

RESULTS OF DRILLING AND TRENCHING

CHARLOTTE RANGE PROPOSED BALLAST SITE

TEMPORARY MINING RESERVE NO. 341

N.T.

by

D.B. CLARKE

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PLATES           I   Charlotte Range Proposed Ballast Site  
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                  II Diagramatic Section through Drillholes.

## SUMMARY

This report sets out the results of drilling and trenching on Temporary Mining Reserve No. 341.

A siliceous capping on Ordovician sandstone has been proposed as possible ballast material. The drilling was carried out to assess the available volume of this rock.

Siliceous material in the scree slope was also proposed as a possible source of ballast. The trenching tested the volume of suitable scree available around the sandstone outcrop.

Drilling indicates that approximately 100,000 cubic yards of moderately to very well cemented sandstone may be available within the outcrop. Further reserves of possibly suitable sandstone are indicated.

The material previously described as silcrete occurs in discontinuous, irregular and generally sparse bands within the sandstone.

Trenching indicates that approximately 17,000 cubic yards of possibly suitable sandstone are available in the scree slope.

However, because of considerable local variations in grain size and degree of cementation of the sandstones, it is recommended that some laboratory testing of the hardness, abrasion resistance and crushing characteristics of representative samples should be undertaken, before any of the estimates in this report are used as a basis for firm planning.

## PREVIOUS INVESTIGATIONS

Following a brief reconnaissance survey, the area was reported on by Fruzzetti (N.T. Geological Survey unpub. rep. No. 279, 1971) and Temporary Mining Reserve No. 341 (area 31 square miles) was subsequently created.

The proposed ballast site itself was geologically mapped on a scale of one inch to one hundred feet by Shields (1972). His report (N.T. Geological Survey unpub. rep. No. 321, 1972) recommended seven diamond drill holes each thirty feet in depth to further test the site.

A discussion of the regional geology, access, and location of the site is also contained in the report by Shields.

## PRESENT INVESTIGATION

### (1) DRILLING

The seven diamond coreholes recommended by Shields were completed to a depth of 30 feet (See Plate I).

Drilling was carried out in August and September 1972 by a Mines Branch drilling crew using an EDECO MK VI diamond drilling rig.

The overall core recovery was 82%.

(2) TRENCHING

At the request of the Commonwealth Railways, Port Augusta, seven trenches totalling 1290 feet were made in the scree slope (See Plate I). Work was carried out by K. Goodluck of Alice Springs under agreement with the Commonwealth Railways and was supervised by the writer.

RESULTS(1) DRILLING

(a) Geological. As indicated in Plate II, the uppermost unit is predominantly sandstone (See also Appendix I). It increases gradually in thickness from 8 feet in D.D.H.7 to 14 feet 7 inches in D.D.H.2, with the probable exception of D.D.H.3 where poor core recovery renders the thickness uncertain. There is a relatively large increase in thickness from 14 feet 7 inches to 25 feet 3 inches between D.D.H.2 and D.D.H.1.

A surface zone, several feet thick, is generally orange in colour and moderately friable due to weathering; otherwise the rock is typically moderately well cemented. The very siliceous material noted by Shields in outcrop is found only as irregular, and, with the exception of D.D.H.1, sparse blotches and bands in the drill core. In most drill holes, about half of the unit appears to provide material suitable for ballast, with about another 25% possibly suitable.

Towards the base of this unit, an argillaceous matrix or thin claystone interbeds are generally developed.

The underlying unit is predominantly sandy siltstone. It varies in thickness from 7 feet 3 inches in D.D.H.7 to 3 feet 7 inches in D.D.H.2. D.D.H.1 bottomed in this lithology.

A second thinner sandstone unit underlies the sandy siltstone. It is thickest (2 feet 6 inches) in D.D.H.3 and thinnest (6 inches) in D.D.H.4. It is generally moderately to very well cemented and lithologically is probably suitable ballast material.

The deepest unit penetrated consisted of claystone siltstone interbeds. In D.D.H.'s 5, 6 and 7 it contains a thin sandstone interbed (3 inches, 5 inches and 2 inches respectively), which is well indurated.

(b) Reserves. Sandstone that is moderately well to very well cemented (siliceous cement) has been included in the reserves as "probably suitable" for ballast. All other sandstone is included under the heading "possibly suitable". Other lithologies are regarded as "unsuitable" and the volume for which there was no core recovery has been classified as "unknown". It is unlikely that a significant amount of material suitable for ballast could be derived from the "unknown" category.

Within the uppermost unit, the drill logs show an average thickness of six feet of probably suitable material and slightly more than three feet of possibly suitable material. For a total outcrop area of about 420,000 square feet, this would indicate reserves of about 90,000 cubic yards of probably suitable material and about 50,000 cubic yards of possibly suitable material.

