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.

NORTHERN TERRITORY GOVERNMENT

Department of **Primary Industry and Resources**

Base and Pit Walls

Southern and Eastern Pit Walls

Spoil Pile

Looking South

Laterite Cobble

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

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

NORTHERN TERRITORY GOVERNMENT

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 Excavato | ANGLE FROM HORIZONTAL : 90° | CHECKED BY : BT

DATE LOGGED : 03/10/19 | DRILLER : C. McGregor | STABILITY : Stable

DRILLING				MATERIAL						OBSERVATION	
METHOD& BUCKET TYPE	PENETRATION VE E F H	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 5 10 15 20	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	**1.30m (B)**	79	1		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		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.		VD		Laterite	
				78	2			EOH: 2.00m - Target depth					
				77	3								
				76	4								
				75	5								

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle

SLR
5 Foelsche Street, Darwin, NT 0800

Looking East

Northern Pit Wall

Looking North

Spoil Pile

Spoil Pile

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

SLR

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP05 Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Datum:	AHD
Status:	Design		
Date:	03/10/2019		

Version: 1.0

NORTHERN TERRITORY GOVERNMENT

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 Excavato | ANGLE FROM HORIZONTAL : 90° | CHECKED BY : BT

DATE LOGGED : 08/10/19 | DRILLER : C. McGregor | STABILITY : Stable

DRILLING				MATERIAL						OBSERVATION	
METHOD& BUCKET TYPE	PENETRATION (VE E F H)	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 (5, 10, 15, 20)	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.		St - VSt			
							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.		MD - D			
				78	2		SM	SM - silty SAND with clay, fine grained, red brown; clay, medium plasticity. 1.9m: Boulder of shale present.	D			Alluvium	
				77	3			SM - silty SAND with gravel, fine grained, red brown; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, conglomerate, quartz and ironstone.		VD			
				76	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								

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

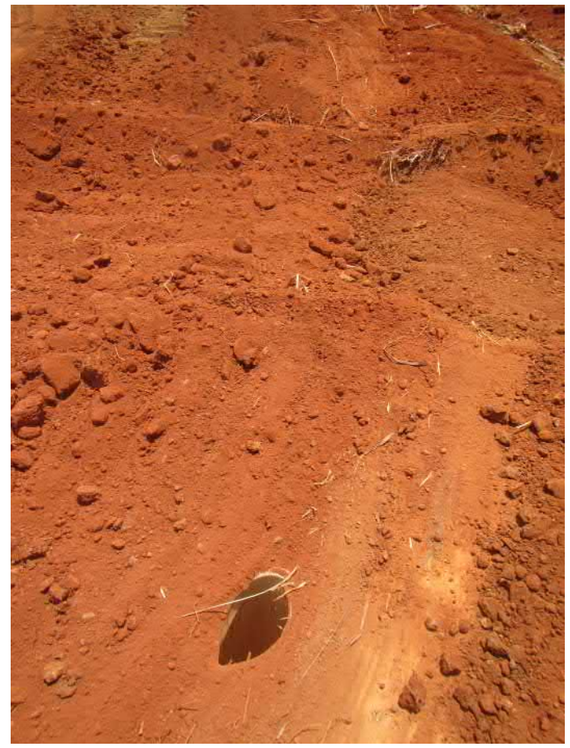
Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle

SLR
5 Foelsche Street, Darwin, NT 0800

Western Pit Wall

Western Pit Wall



Exposed Borehole to the East of the Test Pit

Looking South

Spoil Pile

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

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

NORTHERN TERRITORY GOVERNMENT

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 (VE E F H)	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 (5, 10, 15, 20)	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	0.50m (D)	79	1		SC	MIXTURE OF SOIL AND COBBLES/BOULDERS (MATRIX SUPPORTED) SC clayey gravelly SAND, low to medium plasticity, fine to coarse grained, red brown; gravel, fine to medium grained, rounded to sub-angular, weathered granite, shale and meta-sediment; cobbles, <100mm, subrounded to subangular, granite, shale and breccia.	D	VD	>>	Fill	
			2.00m (B)	78	2			1.8m: Becomes dark reddish brown and sandy.					
				77	3								
			4.00m (D)	76	4		ML	ML - clayey SILT trace sand and gravel, low plasticity, reddish brown; sand, fine to coarse grained; gravel, fine to coarse grained, rounded to sub-angular, weathered granite, shale, meta-sediment and quartz		VSt		Alluvium	
				75	5			EOH: 4.80m - Machine Limit					

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle Geotechnical Investigation

SLR
5 Foelsche Street, Darwin, NT 0800

Northern Pit Wall

Looking East

Spoil Pile

Spoil Pile

Looking South East

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP06b Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Datum:	AHD
Status:	Design	Version:	1.0
Date:	03/10/2019		

NORTHERN TERRITORY GOVERNMENT

TEST PIT EXCAVATION LOG

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 AMG | 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 (VE E F H)	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 (5 10 15 20)	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	**0.10m (B)** **1.40m (D)** **1.90m (D)**	79 78 77 76 75	1 2 3 4 5		ML SP Cl - CH	ML - sandy SILT with gravel, low to medium plasticity, grey brown; sand, fine to medium grained; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, ironstone and quartz; frequent rootlets (<2mm diameter) and occasional sub-rounded cobbles of granite and quartz SP - gravelly SAND with silt, poorly graded, fine to coarse grained, orange brown mottled red; gravel, fine to coarse grained, rounded to sub-angular, weathered granite, quartz, meta sediments and siltstone; occasional sub-rounded cobbles of granite Cl - CH - gravelly CLAY with sand, low to medium plasticity, red brown; gravel, fine to coarse grained, rounded to sub-angular, weathered granite, shale, meta-sediment and quartz; sand, fine to medium grained; occasional horizons of sand and gravel, occasional boulder and frequent sub-rounded to sub-angular cobbles of granite, met sediment and quartz. 1.0m - 1.3m: Boulder of granite present. EOH: 2.10m - Target depth	D	VSt VD VSt		Fill	

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle

5 Foelsche Street, Darwin, NT 0800

Southern Pit Wall - Gravel Drainage Bed

Looking West

Spoil Pile

Spoil Pile

Spoil Pile - Waste Rock

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

SLR

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP07 Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3 Version: 1.0
Project No.:	680.10421	Datum:	AHD
Status:	Design		
Date:	03/10/2019		

NORTHERN TERRITORY GOVERNMENT

TEST PIT EXCAVATION LOG

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 Excavato | ANGLE FROM HORIZONTAL : 90° | CHECKED BY : BT

DATE LOGGED : 07/10/19 | DRILLER : C. McGregor | STABILITY : Stable

DRILLING				MATERIAL						OBSERVATION	
METHOD& BUCKET TYPE	PENETRATION (VE E F H)	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 (5 10 15 20)	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	**0.80m (D)**	79	1		ML	ML - sandy SILT trace gravel, low to medium plasticity, grey brown; sand, fine to medium grained; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, ironstone and quartz; frequent rootlets (<2mm diameter)	D			Topsoil	
							CI - CH	CI - CH - gravelly CLAY with sand, low to medium plasticity, red brown; gravel, fine to coarse grained, rounded to sub-rounded, weathered granite, ironstone, siltstone and quartz; sand, fine to medium grained; occasional horizons of clayey sand.		VSt		Laterite	
				78	2		GP	MIXTURE OF SOIL AND COBBLES/BOULDERS (MATRIX SUPPORTED) GP sandy GRAVEL with silt, low plasticity, poorly graded, fine to coarse grained, sub-rounded to sub-angular, meta-sediment and siltstone, red brown; sand, fine to coarse grained. EOH: 2.10m - Machine Limit		VD		Extremely Weathered Bedrock	
				77	3								
				76	4								
				75	5								

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Rum Jungle

SLR
5 Foelsche Street, Darwin, NT 0800

Looking North

Spoil Pile

Eastern Pit Wall

Looking North

Spoil Pile

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

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

NORTHERN TERRITORY GOVERNMENT

TEST PIT EXCAVATION LOG

HOLE NO.: HR-SLR-TP09A

PROJECT : Rum Jungle Geotechnical Investigation | LOCATION : Rum Jungle Mine | FILE / JOB NO.: 680.10421

DATE STARTED : 07/10/19 | POSITION : E: 717045.48, N: 8563084.18 (52 MGA94) | 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 : Flooding

DRILLING				MATERIAL					OBSERVATION	
METHOD& BUCKET TYPE	PENETRATION VE E F H	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 5 10 15 20	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		07/10/2019	**1.40m (B)**	79 78 77 76 75	1 2 3 4 5		GC	GC - sandy GRAVEL with silt, fine to coarse grained, sub-rounded to sub-angular, shale, schist and meta sediment, greenish grey mottled brown; sand, fine to coarse grained; rare sub-rounded cobble of shale (paving sub-base)				Fill	
							SP	SP - gravelly SAND with silt, poorly sorted, fine to coarse grained, orangish brown mottled red; gravel, fine to coarse grained, sub-rounded to sub-angular, shale, schist and meta sediment; rare sub-rounded cobbles of shale		MD - D			
							SM	SM - silty SAND with gravel, fine grained, orangish brown mottled grey; gravel, fine to coarse grained, rounded to sub-rounded, siltstone, comglomerate, quartz and ironstone 1.8m: Becomes pale grey mottled brown.	D	D - VD		Alluvium	
							SM	SM - silty SAND with gravel, fine grained, dark grey mottled brown; gravel, fine to coarse grained, sub-rounded to sub-angular, shale; frequent sub-rounded cobbles of shale EOH: 3.60m - Flooding				Extremely Weathered Bedrock	

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle Geotechnical Investigation

SLR
5 Foelsche Street, Darwin, NT 0800

Looking North - Water filled base

Eastern Pit Wall

Looking North

Spoil Pile

Spoil Pile

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

SLR
2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

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

NORTHERN TERRITORY GOVERNMENT

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 (VE E F H)	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 (5 10 15 20)	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered		80	0			Ground Surface					
				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)		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		D			
				78	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	D	VSt		River Terrace	
				77	3		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		D			
				76	4								
				75	5			EOH: 5.00m - Target depth					

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle Geotechnical Investigation

SLR
5 Foelsche Street, Darwin, NT 0800

Looking South

Looking South

Western Pit Wall

Eastern Pit Wall

Spoil Pile

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP09b Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Datum:	AHD
Status:	Design		
Date:	08/10/2019		

Version: 1.0

NORTHERN TERRITORY GOVERNMENT

TEST PIT EXCAVATION LOG

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 AMG | 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

DRILLING				MATERIAL						OBSERVATION	
METHOD& BUCKET TYPE	PENETRATION VE E F H	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 5 10 15 20	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	1.60m (B)	72	1		SM	SM - gravelly SAND with silt, fine to medium grained, red brown; gravel, fine to coarse grained, rounded to sub-angular, shale, granite, meta-sediment and quartz; rare sub-rounded cobble of shale and quartz; frequent rootlets (<2mm diameter)				Topsoil	
								QUARTZITE SANDSTONE BRECCIA; extremely weathered, red brown, medium strength; Recovered as gravelly SAND with silt, fine to coarse grained, red brown; gravel, fine to coarse grained, rounded to sub-angular, quartz, ironstone, mudstone and sandstone; frequent sub-rounded to angular cobbles and rare boulders of sandstone and quartz.					
				71	2			SHALE; extremely weathered, red brown mottled grey, low strength; Recovered as SAND and GRAVEL with clay, poorly graded, fine to coarse grained, sub-angular to angular, shale, red brown mottled grey; sand, fine to coarse grained; occasional sub-rounded cobble of shale.	D	D - VD		Extremely Weathered Bedrock	
								EOH: 2.40m - Target depth					
				70	3								
				69	4								
				68	5								

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle

SLR
5 Foelsche Street, Darwin, NT 0800

Looking West

Northern Pit Wall

Spoil Pile

Spoil Pile

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP10 Photo Log	Drawn:	FC		
Client:	DPIR	Reviewed:	BT		
Project:	Rum Jungle Rehabilitation	Size:	A3	Version:	1.0
Project No.:	680.10421	Datum:	AHD		
Status:	Design				
Date:	02/10/2019				

NORTHERN TERRITORY GOVERNMENT

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 Excavato | ANGLE FROM HORIZONTAL : 90° | CHECKED BY : BT

DATE LOGGED : 03/10/19 | DRILLER : C. McGregor | STABILITY : Stable

DRILLING				MATERIAL							OBSERVATION	
METHOD& BUCKET TYPE	PENETRATION VE E F H	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 5 10 15 20	ORIGIN	STRUCTURE & Other Observations
Excavator 600mm Toothed Bucket		Groundwater Not Encountered	**0.50m (B)**	86	1			QUARTZITE SANDSTONE BRECCIA; extremely weathered, red brown, medium strength; Recovered as gravelly SAND with silt, fine to coarse grained, red brown; gravel, fine to coarse grained, rounded to sub-angular, quartz, ironstone, mudstone and sandstone; frequent sub-rounded to angular cobbles and rare boulders of sandstone and quartz.	D	VD		Extremely Weathered Bedrock	
								QUARTZITE SANDSTONE BRECCIA; extremely weathered, red brown, medium strength.					
				85	2			EOH: 1.00m - Target depth					
				84	3								
				83	4								
				82	5								

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle

SLR

5 Foelsche Street, Darwin, NT 0800

Looking East

Spoil Pile

Eastern Pit Wall

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP11 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:	02/10/2019		

NORTHERN TERRITORY GOVERNMENT

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 (VE E F H)	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 (5, 10, 15, 20)	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.		S VSt		Topsoil	
							GP	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. 1.2m: Occasional sub-rounded cobble of weathered granite.	D	VD		Residual Soil	
				78	2			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	
				77	3								
				76	4								
				75	5								

See Symbology & Classification notes for details of abbreviations & basis of descriptions.

Proudly sponsored by NORTHERN TERRITORY GOVERNMENT

Rum Jungle Geotechnical Investigation

SLR
5 Foelsche Street, Darwin, NT 0800

Looking North

Western Pit Wall

Spoil Pile

Looking North

Looking East

File Location: \\AU.SLR.Local\Corporate\Projects-SLR\

SLR

2 LINCOLN STREET
LANE COVE
NEW SOUTH WALES 2066
AUSTRALIA
T: 61 2 9428 8100
F: 61 2 9428 8100
www.slrconsulting.com

Title:	SLR-HR-SLR-TP12 Photo Log	Drawn:	FC
Client:	DPIR	Reviewed:	BT
Project:	Rum Jungle Rehabilitation	Size:	A3
Project No.:	680.10421	Datum:	AHD
Status:	Design		
Date:	02/10/2019		

Version: 1.0

NORTHERN TERRITORY GOVERNMENT

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

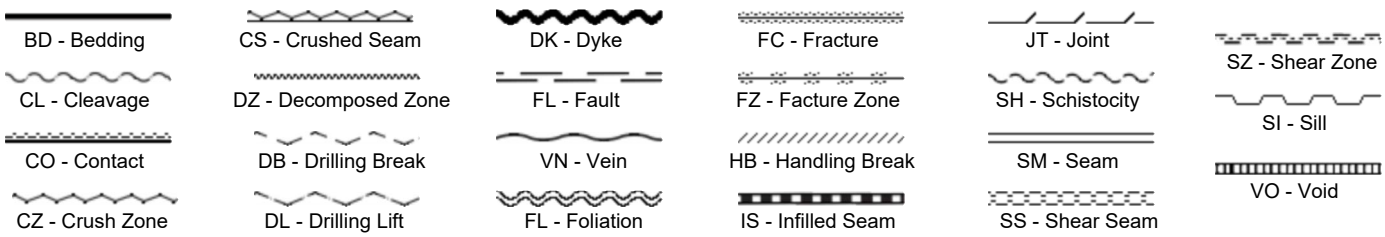
*FABRIC**

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



Notes

* AS1726:2017
** AGS3.1 RTA

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION - DRILLING

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)


Gravel (GRAVBKFL)


Concrete (CONCBKFL)


Bentonite (BENTBKFL)


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 Pentrometer


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

Douglas Partners
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

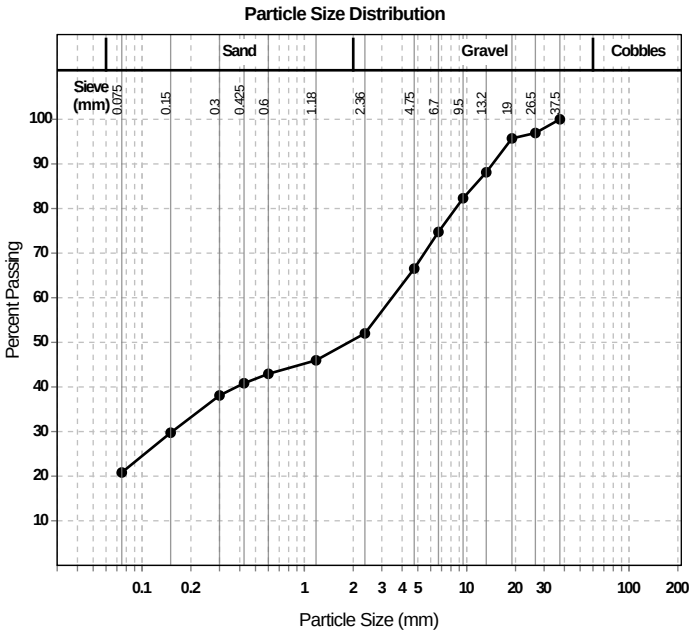
Accredited for compliance with ISO/IEC 17025 - Testing

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
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

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 (^{o}C)	26		



Material Test Report

Douglas Partners
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

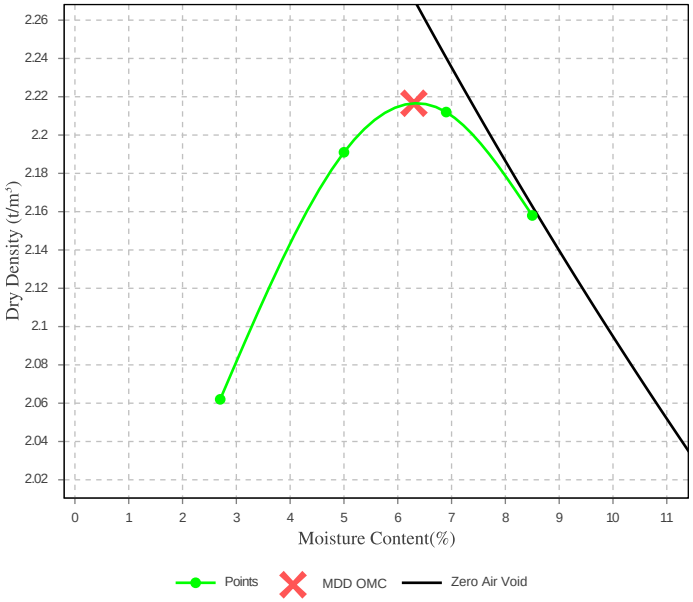
Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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
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

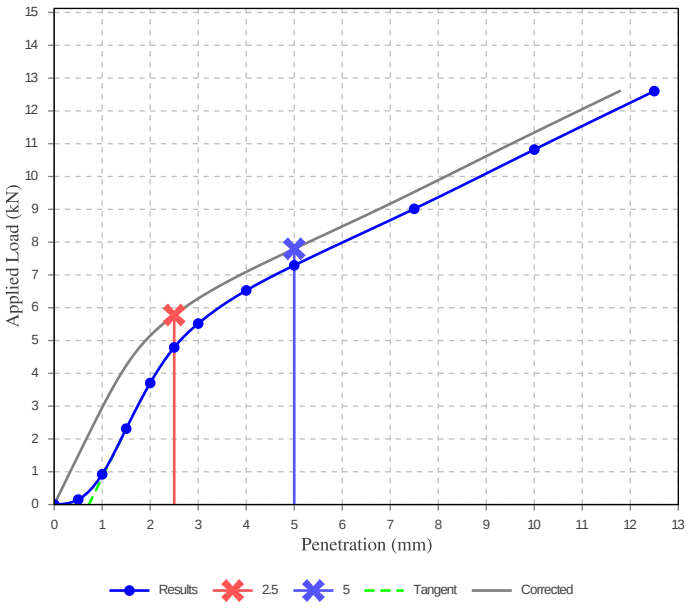
Dry Density - Moisture Relationship (AS 1289 5.2.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Modified
No. Layers	5
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	2.22
Optimum Moisture Content (%)	6.5
Retained on 19mm (%)	9.6
Oversize Sieve (mm)	19
Oversize Material Wet (%)	7.3
Oversize Material 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		

Moisture Density Relationship



California Bearing Ratio



Material Test Report

Douglas Partners
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

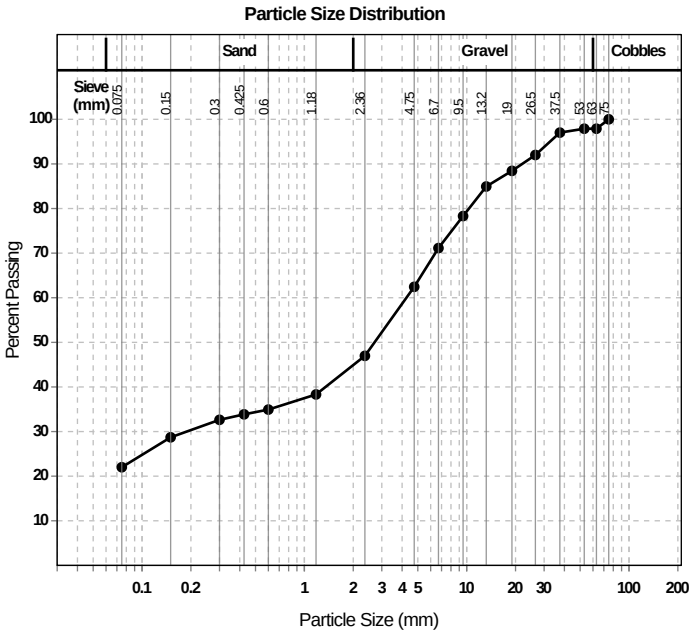
Accredited for compliance with ISO/IEC 17025 - Testing

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
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 (^{o}C)	26		

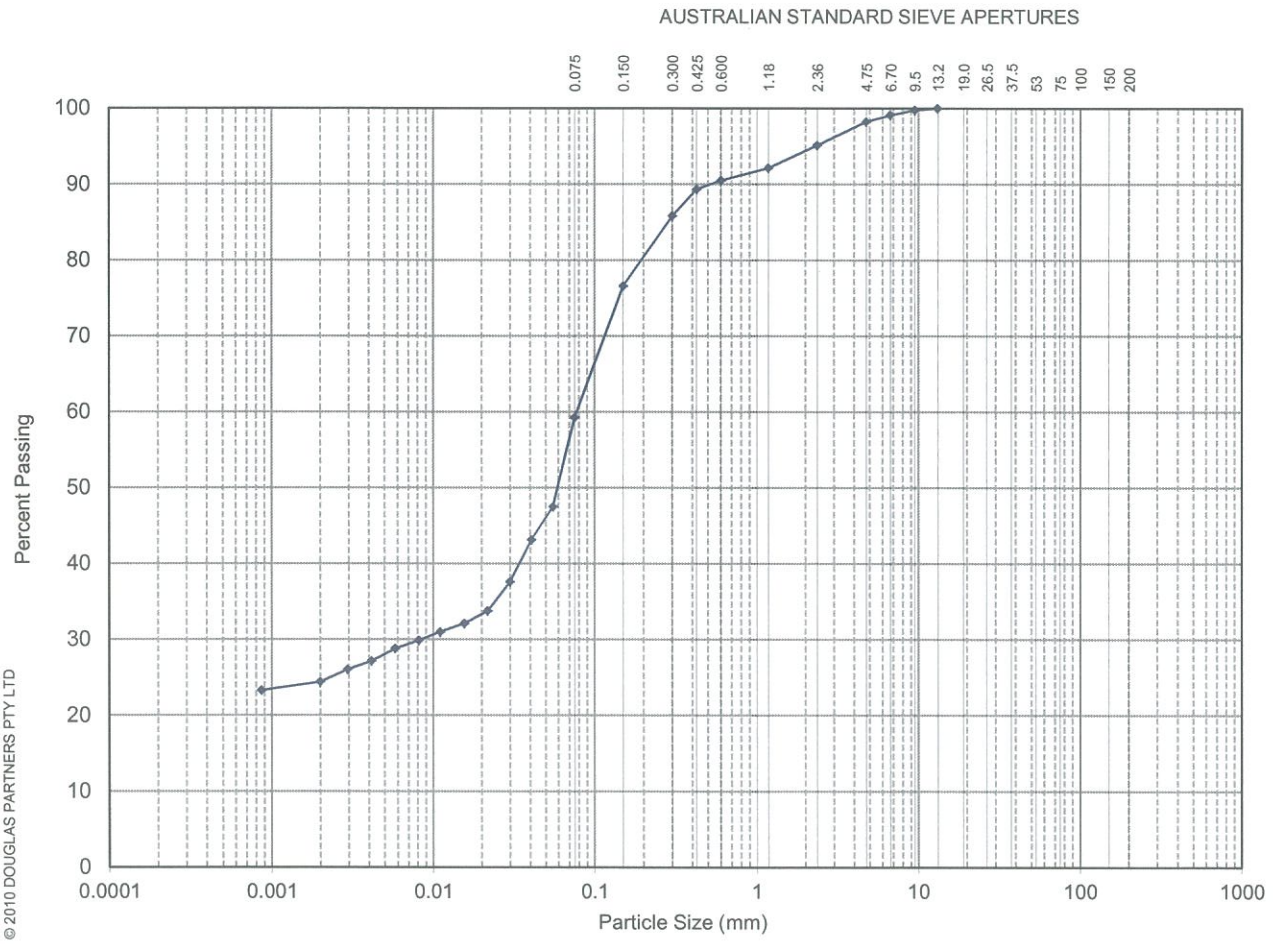


Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

Peter Chan
Associate

Material Test Report

Douglas Partners
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
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

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**		

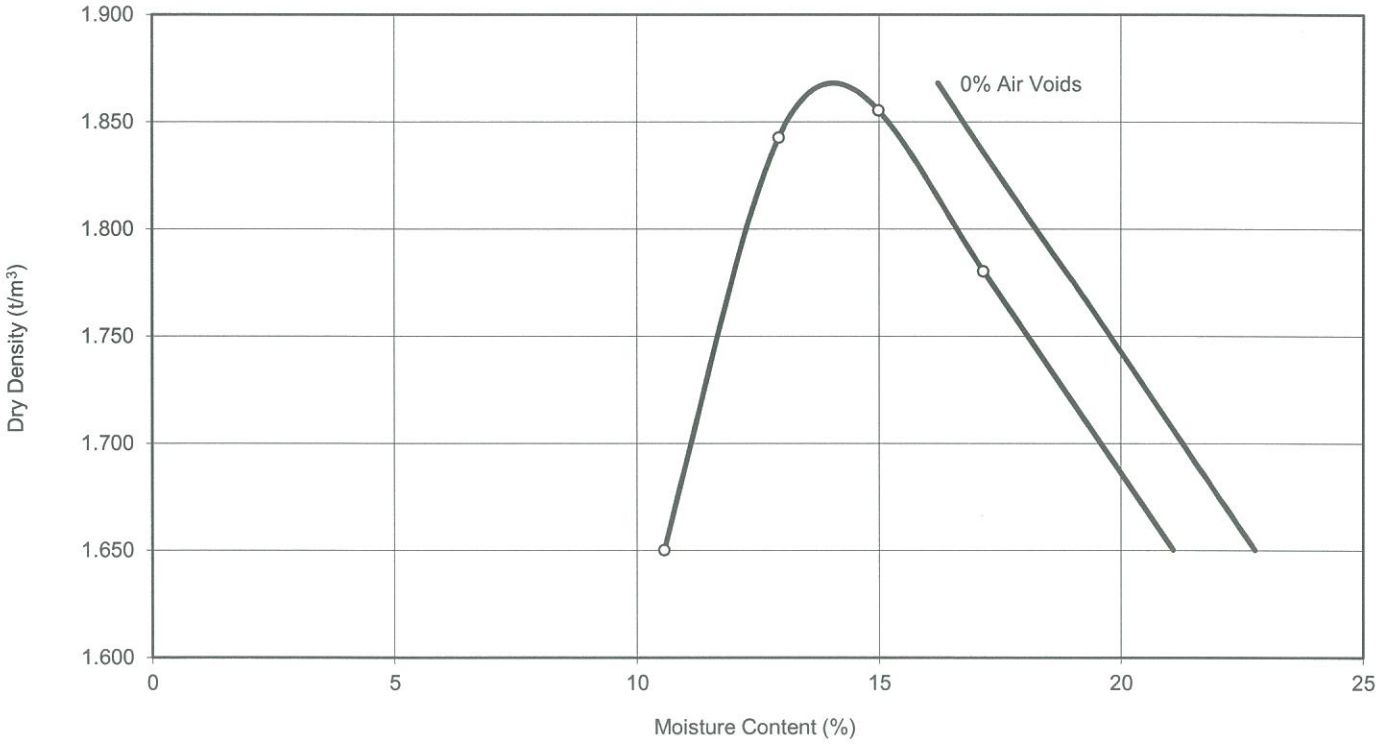
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	9.0		
Cracking Crumbling Curling	Cracking		

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136029
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	9/11/2019
Location :	Rum Jungle, Batchelor, NT	**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/m^3**
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 FOR TECHNICAL COMPETENCE

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

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Falling Head Permeability Test

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

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

Material Test Report

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

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: 19-2027G
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

