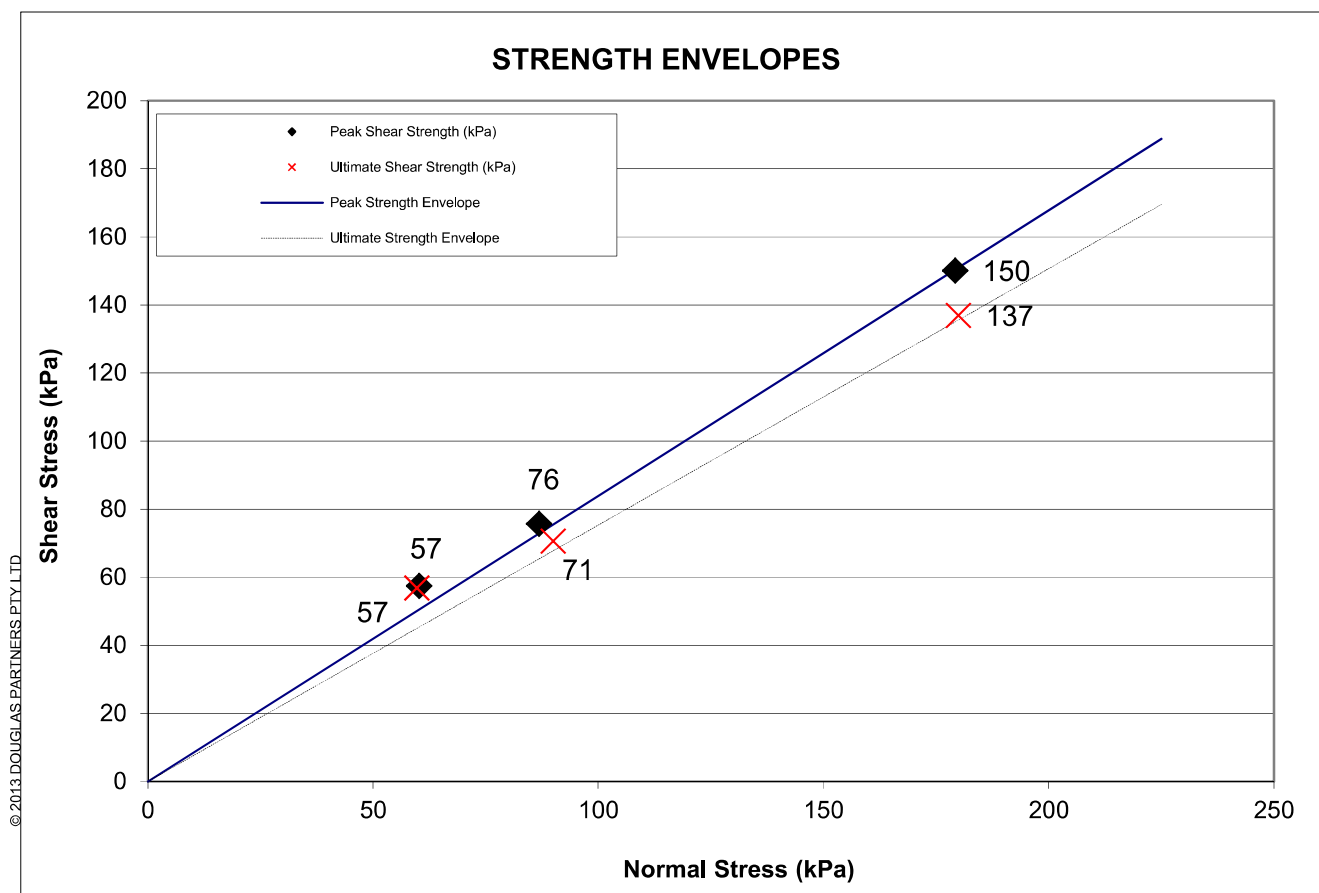
NATA Accredited Laboratory No 828
 The results of the tests, calibrations and/or
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 Accredited for compliance with ISO/IEC 17025

Tested: AD
 Checked: AD


 Peter Chan
 Associate

Direct Shear Test Results

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005008
Location :	Rum Jungle Mine, Batchelor, NT	Report Date :	07 Feb 2020
Test Location :	HR-SLR-TP02	Date Sampled :	-
Depth / Layer :	0.8-1.3 (m)	Date of Test:	04 Feb 2020
Sample Description:	Silty gravelly SAND (Blended 0.8-1.0 & 1.0-1.3)	Sample State:	Loose, Saturated
		Page:	2 (Optional)



INTERPRETED RESULTS

Cohesion (kPa)	PEAK 0	ULTIMATE 0
Angle of Internal Friction	40°	37°

NOTES

- Area correction applied to normal stress
- Material retained on 1.18mm sieve excluded