Another method of calculation would be to assume that the section encountered in each drill hole is representative of an area extending half-way to the adjoining drill holes on either side, although this is obviously subject to considerable local variation. This leads to very similar over-all figures:

Drill hole	Area for which drill hole is assumed to be representative. Units of one thousand square feet.
1	60
2	72
3	58
4	46
5	42
6	43
7	90
<u>TOTAL</u>	<u>421 (Areal extent of Outcrop)</u>

Volume of Rock in Upper Sandstone Unit (in units of 1,000 cubic yards).

Hole	Probably Suitable	Possibly Suitable	Unsuitable	Unknown	Total
DDH 1	29.0	17.8	1.8	7.1	55.7
DDH 2	20.0	13.3		5.3	38.6
DDH 3	11.2	8.6		3.6	23.4
DDH 4	10.2	5.8	2.6	5.4	24.0
DDH 5	8.4	5.6		5.0	19.0
DDH 6	1.6	5.7	2.5	6.7	16.5
DDH 7	14.0	2.3		10.0	26.3
<u>TOTAL</u>	<u>94.4</u>	<u>59.1</u>	<u>6.9</u>	<u>43.1</u>	<u>203.5</u>

The underlying sandy siltstone unit is made up entirely of "unsuitable" or "unknown" rock.

Volume of Rock in Lower Sandstone Unit, (units of 1,000 cubic yards).

<u>Hole</u>	<u>Probably Suitable</u>	<u>Possibly Suitable</u>	<u>Total</u>
DDH 1	-	-	-
DDH 2	1.5	-	1.5
DDH 3	5.4	-	5.4
DDH 4	.9	-	.9
DDH 5	2.2	-	2.2
DDH 6	1.9	.3	2.2
DDH 7	2.7	-	2.7
<b>TOTAL</b>	<b>14.6</b>	<b>.3</b>	<b>14.9</b>

The fourth (claystone/siltstone) unit is generally composed of "unsuitable" or unknown rock. The sandstone interbed is assumed to be too thin to be of any interest.

(2) TRENCHING

(a) Reserves. The volume calculated as being inferred from each section of trench is the product of the area for which the trench is assumed to be representative and the appropriate depth of scree.

The figures given should be treated as rough estimate only.

<u>Trench</u>	<u>Volume of Scree (units of cubic yards)</u>
1	600
2	1550
3	6350
4	2500
5	3200
6	6000
7	4800
<b>TOTAL</b>	<b>25,000 cubic yards</b>

"Unsuitable" soil and small pebbles may constitute around 30% of this volume. The remaining 17,000 cubic yards should be regarded as only "possibly suitable" for ballast, since friable weathered sandstone is a major component of the scree.

CONCLUSIONS

About 100,000 cubic yards of moderately well to very well cemented sandstone may be available within the uppermost sandstone unit. This unit may also contain a further 60,000 cubic yards of less well cemented sandstone.

A relatively small volume of possible ballast material may also be available in deeper sandstone beds and in the scree slopes.

However, because of the considerable local variations in grain size and degree of cementation of the sandstones, it is recommended that some laboratory testing of the hardness, abrasion resistance and crushing characteristics of representative samples should be undertaken before any of the estimates in this report are used as a basis for firm planning.

REFERENCES

- |               |      |   |
|---------------|------|---|
| FRUZZETTI, O. | 1971 | Preliminary report on a reconnaissance survey of ballast resources, Tarcoola - Alice Springs standard gauge railway, Kulgera - Alice Springs section. N.T. Geological Survey unpub. rep. G.S.279. |
| SHIELDS, J.W. | 1972 | Railway ballast potential in Mining Reserve No. 341 Charlotte Range, N.T. N.T. Geological Survey unpub. rep. G.S. 321.  |

CHARLOTTE RANGE PROPOSED BALLAST SITE

LOG OF TRENCHES

Trench No. 1

Distance (feet)	Scree depth (feet)	Bedrock
South 0	.2	White Claystone.
10	.2	White Claystone.
20	.2	White Claystone.
30	.3	Sandstone.
40	.3	White Claystone.
50	.5	White Claystone.
60	.5	White Claystone.
70	.5	White Claystone.
80	.5	Sandstone.
90	1.0	Sandstone.
North 100	2.0	Sandstone.

Trench No. 2

South 0	.3	Sandstone.
10	.2	Sandstone.
20	2.5	White Claystone.
30	2.5	White Claystone.
40	1.7	White Claystone.
50	2.2	White Claystone.
60	3.2	White Claystone.
North 70	3.0	White Claystone.

Trench No. 3

South 0	.5	White Claystone.
10	1.0	Sandstone.
20	1.0	Brown Claystone.
30	.5	White Claystone.
40	.3	White Claystone.
50	.3	White Claystone.
60	.5	White Claystone.