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		

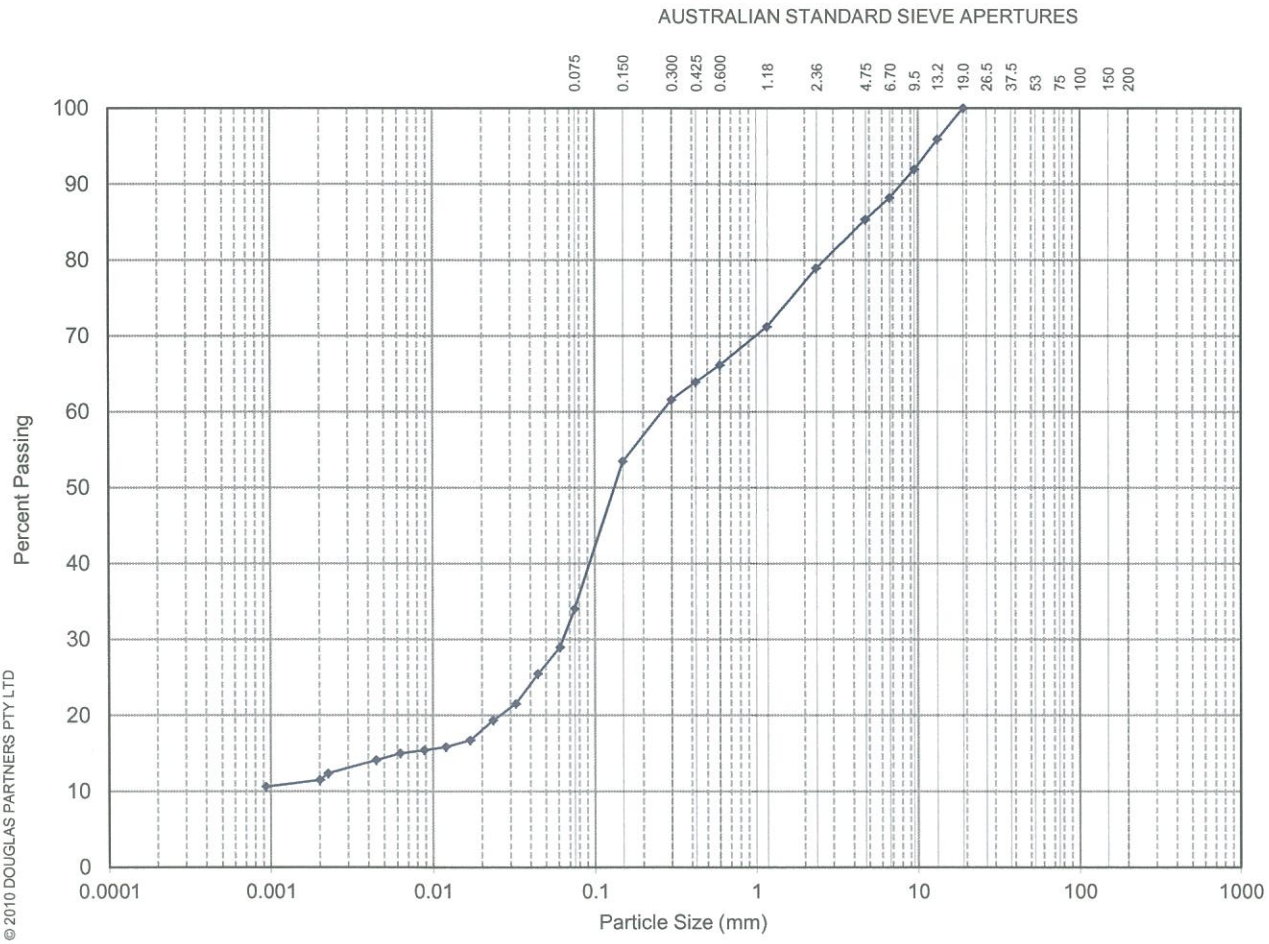
Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**4 ***		
Soil Description	Distilled		
Nature of Water	Natural		
Temperature of Water (^{o}C)	29.6		
* Mineral Present	Carbonate and Gypsum		

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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, 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 = 2.70 t/m³

Type of Hydrometer: g/l

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

Peter Chan
Associate

Material Test Report

Douglas Partners
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

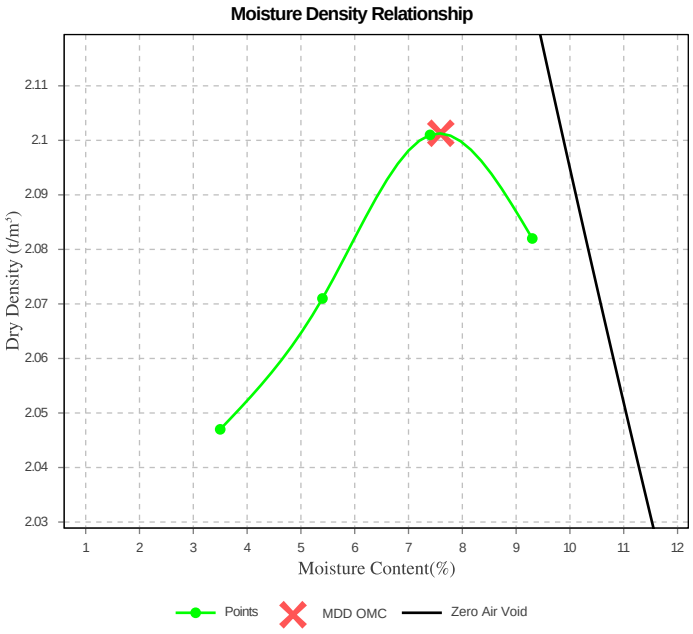
Accredited for compliance with ISO/IEC 17025 - Testing

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
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

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 (^{o}C)	26		



Material Test Report

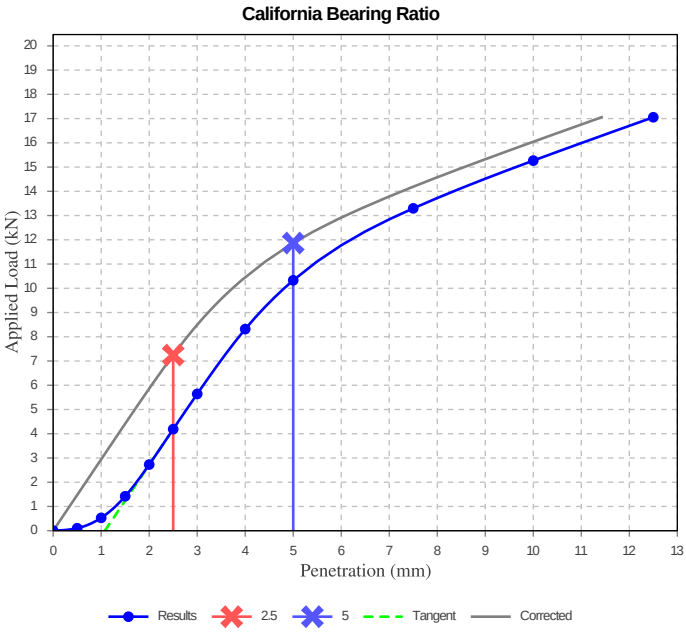
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

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
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

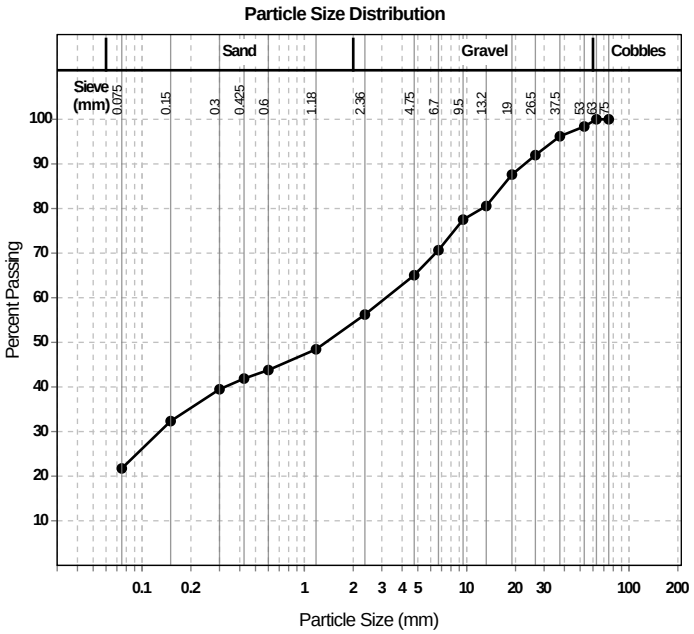
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

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
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

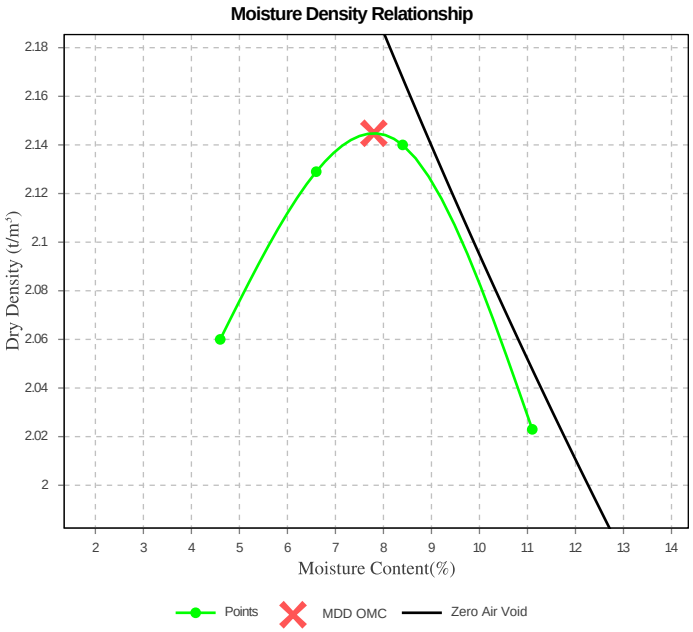
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

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
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

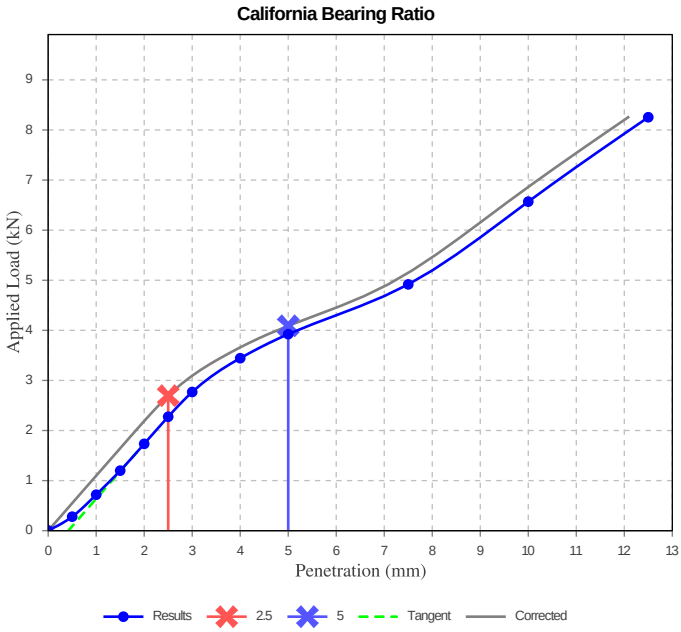
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

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
Sample Number: 19-2027I
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

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

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

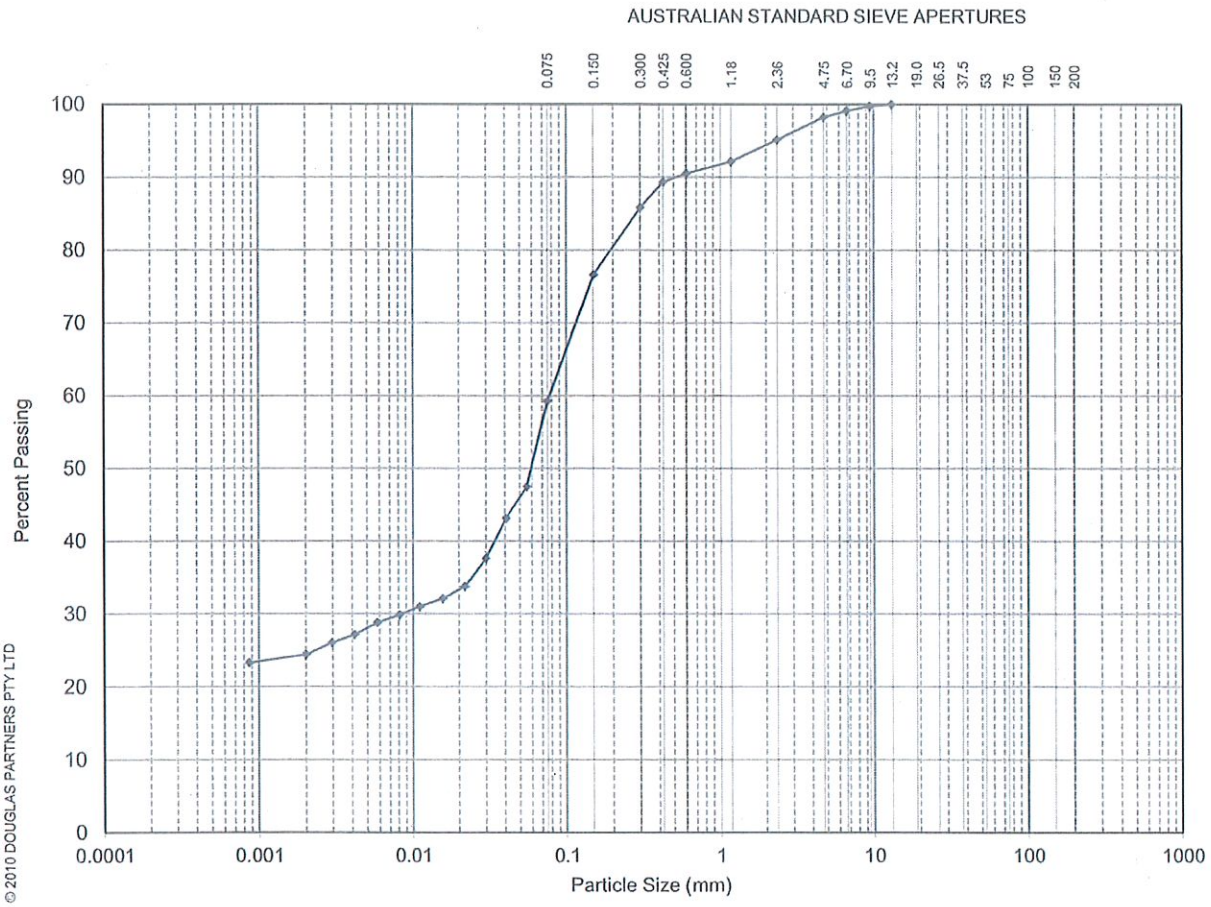
Sample Number	Sample Location	Moisture Content (%)	Material
19-2027B	WRTP-06 (0.70 - 1.00m)	6.1 %	Clayey Gravel. Resid
19-2027D	WRTP-08 (0.40 - 1.10m)	9.6 %	Cobb/Bould. Sandy Gravel w/Clay. Ex Weath
19-2027E	WRTP-13 (1.00 - 1.40m)	18.4 %	Sandy Clay w Silt. Resid
19-2027F	WTRP-14 (1.70 - 2.00m)	12.7 %	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

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

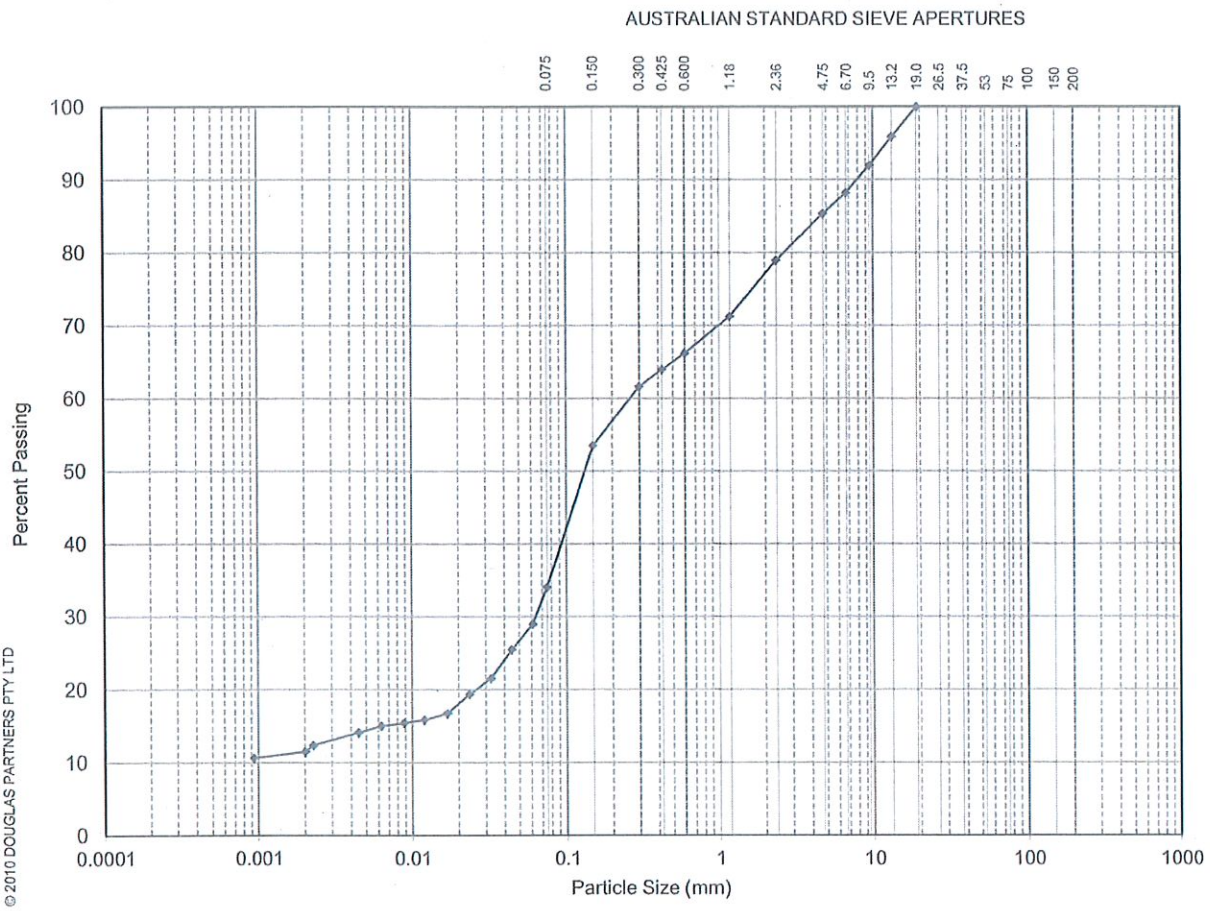
Peter Chan
Associate

Douglas Partners
Geotechnics | Environment | Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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, 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 = 2.70 t/m³

Type of Hydrometer: g/l

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

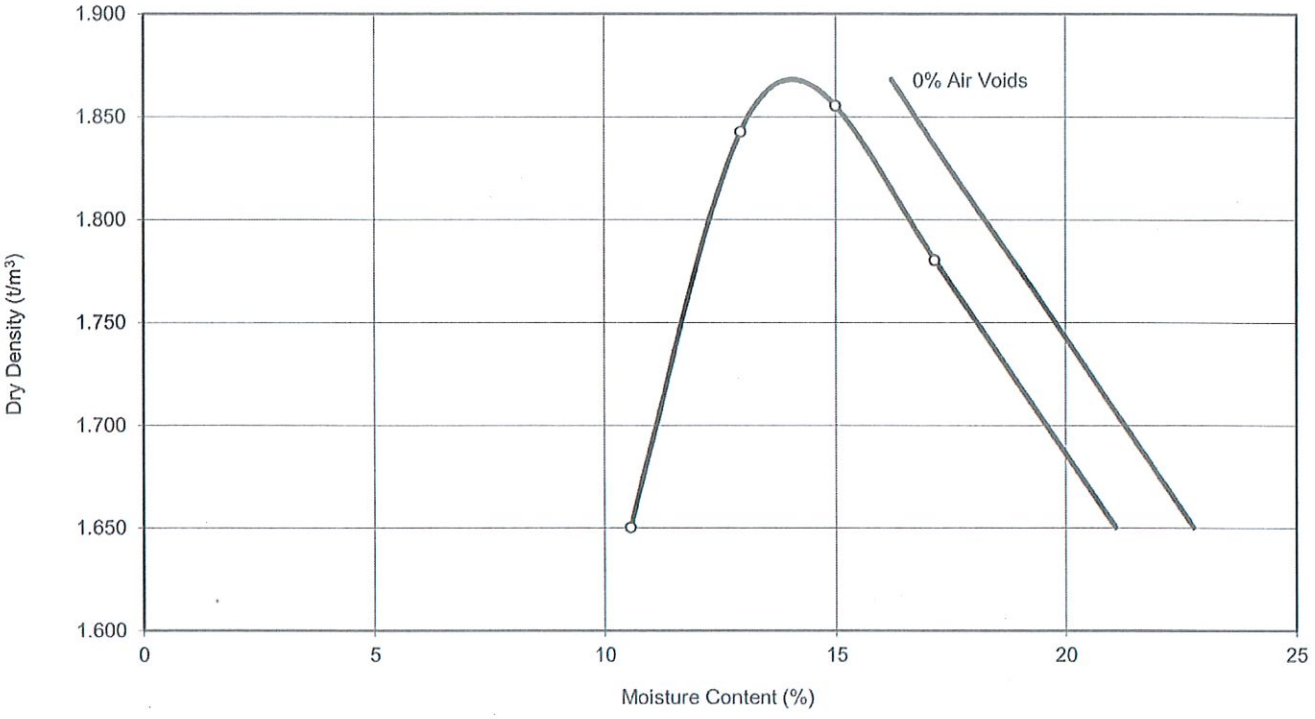
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136029
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	9/11/2019
Location :	Rum Jungle, Batchelor, NT	**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/m^3**
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 FOR TECHNICAL COMPETENCE

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

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Falling Head Permeability Test

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

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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: TT
Checked: AG

Peter Chan
Associate

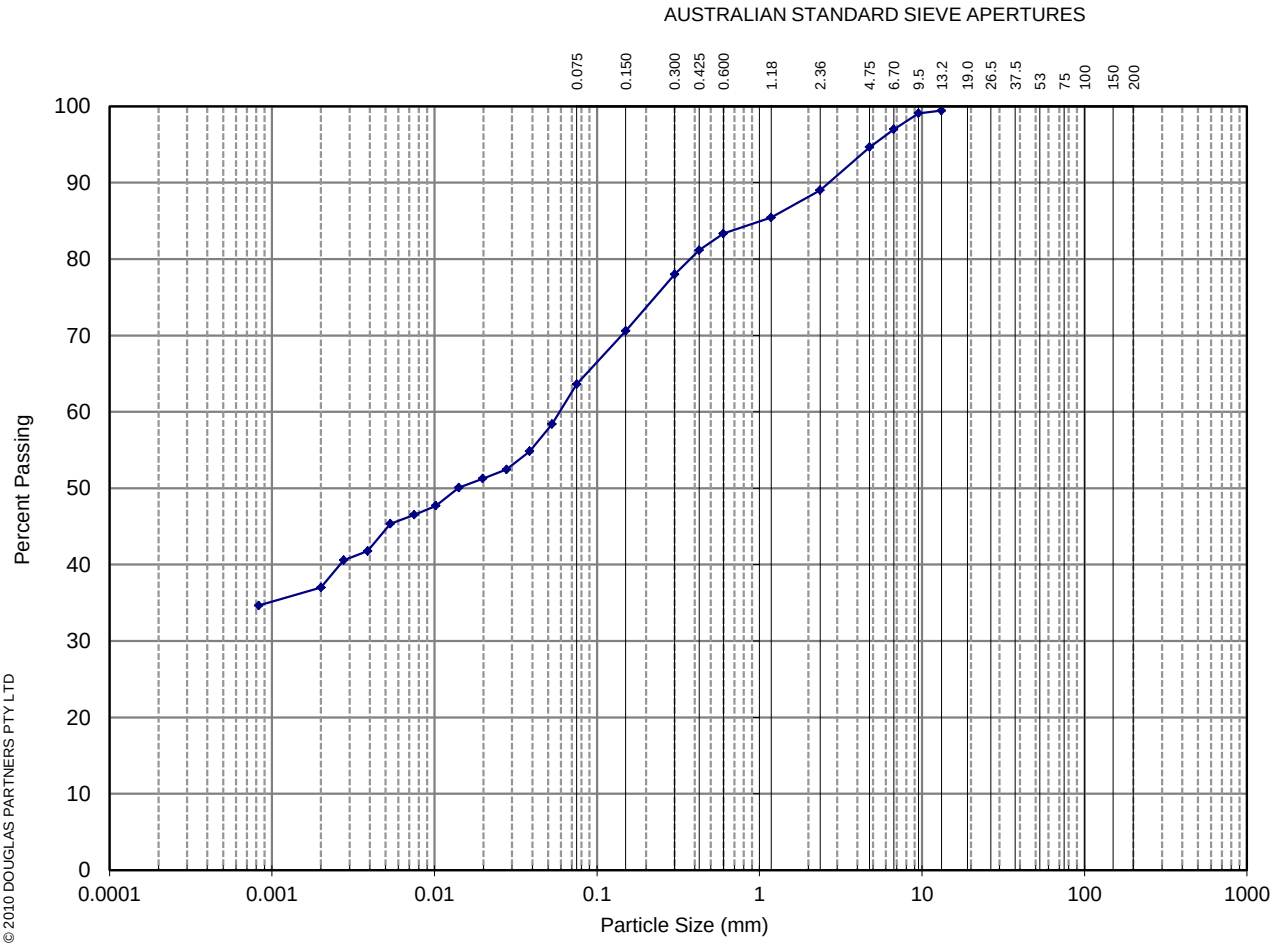
WRD-SLR-TP LABORATORY RESULTS

SLR **OCTOBER 2019** INVESTIGATION LABORATORY RESULTS

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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%**

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

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

Material Test Report

Douglas Partners
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: **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

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**		

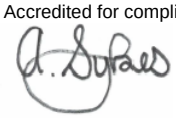
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Linear Shrinkage (%)	10.0		
Cracking Crumbling Curling	Cracking		

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 (^{o}C)			

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Coffs Harbour Laboratory
18 Lawson Crescent Coffs Harbour NSW 2450
Phone: (02) 6650 3200
Email: Doug.Dengate@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



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

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)**

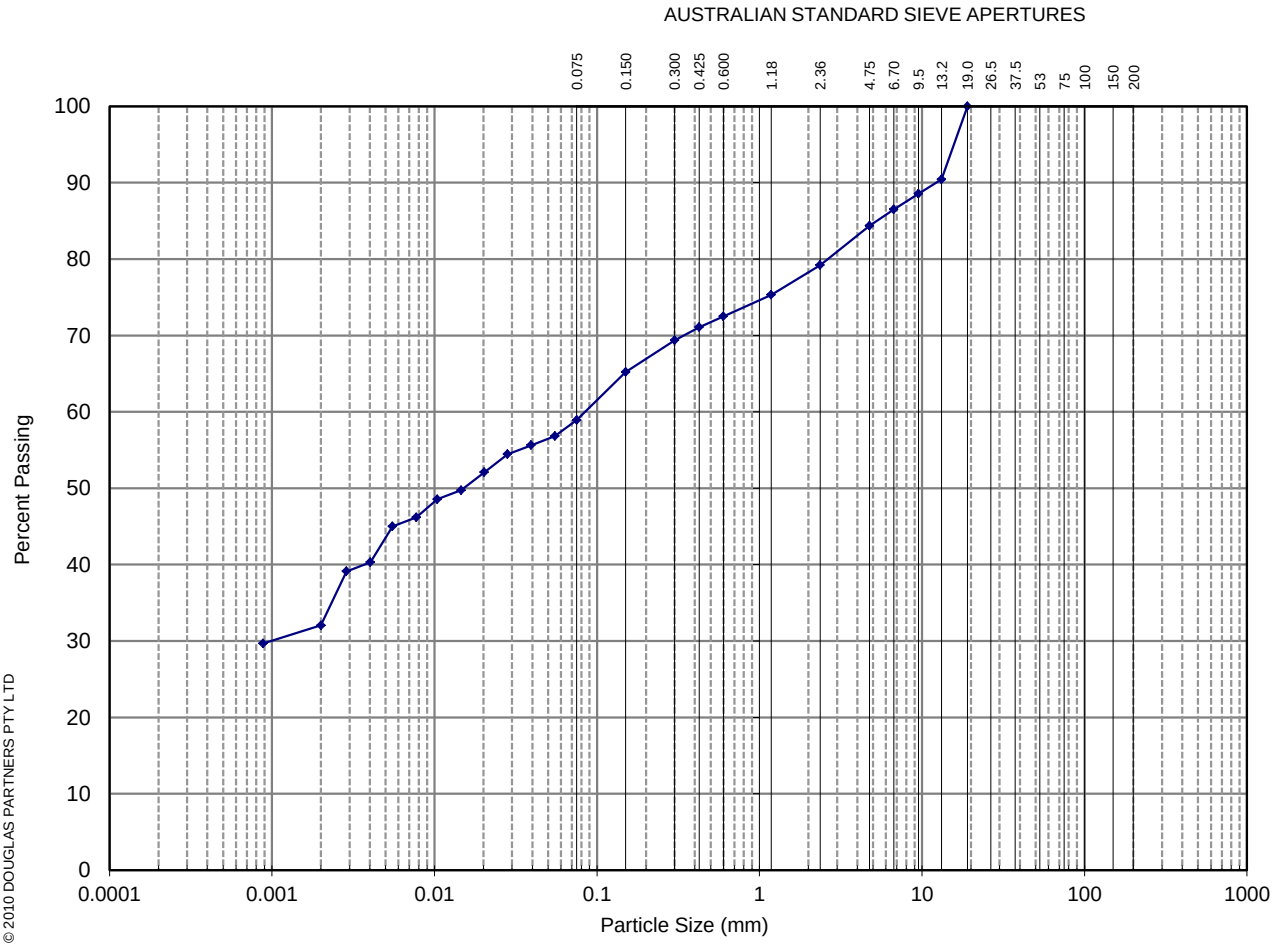
Falling Head Permeability (AS 1289 6.7.2 & 2.1.1)	
Coefficient of Permeability (m/sec)	**$2x10^{-9}$**
Method of Compactive Effort	Standard
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1
Maximum Dry Density (t/m^3)	1.711
Optimum Moisture Content (%)	19.8
Field Moisture Content (%)	20.0
Sieve for Oversize (mm)	19
Oversize Material (%)	0
Laboratory Density Ratio (%)	100.0
Laboratory Moisture Ratio (%)	100.5
Surcharges and Pressure Applied	4.95