Test Method(s): AS 1289.6.2.2, AS 1289.2.1.1



NATA Accredited Laboratory No 828
The results of the tests, calibrations and/or

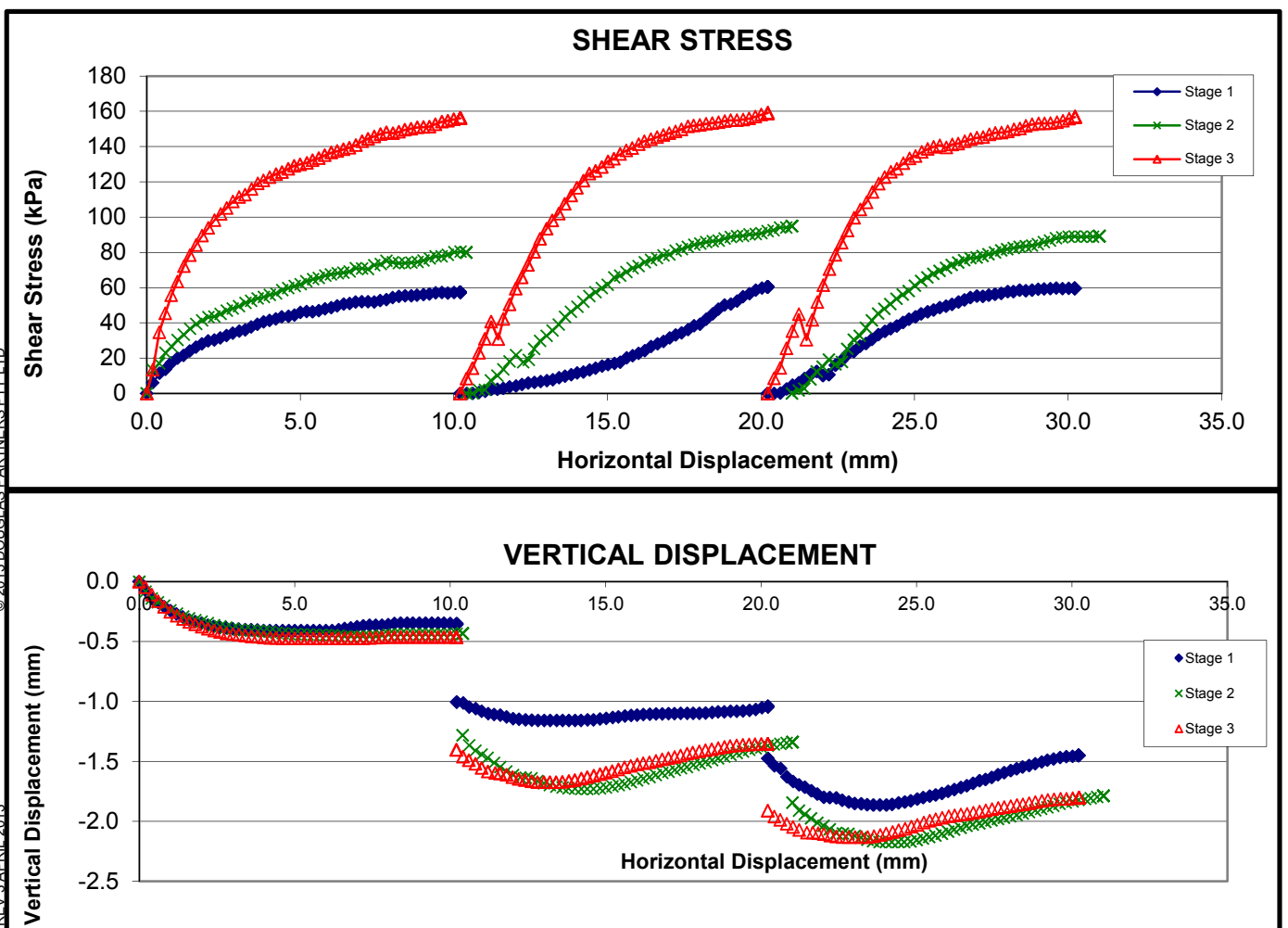
Tested: AD
Checked: AD

P. Chan
Peter Chan
Associate

Direct Shear Test Results

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005007
Location :	Rum Jungle Mine, Batchelor, NT	Report Date :	07 Feb 2020
Test Location :	HR-SLR-TP02	Date Sampled :	-
Depth / Layer :	0.8-1.3 (m)	Date of Test:	21 Jan 2020
Sample Description:	Silty gravelly SAND (Blended 0.8-1.0 & 1.0-1.3)	Sample State:	Loose, Saturated
		Page:	1 of 2

STAGE DETAILS	1	2	3	SPECIMEN DETAILS	1	2	3
Normal Stress (kPa)	50	75	150	Initial Dry Density (t/m ³)	1.30	1.30	1.31
Strain rate (mm/min)	0.5	0.5	0.5	Initial Height (mm)	24	26	26
				Initial Length/Diameter (mm)	60.05	60.05	60.05
Condition	Loose, Saturated			Moisture Content Initial (%)	3.9	3.9	3.9
				After Test	17.3	16.2	16.8