Distance (feet)	Scree depth (feet)	Bedrock
70	.5	Sandstone .
80	.7	White Claystone.
90	.5	White Claystone.
100	.5	White Claystone.
110	.5	White Claystone.
120	.5	White Claystone.
130	1.0	Sandstone.
140	.7	Sandstone.
150	.5	White and yellow Claystone.
160	.5	White and yellow Claystone.
170	1.0	White and yellow Claystone.
180	.7	White and yellow Claystone.
190	.5	White and yellow Claystone.
200	.5	Sandstone.
210	1.0	Sandstone.
220	2.0	Sandstone.
230	3.5	White and red mottled clay.
240	3.7	White and red mottled clay.
250	4.5	White and red mottled clay.
260	5	White and red mottled clay.
280	5	White and red mottled clay.
290	.5	White and red mottled clay.
300	.5	White and red mottled clay.
North 310	.5	White and red mottled clay.

Trench No. 4

South 0	.2	Purple Claystone.
10	.2	Purple Claystone.
20	.3	Yellow purple Claystone.
30	.3	Grey Claystone.
40	.2	Interbedded purple, grey, yellow Claystone.
50	.2	Interbedded purple, grey, yellow Claystone
60	.1	As above with bed limestone.
70	.1	As above with bed limestone.
80	.1	Limestone.

Distance (feet)	Scree depth (feet)	Bedrock
90	.1	Yellow and purple Claystone.
100	.2	Yellow and purple Claystone.
110	.7	White Claystone.
120	2.3	White Claystone.
130	2.0	White Claystone.
140	2.0	White Claystone.
150	4.0	White Claystone.
North 160	4.0	White Claystone.

Trench No. 5

0	.7	Yellow purple Claystone.
10	.7	Yellow purple Claystone.
20	.5	Yellow purple Claystone.
30	.3	Yellow purple Claystone.
40	.3	Sandstone.
50	.3	Sandstone.
60	.3	Sandstone.
70	.3	Sandstone.
80	.5	Grey Claystone.
90	.3	Grey Claystone.
100	1.3	Limestone.
110	1.5	Yellow Claystone.
120	2.5	White Claystone.
130	3.0	White Claystone.
North 140	4.0	Yellow purple Claystone.

Trench No. 6

East 0	.2	White and yellow Claystone.
10	.2	White and yellow Claystone.
20	.3	White and yellow Claystone.
30	.3	White and yellow Claystone.
40	.3	White and yellow Claystone.
50	.5	White and yellow Claystone.
60	.5	Sandstone.
70	.1	Sandstone.
80	.5	Sandstone.

Distance (feet)	Scree depth (feet)	Bedrock
90	.3	Sandstone.
100	.3	White Shale.
110	.5	White Shale.
120	.3	White Shale.
130	.7	White Shale.
140	.5	Sandstone.
150	.2	Sandstone.
160	.2	Sandstone.
170	.3	Brown Claystone.
180	.3	Brown Claystone.
190	.3	Brown Claystone.
200	.3	Brown Claystone.
210	.3	Brown Claystone.
220	.3	Sandstone.
230	.3	Sandstone.
240	.3	Sandstone.
250	.5	Sandstone.
260	.7	Sandstone.
270	1.0	Sandstone
280	3.0	Sandstone
290	4.0	Sandstone
West 300	3.0	White Claystone.

Trench No. 7

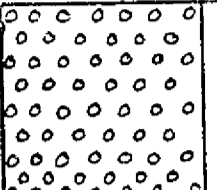
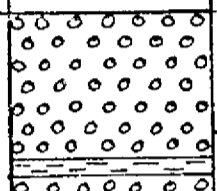
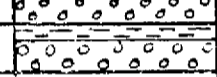
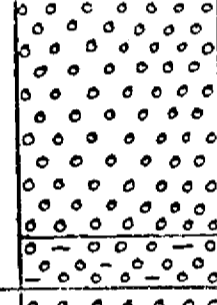
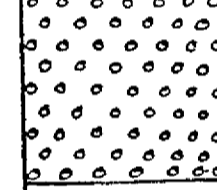
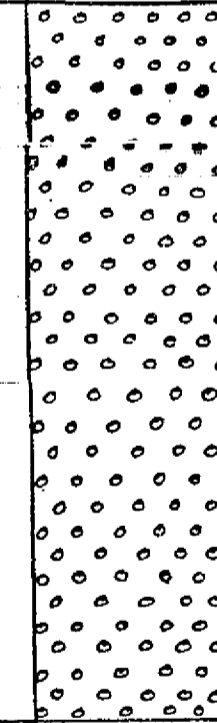
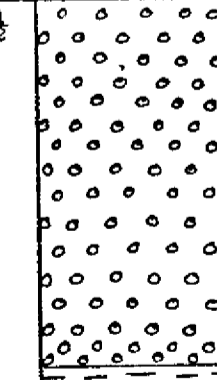
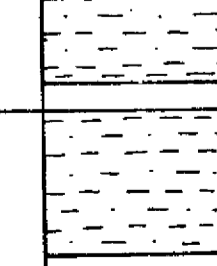
North 0	.3	Sandstone.
10	.3	Sandstone.
20	.3	Sandstone.
30	.3	Sandstone.
40	.5	Sandstone.
50	.5	White Claystone.
60	.7	White Claystone.
70	1.0	White Claystone.
80	.5	White Claystone.
90	.5	White Claystone.
100	.5	White Claystone.
110	.3	White Claystone.