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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%**

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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Moisture Content, Plasticity and Linear Shrinkage Tests

Client:	**SLR Consulting Australia Pty Ltd**	**Project No:**	677667.00
		Report No:	M20005005A
Project:	BATCHELOR - Rum Jungle Rehabilitation #3	**Report Date:**	13-Feb-2020
		Date Sampled:	-
Location:	Rum Jungle Mine	**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 length254mm)

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 (<50ºC) oven dried
3. Oven (105ºC) 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

Tested: SR
Checked: AG

Peter Chan
Associate

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

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Moisture Content Test

Client:	SLR Consulting Australia Pty Ltd	**Project No:**	677667.00
		Report No:	M20005004A
Project:	BATCHELOR - Rum Jungle Rehabilitation #3	**Report Date:**	01-Apr-2020
		Date Sampled:	-
Location:	Rum Jungle Mine	**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

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Determination of Emerson Class Number of Soil

Client:	**SLR CONSULTING AUSTRALIA PTY LTD**	**Project No:**	677667.00
		Report No:	M20005006A
Project:	BATCHELOR - Rum Jungle Rehabilitation #3	**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

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: AD
Checked: AG

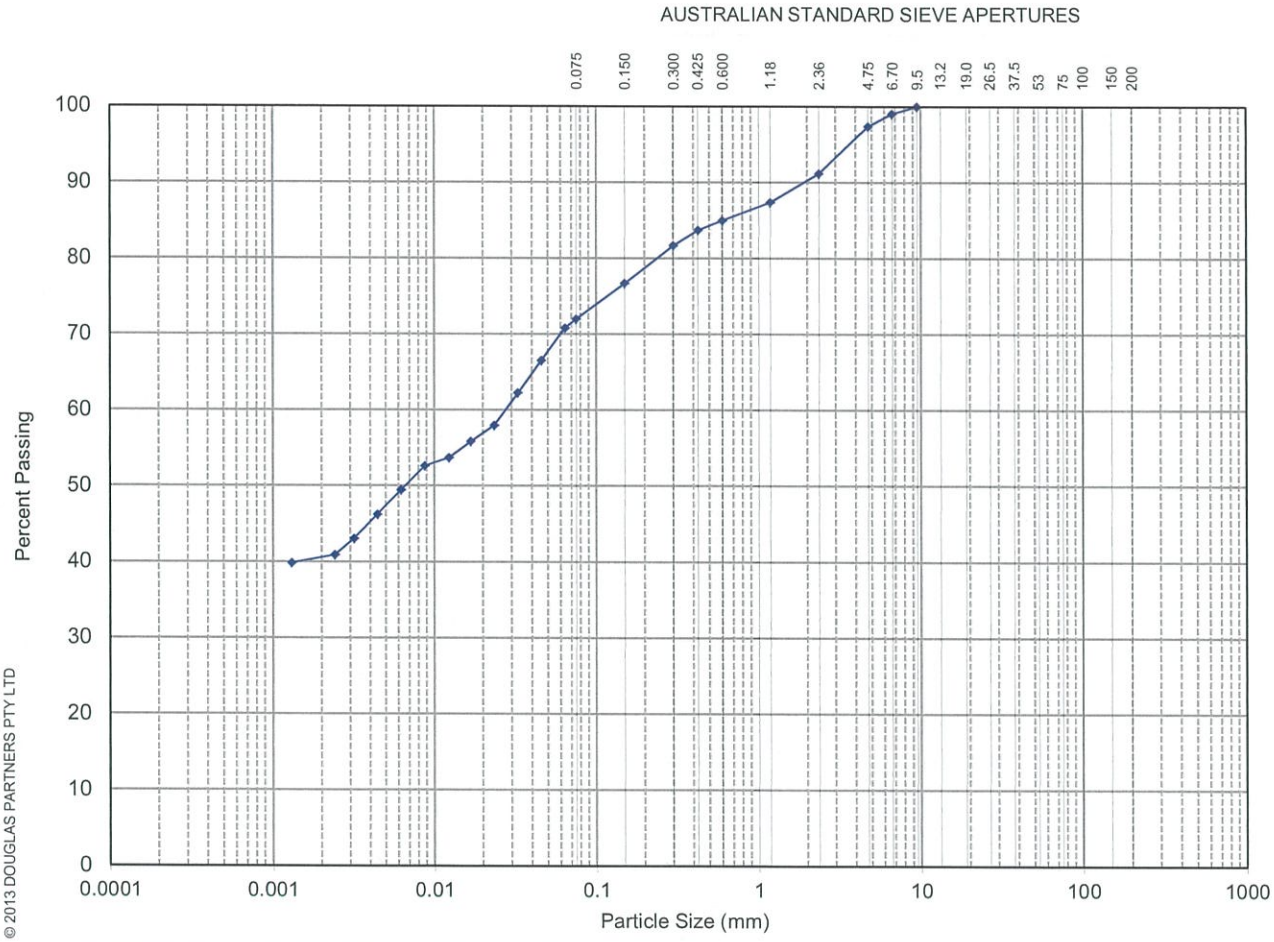
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
439 Montague Road
West End QLD 4101
Phone (07) 3237 8900
Fax (07) 3237 8999

Results of Particle Size Distribution (Hydrometer)

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



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	~
9.5	100%
6.7	99%
4.75	97%
2.36	91%
1.18	87%
0.600	85%
0.425	84%
0.300	82%
0.150	77%
0.075	72%
0.046	67%
0.033	62%
0.024	58%
0.017	56%
0.012	54%
0.009	53%
0.006	49%
0.004	46%
0.003	43%
0.002	41%
0.001	40%

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

Type of Hydrometer: g/l

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

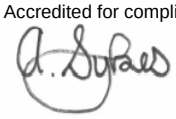
Tested:	HW
Checked:	AC

Aimee Cartwright
Laboratory Technician

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Coffs Harbour Laboratory
18 Lawson Crescent Coffs Harbour NSW 2450
Phone: (02) 6650 3200
Email: Doug.Dengate@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



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

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

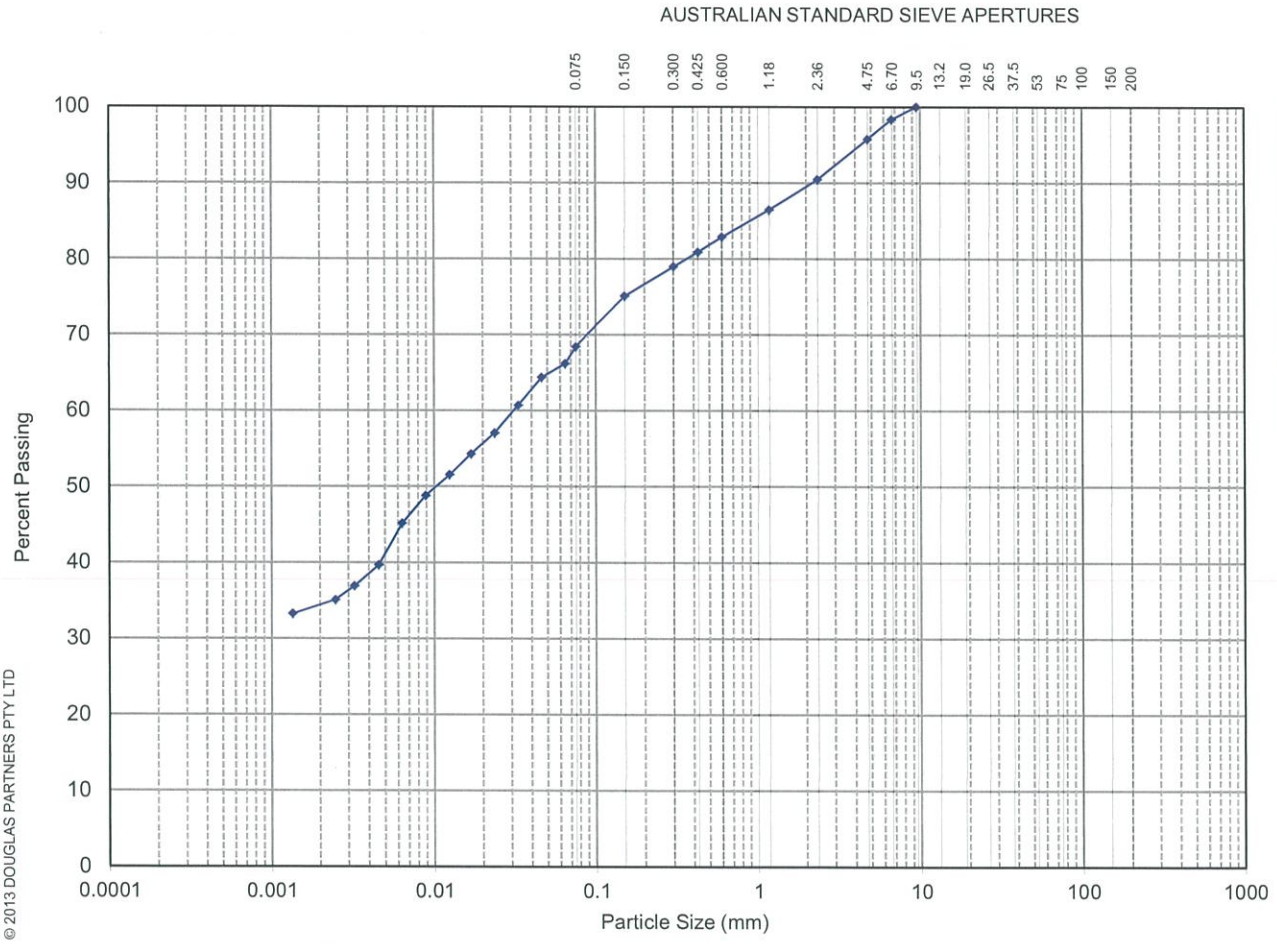
Falling Head Permeability (AS 1289 6.7.2 & 2.1.1)	
Coefficient of Permeability (m/sec)	**5x10^{-9}**
Method of Compactive Effort	Standard
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1
Maximum Dry Density (t/m^3)	2.132
Optimum Moisture Content (%)	8.2
Field Moisture Content (%)	6.8
Sieve for Oversize (mm)	19
Oversize Material (%)	0
Laboratory Density Ratio (%)	95.0
Laboratory Moisture Ratio (%)	100.0
Surcharges and Pressure Applied	4.95

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
439 Montague Road
West End QLD 4101
Phone (07) 3237 8900
Fax (07) 3237 8999

Results of Particle Size Distribution (Hydrometer)

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



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

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

Tested:	HW
Checked:	AC

Aimee Cartwright
Lab Technician

Material Test Report

Douglas Partners
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: **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		

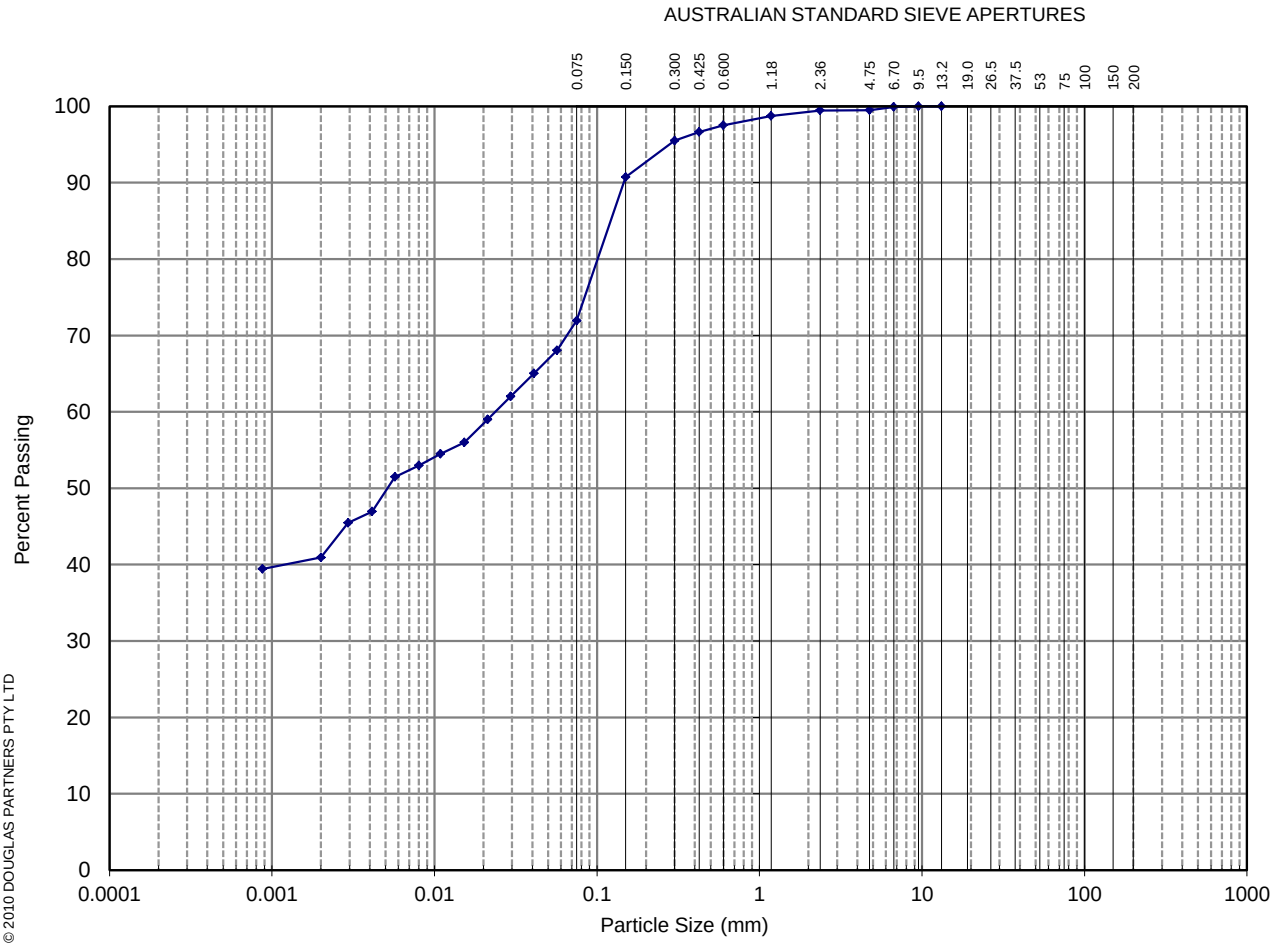
Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	**4 ***		
Soil Description	Clayey, gravelly		
Nature of Water	Demineralised water		
Temperature of Water (^{o}C)	26		
* Mineral Present	Carbonate		

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

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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%**

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
Associate

Material Test Report

Douglas Partners
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: **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)**

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 (^{o}C)	26		

BORROW AREA A

LABORATORY RESULTS

SLR INVESTIGATION LABORATORY RESULTS

Material Test Report

Douglas Partners
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:	*PIs 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

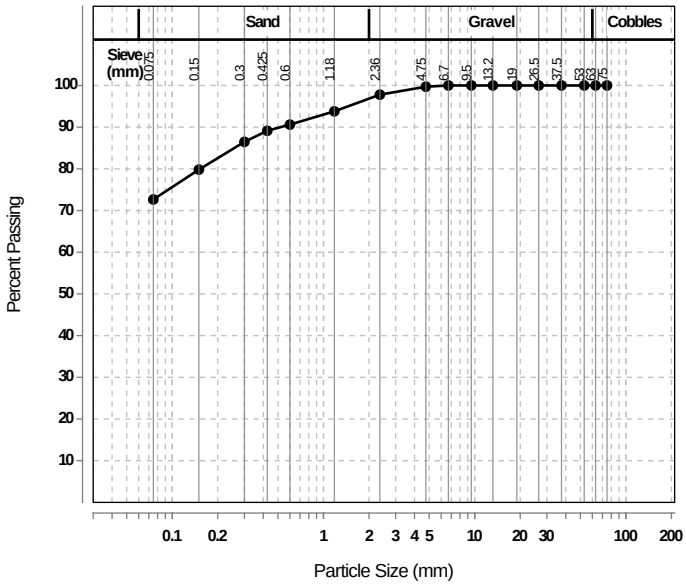
Particle Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
19 mm	**100**		
13.2 mm	**100**		
9.5 mm	**100**		
6.7 mm	**100**		
4.75 mm	**100**		
2.36 mm	**98**		
1.18 mm	**94**		
0.6 mm	**91**		
0.425 mm	**89**		
0.3 mm	**86**		
0.15 mm	**80**		
0.075 mm	**73**		

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 watet		
Temperature of Water (^{o}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

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

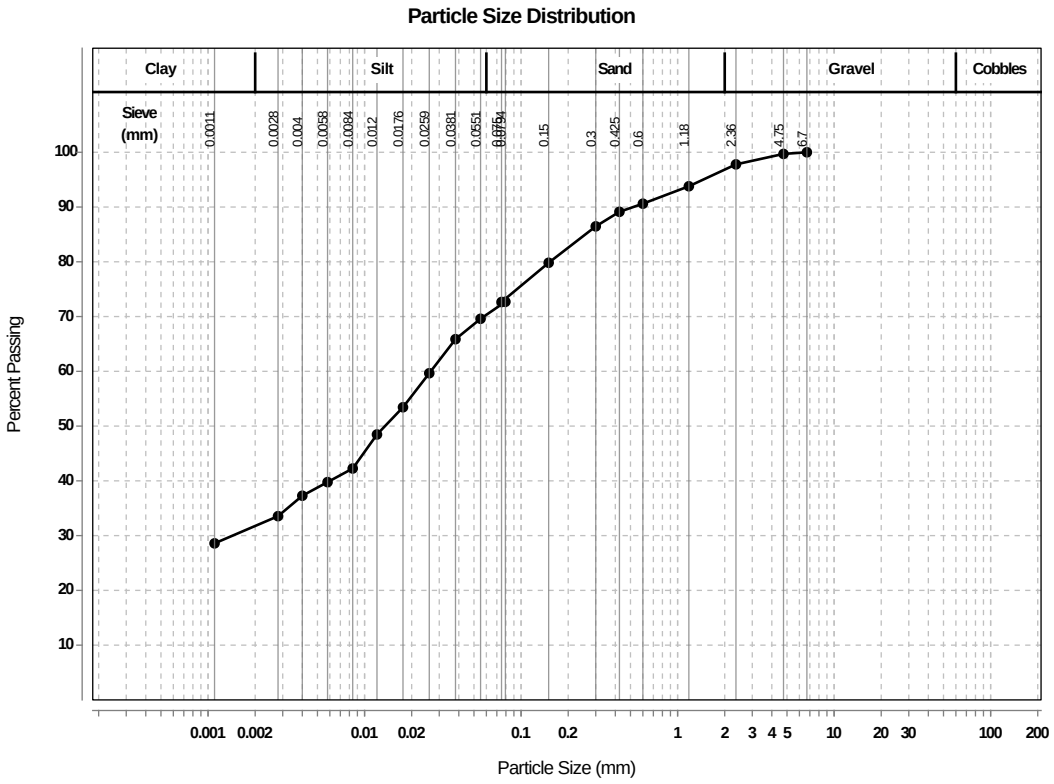
Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

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: **DPIR-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 %
0.0794	**72.7**
0.0551	**69.6**
0.0381	**65.9**
0.0259	**59.7**
0.0176	**53.4**
0.0120	**48.5**
0.0084	**42.3**
0.0058	**39.8**
0.0040	**37.3**
0.0028	**33.6**
0.0011	**28.6**



Material Test Report

Douglas Partners
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

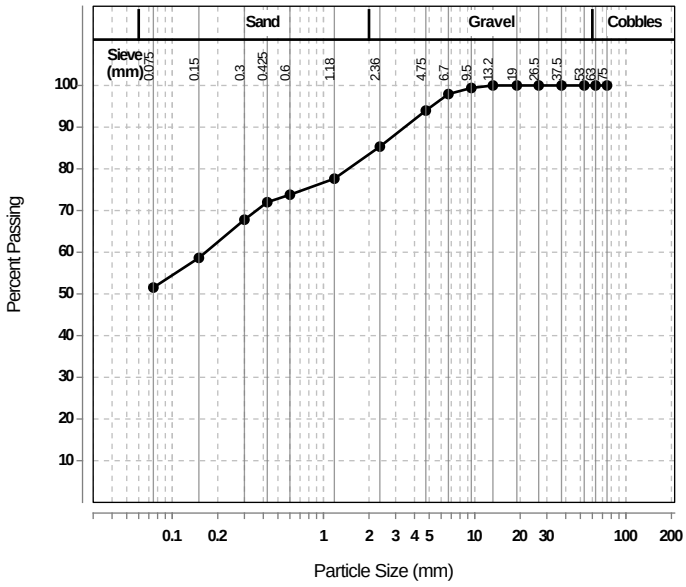
Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number:	**677637.00-1**
Issue Number:	2 - *This version supersedes all previous issues*
Reissue Reason:	*PIs 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

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 (^{o}C)	26		
* Mineral Present	Carbonate		

Particle Size Distribution



Material Test Report

Douglas Partners
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

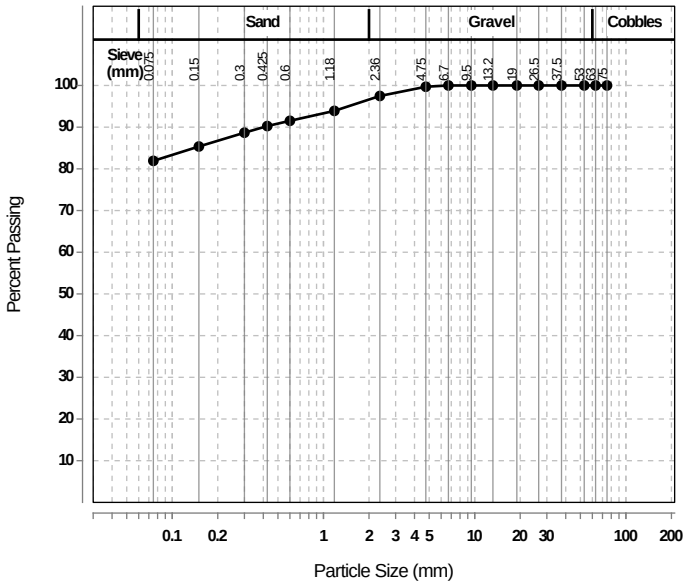
Report Number:	**677637.00-1**
Issue Number:	2 - *This version supersedes all previous issues*
Reissue Reason:	*PIs added*
Date Issued:	18/07/2019
Client:	SLR Consulting Australia Pty Ltd
	5 Foelsche Street, Darwin NT 0800
Contact:	Danielle O'Toole
Project Number:	677637.00
Project Name:	Clay Borrow 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

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

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

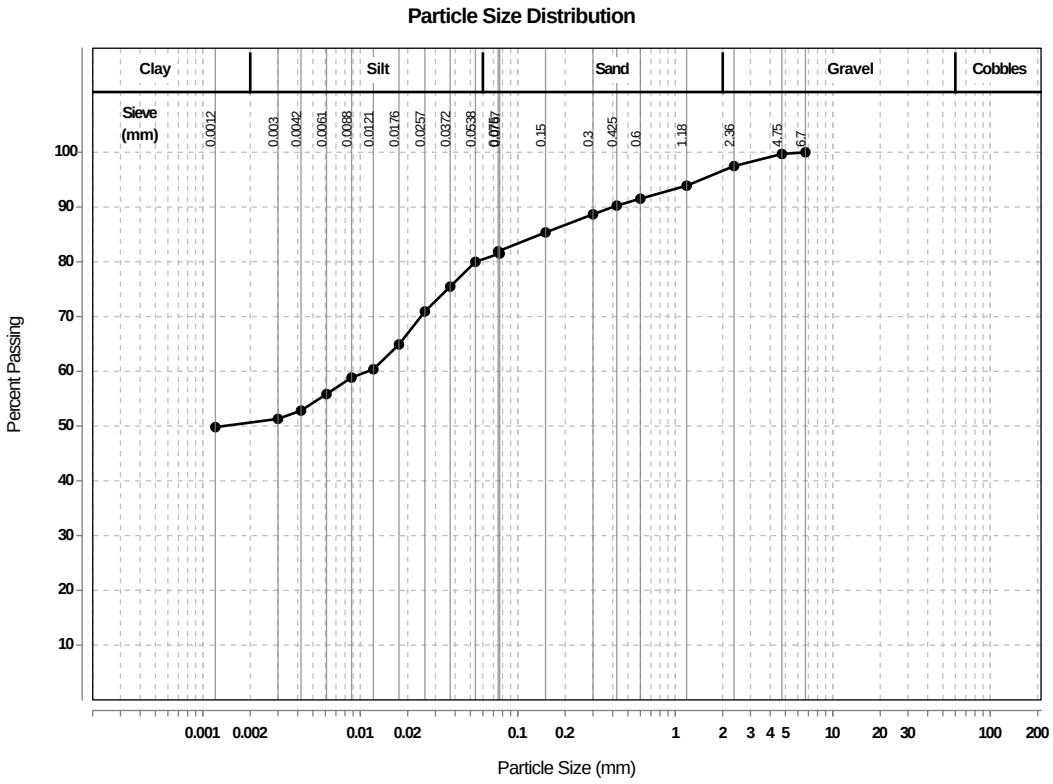
Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

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: **DPIR-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 %
0.0767	**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**



Material Test Report

Douglas Partners
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:	*PIs 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

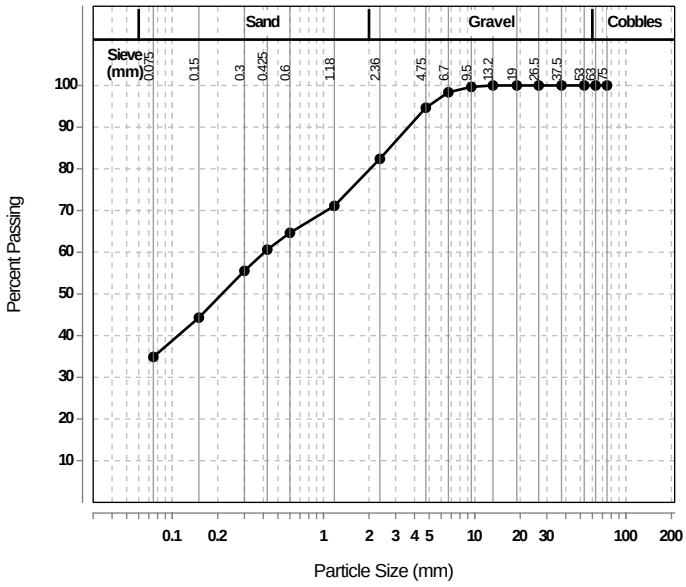
Particle Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
19 mm	**100**		
13.2 mm	**100**		
9.5 mm	**100**		
6.7 mm	**98**		
4.75 mm	**95**		
2.36 mm	**82**		
1.18 mm	**71**		
0.6 mm	**65**		
0.425 mm	**61**		
0.3 mm	**56**		
0.15 mm	**44**		
0.075 mm	**35**		

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 (^{o}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

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

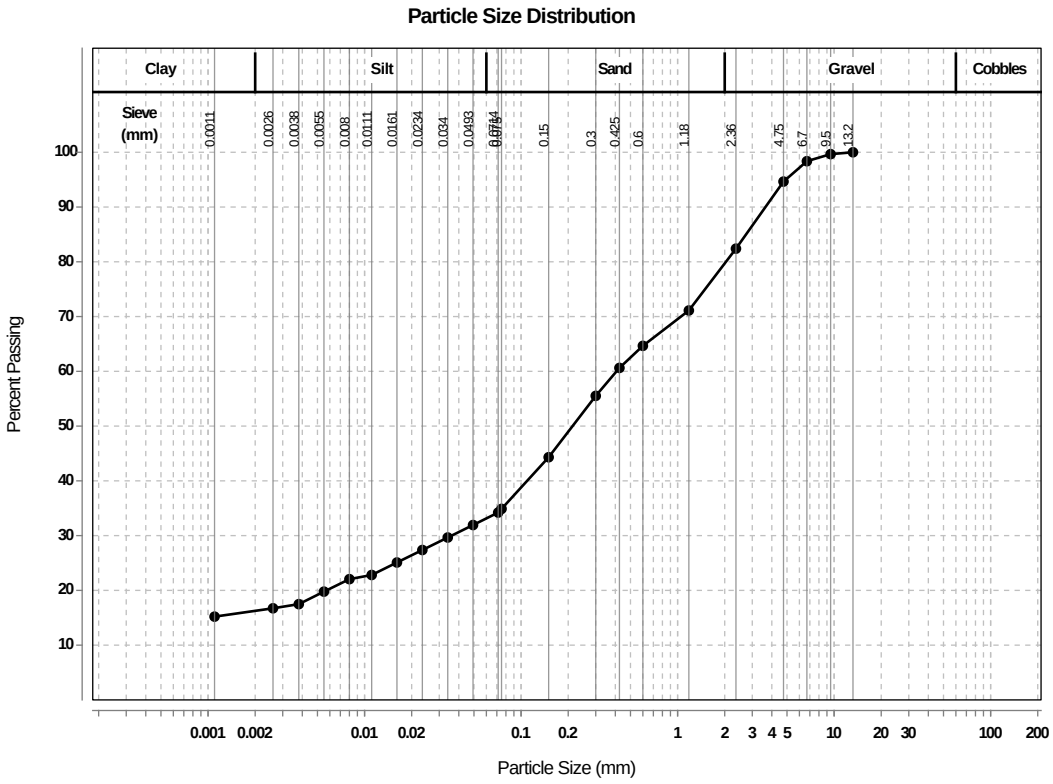
Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

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: **DPIR-TP05, Depth: 0.80 - 1.00m**
Material: Gravelly Silty 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	
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

Douglas Partners
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:	*PIs 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