NOTES

Test Method(s): AS 1289.6.2.2, AS 1289.2.1.1



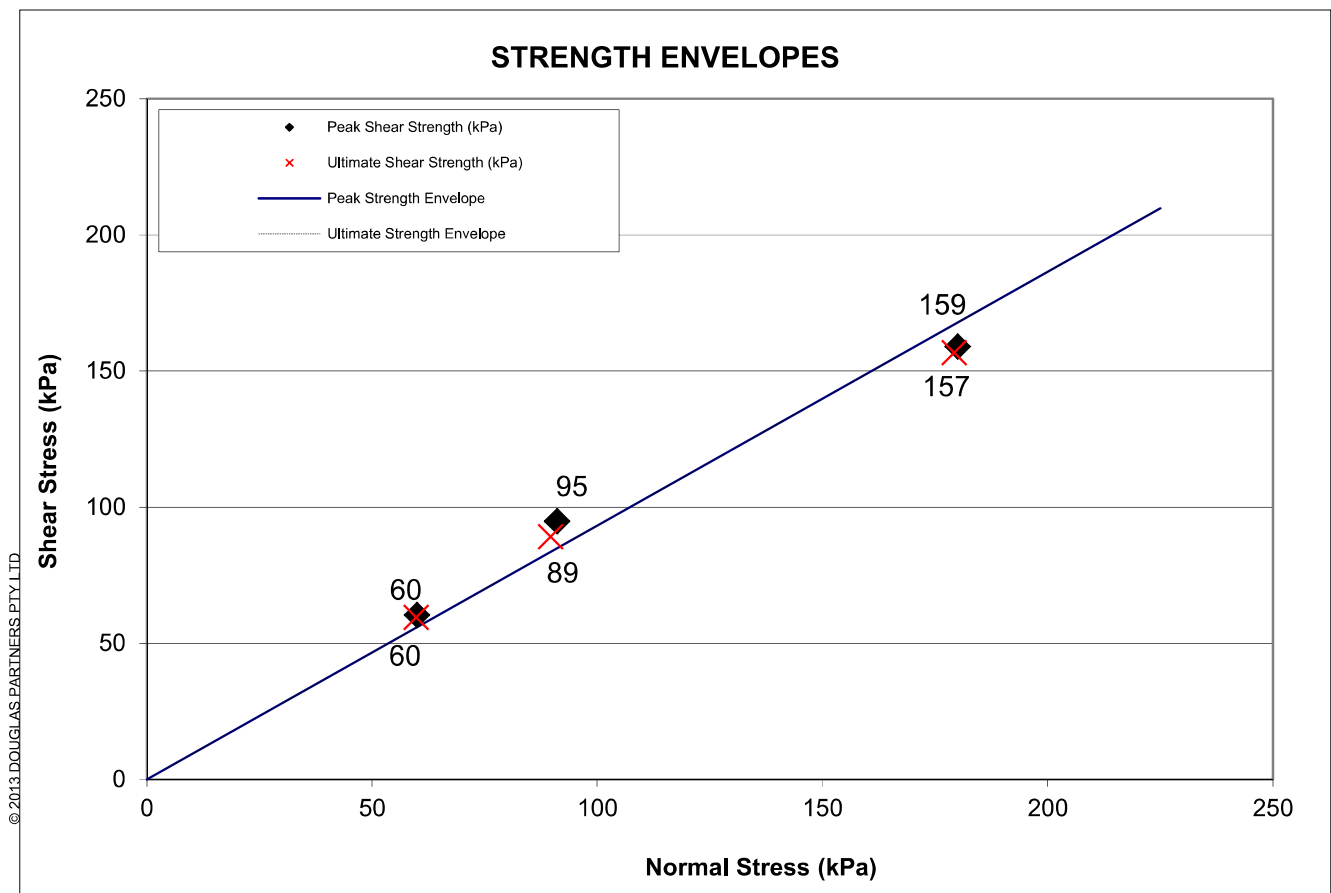
NATA Accredited Laboratory No 828
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 measurements included in this document are
 traceable to Australian/national standards.
 Accredited for compliance with ISO/IEC 17025

Tested: AD
 Checked: AD

P. Chan
 Peter Chan
 Associate

Direct Shear Test Results

Client :	SLR Consulting Australia Pty Ltd	Project No. :	677667.00
Project :	BATCHELOR - Rum Jungle Rehabilitation #3	Report No. :	M20005007
Location :	Rum Jungle Mine, Batchelor, NT	Report Date :	07 Feb 2020
Test Location :	HR-SLR-TP02	Date Sampled :	-
Depth / Layer :	0.8-1.3 (m)	Date of Test:	21 Jan 2020
Sample Description:	Silty gravelly SAND (Blended 0.8-1.0 & 1.0-1.3)	Sample State:	Loose, Saturated
		Page:	2 (Optional)