Distance (feet)	Scree depth (feet)	Bedrock
120	1.0	White Claystone.
130	.7	White Claystone.
140	.7	Claystone.
150	1.5	Sandstone.
160	1.0	Sandstone.
170	1.5	Sandstone.
180	1.5	Sandstone.
190	2.0	Sandstone.
South 200	2.0	Sandstone.

CHARLOTTE HAVEN C.D.R. I

Location See Plate 2  
 Bearing Vertical Hole  
 Logged by D.B. Clarke  
 Notes All angles measured relative to core axis (0°)  
 Core Size 8x 0'-30'  
 Missing Core assumed to be from bottom of lift

Sandstone  Sandy Sandstone  Claystone  No Recovery 

Interval Cored (feet)	Graphic Lithology	Depth (feet)	Probably Suitable	Possibly Suitable	Unsuitable	Lithological Description
0 - 4'9"		0				2'0" Sandstone white to orange, very fine to fine grained, well sorted, poorly cemented, moderately friable, occasional dark ferruginous specks.
		2				
		4				
4'9" - 8'		6				1'6" Sandstone as above.
		8				2" Claystone white to red, firm, silty, irregularly interbedded with friable sandstone. 2" Sandstone white to light grey, very silicified, hard.
8 - 8 1/2'		8 1/2				1'5" Sandstone very fine grained, moderately well cemented, hard.
8 1/2' - 11 1/2'		10				2" Claystone light grey, firm to hard occasional small dark specks, numerous small cavities. 10" Sandstone light grey, very well silicified, thin fractures with claystone- 2'0" Sandstone moderately well cemented, hard, occasional, faint? heavy mineral banding, occasional very silicified layers.
11 1/2' - 14'		12				6" Sandstone as above, interbedded with claystone, red to yellow, crumbly, silty. 1'4" Sandstone hard, 50% well silicified mottles. 4" Sandstone white, very well silicified. 5" Sandstone moderately well cemented, hard.
14 - 21 1/2'		14				6" Sandstone light grey to white, very well silicified. 1" Claystone thin band, moderately well cemented, hard. 6" Sandstone moderately well cemented, hard. 6" Sandstone as above, 50% very well silicified. 1'0" Sandstone as above, moderately well cemented. 1'0" Sandstone as above. 50% very well silicified 1'0" Sandstone fawn, moderately well cemented, with thin very silicified bands.
		16				
		18				
		20				2'3" Sandstone moderately cemented, 30% light grey, very well silicified.
		22				9" Sandstone poorly to moderately well cemented, occasional medium to coarse rounded grains.
21 1/2' - 26 1/2'		24				2'9" Sandstone white to fawn, very fine grained poor to moderately silicified, with occasional very well silicified blebs and bands.
		26				1'0" Sandstone as above, with well developed white and yellow clay matrix.
26 1/2' - 30'		28				1'0" Claystone white, occasional red, firm to crumbly, soluble, silty, with rare loose sand grains. 1'6" Claystone as above, white
		30				

CHARLOTTE PASS 00H 2





Location See Plate 2  
 Bearing Vertical Hole  
 Logged by D. B. Clarke  
 Notes All angles measured relative to core axis (0°)  
 Core Size Bx 0'-30'  
 Missing Core assumed to be from bottom of lift

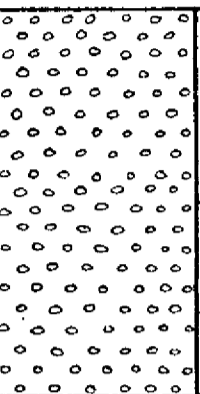
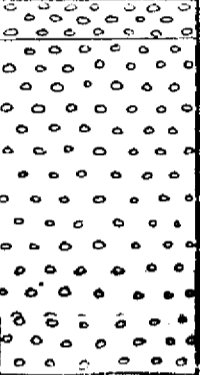
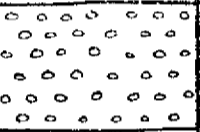
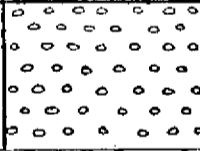
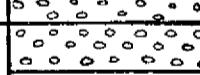
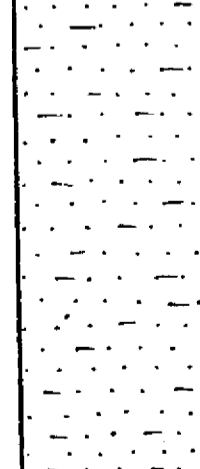
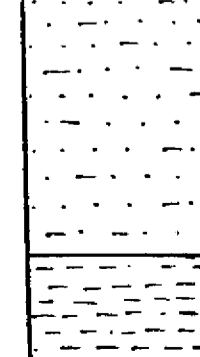
Sandstone Sandy Siltstone Claystone No Recovery