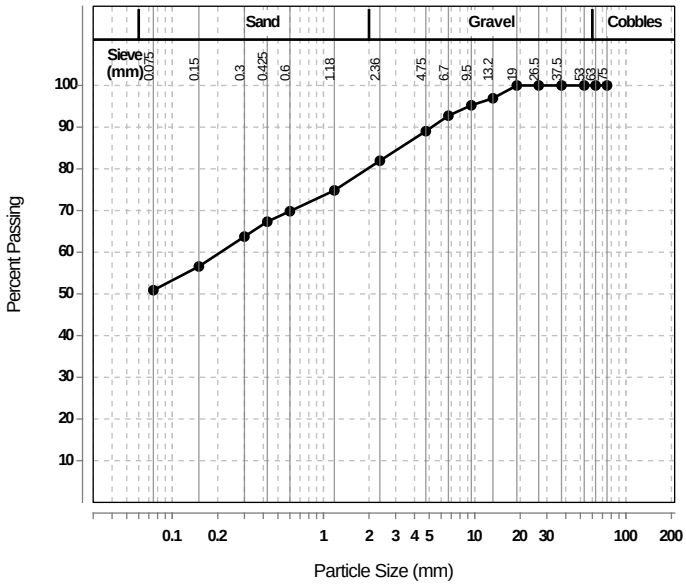
Particle Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
19 mm	**100**		
13.2 mm	**97**		
9.5 mm	**95**		
6.7 mm	**93**		
4.75 mm	**89**		
2.36 mm	**82**		
1.18 mm	**75**		
0.6 mm	**70**		
0.425 mm	**67**		
0.3 mm	**64**		
0.15 mm	**57**		
0.075 mm	**51**		

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 (^{o}C)	26		
* Mineral Present	Carbonate		

Particle Size Distribution



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

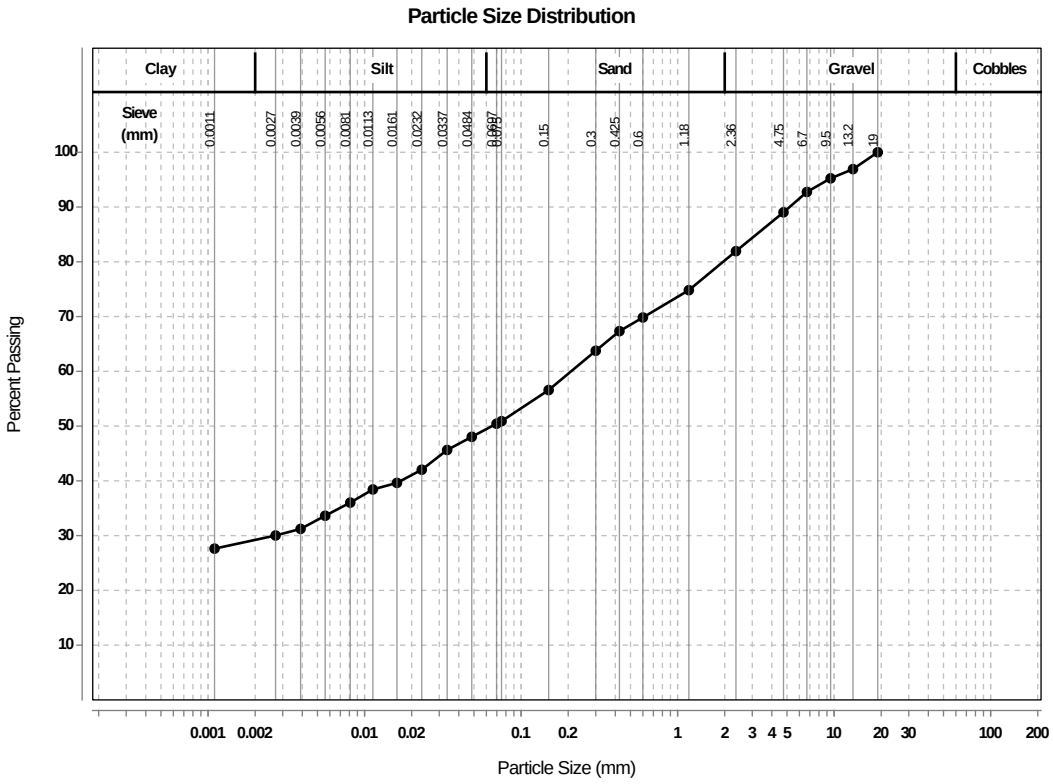
Approved Signatory: Peter Gorseski
Laboratory Manager
NATA Accredited Laboratory Number: 828

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**



Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
15 Callistemon Close
Warabrook NSW 2304
PO Box 324
Hunter Regional MC NSW 2310
Phone (02) 4960 9600
Fax (02) 4960 9601

Results of Pinhole Dispersion Tests

Client: **SLR CONSULTING AUSTRALIA PTY LTD**

Project: CLAY BORROW ASSESSMENT - PROJECT REF: 680.10241

Location: RUM JUNGLE MINE, BATCHELOR

Project No: 677637.00
Report No: 677637.00-1a
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/m³)	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

Douglas Partners
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: *PIs 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

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
Unit 2, 14 Caryota Court
Coconut Grove NT 0810
PO Box 36858
Winnellie NT 0821
Phone (08) 8948 6800
Email: clare.whelan@douglaspartners.com.au

Client SLR Consulting Australia Pty Ltd
Project Rum Jungle Rehabiliation - 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

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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 (^{o}C)	26		

Material Test Report

Douglas Partners
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: **677659.00-1C**
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 (^{o}C)	26		

Material Test Report

Douglas Partners
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: **677659.00-4**
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)**

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

Douglas Partners
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: **677659.00-1C**
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

Material Test Report

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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

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

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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

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 (^{o}C)	26		
* Mineral Present	Carbonate		

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

Material Test Report

Douglas Partners
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

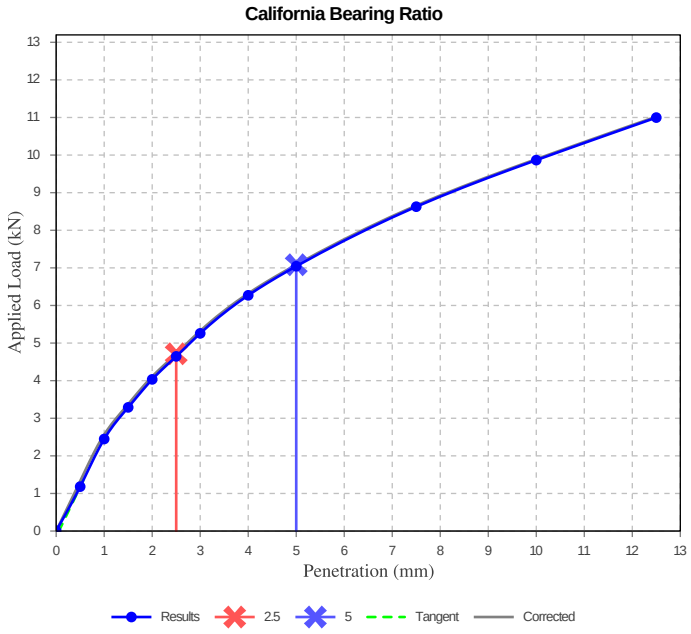
Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

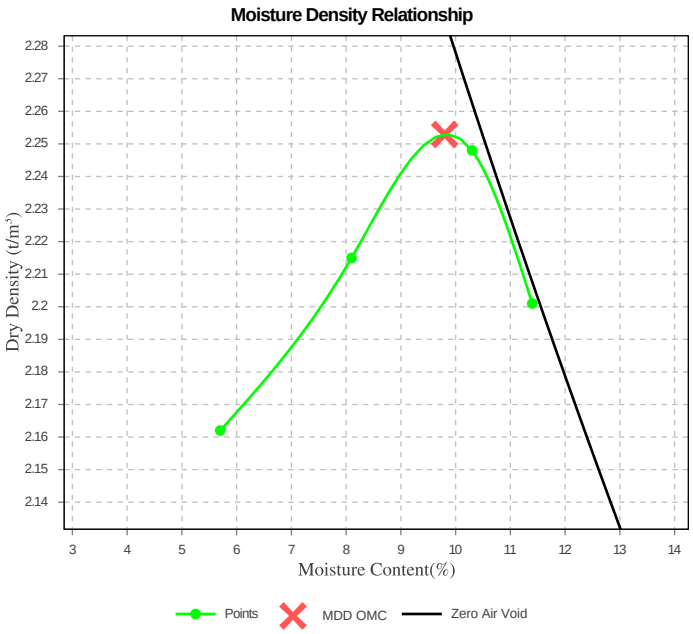
Report Number:	**677659.00-1C**
Issue Number:	1
Date Issued:	20/12/2019
Client:	SLR Consulting Australia Pty Ltd
	Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact:	Ben Tarrant
Project Number:	677659.00
Project Name:	Rum Jungle Rehabilitation - Project Ref 680.10421
Project Location:	Rum Jungle, 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

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

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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

Material Test Report

Douglas Partners
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: **677659.00-1C**
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

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

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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

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 (^{o}C)	26		
* Mineral Present	Gypsum		

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

Material Test Report

Douglas Partners
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

NATA
WORLD RECOGNISED ACCREDITATION

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

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

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Moisture Content Test

Client:	SLR Consulting Australia Pty Ltd	**Project No:**	677659.00
		Report No:	M19136001
Project:	BATCHELOR - Rum Jungle Rehabilitation	**Report Date:**	13-Nov-2019
		Date Sampled:	-
Location:	Rum Jungle, Batchelor, NT	**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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: SP
Checked: AG

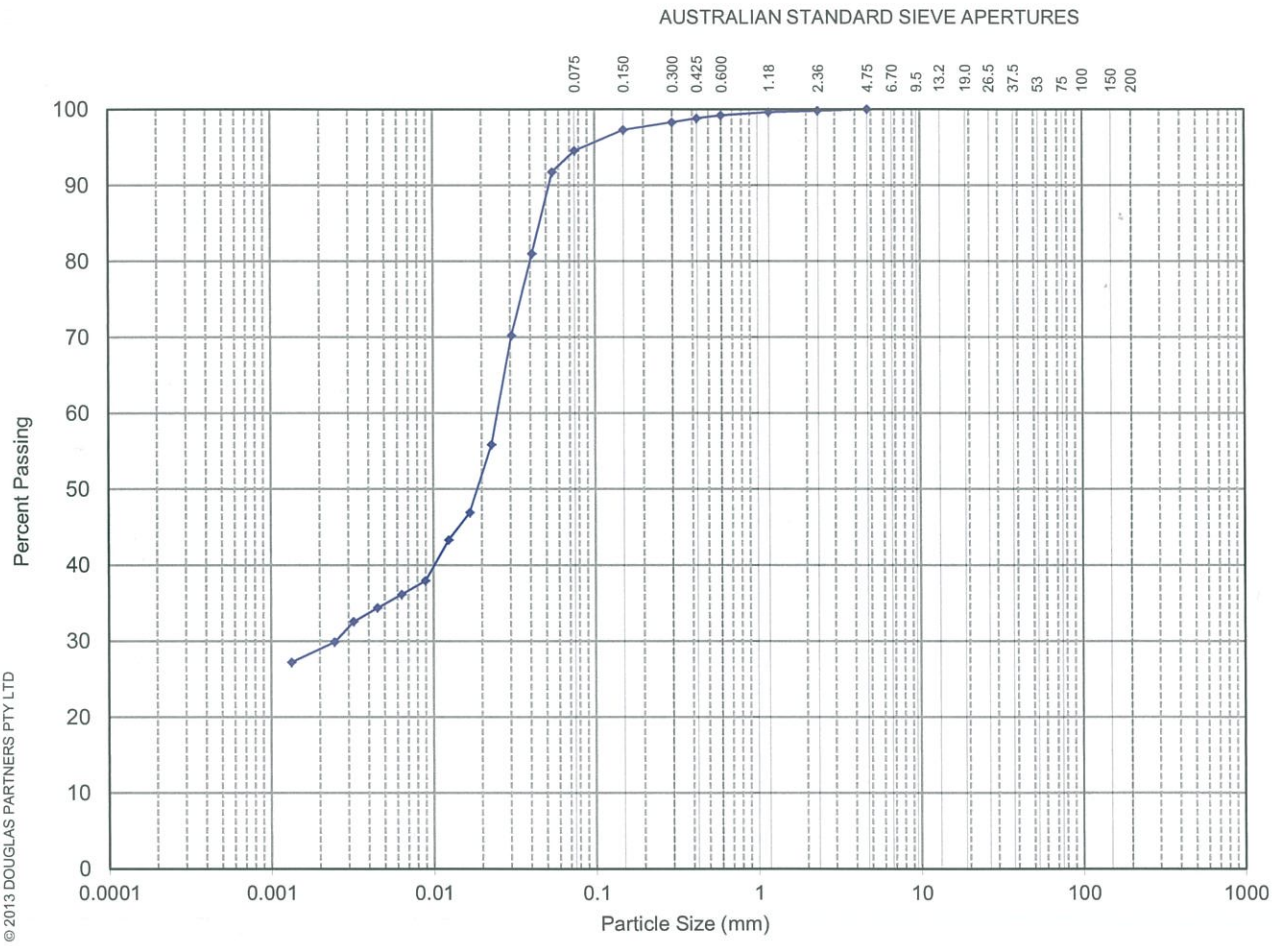
Arveendra Gounder
Laboratory Manager

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
439 Montague Road
West End QLD 4101
Phone (07) 3237 8900
Fax (07) 3237 8999

Results of Particle Size Distribution (Hydrometer)

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



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

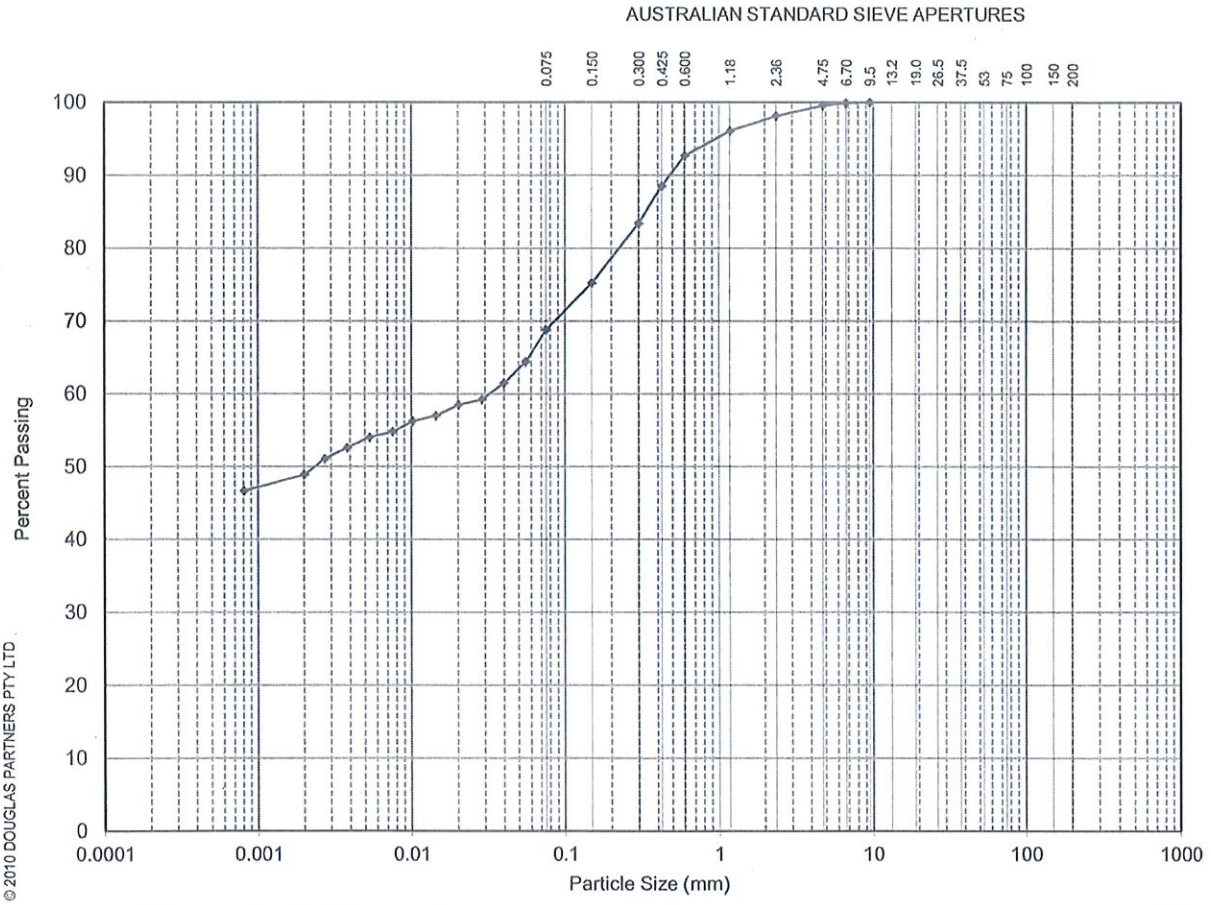
Aimee Cartwright
Laboratory Technician

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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	0.006	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 = 2.75 t/m³

Type of Hydrometer: g/l

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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: SP
Checked: AG

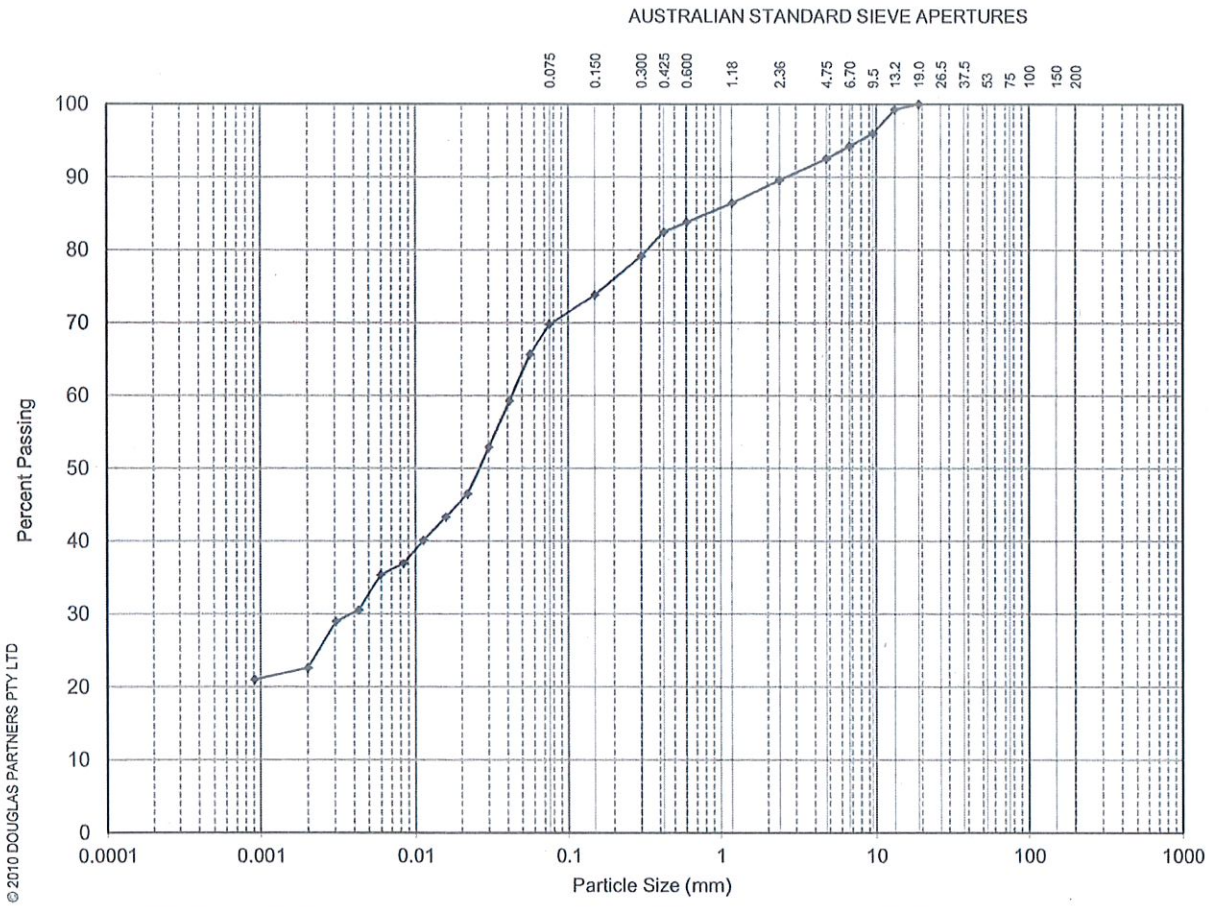
Peter Chan
Associate

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

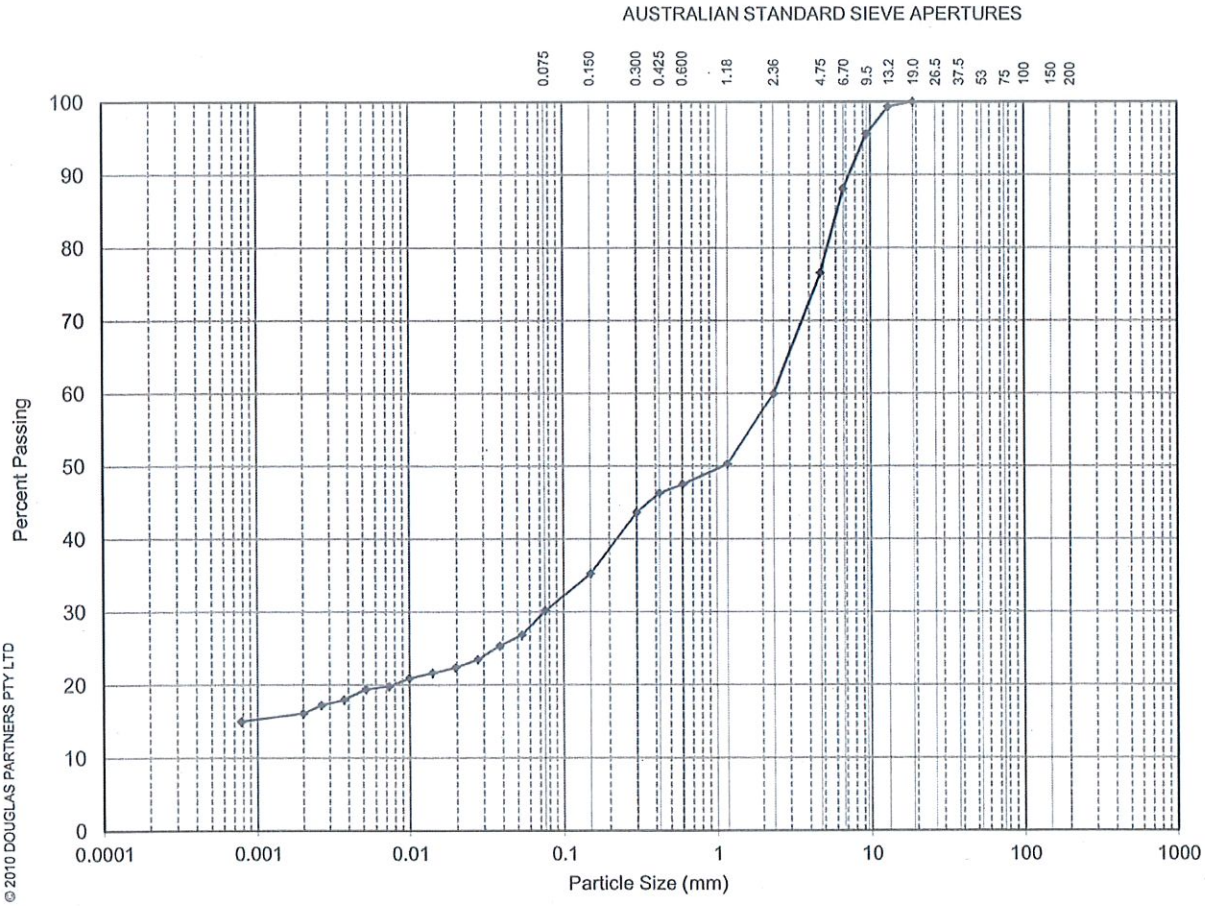
Peter Chan
Associate

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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 FOR TECHNICAL COMPETENCE

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

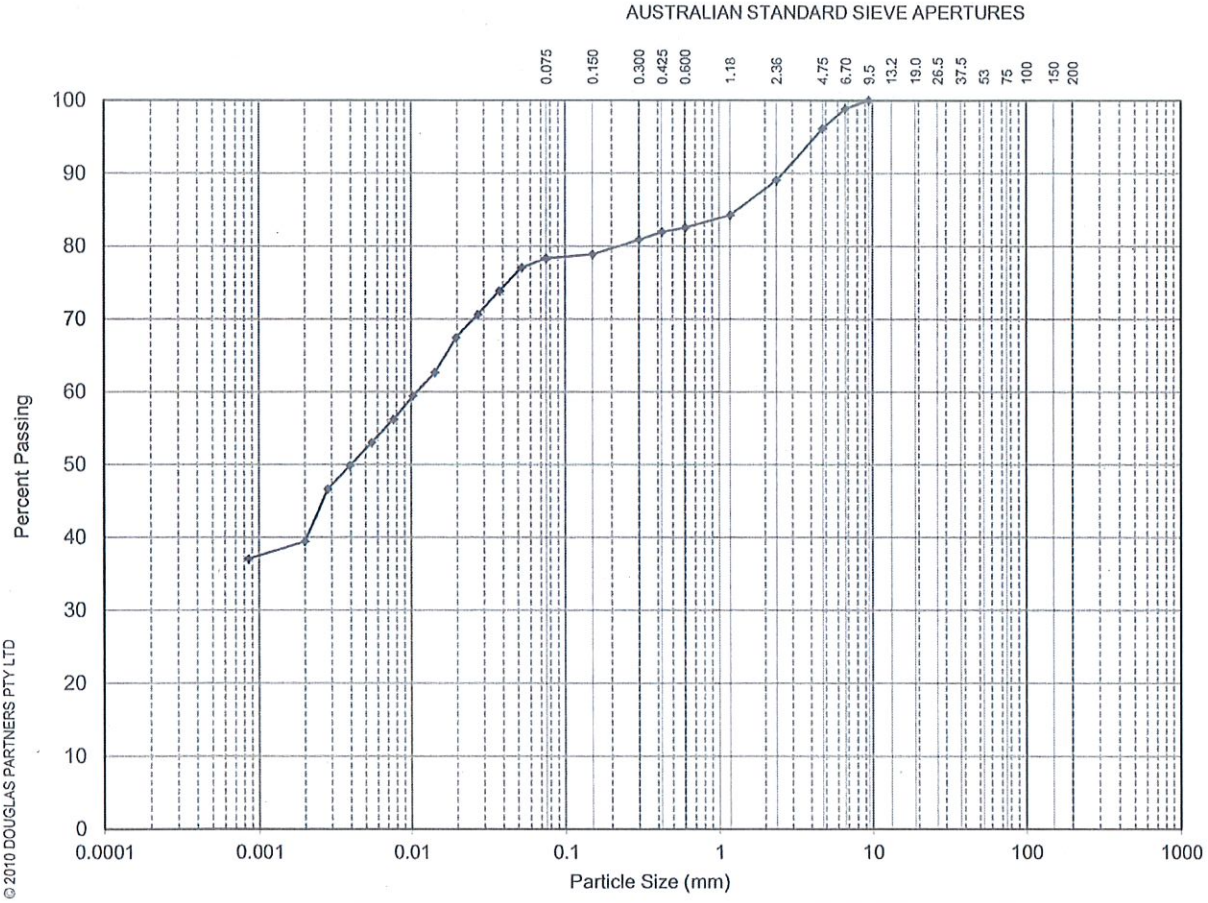
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.73 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