INTERPRETED RESULTS

Cohesion (kPa)	0	0
Angle of Internal Friction	43°	43°

NOTES

- Area correction applied to normal stress
- Material retained on 3.15mm sieve excluded

Test Method(s): AS 1289.6.2.2, AS 1289.2.1.1



NATA Accredited Laboratory No 828
 The results of the tests, calibrations and/or

Tested: AD
 Checked: AD



Peter Chan
 Associate

Material Test Report



(Signature)

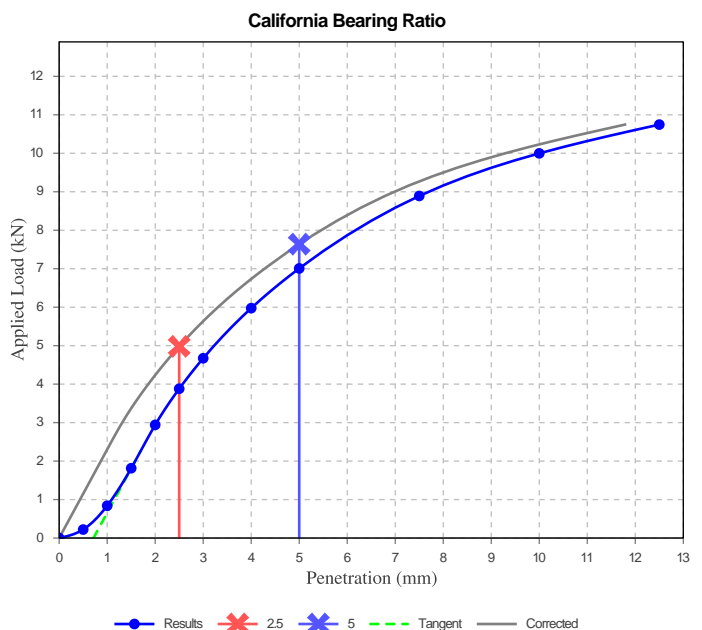
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3
Issue Number: 1
Date Issued: 26/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177A
Date Sampled: 03/10/2019
Dates Tested: 17/10/2019 - 15/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: HR-SLR-TP04 (0.6 - 0.8m)
Material: Silty Sandy Gravel

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	40		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.12		
Optimum Moisture Content (%)	6.0		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	2.01		
Field Moisture Content (%)	4.5		
Moisture Content at Placement (%)	6.0		
Moisture Content Top 30mm (%)	12.4		
Moisture Content Rest of Sample (%)	10.5		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report



(Signature)

Approved Signatory: Clare Whelan

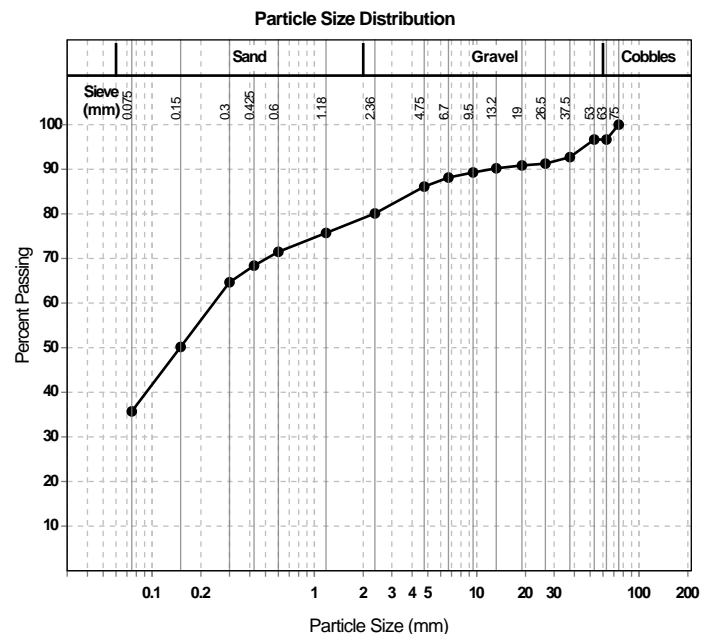
Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3
Issue Number: 1
Date Issued: 26/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177B
Date Sampled: 03/10/2019
Dates Tested: 17/10/2019 - 29/10/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: HR-SLR-TP06b (2.0 - 2.2m)
Material: Silty Sandy Clay

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
75 mm	100	
63 mm	97	
53 mm	97	
37.5 mm	93	
26.5 mm	91	
19 mm	91	
13.2 mm	90	
9.5 mm	89	
6.7 mm	88	
4.75 mm	86	
2.36 mm	80	
1.18 mm	76	
0.6 mm	71	
0.425 mm	68	
0.3 mm	65	
0.15 mm	50	
0.075 mm	36	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	27		
Plastic Limit (%)	21		
Plasticity Index (%)	6		