Interval (feet)	Graphic Lithology	Depth (feet)	Probably Suitable	Ballast	Possibly Suitable	Unsuitable	Lithological Description
0 - 7		0					
		2					
		4					4'6" Sandstone white to orange, very fine to fine grained, well sorted, poorly cemented, moderately friable, with occasional dark iron oxide specks, with one thin claystone layer.
		6					6" Sandstone as above with frequent thin inter laminations of claystone, red and white, firm, silty in part.
7 - 11½		8					
		10					
		12					7'7" Sandstone white, rare pale yellow and red banding, very fine grained well sorted, moderately well cemented, hard, with occasional very thin claystone layers, 1" moderately friable sandstone, and occasional very thin heavily indurated sandstone.
11½ - 17		14					
		16					11" Claystone yellow-orange-red, firm-crumbly, silty and sandy in part, irregularly interbedded with sandstone, friable with argillaceous matrix.
17 - 26½		18					2" Claystone white-yellow, firm. 1' Sandy Siltstone fawn, soft-firm argillaceous matrix with red and dark brown bands.
		20					7" Sandstone white, very fine grained, well sorted, moderately well cemented, hard with argillaceous matrix in last 2".
		22					
		24					7'3" Sandy Siltstone off white, soft, argillaceous matrix, with increasing interbeds of claystone, pale green, firm in last 3'.
		26					
26½ - 30		28					3'6" Claystone pale green-white, firm, finely micaceous with frequent silty interbeds.
		30					

Location : See Plate 2  
 Bearing : Vertical Hole  
 Logged by : D.B. Clarke  
 Notes : All angles measured relative to core axis (0°)  
 : Core Size Bx 0'-30'  
 : Missing Core assumed to be from bottom of lift

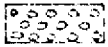
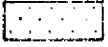
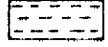
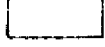
Sandstone  Sandy Siltstone  Claystone  No Recovery 

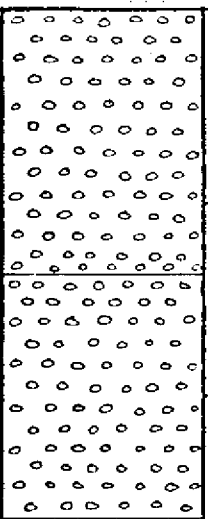




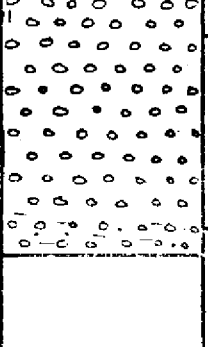


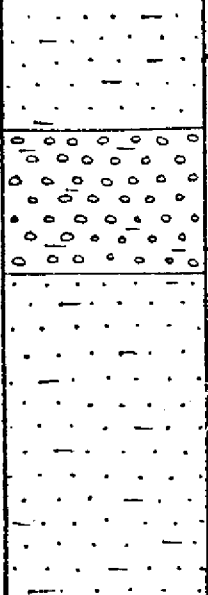






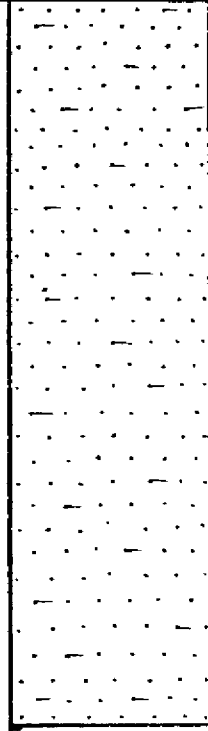





Interval Cored Graphic Depth (feet) Lithology (feet)  Probably Suitable  
 Ballast  
 Possibly Suitable  
 Unsuitable Lithological Description

Interval Cored (feet)	Graphic Lithology	Depth (feet)	Lithological Description
0 - 5½		0 2 4	4' Sandstone white-orange, fine-very fine grained, well sorted, predominantly moderately friable, dark ferruginous specks near top.
5½ - 9½		6 8	3'10" Sandstone white, hard, well indurated with 5%, very silicified for first 5", then white-pale orange, moderately hard to hard.
9½ - 16		10 12 14	1'4" Sandstone as above, moderately hard to hard, with occasional dark ferruginous specks.
16 - 18		16	2'6" Sandstone white-pale orange, with frequent thin pale yellow bands and laminations, very fine grained, moderately well indurated, hard.
18 - 21		18	
21 - 26		22 24 26	7'9" Sandy Siltstone white, soft-firm argillaceous matrix interbedded and interlaminated with claystone pale green, firm, finely micaceous.
26 - 30		28 30	1'3" Claystone yellow-orange, firm, with occasional thin silty bands.