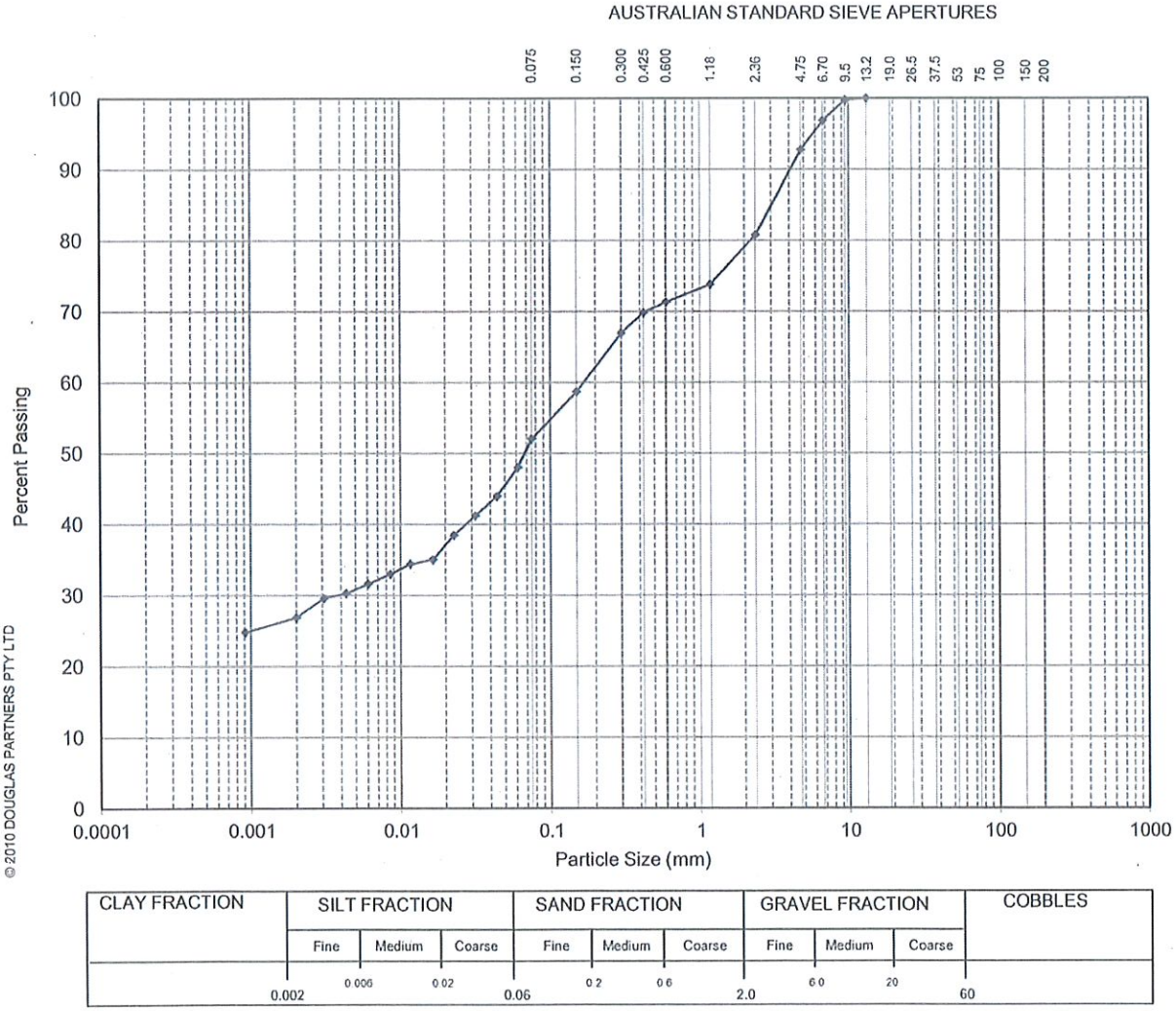
Peter Chan
Associate

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

Loss in pretreatment: 0%

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

Type of Hydrometer: g/l

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

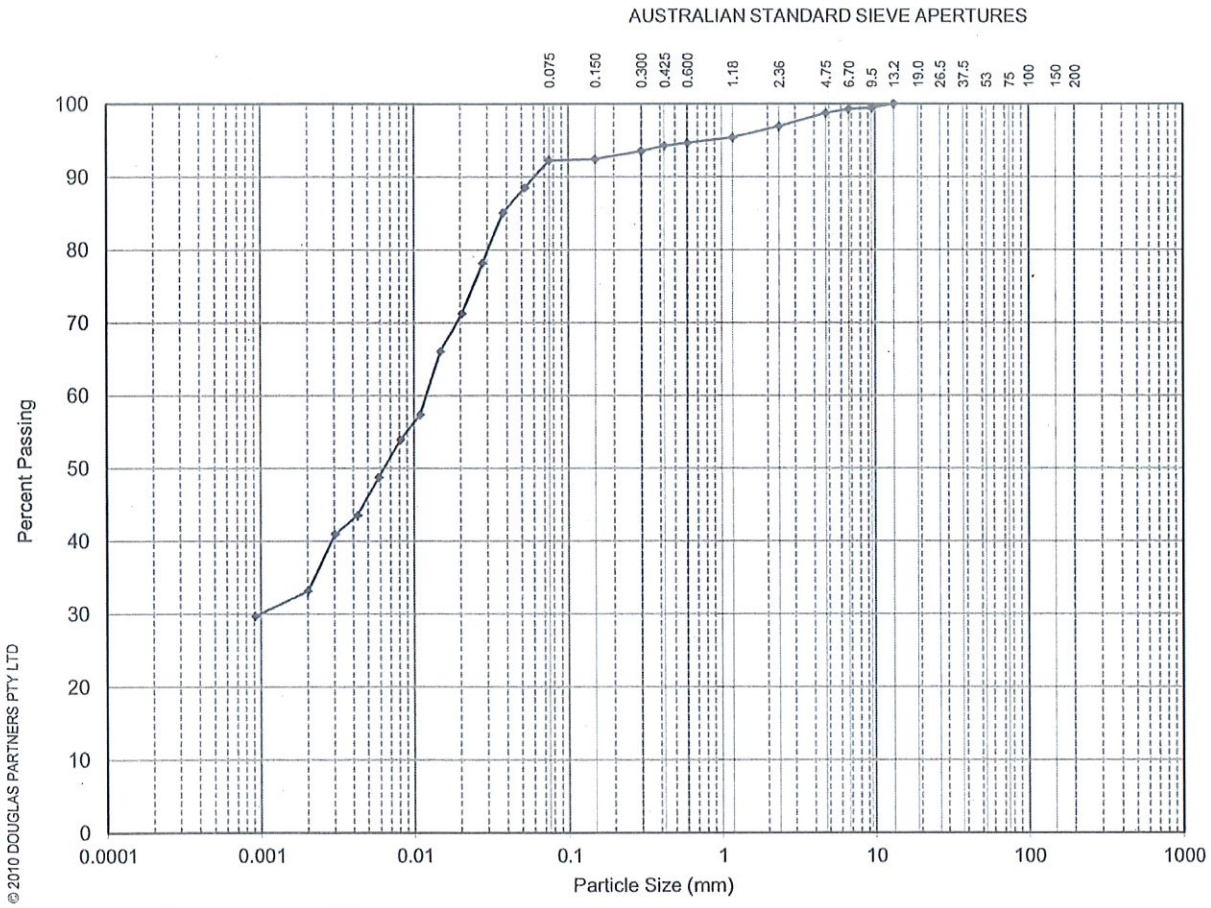
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



Sieve Size (mm)	% Passing
75.0	~
53.0	~
37.5	~
26.5	~
19.0	~
13.2	100%
9.5	99%
6.7	99%
4.75	99%
2.36	97%
1.18	95%
0.600	95%
0.425	94%
0.300	94%
0.150	92%
0.075	92%
0.038	85%
0.028	78%
0.020	71%
0.015	66%
0.011	57%
0.008	54%
0.006	49%
0.004	44%
0.003	41%
0.002	33%
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 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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

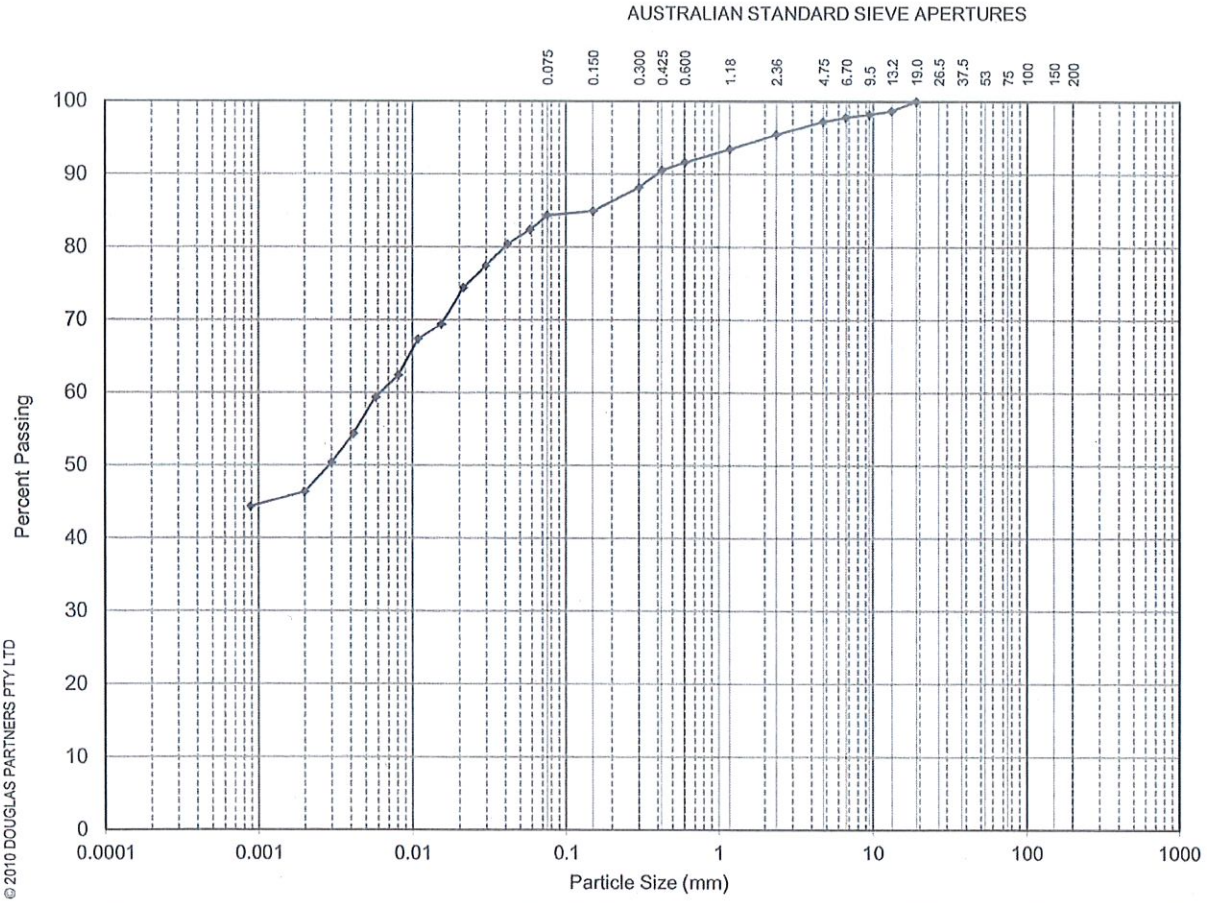
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

Loss in pretreatment: 0%

Remarks: Soil Particle Density Passing 2.36 mm Sieve = 2.62 t/m³

Type of Hydrometer: g/l

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

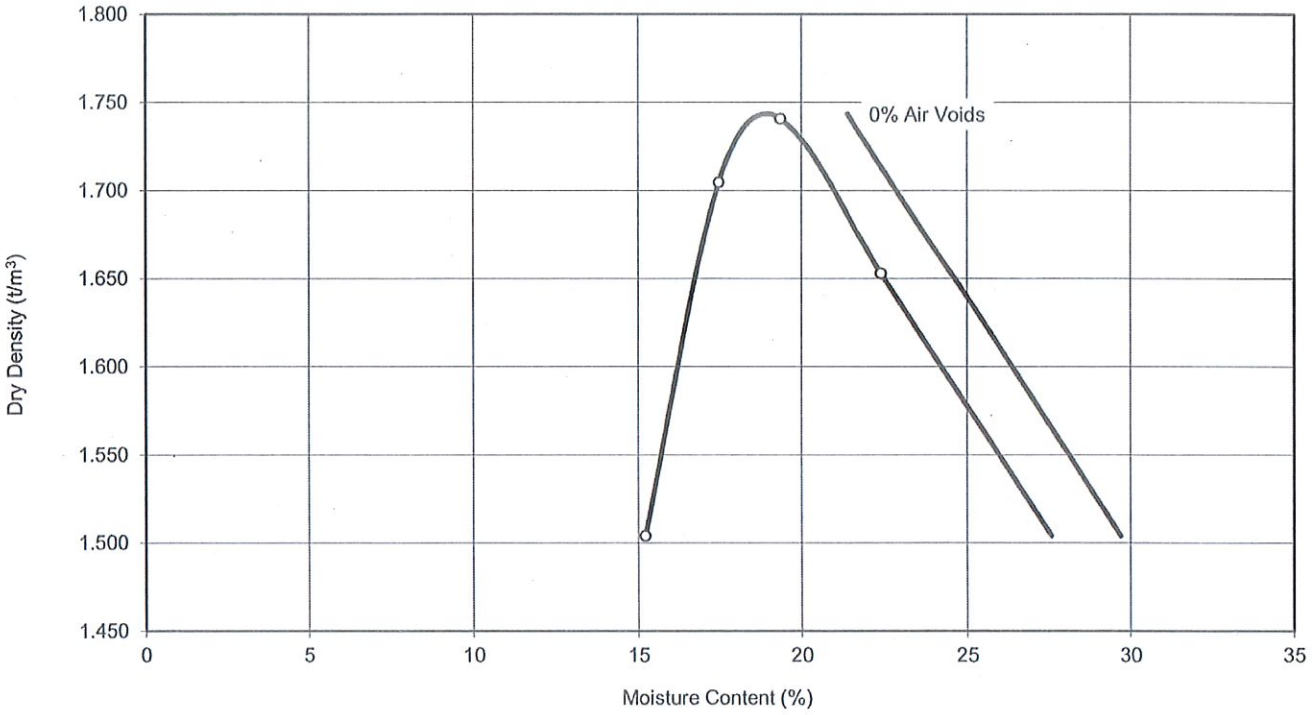
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136009
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	31/10/2019
Location :	Rum Jungle, Batchelor, NT	**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 FOR TECHNICAL COMPETENCE

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

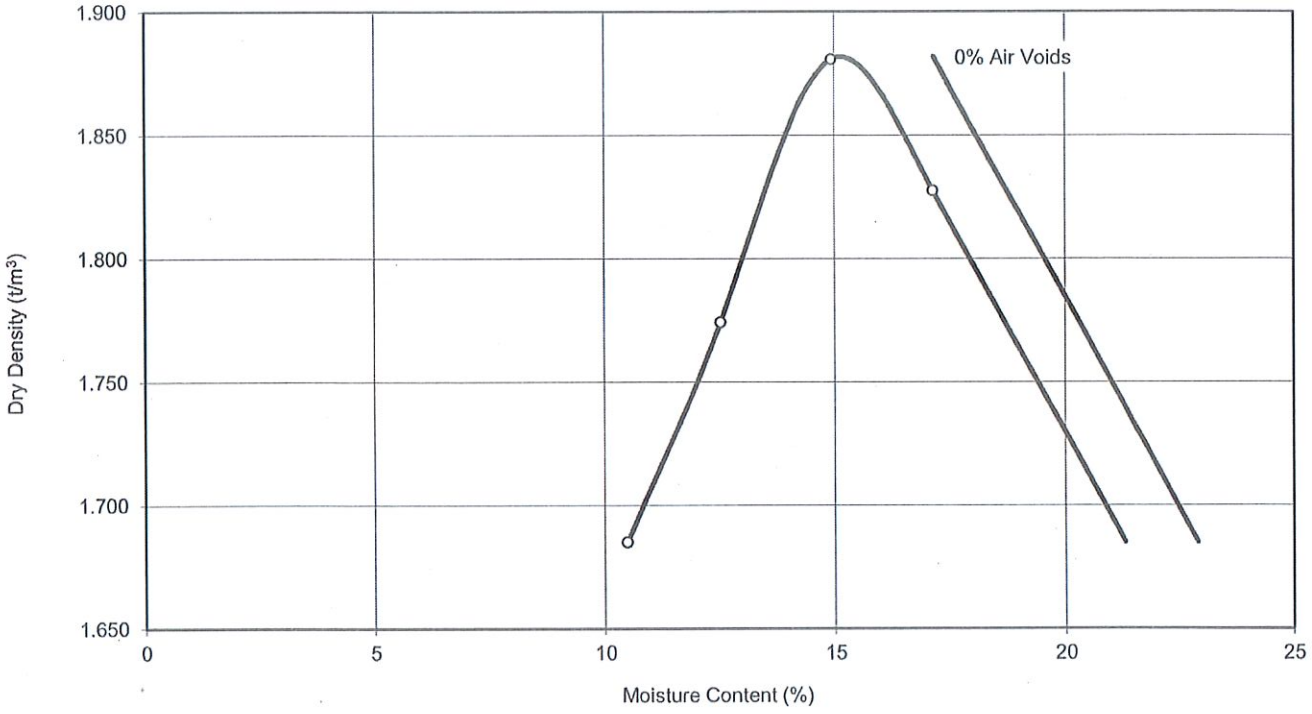
Arveendra Gounder
Laboratory Manager

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136010
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	31/10/2019
Location :	Rum Jungle, Batchelor, NT	**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 FOR TECHNICAL COMPETENCE

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

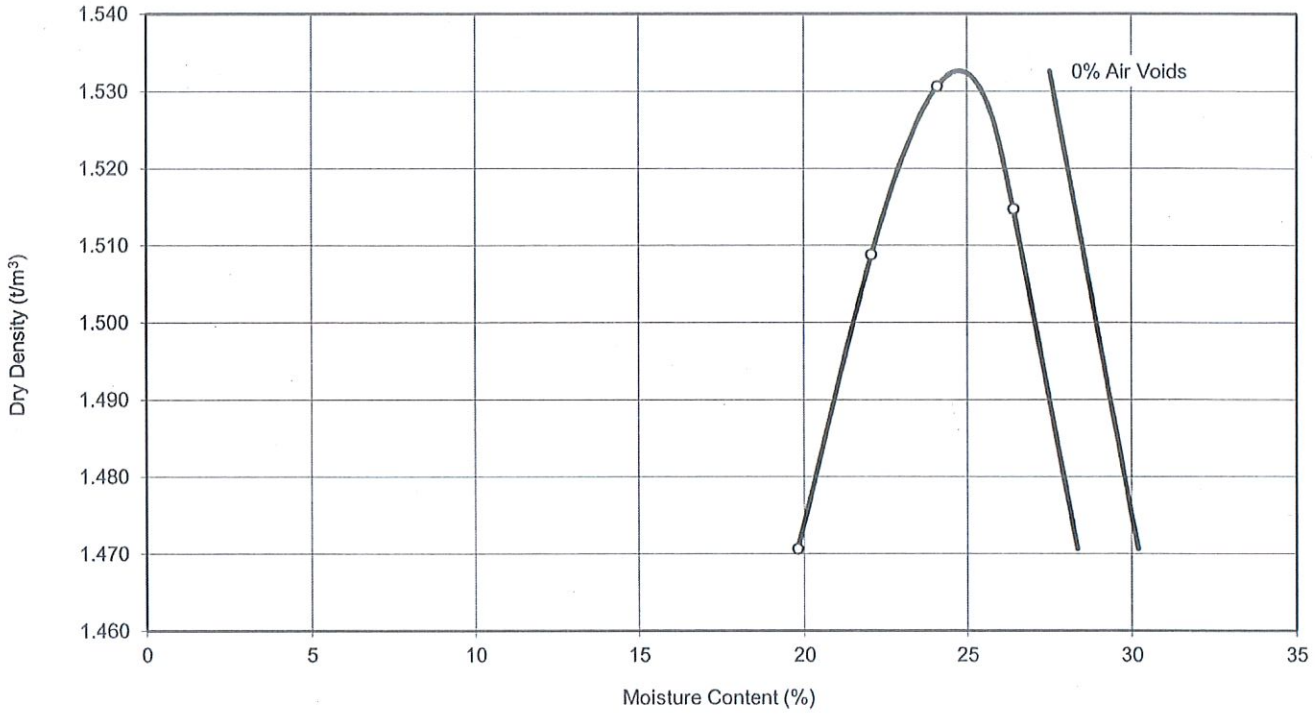
Arveendra Gounder
Laboratory Manager

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136011
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	31/10/2019
Location :	Rum Jungle, Batchelor, NT	**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/m^3**
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 FOR TECHNICAL COMPETENCE

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

Douglas Partners
Geotechnics | Environment | Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Falling Head Permeability Test

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

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Falling Head Permeability Test

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

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Falling Head Permeability Test

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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: SR
Checked: AG

Peter Chan
Associate

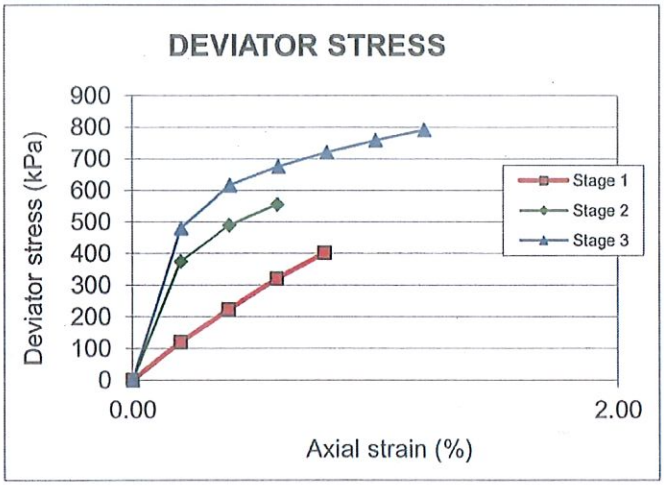
Douglas Partners
Geotechnics / Environment / Groundwater

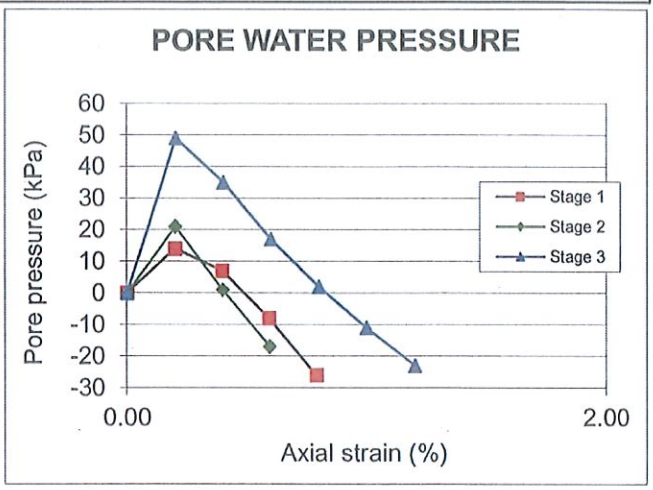
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

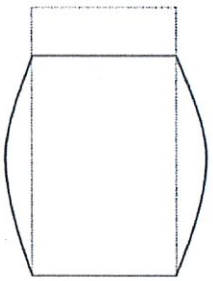
Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136015
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	13 Nov 2019
		Date Sampled :	-
Location :	Rum Jungle, Batchelor, NT	**Date of Test:**	01 Nov 2019
Test Location :	19-1967E/ NTP06	**Sample Type:**	Remoulded
Depth / Layer :	1.80-2.00(m)	**Page:**	1
Sample Description:	Silty clayey GRAVEL, with sand		





STAGE DETAILS	STAGE 1	STAGE 2	STAGE 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			
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

MODE OF FAILURE DIAGRAM



SPECIMEN DETAILS	Initial	Final
Moisture content (%)	10.2	13.5
Dry density (t/m3)	2.22	
B' value after saturation	0.98	

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

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

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

Tested: CP
Checked: AG

Peter Chan
Associate

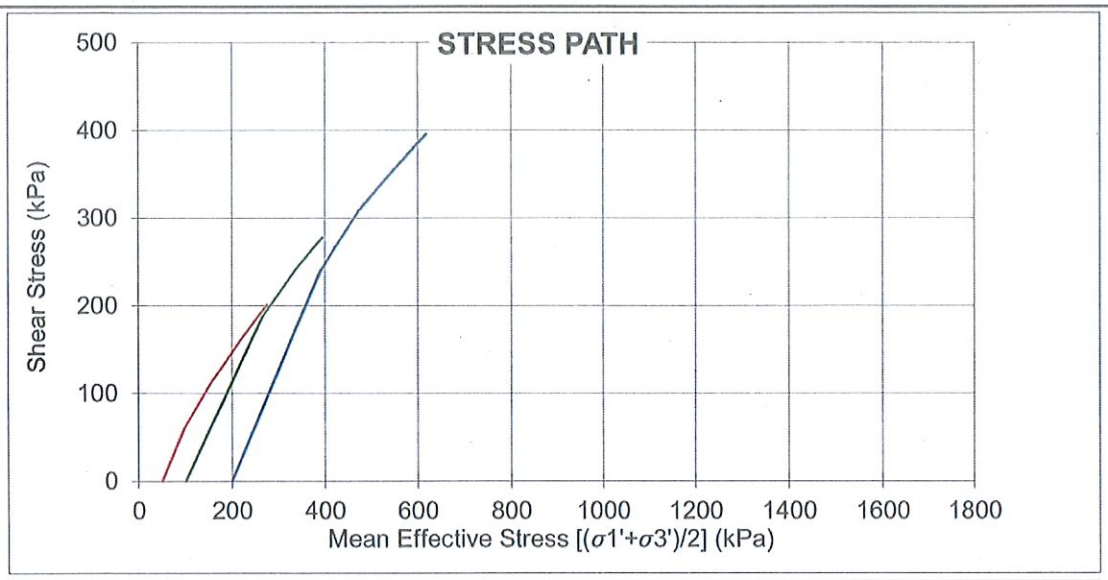
Douglas Partners
Geotechnics / Environment / Groundwater

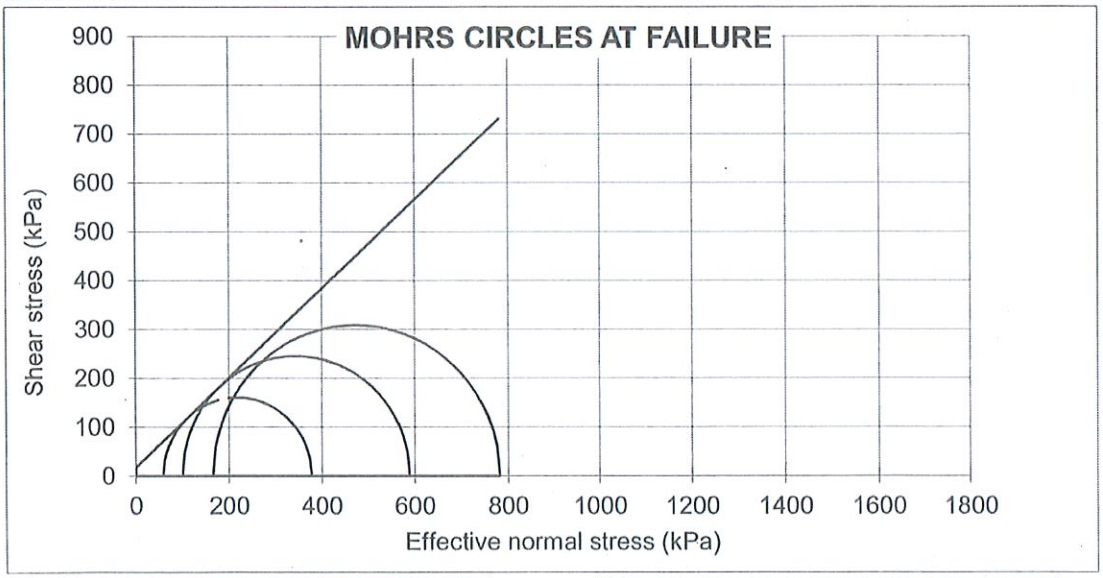
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

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, Ø'	**42°**

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

Peter Chan
Associate

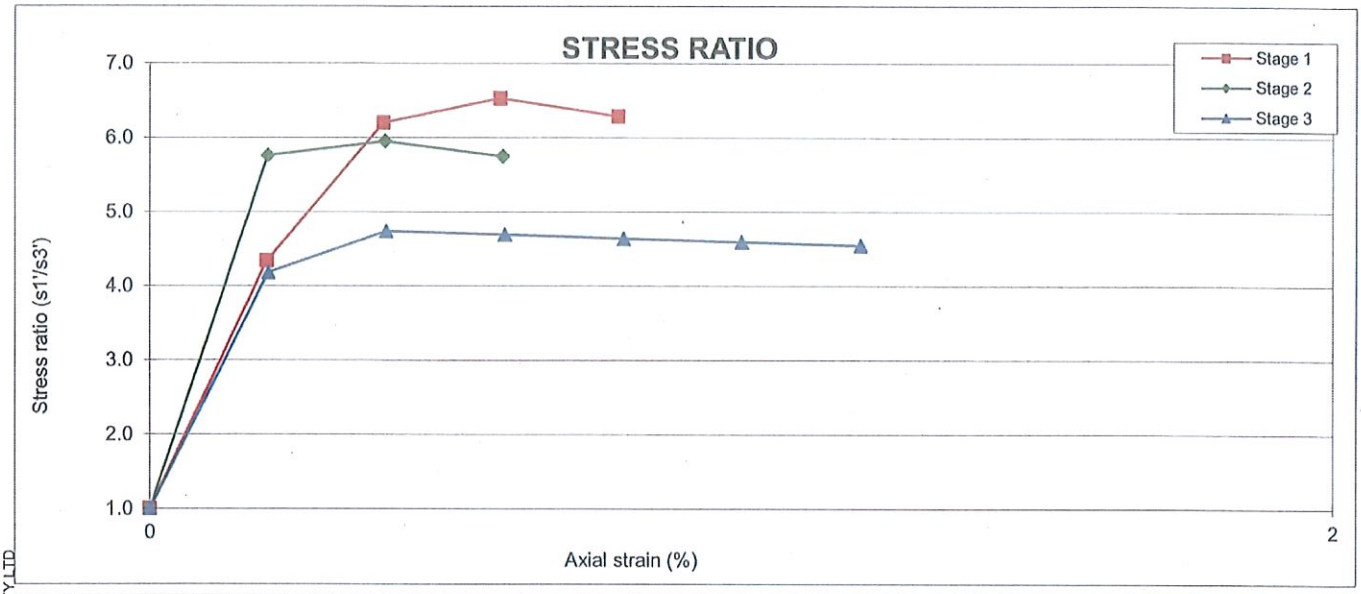
Douglas Partners
Geotechnics / Environment / Groundwater

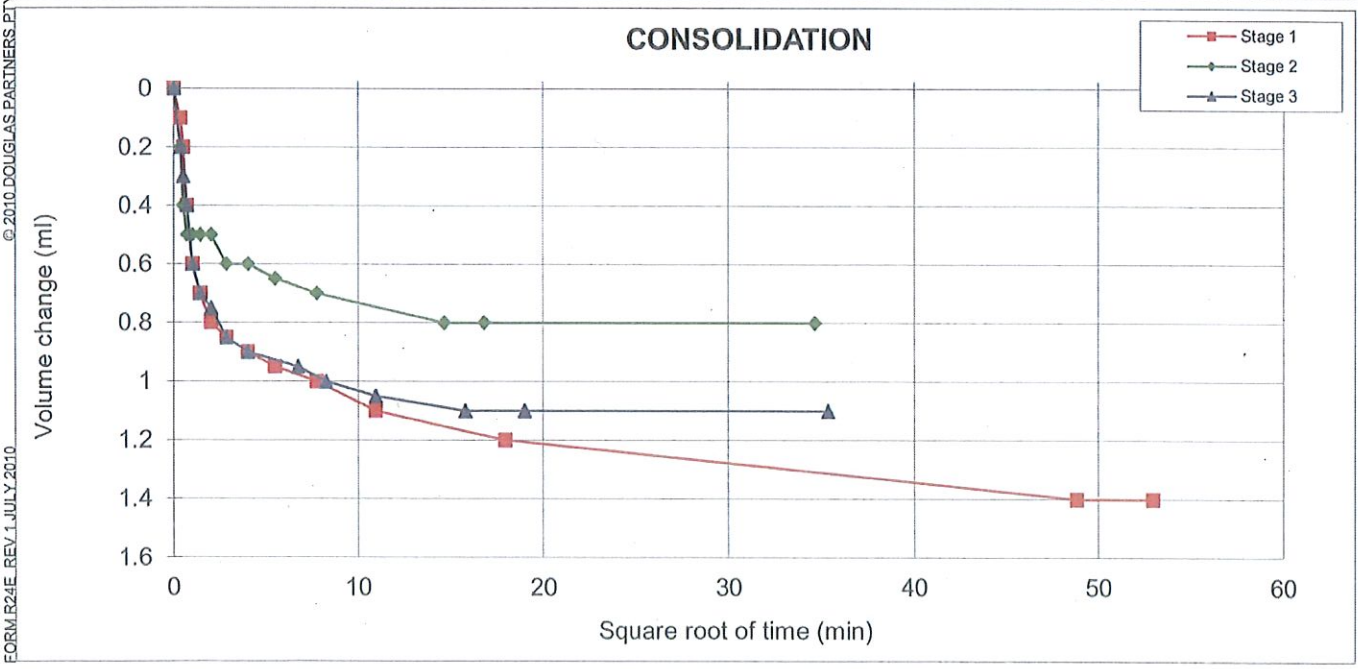
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