Material Test Report



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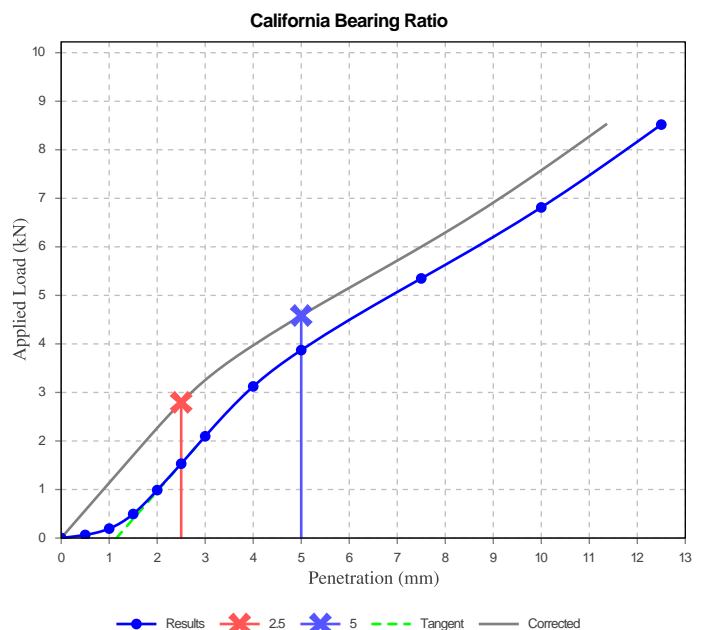
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3
Issue Number: 1
Date Issued: 26/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177B
Date Sampled: 03/10/2019
Dates Tested: 17/10/2019 - 15/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: HR-SLR-TP06b (2.0 - 2.2m)
Material: Silty Sandy Clay

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	25		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.01		
Optimum Moisture Content (%)	11.5		
Laboratory Density Ratio (%)	94.5		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.90		
Field Moisture Content (%)	11.9		
Moisture Content at Placement (%)	11.6		
Moisture Content Top 30mm (%)	12.8		
Moisture Content Rest of Sample (%)	11.4		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	8.3		



Material Test Report



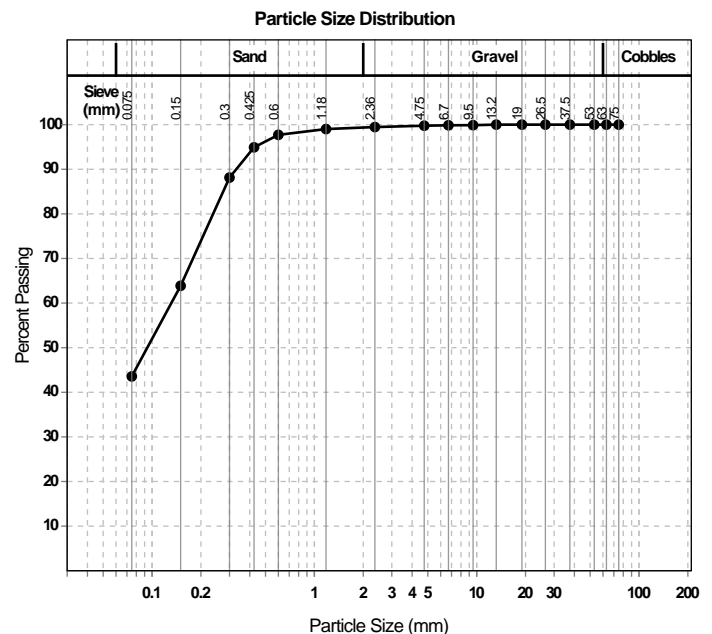
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3
Issue Number: 1
Date Issued: 26/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177C
Date Sampled: 07/10/2019
Dates Tested: 17/10/2019 - 29/10/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: HR-SLR-TP09a (1.4 - 1.8m)
Material: Silty Sand

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	99	
1.18 mm	99	
0.6 mm	98	
0.425 mm	95	
0.3 mm	88	
0.15 mm	64	
0.075 mm	44	



Material Test Report



[Signature]