CHARLOTTE RANGE D.D.H. 4

Location See Plate 2  
 Bearing Vertical Hole  
 Logged by D.B. Clarke  
 Notes All angles measured relative to core axis (0°).  
 Core Size Bx 0'-30'  
 Missing Core assumed to be from bottom of lift

Sandstone  Sandy Siltstone  Claystone  No Recovery 

Interval Cored (feet)	Graphic Lithology	Depth (feet)	Probably Suitable	Lithological Description
0 - 7 1/2		0		
		2		2'9" Sandstone white-fawn-red brown, clean, very fine-fine grained, moderately friable.
		4		2'6" Sandstone as above, moderately well indurated, hard with 20% light grey, very silicified, hard, with 5 half inch bands of Claystone, red-white, firm, silty, sandy.
		6		
7 1/2 - 11'3"		8		2' Sandstone as above, hard, with 70% very silicified.
		10		9" Sandstone white, very fine grained, well sorted, poorly cemented, friable, silty in part with occasional thin clay layers.
11'3" - 21 1/2		12		1'6" Sandy Siltstone off-white, sandy and hard for 2", then firm with occasional ferruginous staining and thin interbeds of claystone, pale grey firm, micaceous.
		14		1'6" Sandstone white, very fine grained, well sorted, well cemented, hard, with ferruginous spots and occasional thin lenses of claystone, light green.
		16		
		18		5' Sandy Siltstone off white, firm, argillaceous matrix, with 4 thin bands of ferruginous staining and with minor interbeds of claystone, light green, firm.
		20		6" Sandstone, as above, moderately well indurated, deep orange in last 1".
		21		1' Sandy Siltstone white, soft, argillaceous matrix.
21 1/2 - 30		22		
		24		
		26		7'6" Sandy Siltstone white, firm with occasional claystone interbeds as above, weakly to heavily ferruginously stained in first 1'.
		28		
		30		



Location: See Plate 2  
 Bearing: Vertical Hole  
 Logged by: D. B. Clarke  
 Notes: All angles measured relative to core axis (0°)  
 Core Size: 3x 0-30'  
 Missing Core assumed to be from bottom of lift

Sandstone Sandy Siltstone Claystone No Recovery

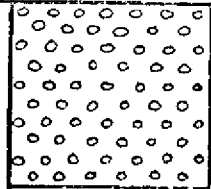

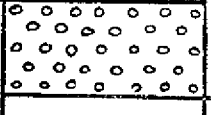


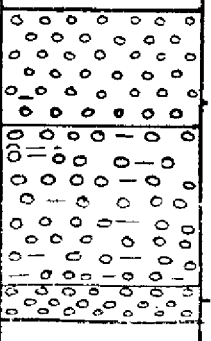

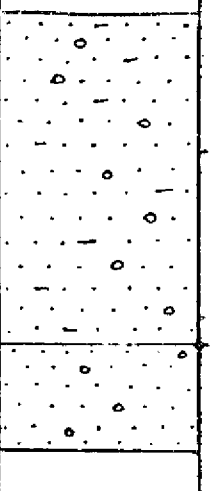
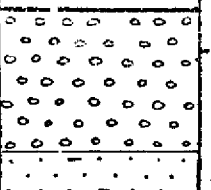

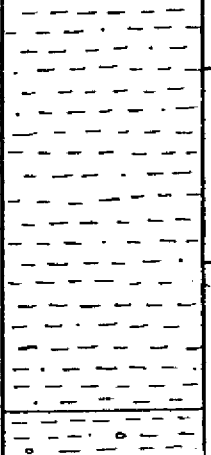
Interval (feet)	Grain Size (feet)	Depth (feet)	Lithological Description
0 - 5		0	Probably Suitable
		3'4"	Sandstone white to orange with ferruginous staining, very fine grained, occasional dark ferruginous specks, predominantly moderately friable, friable in first 3" and last 1".
		2	
		4	
5 - 10		6	1' Sandstone white-light orange, very fine grained, moderately well cemented, moderately hard.
		4"	Sandstone white, very fine grained friable in contemporaneous breccia with siltstone, ferruginous staining, well developed argillaceous matrix.
		8	2'6" Sandstone white, very fine grained, well sorted, well cemented, hard, with occasional thin very well indurated bands, with 3 thin bands of yellow red sandy siltstone, firm, argillaceous matrix at 65°.
		10	
10 - 18		12	2' Sandstone white, hard, as above.
		14	
		16	5'5" Sandy Siltstone white-yellow, banded red and brown in part, firm, argillaceous matrix.
		18	1'5" Sandstone white, hard, as above.
18		20	
25 1/2		22	2'11" Sandy Siltstone white-pale yellow, firm with occasional thin claystone interbeds.
		24	10" Claystone pale green, firm, with occasional sandy siltstone interbeds, with ferruginous staining in first 1".
		24	3" Sandstone white, hard as above, with black iron staining along fracture at 80°.
		24	11" Sandy Siltstone off white, firm, argillaceous matrix.
25 1/2		26	3" Sandy Siltstone as above.
30		28	3'2" Claystone pale green, firm, finely micaceous with interbeds of sandy siltstone, white, firm, argillaceous.
		30	4" Sandstone white, fine grained, moderately friable with frequent thin claystone interlamination.
		30	5" Claystone pale green, firm as above.