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

Peter Chan
Associate

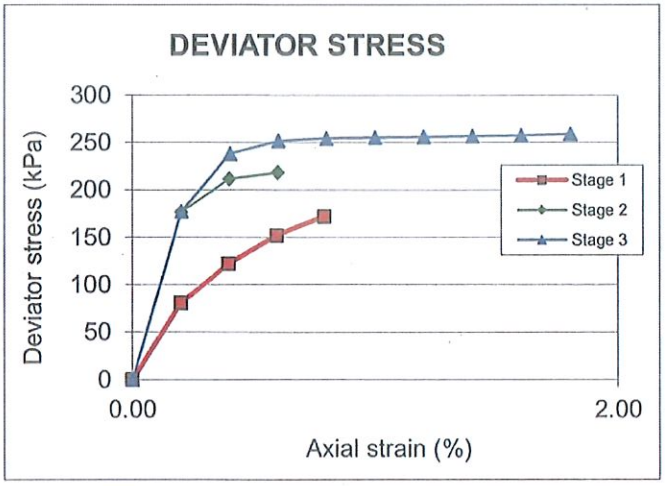
Douglas Partners
Geotechnics / Environment / Groundwater

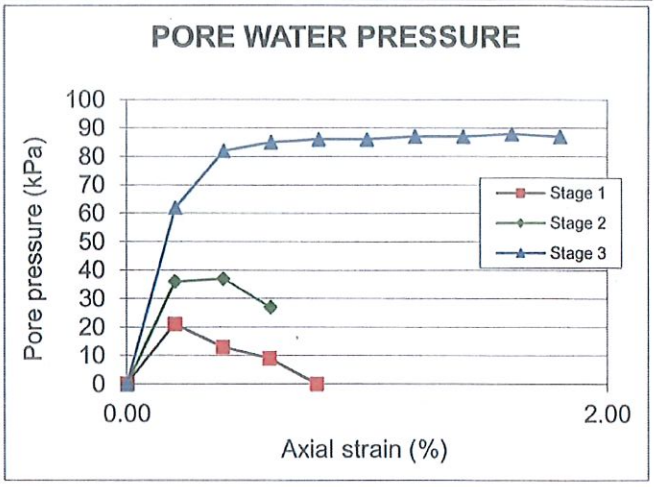
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

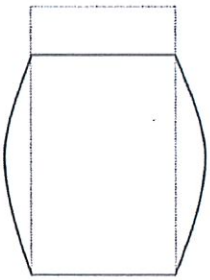
Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136016
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	13 Nov 2019
		Date Sampled :	-
Location :	Rum Jungle, Batchelor, NT	**Date of Test:**	01 Nov 2019
Test Location :	19-1967G/ NTP-07	**Sample Type:**	Remoulded
Depth / Layer :	1.10-1.70(m)	**Page:**	1
Sample Description:	Silty CLAY, with gravel and sand		





STAGE DETAILS	STAGE 1	STAGE 2	STAGE 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

MODE OF FAILURE DIAGRAM



SPECIMEN DETAILS	Initial	Final
Moisture content (%)	14.9	16.9
Dry density (t/m3)	1.88	
B' value after saturation	0.98	
Sample Type	Remoulded	
	Length(mm)	Diameter(mm)
Initial Sample Dimensions	126	63
	126	63

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

Peter Chan
Associate

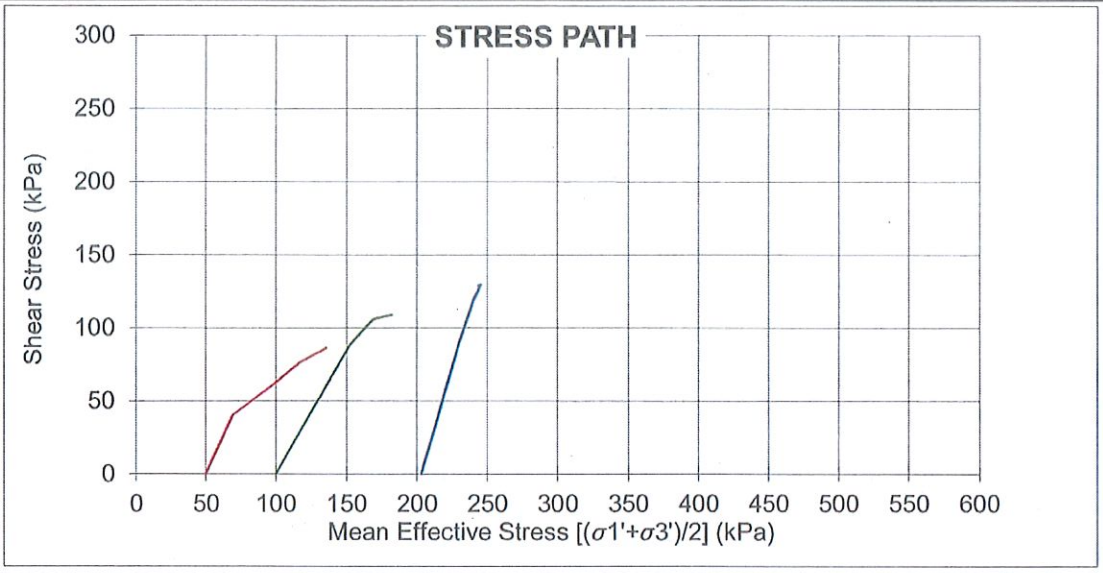
Douglas Partners
Geotechnics I Environment I Groundwater

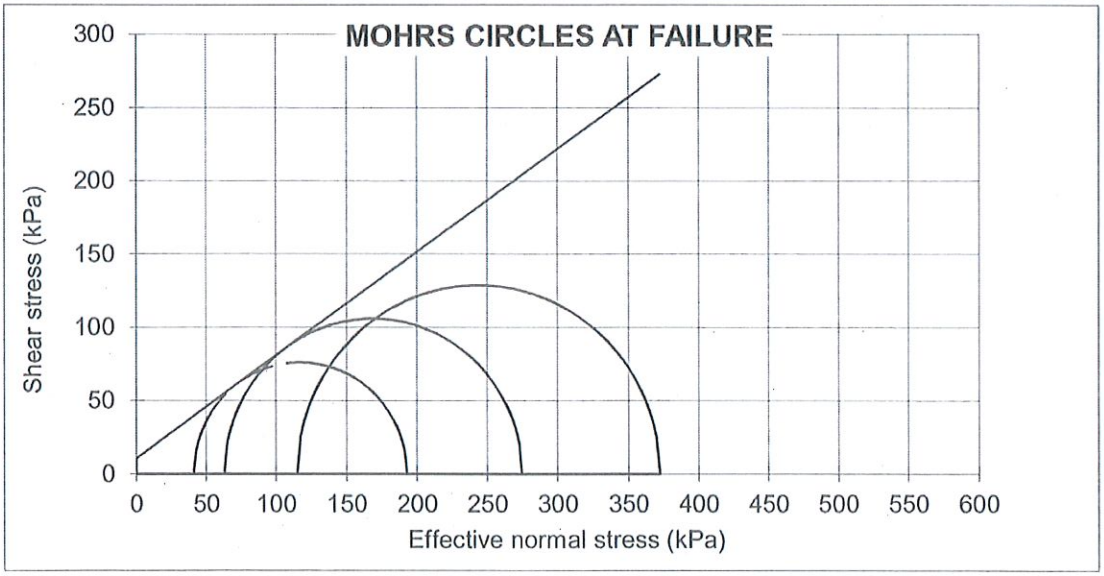
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3205

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, Ø'	**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

Peter Chan
Associate

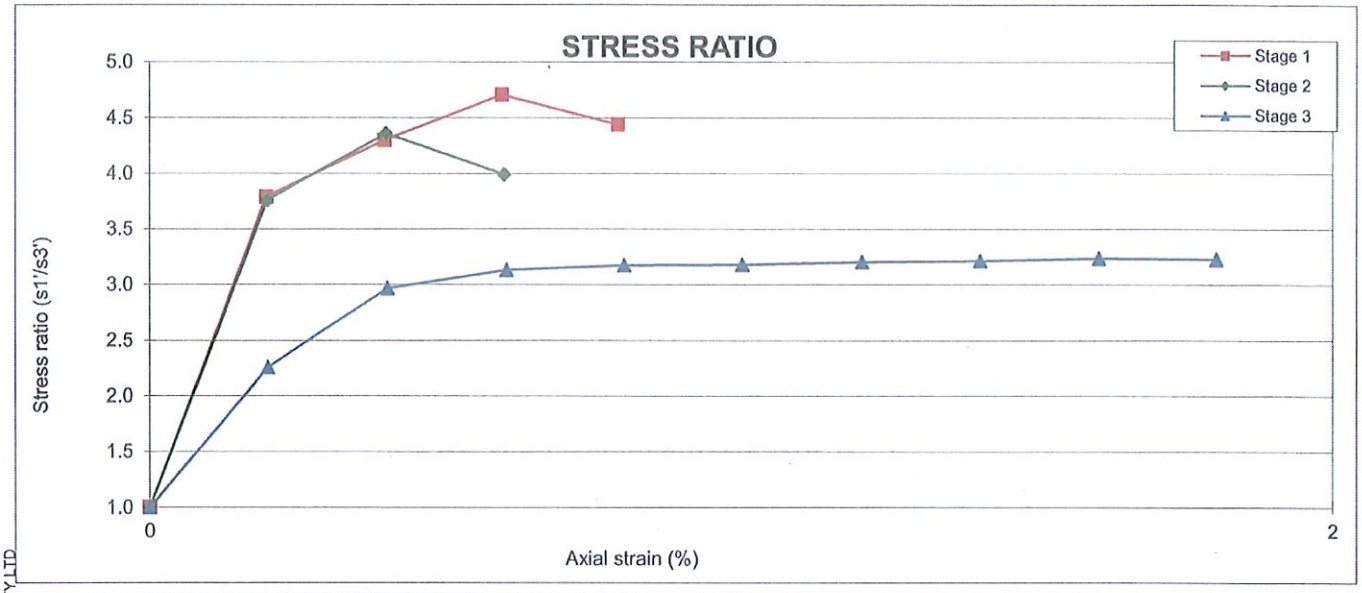
Douglas Partners
Geotechnics / Environment / Groundwater

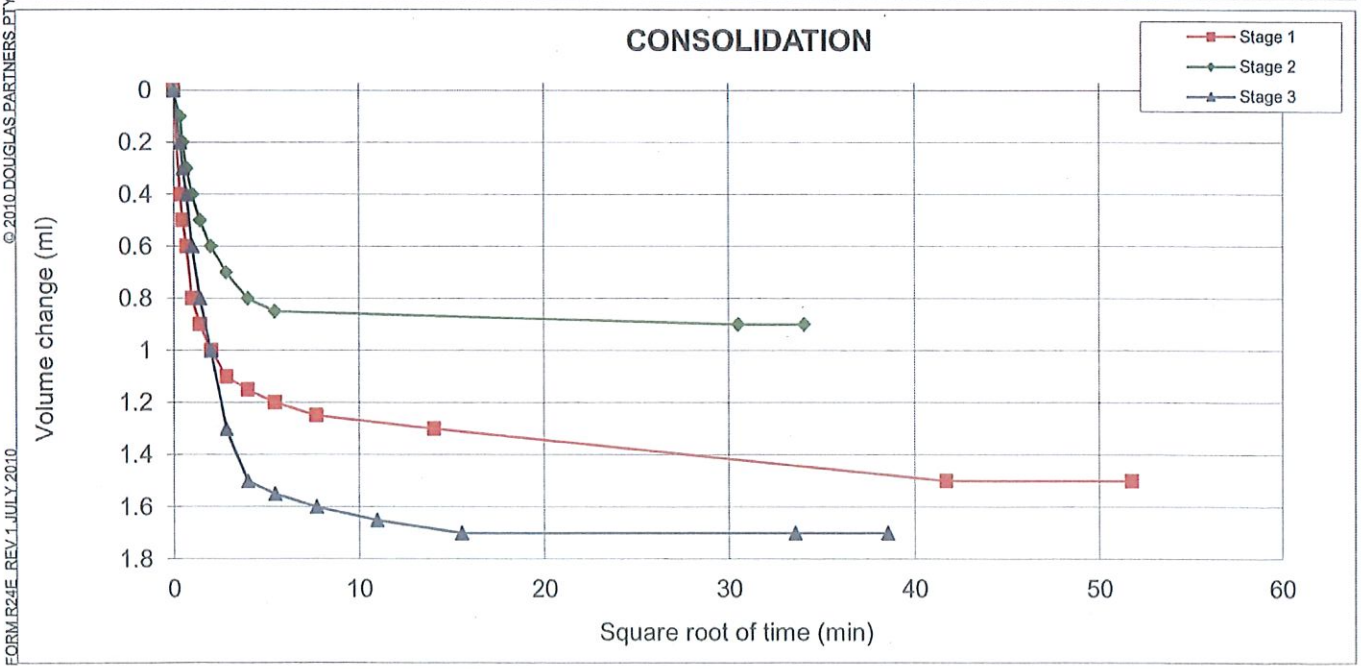
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

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

Peter Chan
Associate

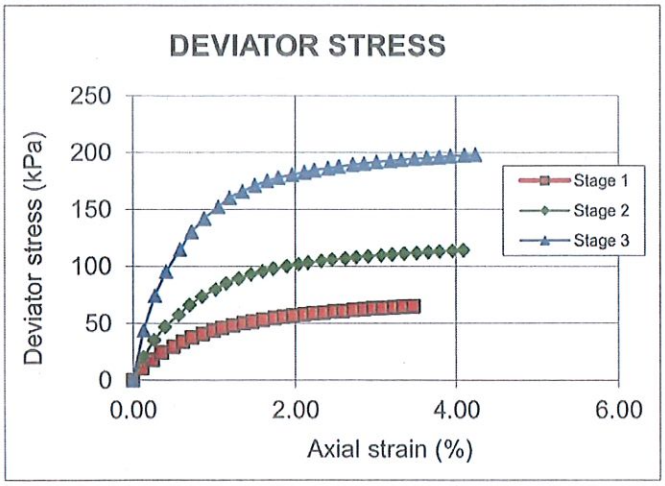
Douglas Partners
Geotechnics I Environment I Groundwater

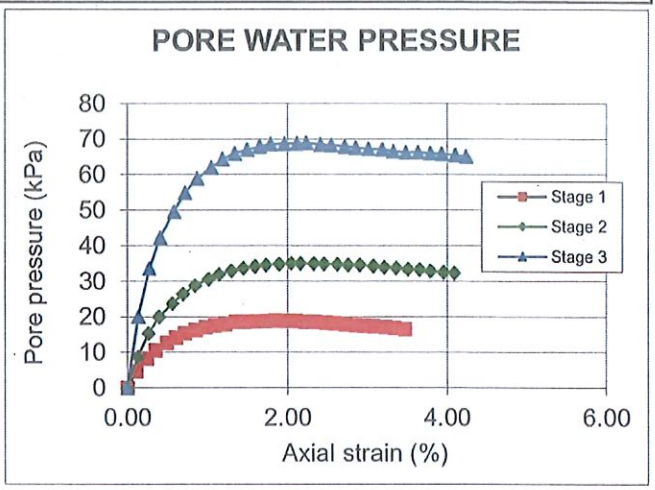
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Triaxial Compression Test Results

(CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENT)

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



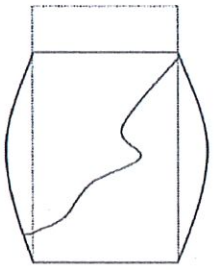


STAGE DETAILS	STAGE 1	STAGE 2	STAGE 3
Cell pressure (kPa)	550	600	700
Back pressure (kPa)	500	500	500
Volume change (%)	2.2	4.4	6.6
Strain rate (mm/min)	0.020	0.020	0.020
AT FAILURE			
Strain (%)	3.3	4.1	4.1
Deviator Stress (kPa)	65	114	197
Pore pressure (kPa)	517	533	568
Stress ratio	3.0	2.7	2.5

SPECIMEN DETAILS	Initial	Final
Moisture content (%)	24.9	27.2
Dry density (t/m3)	1.53	
B' value after saturation	0.99	

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

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

Tested: CP
Checked: AD

Peter Chan
Associate

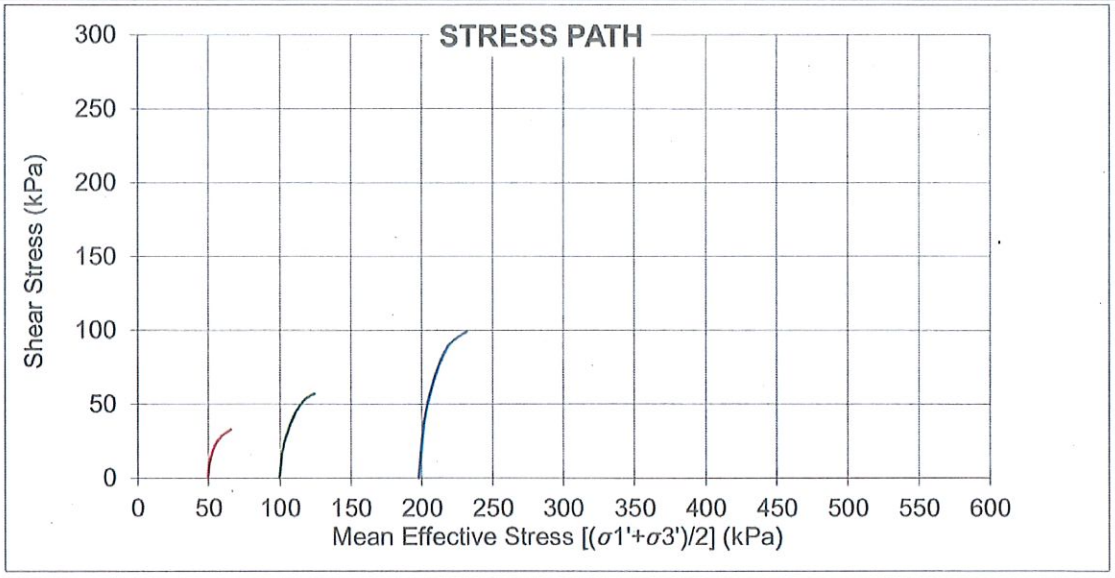
Douglas Partners
Geotechnics / Environment / Groundwater

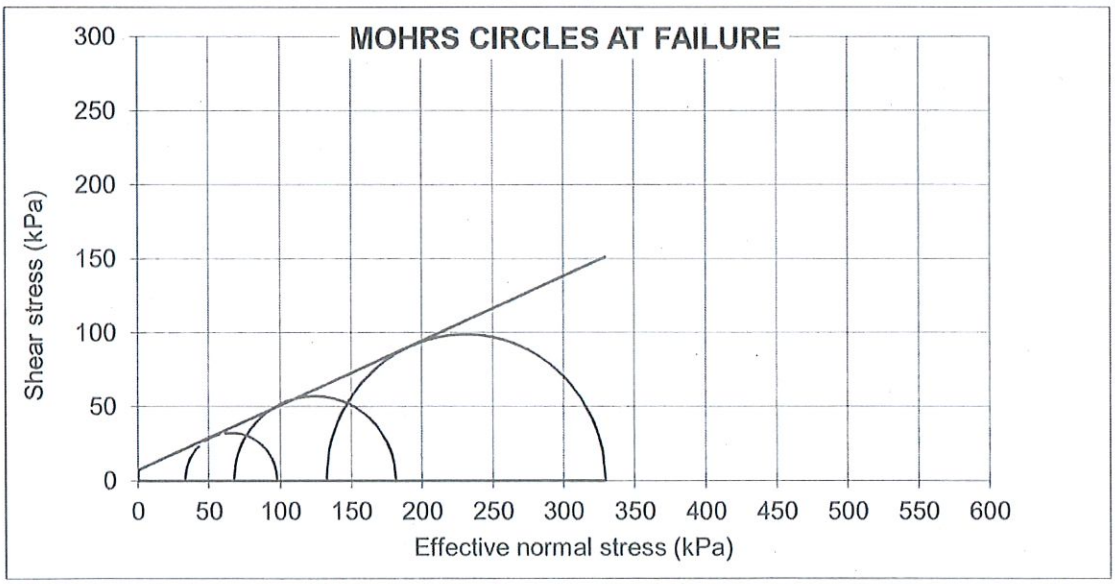
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3205

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, Ø'	**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

Peter Chan
Associate

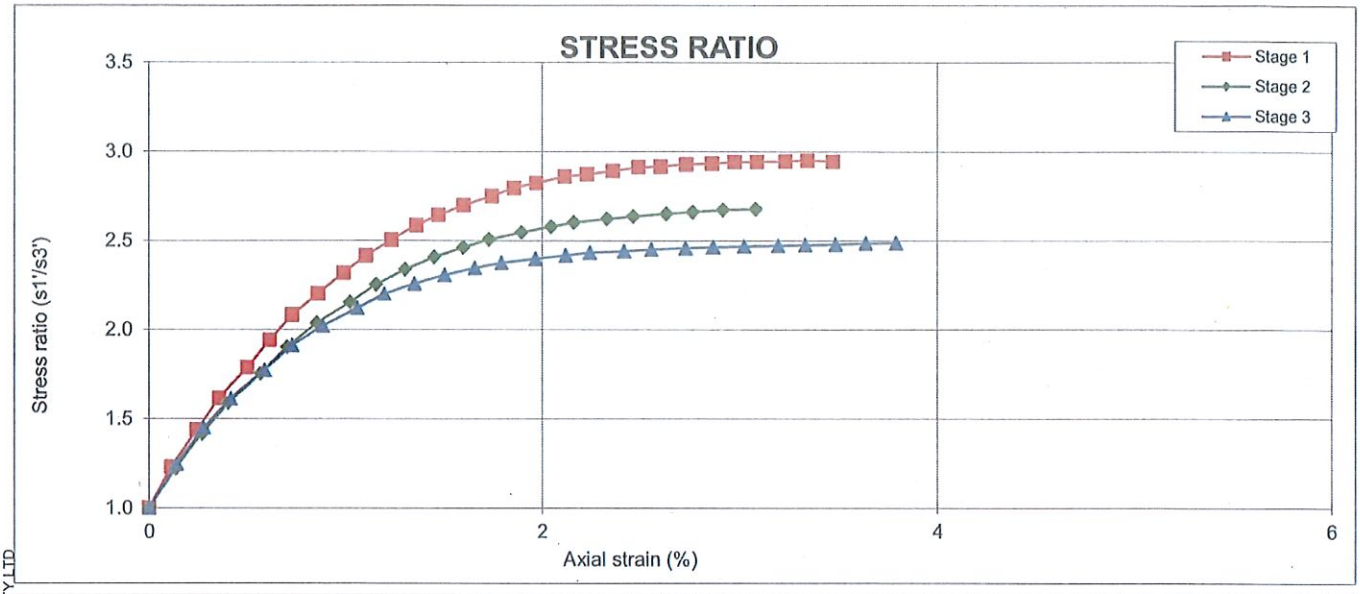
Douglas Partners
Geotechnics I Environment I Groundwater

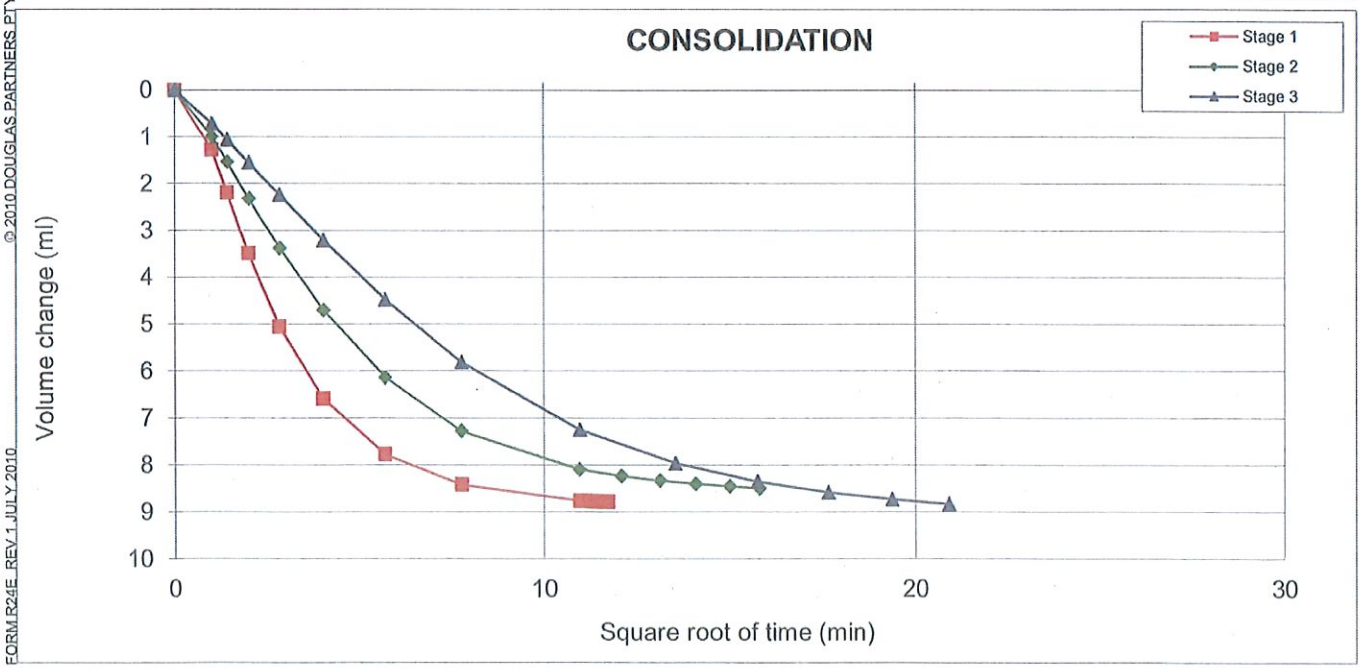
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

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
WORLD RECOGNISED ACCREDITATION

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

Tested: CP
Checked: AD

Peter Chan
Associate

BORROW AREA B

LABORATORY RESULTS

SLR INVESTIGATION LABORATORY RESULTS

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
Unit 2, 14 Caryota Court
Coconut Grove NT 0810
PO Box 36858
Winnellie NT 0821
Phone (08) 8948 6800
Email: clare.whelan@douglaspartners.com.au

Client **SLR Consulting Australia Pty Ltd**
Project **Rum Jungle Rehabiliation - 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

Douglas Partners
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

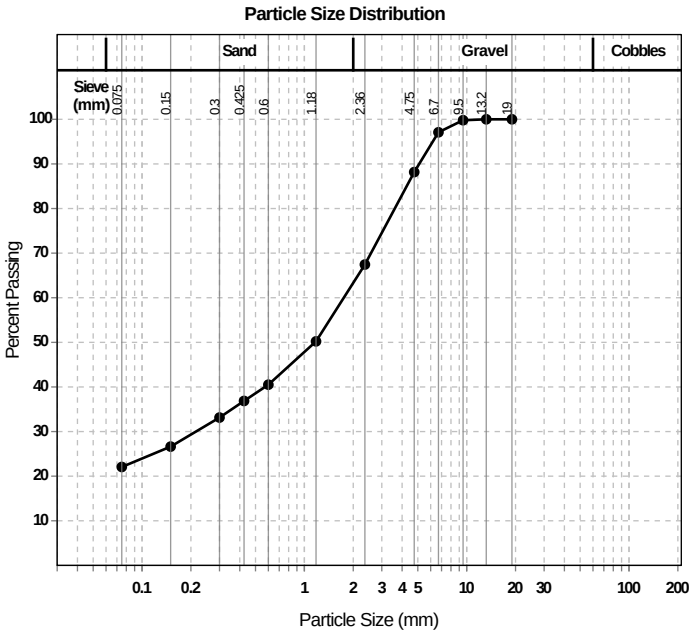
Report Number: **677659.00-2**
Issue Number: 2 - *This version supersedes all previous issues*
Reissue Reason: *Dry Density Reports Added*
Date Issued: 21/01/2020
Client: SLR Consulting Australia Pty Ltd
Level 2/14 Ventnor Avenue, West Perth WA 6005
Contact: Ben Tarrant
Project Number: 677659.00
Project 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 (^{o}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

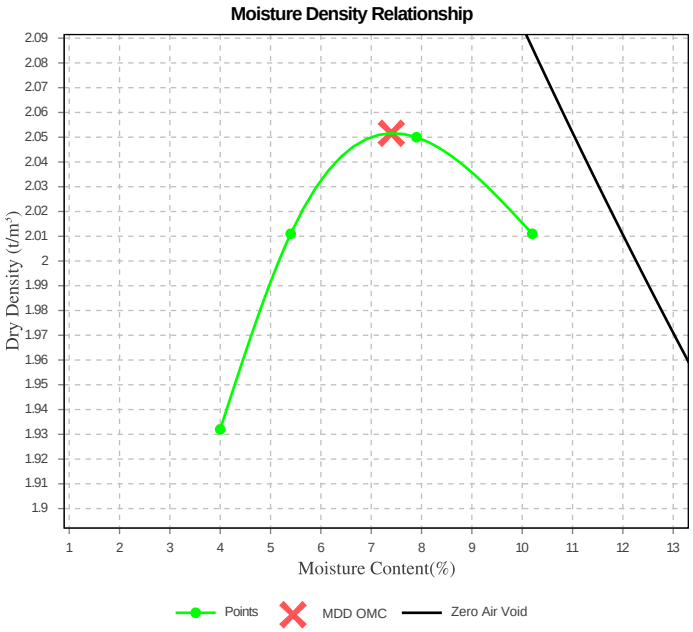
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **677659.00-2**
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