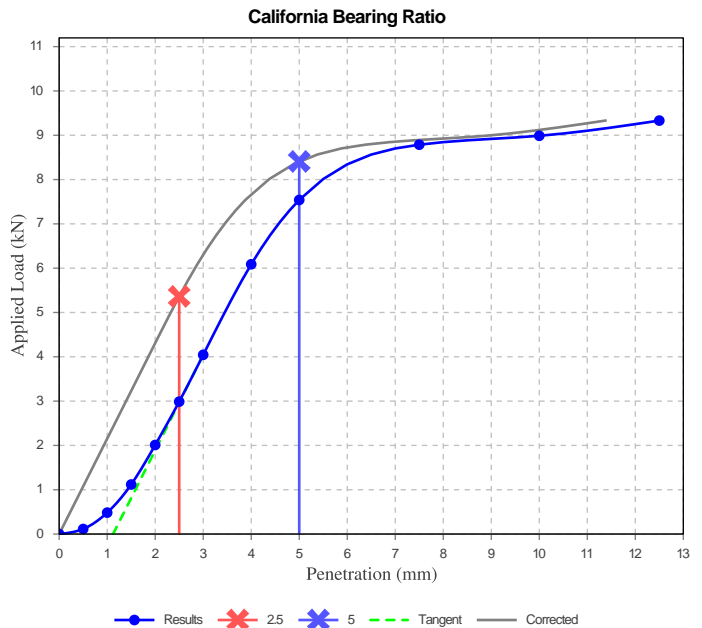
Approved Signatory: Clare Whelan

Lab Manager

NATA Accredited Laboratory Number: 828

Report Number: 677667.00-3
Issue Number: 1
Date Issued: 26/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300 (Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 2177
Sample Number: DW-2177C
Date Sampled: 07/10/2019
Dates Tested: 17/10/2019 - 15/11/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: HR-SLR-TP09a (1.4 - 1.8m)
Material: Silty Sand

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	40		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.97		
Optimum Moisture Content (%)	8.0		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.88		
Field Moisture Content (%)	6.8		
Moisture Content at Placement (%)	8.0		
Moisture Content Top 30mm (%)	14.7		
Moisture Content Rest of Sample (%)	13.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	24		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



ALDEBARAN QUARRY

LABORATORY RESULTS


SLR INVESTIGATION LABORATORY RESULTS

Material Test Report

Report Number: 677667.00-1
Issue Number: 1
Date Issued: 18/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300
(Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 4088
Sample Number: NC-4088B
Date Sampled: 08/10/2019
Dates Tested: 26/10/2019 - 31/10/2019
Sampling Method: Sampled by Others
The results apply to the sample as received
Sample Location: Q-SLR-GS03
Material: Granite

Sodium Sulphate Soundness (AS 1141.24)	Min	Max
75 - 53mm		
53 - 37.5mm	50.1	
37.5 - 26.5mm		
26.5 - 19mm		
19 - 13.2mm		
13.2 - 9.5mm		
9.5 - 4.75mm		
4.75 - 2.36mm		
2.36 - 1.18mm		
1.18 - 0.600mm		
0.600 - 0.300mm		
Total Weighted Loss (%)	50.1	




Approved Signatory: Peter Gorseski
Laboratory Manager

NATA Accredited Laboratory Number: 828

Material Test Report

Report Number: 677667.00-1
Issue Number: 1
Date Issued: 18/11/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300
(Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 4088
Sample Number: NC-4088D
Date Sampled: 08/10/2019
Dates Tested: 26/10/2019 - 31/10/2019
Sampling Method: Sampled by Others
The results apply to the sample as received
Sample Location: Q-SLR-GS05
Material: Granite

Sodium Sulphate Soundness (AS 1141.24)		Min	Max
75 - 53mm	0.5		
53 - 37.5mm			
37.5 - 26.5mm			
26.5 - 19mm			
19 - 13.2mm			
13.2 - 9.5mm			
9.5 - 4.75mm			
4.75 - 2.36mm			
2.36 - 1.18mm			
1.18 - 0.600mm			
0.600 - 0.300mm			
Total Weighted Loss (%)	0.5		



Approved Signatory: Peter Gorseski
Laboratory Manager

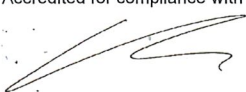
NATA Accredited Laboratory Number: 828

Material Test Report

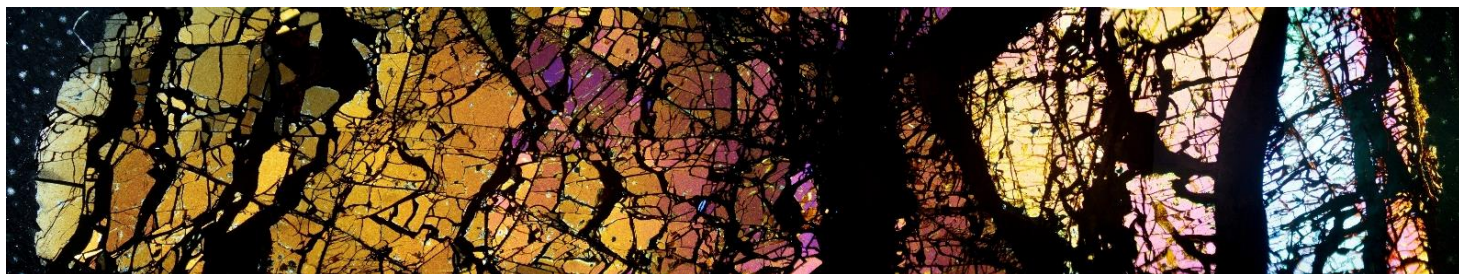
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Issue Number: 1
Date Issued: 06/12/2019
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Project Number: 677667.00
Project Name: Rum Jungle Rehabilitation - Project Ref 680.10421.02300
(Geotech St II)
Project Location: Rum Jungle Mine, Batchelor
Work Request: 4279
Sample Number: NC-4279A
Date Sampled: 28/11/2019
Dates Tested: 01/12/2019 - 01/12/2019
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: Q-SLR-GS03
Material: Granite