CHARLOTTE RANGE D.D.H. 6

Location See Plate 2  
 Boring Vertical Hole  
 Logged by D.B. Clarke  
 Notes All angles measured relative to core axis (0°)  
 Core Size Bx 0'-30'  
 Missing Core assumed to be from bottom of lift

Sandstone  Sandy Siltstone  Claystone  No Recovery 

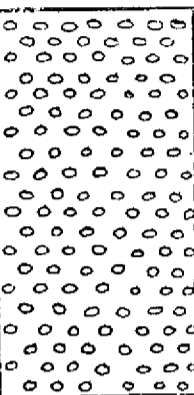
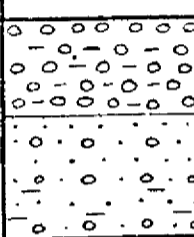
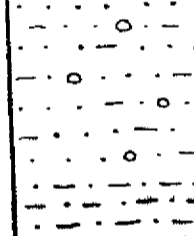
Interval Cored (feet)	Graphic Lithology	Depth (feet)	Probably Suitable Ballast Possibly Suitable Unsuitable	Lithological Description
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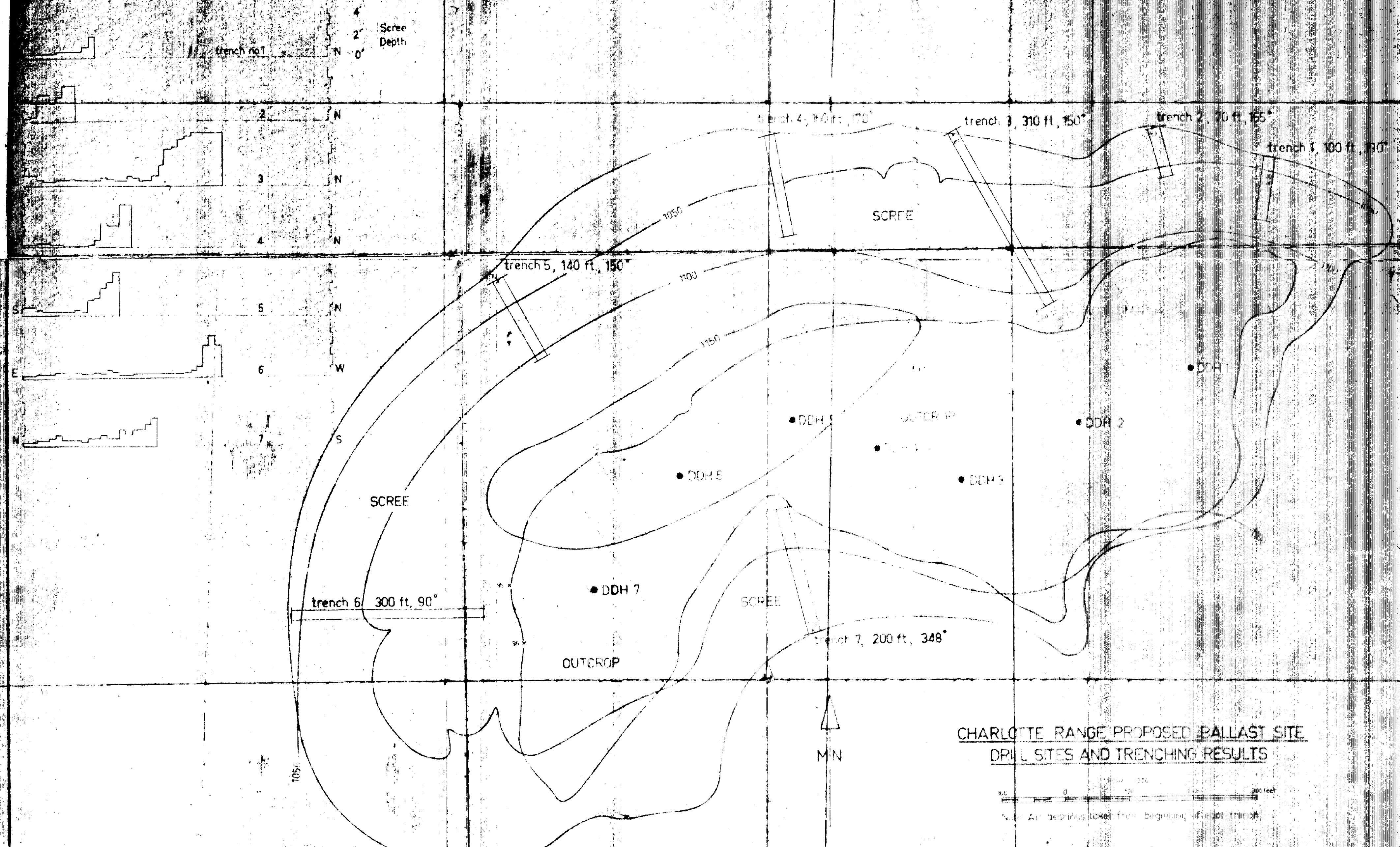
0 - 5		0		1'11" Sandstone white-pale orange, occasional dark iron oxide specks, friable to moderately well cemented.
		2		
		4		
5 - 7		6		1' Sandstone white, very fine-fine grained, moderately well indurated, hard, with occasional very well silicified inter-laminations.
		8		1'3" Sandstone white, hard, as above.
7 - 10 1/2		10		2' Sandstone white pale yellow, fine grained, moderately friable, irregularly inter-bedded with claystone white, red-yellow, silty, finely laminated for first 1'3".
10 1/2 - 15 1/2		12		
		14		4'7" Sandy Siltstone white-yellow, firm, argillaceous matrix, grading in part to silty sandstone with frequent thin interbeds of white-pink, firm claystone in first 3'6".
15 1/2 - 25		16		1'7" Sandstone white very fine fine grained, well sorted, hard, well indurated with very hard very silicified bands with one thin layer of Clay, red and iron stained at 60° in first 1'4". Poorly-moderately cemented and limonite stained in last 3".
		18		
		20		5'2" Sandy Siltstone white-pale yellow, firm argillaceous matrix with occasional thin layers of claystone, white-pale green, firm.
		22		
		24		5" Sandstone white very fine-fine grained, well indurated, hard.
25 - 30		26		
		28		7'4" Claystone pale green, firm, finely micaceous, occasional orange and brown banding, becoming predominantly orange-brown in last 6". Minor interbedded sandy siltstone white-yellow as above.
		30		