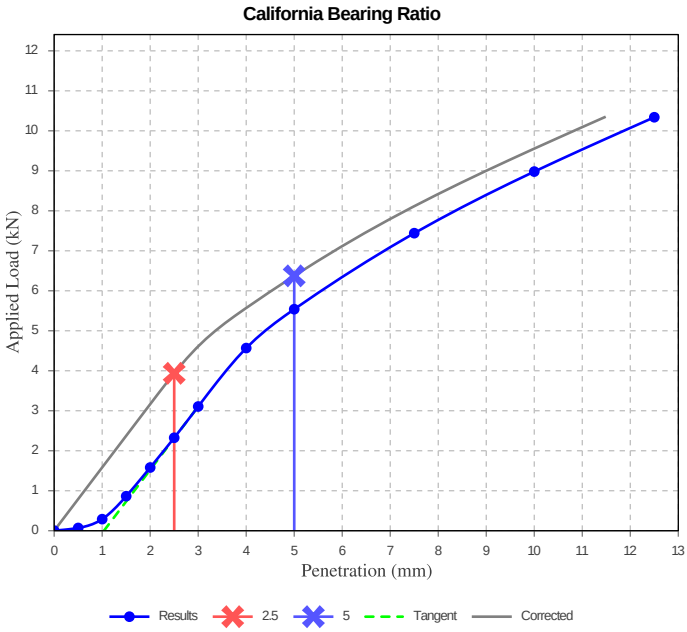
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **677659.00-2**
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		

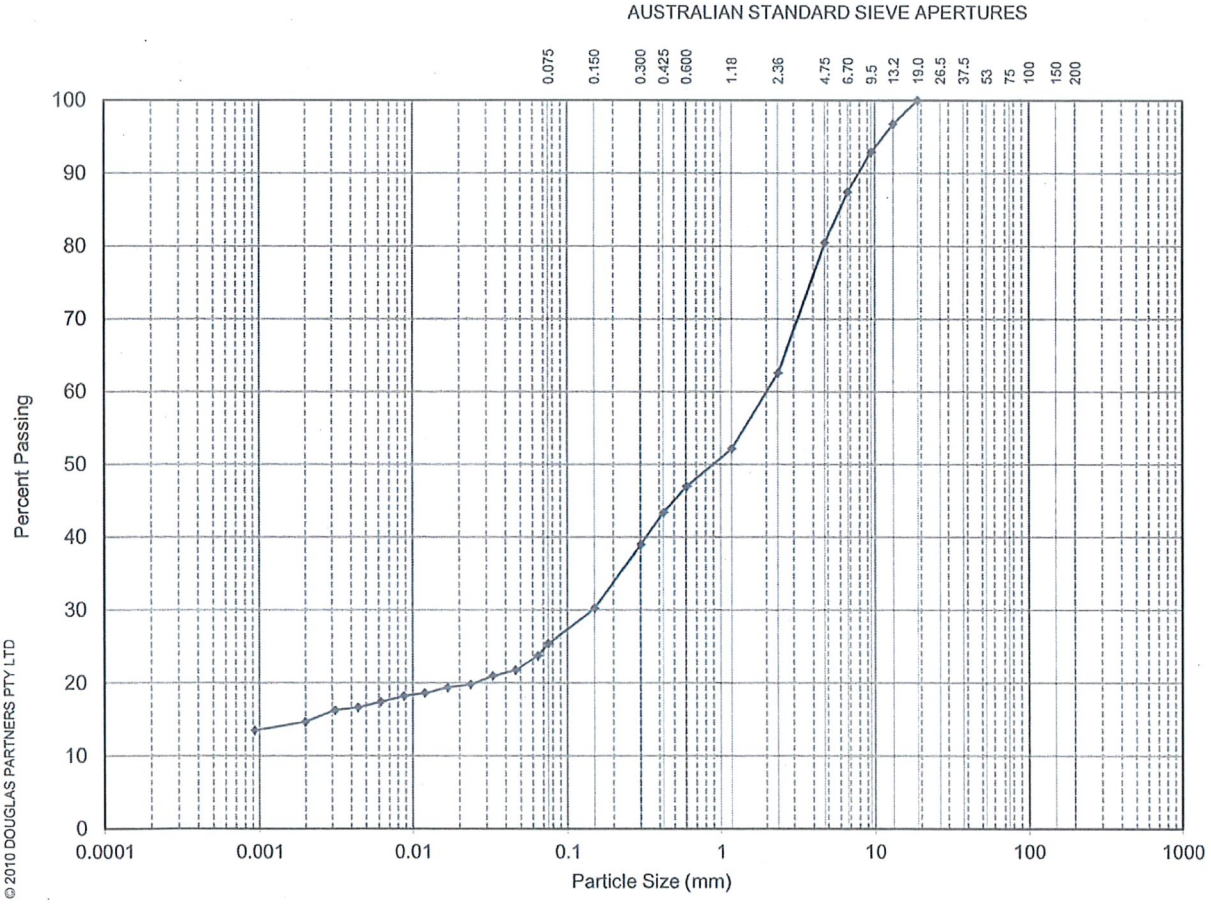


Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136019
Project :	BATCHELOR - Rum Jungle Rehabilitation	**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



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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

Peter Chan
Associate

Material Test Report

Douglas Partners
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: **677659.00-2**
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.

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 (^{o}C)	26		
* Mineral Present	Gypsum		

Material Test Report

Douglas Partners
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

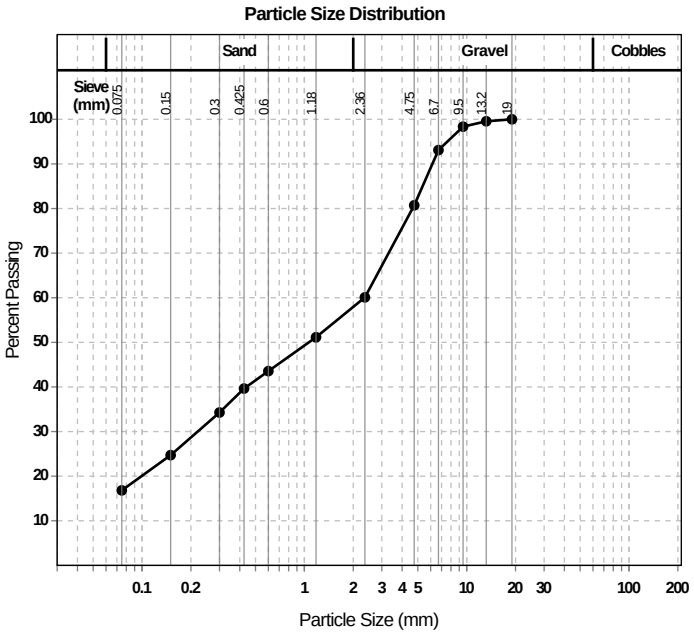
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **677659.00-2**
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 (^{o}C)	26		

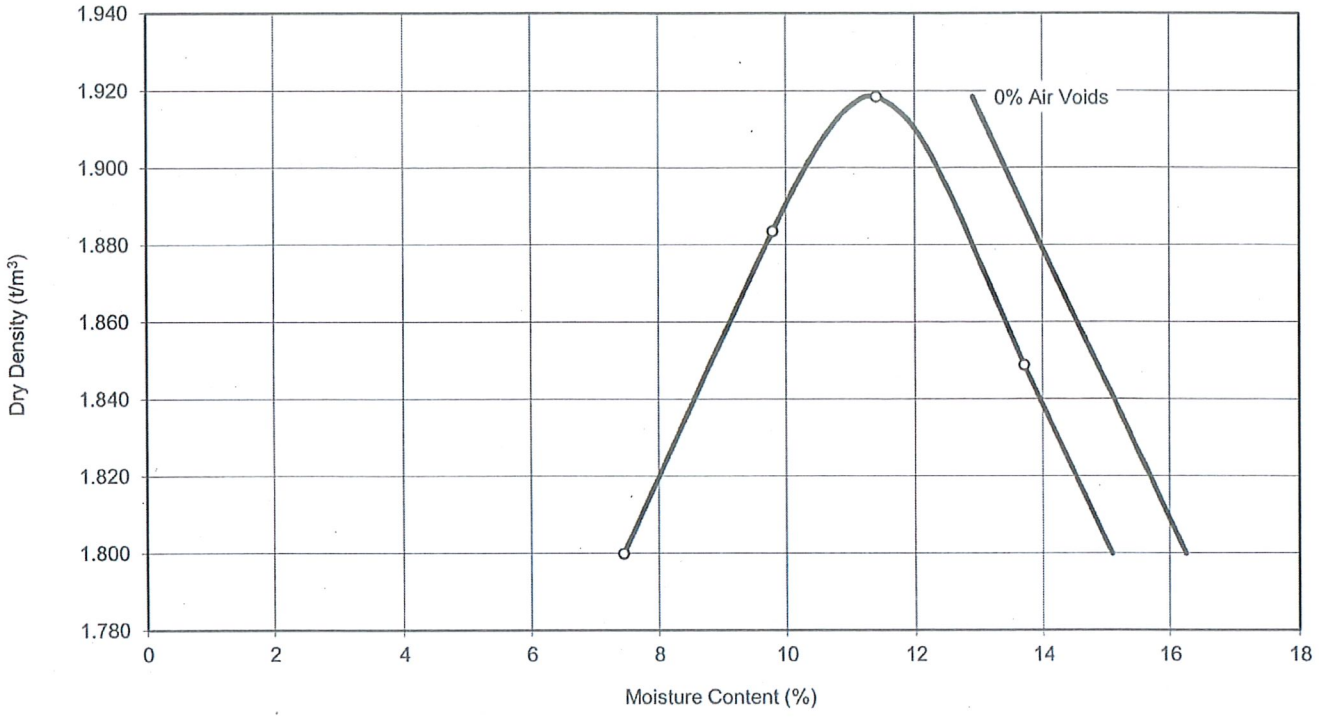


Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Compaction Test

Client :	SLR Consulting Australia Pty Ltd	**Project No. :**	677659.00
		Report No. :	M19136022
Project :	BATCHELOR - Rum Jungle Rehabilitation	**Report Date :**	8/11/2019
Location :	Rum Jungle, Batchelor, NT	**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/m^3**
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 FOR TECHNICAL COMPETENCE

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

Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Falling Head Permeability Test

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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: TT
Checked: AG

Peter Chan
Associate

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Douglas Partners
Geotechnics / Environment / Groundwater

Results of Soil Particle Density Test

Client:	**SLR Consulting Australia Pty Ltd**	**Project No:**	677659.00
		Report No:	MSPD
		Report Date:	26-Nov-2019
Project:	BATCHELOR - Rum Jungle Rehabilitation		
		Date Sampled:	-
		Date of Test:	14-Nov-2019
Location:	Rum Jungle, Batchelor, NT	**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 $\overline{P_c}$ (g/cm^3)	Passing 2.36 mm $\overline{P_f}$ (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

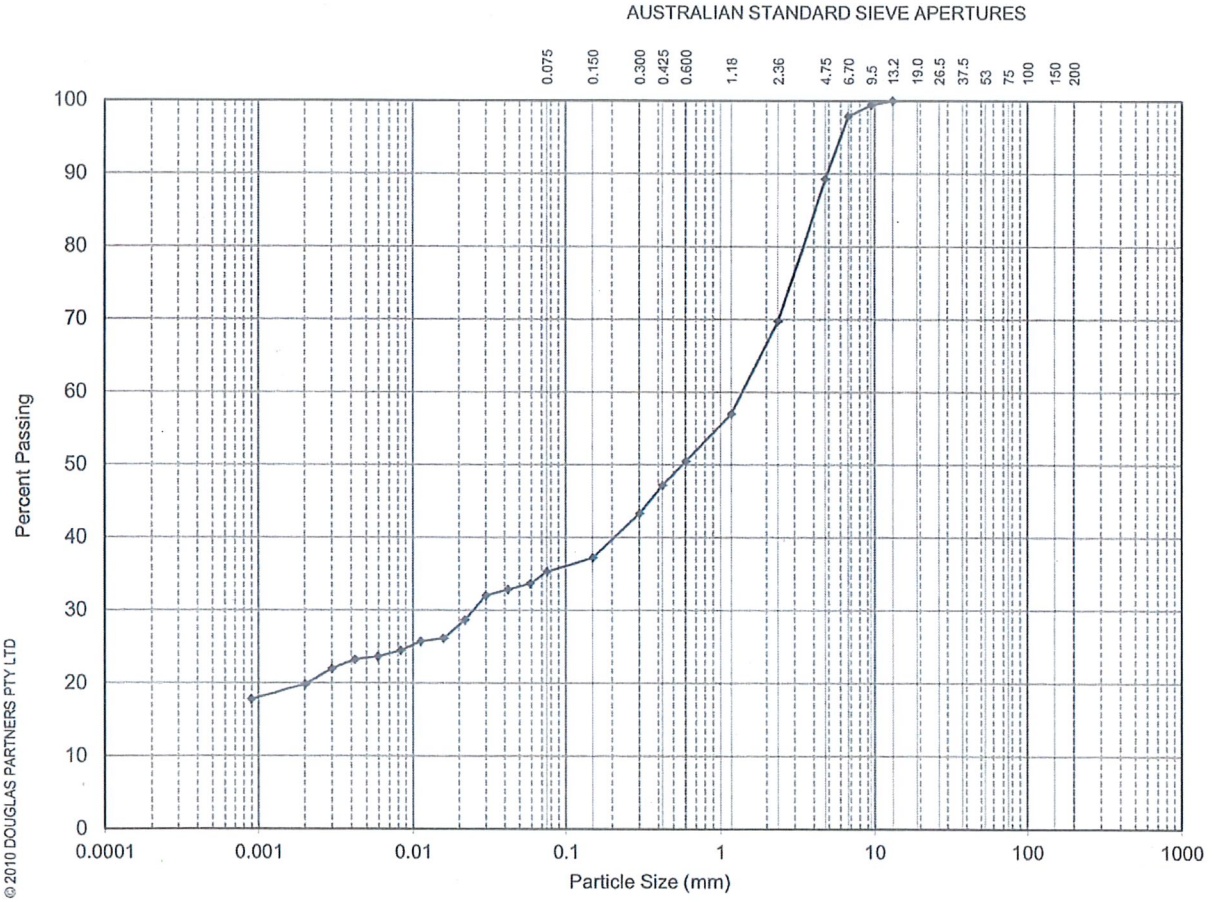
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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	0.006	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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Moisture Content, Plasticity and Linear Shrinkage Tests

Client:	**SLR Consulting Australia Pty Ltd**	**Project No:**	677659.00
		Report No:	M19136025
Project:	BATCHELOR - Rum Jungle Rehabilitation	**Report Date:**	26-Nov-2019
		Date Sampled:	-
Location:	Rum Jungle, Batchelor, NT	**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 length254mm)

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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: SR
Checked: AG

Arveendra Gounder
Laboratory Manager

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Determination of Emerson Class Number of Soil

Client:	**SLR CONSULTING AUSTRALIA PTY LTD**	**Project No:**	677659.00
		Report No:	M19136024
Project:	BATCHELOR - Rum Jungle Rehabilitation	**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
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

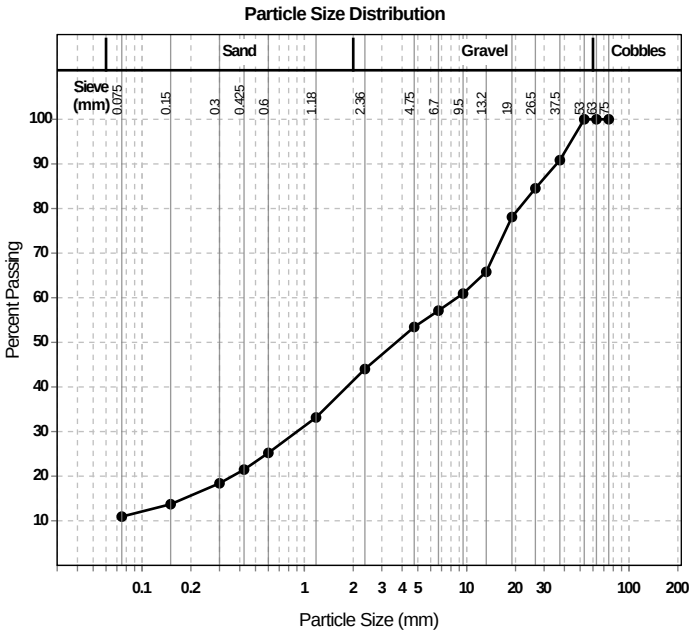
Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

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

Douglas Partners
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

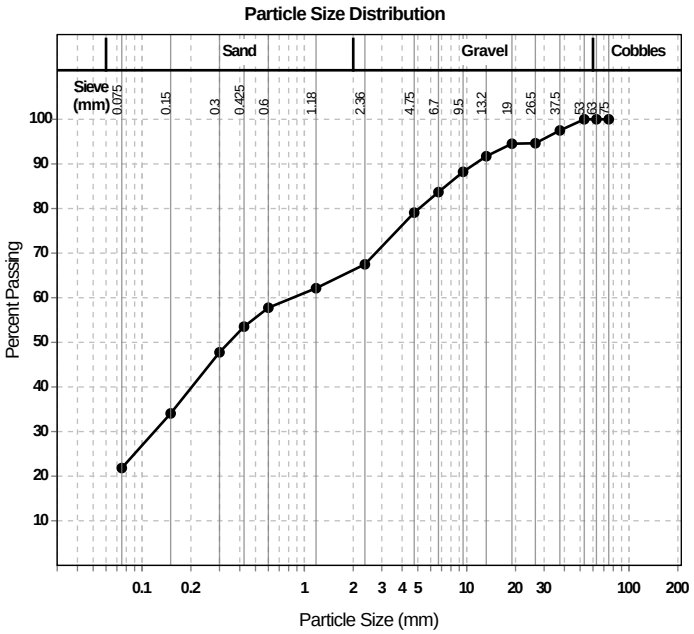
Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

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

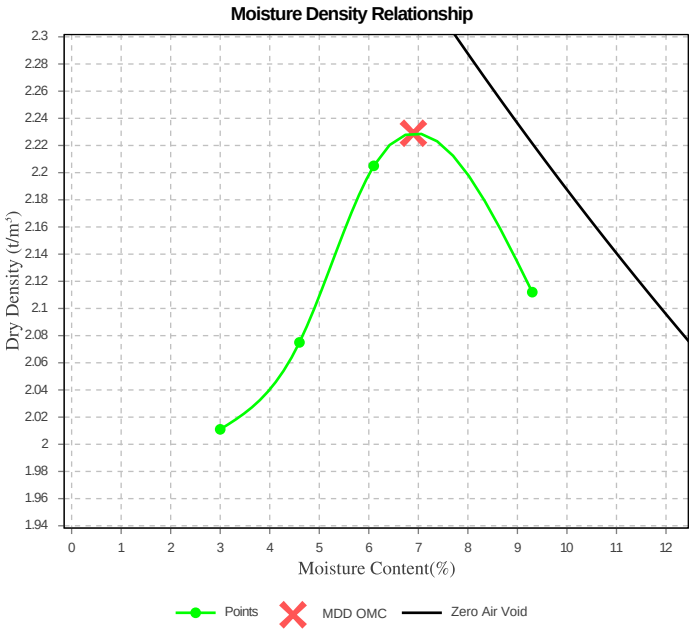
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **677659.00-2**
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

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

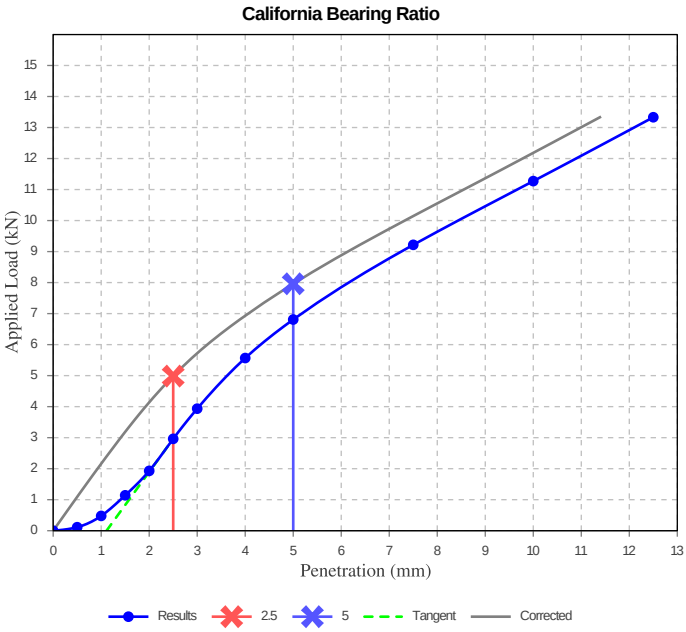
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **677659.00-2**
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		

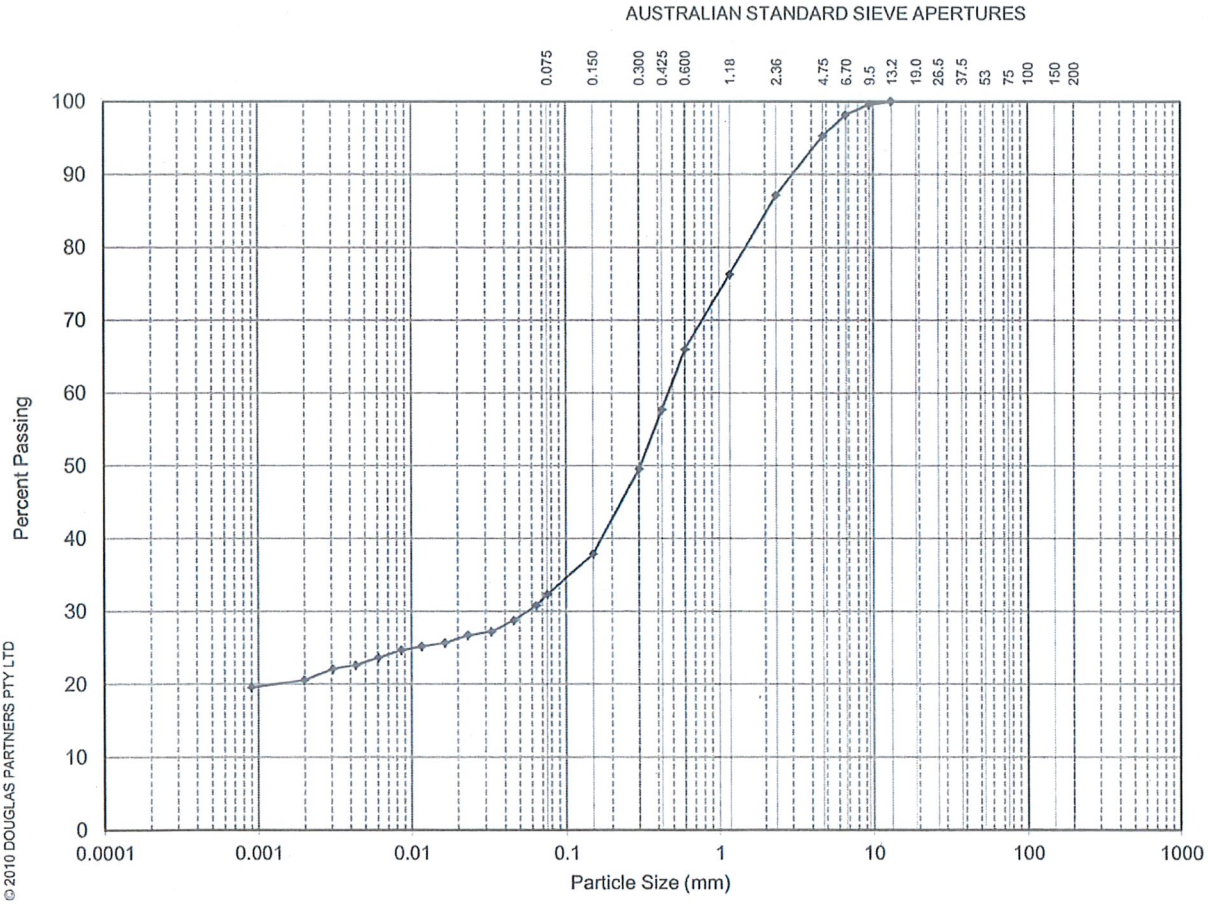


Douglas Partners
Geotechnics I Environment I Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Results of Particle Size Distribution (Hydrometer)

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



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

NATA ACCREDITED FOR TECHNICAL COMPETENCE

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
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: **677659.00-2**
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 (^{o}C)	26		

Material Test Report

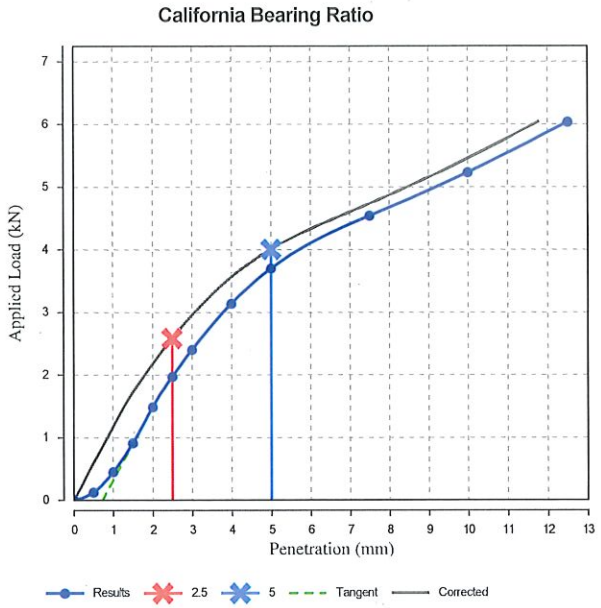
Douglas Partners
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: 677659.00-2
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		



Material Test Report

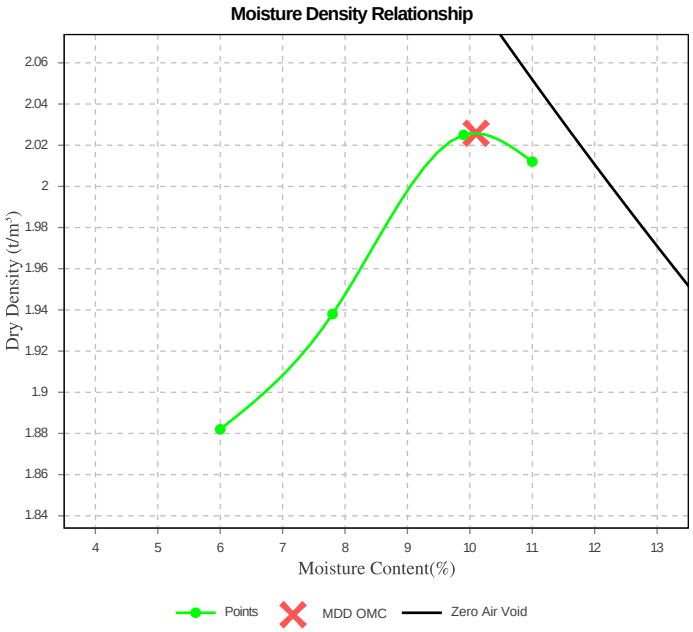
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **677659.00-2**
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
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

NATA
WORLD RECOGNISED ACCREDITATION

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

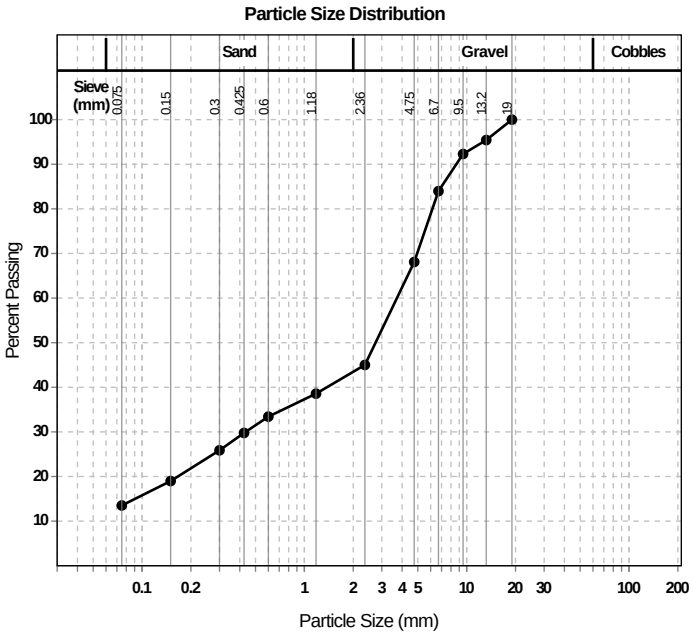
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **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

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Melbourne Laboratory
231 Normanby Road South Melbourne Vic 3205
Phone: (03) 9673 3500
Fax: (03) 9673 3599
Email: arveendra.gounder@douglaspartners.com.au

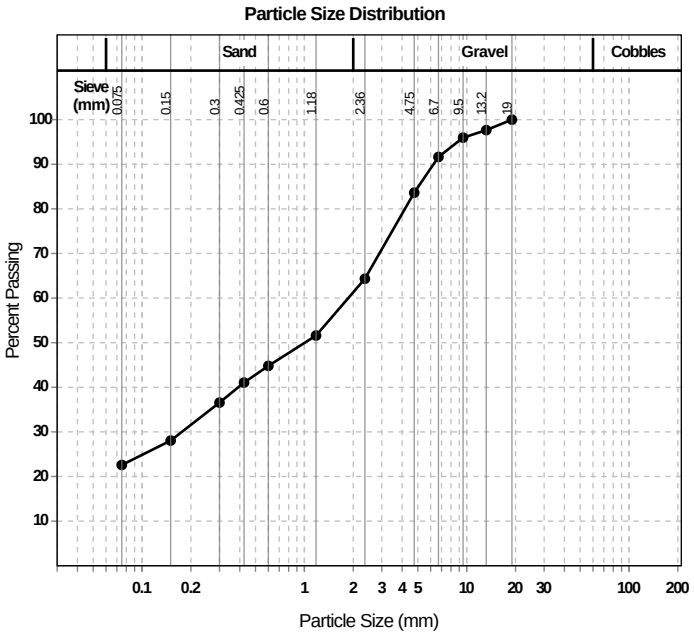
Accredited for compliance with ISO/IEC 17025 - Testing