Sodium Sulphate Soundness (AS 1141.24)	Min	Max
75 - 53mm		
53 - 37.5mm	13.4	
37.5 - 26.5mm		
26.5 - 19mm		
19 - 13.2mm		
13.2 - 9.5mm		
9.5 - 4.75mm		
4.75 - 2.36mm		
2.36 - 1.18mm		
1.18 - 0.600mm		
0.600 - 0.300mm		
Total Weighted Loss (%)	13.4	




Approved Signatory: Peter Gorseski
Laboratory Manager

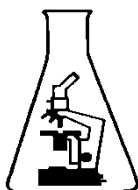
NATA Accredited Laboratory Number: 828



Geochempet Services

ABN 25 065 630 506

PETROGRAPHIC, GEOLOGICAL & GEOCHEMICAL CONSULTANTS



28 Cameron Street
Clontarf Q 4019

Telephone: (07) 3284 0020

Email: info@geochempet.com
www.geochempet.com

**PETROGRAPHIC REPORT
ON A ROCK SAMPLE (DW-2179E)
FROM NEAR RUM JUNGLE
FOR SLR CONSULTING AUSTRALIA PTY LTD**

prepared for

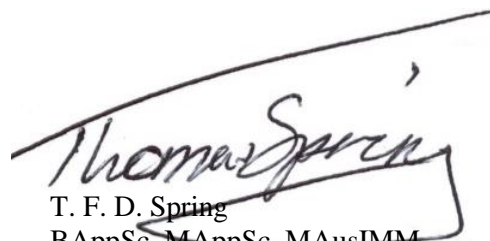
**DOUGLAS PARTNERS PTY LTD
DARWIN LABORATORY**

Purchase Order: 147892

Invoice Number: G2011535

Client Ref: Clare Whelan
Frances Cull

Issued by


T. F. D. Spring
BAppSc. MAppSc. MAusIMM
18 November 2019

NOVEMBER, 2019

Do191101

Page 1 of 5

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GEOCHEMPET SERVICES BRISBANE

<u>Sample Label:</u>	DW-2179E	<u>Date Sampled:</u>	08/10/2019
<u>Project Number:</u>	677667.00	<u>Date Received:</u>	30/10/2019
<u>Location:</u>	Q-SLR-GS04	<u>Sample Type:</u>	Rock
<u>Sample Location:</u>	52 L 715340 E 8564974 S		
<u>Work Requested</u>	Petrographic analysis in relation to suitability for use as armour rock for erosion protection		

Methods Account taken of ASTM C295 Standard Guide for *Petrographic Assessment of Aggregates for Concrete*, the AS2758.1 – 2014 *Aggregates and rock for engineering purposes part 1; Concrete aggregates (Appendix B)*, and in accordance with ASTM D4992-07 *Standard Guide for Evaluation of Rock to be used for Erosion Control*

Identification Porphyritic micro-granite (or more specifically micro-adamellite)

Description

The sample consisted of a hard, robust, apparently fresh, finely speckled, broadly greyish-orange pink, fine to medium-grained crystalline igneous rock fragment of granitic appearance. Close inspection reveals greyish-orange pink feldspar, colourless and clear quartz and dark biotite.



Figure 1: Photograph of washed sub-sample from supplied aggregate

GEOCHEMPET SERVICES BRISBANE

A thin section was prepared to permit detailed microscopic examination in transmitted polarised light of area 64 x 22 mm. An approximate mineralogical composition of the aggregate, expressed in volume percent and based on a brief count of 100 widely spaced points, is:

Primary minerals

35%	quartz
28%	plagioclase feldspar
28%	orthoclase feldspar (orthoclase and microcline)
1%	biotite
<1%	other primary minerals (including opaque oxide, apatite and zircon)

Secondary minerals

4%	muscovite/sericite
<1%	epidote
3%	chlorite
1%	limonite

In thin section, the rock fragments are seen to consist of fine to medium-grained granitic rock, displaying porphyritic, hypidiomorphic, crystalline igneous textures with groundmass grains in the size range from about 0.1 to 0.5 mm: phenocrysts range from 1 to 2 mm in size.

Phenocrysts comprise recrystallized aggregates of quartz, plagioclase and K-feldspar similar in appearance to groundmass grains. Quartz is observed as essentially equidimensional, anhedral grains and commonly clusters of grains in an unstrained to faintly strained condition. Plagioclase feldspar is present as crudely prismatic, well-twinned grains showing slight, zonal clouding and fine sericitization. K-feldspar grains form anhedral, slightly clouded, micro-perthitic and tartan twinned grains (microcline). Clots of brown biotite contain small inclusions of some fine accessory mineral (opaque oxide and zircon), and is now generally partly chloritized. Some coarse sericite or fine muscovite is present in association with biotite and within some orthoclase grains: it is probably deuteric rather than primary. There are also trace amounts of opaque oxide, apatite and zircon present.