CHARLOTTE RANGE D.D.H. 7





Location: See Plate 2.  
 Boring: Vertical Hole  
 Logged by: D. B. Clarke  
 Notes: All angles measured relative to core axis (0°)  
 Core Size Bx C'-30'  
 Missing Core assumed to be from bottom of lift

Sandstone  Sandy Siltstone  Claystone  No Recovery 




Interval Cored (feet)	Graphic Lithology	Depth (feet)	Probably Suitable	Ballast	Possibly Suitable	Unsuitable	Lithological Description
0 - 7		0					
		2	4'				<u>Sandstone</u> white-pale orange, very fine-fine, occasional subrounded coarse grains, clear, hard, occasional ferruginous nodules and staining.
		4					
		6					
7 - 12		8	3"				<u>Sandstone</u> , hard as above.
		9	9"				<u>Sandstone</u> moderately friable, irregularly interbedded with claystone, red-white, firm-crumbly, silty in part.
		10	1'3"				<u>Sandy Siltstone</u> white-cream, firm, variegated argillaceous matrix, grading in part to very fine grained silty sandstone, minor interbedded firm grey claystone.
		12					
12 - 15		14	3'4"				<u>Sandy Siltstone</u> white-cream, orange in part, with occasional interbeds of pale green and grey claystone becoming more numerous in last 1'7".
		16	9"				<u>Sandstone</u> white, very fine-fine grained, well indurated, hard, last 1/2" dark brown with ferruginous staining.
		18	1'10"				<u>Sandy Siltstone</u> orange, firm, very argillaceous in part with occasional irregular thin layers of pale green-grey firm claystone.
		20	2"				<u>Sandstone</u> orange, brown banding, very fine-fine grained, moderately friable.
		22	4'11"				<u>Sandy Siltstone</u> white-fawn, firm, very argillaceous in part with frequent interbeds and interlamination of firm, pale green and grey claystone.
		24	2"				<u>Sandstone</u> white, very fine-fine grained, very well indurated, hard.
		26	2'5"				<u>Claystone</u> white-pale green-grey, firm, slightly finely micaceous, with occasional silty and sandy interbeds.
		28	9"				<u>Claystone</u> pale orange, firm.
		30	3'7"				<u>Sandy Siltstone</u> banded orange and light grey, firm, argillaceous matrix, grading in part to very fine sandstone. In last 1' with red, orange, brown and grey banding and blotches.



Lithology

- Sandstone 
- Sandy Siltstone 
- Claystone 
- No Recovery 

Ballast Suitability

- Probably Suitable 
- Possibly Suitable 
- Unsuitable 

Scale

- Vertical Depth 1" represents 2'
- Zero represents Ground Level
- No Horizontal Scale