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**		



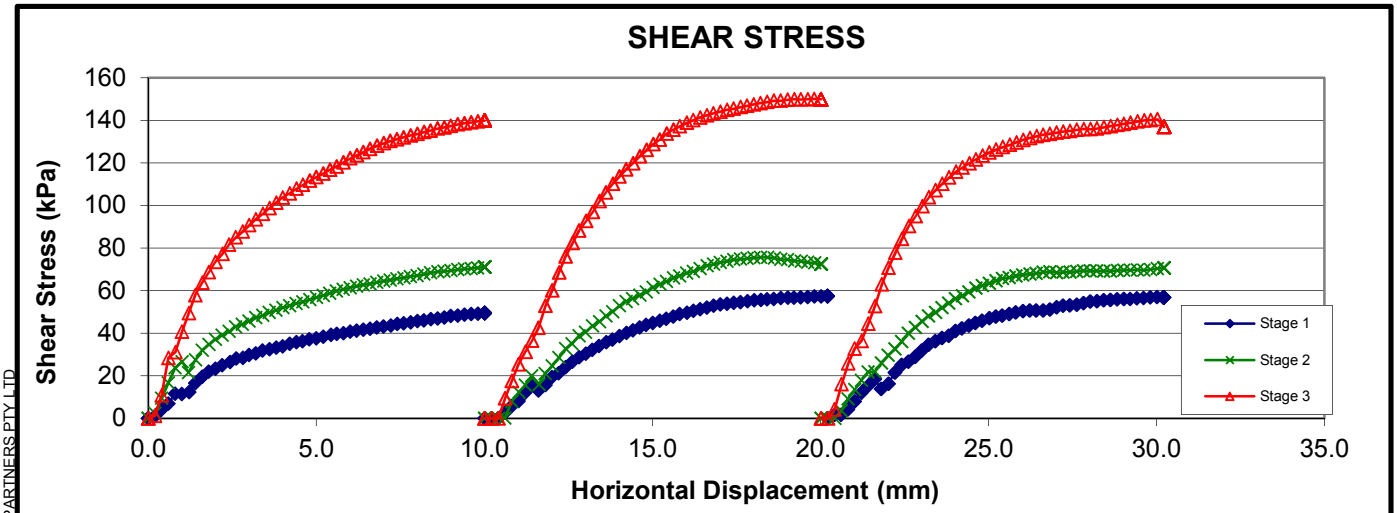
Douglas Partners
Geotechnics | Environment | Groundwater

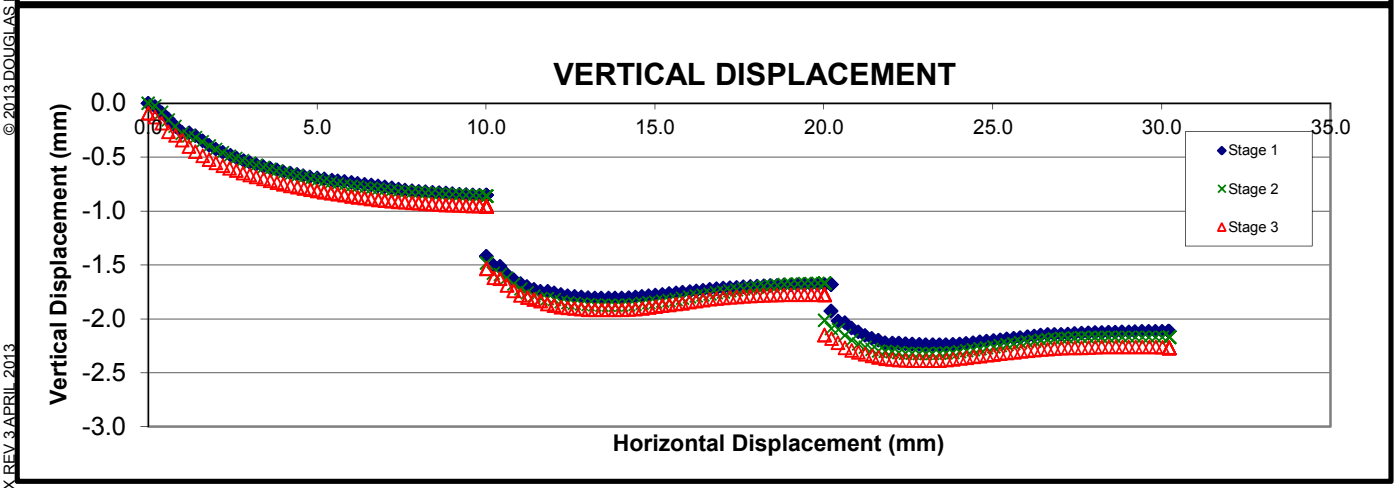
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Direct Shear Test Results

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

STAGE DETAILS		STAGE		SPECIMEN DETAILS			STAGE	
	1	2	3			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





FORM DSX REV 3 APRIL 2013

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 measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: AD
Checked: AD

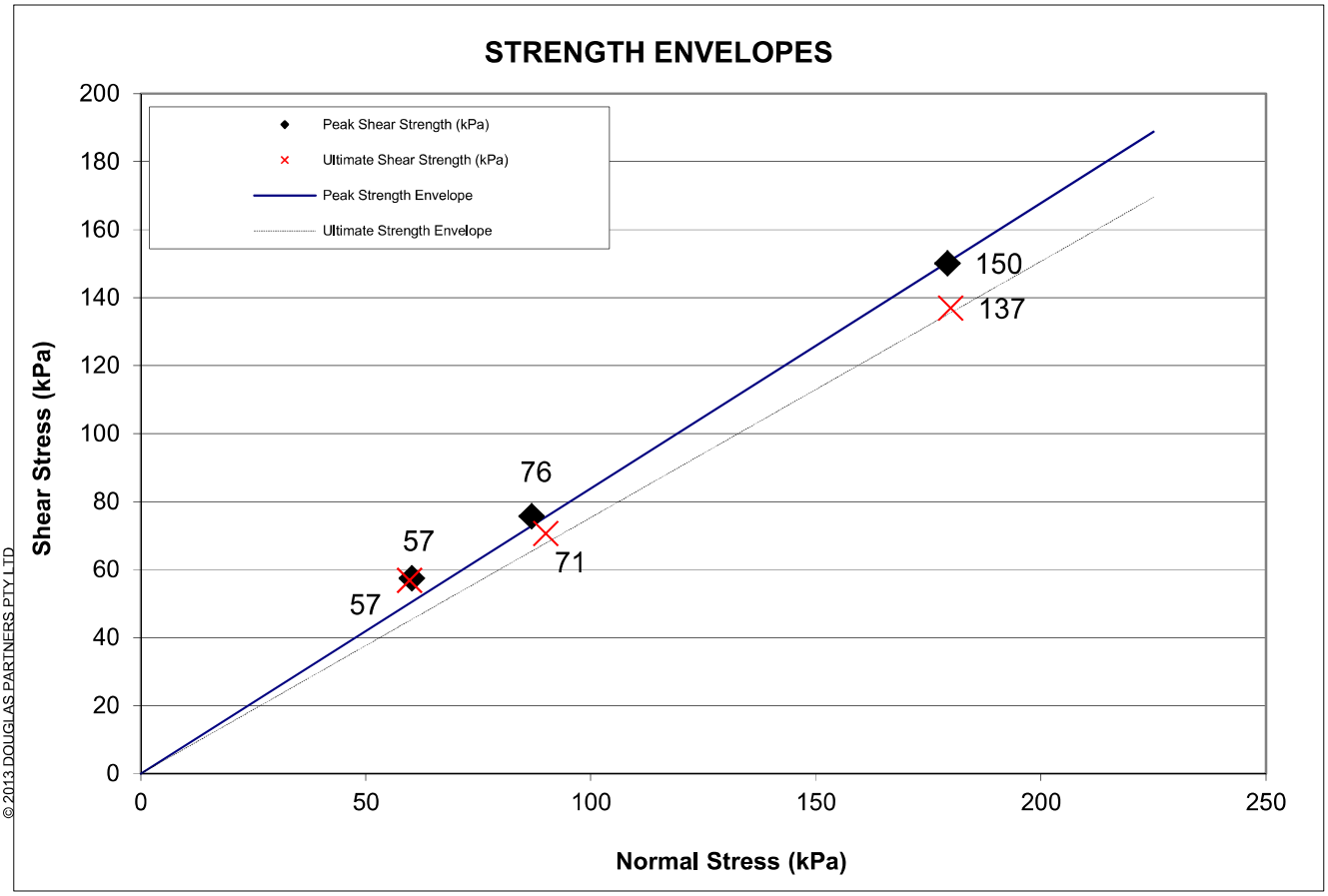
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Direct Shear Test Results

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



INTERPRETED RESULTS

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

NOTES

1. Area correction applied to normal stress
2. 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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: AD
Checked: AD

Peter Chan
Associate

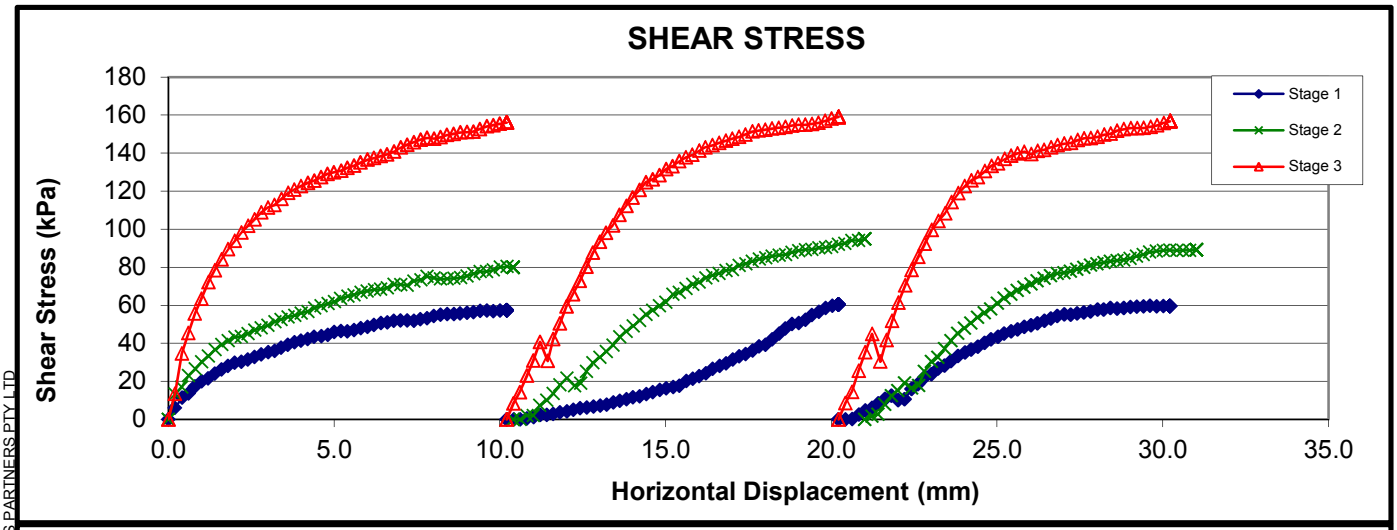
Douglas Partners
Geotechnics / Environment / Groundwater

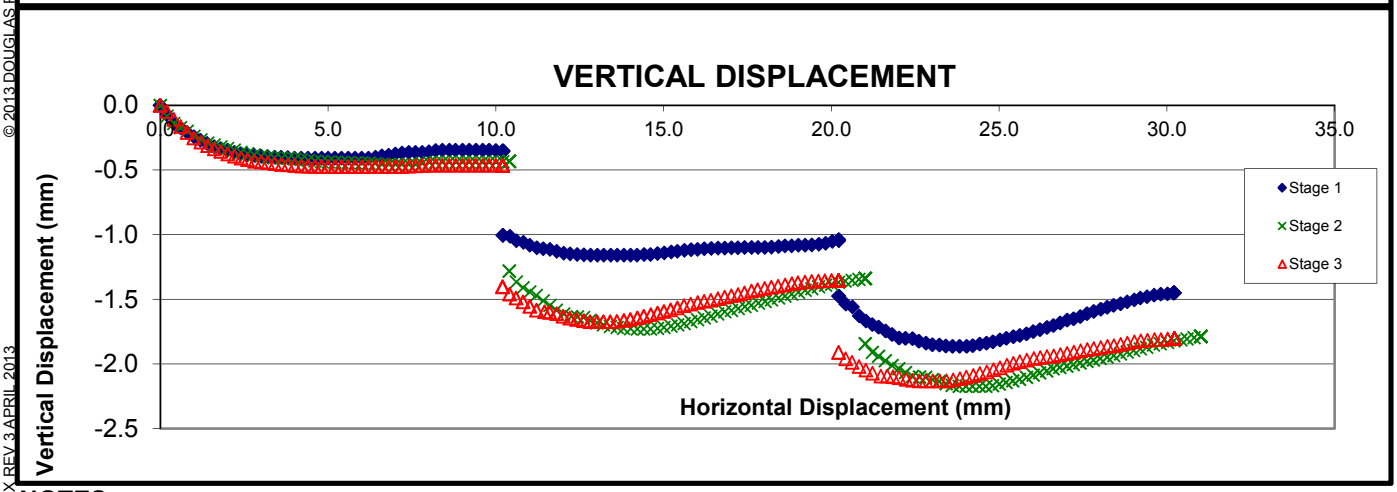
Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Direct Shear Test Results

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

STAGE DETAILS		STAGE		SPECIMEN DETAILS			STAGE	
	1	2	3			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
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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: AD
Checked: AD

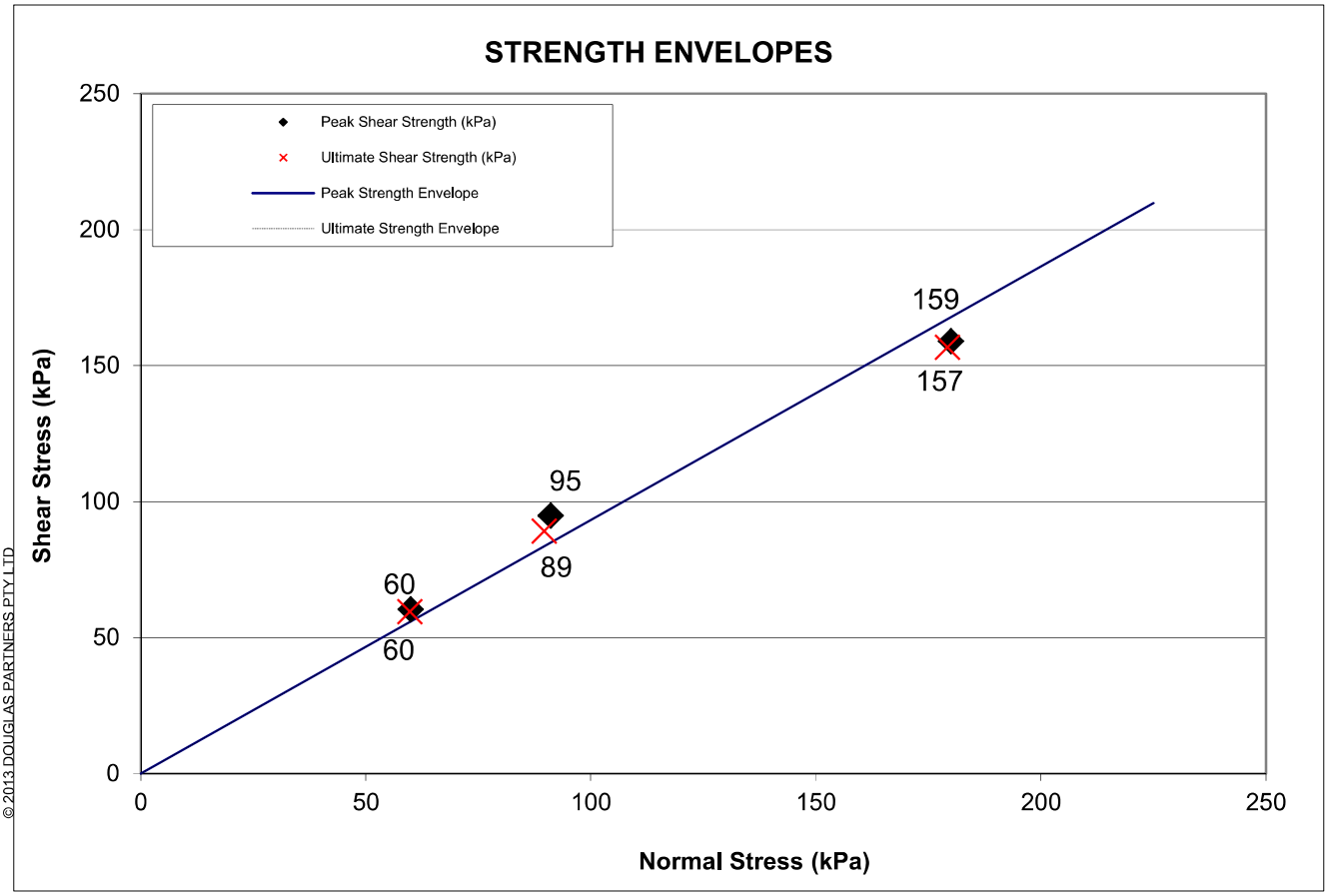
Peter Chan
Associate

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
231 Normanby Road
PO Box 5051
South Melbourne VIC 3205
Phone (03) 9673 3500
Fax (03) 9673 3599

Direct Shear Test Results

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



INTERPRETED RESULTS

	PEAK	ULTIMATE
Cohesion (kPa)	**0**	**0**
Angle of Internal Friction	**43°**	**43°**

NOTES

1. Area correction applied to normal stress
2. 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

ACCREDITED FOR TECHNICAL COMPETENCE

Tested: AD
Checked: AD

Peter Chan
Associate

Material Test Report

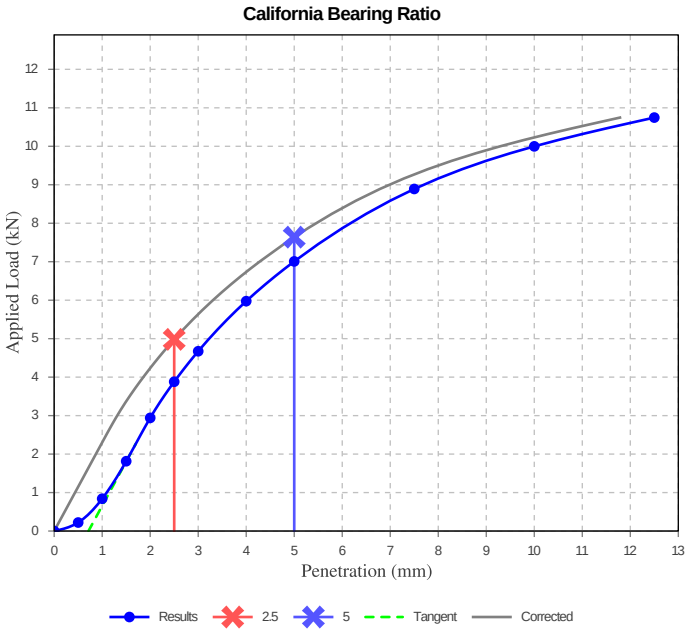
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **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

Douglas Partners
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

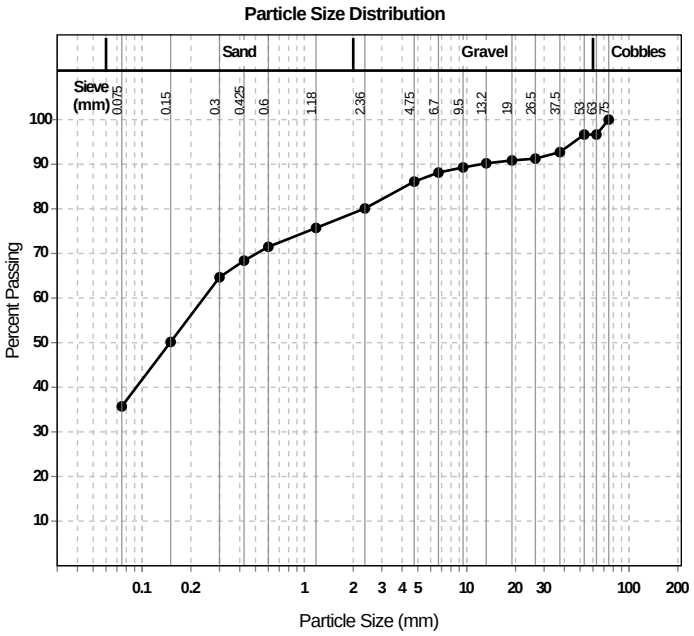
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **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

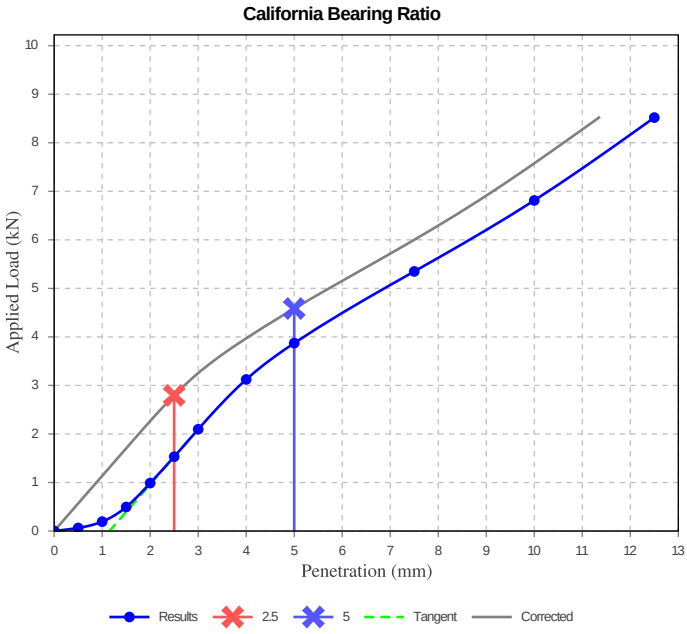
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **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

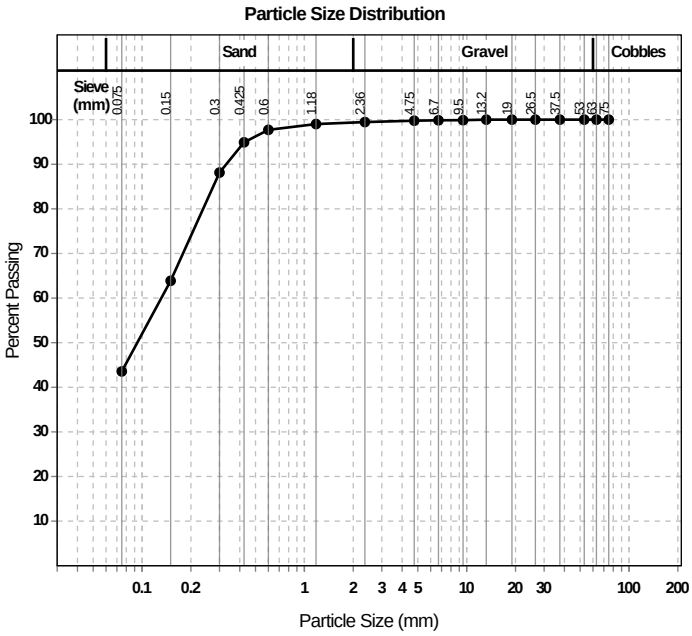
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **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

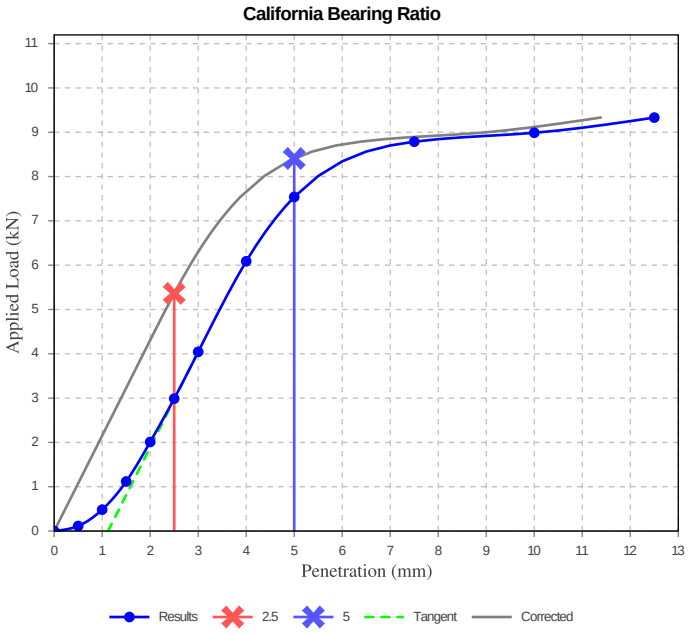
Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: clare.whelan@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Clare Whelan
Lab Manager
NATA Accredited Laboratory Number: 828

Report Number: **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

Douglas Partners
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

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

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**		

Material Test Report

Douglas Partners
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

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

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**		

Material Test Report

Douglas Partners
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: Peter.Gorseski@douglaspartners.com.au

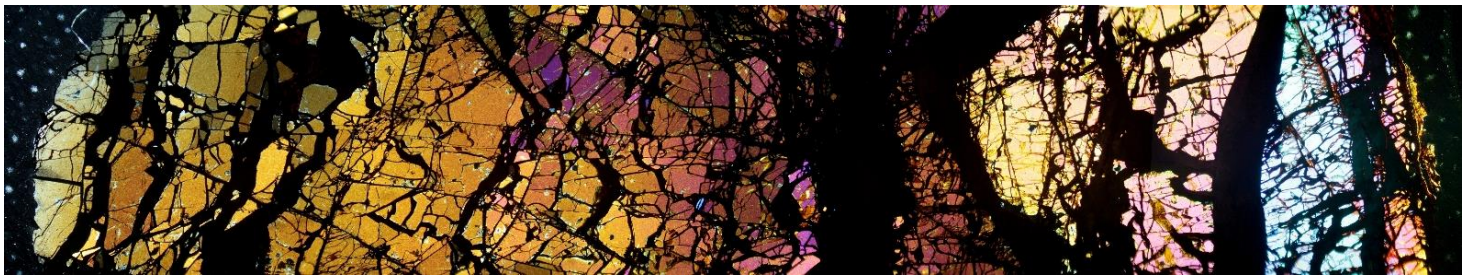
Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

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

Report Number: **677667.00-4**
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**		



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

Sample Label:	DW-2179E	**Date Sampled**:	08/10/2019
Project Number:	677667.00	**Date Received**:	30/10/2019
Location:	Q-SLR-GS04	**Sample Type**:	Rock
Sample Location:	52 L 715340 E 8564974 S		
Work Requested	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

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 (miocrocline). 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.

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 amour 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).

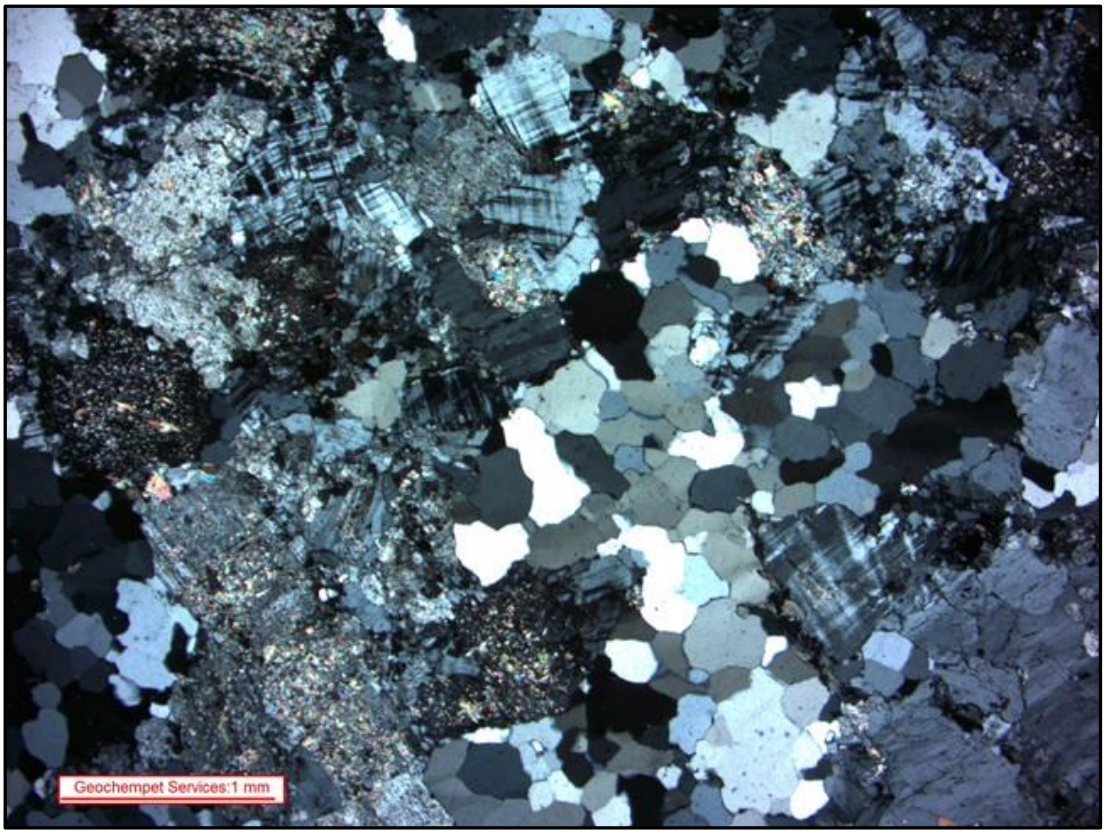


Figure 1. Micrograph taken at low magnification, in transmitted cross polarised light of a micro-granite. Image shows a typical mineral assemblage seen throughout the slide, consisting of quartz, plagioclase and biotite. Note the biotite has been altered in part to brown chlorite and the plagioclase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