Limonite forms a trace amount of staining in some of the fragments.

Comments and Interpretations

The supplied rock sample (labelled DW-2179E) from Rum Jungle, qualifies for identification broadly as granite using the IUGS classification system and more specifically as adamellite using older established British/Australia conventions. Because of the rather fine grainsize of the rock, the prefix micro can be applied to the identification as granite or adamellite, which is an intrusive acid igneous rock. It appears to have been incipiently metamorphosed as quartz phenocrysts are now composed of aggregates of quartz grains and orthoclase has been converted to microcline.

GEOCHEMPET SERVICES BRISBANE

For engineering purposes, the rock in the supplied sample may be summarised as:

- **porphyritic micro-granite** or specifically porphyritic micro-adamellite (an intrusive acid igneous rock)
- fine to medium-grained
- porphyritic
- holocrystalline
- apparently fresh
- lightly altered
- having a secondary mineral content of about 8% (<1% robust epidote along with chlorite, muscovite/sericite as well as a trace of secondary iron oxides)
- 9% of weak, soft or non-durable minerals, specifically biotite, sericite, muscovite and chlorite
- **hard**
- **strong**

The rock is predicted to be **durable**. Thus, rock equivalent to the supplied samples is predicted to be **suitable for use as armour rock for erosion protection**, provided large blocks can be quarried free of weaknesses such as joints, veins and other defects.

Free Silica Content

The free silica content is about 35% (as quartz grains about 0.1 to 2 mm in size, locked within crystalline rock).

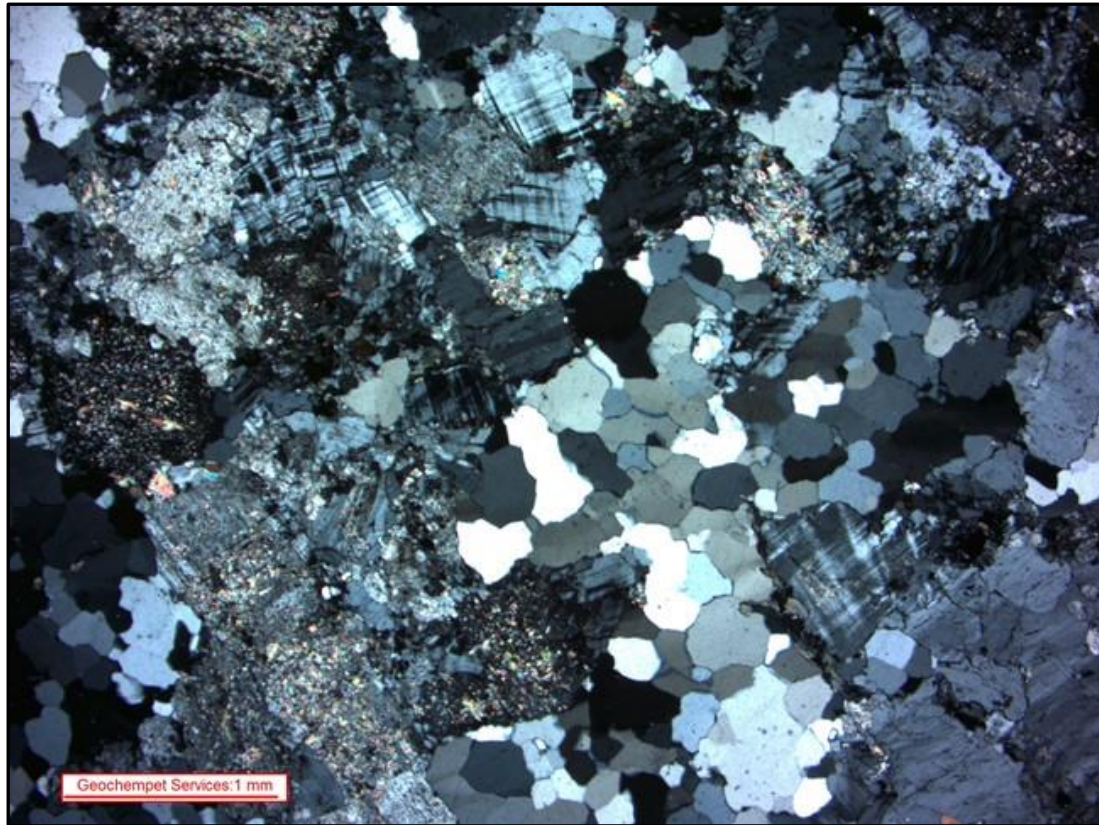


Figure 1. Micrograph taken at low magnification, in transmitted cross polarised light of a micro-granite. Image shows a typical mineral assemblage seen throughout the slide, consisting of quartz, plagioclase and biotite. Note the biotite has been altered in part to brown chlorite and the plagioclase contain disseminated sericite alteration.