



**DEPARTMENT OF MINES
SOUTH AUSTRALIA**

**GEOLOGICAL SURVEY
ENGINEERING DIVISION**

MAIN SOUTH ROAD NO. 3

NOARLUNGA BRIDGE OVER ONKAPARINGA RIVER

GEOLOGICAL INVESTIGATIONS, PROGRESS REPORT NO. 1

DESIGN STAGE

Sec. 339, Hd. Noarlunga.

Client - Highways and Local Government Department

by

**W.R.P. Boucaut
Assistant Senior Geologist
ENGINEERING GEOLOGY SECTION**

4th January, 1967.

D.M. 1636/66

66-34
64/4

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FIGURES

<u>Fig. No.</u>	<u>Title</u>	<u>Reference No.</u>
1	South Main Road No. 3, Onkaparinga River Bridge, Geological Plan and Sections.	66-1026

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INTRODUCTION

Investigation of the foundation conditions for a bridge over the Onkaparinga River at Noarlunga was requested in a letter dated 25th October, 1966, from the Commissioner of Highways. Geological mapping and drilling was requested.

Previous auger drilling carried out by the Highways Department had been unable to penetrate a river gravel horizon encountered at a depth of about 45 feet below the bridge site. It was proposed to support the bridge pylons on end-bearing piles seated on the gravels. The main purpose of the investigation was to determine the geological succession and the nature of the materials immediately below the gravels.

SCOPE OF INVESTIGATION

Between 8th November and 5th December, 1966, the following investigations were carried out:

.... Geological mapping in the bridge site
area (Fig. 1).

.... One cable-tool drill hole 59ft. deep. Continuous open tube sampling (Type SA Tube) was carried out, with 2 sealed tubes being taken in material below the gravel horizon.

.... The drill core recovered was logged on a scale of 1 in. = 10 ft. using the Unified Soils Classification System (Reference 1), except for the material in the sealed tubes. A log is attached. (Appendix A).

.... A palaeontological examination was made on a sample from the drill core - Appendix B.

The location of auger holes put down by the Highways Department is shown, and some of the results summarized, on Fig. 1.

Several drill holes were put down in the Nearlunga area in 1922 to 1923, for lignite exploration. The location of the holes closest to the bridge site is shown on Fig. 1, and a summary of one of these holes is shown in section on Fig. 1. Logs of three of these holes are attached (Appendix C). There are no recorded logs of the other holes.

SITE GEOLOGY

Topography

The Onkaparinga River meanders over a broad flood plain, which, at the bridge site, is about 1400ft. wide. The river is entrenched about 6ft. into the plain. To the west, low rolling hills rise to about 100ft. above the plain. To the east, hills rise more steeply to over 200ft. above the plain. About 1000ft. upstream of the bridge site the river has cut into the base of these hills and cliffs up to 50ft. high have been formed.

Rock Types

.... Alluvium: Alluvial deposits occupy much of the floor of the Onkaparinga River valley. Drilling at the bridge site has shown a thickness of 55 ft., of which the upper 45ft. is black, organic, poorly consolidated, sands and silts, overlying 10ft. of poorly graded gravel-sand mixture with few fines. The gravel is mainly fresh quartz and metasedimentary rocks up to 0.5ft. in diameter, mainly 0.1ft. to 0.2ft.

.... Blanche Point Marls: Marls underlie the alluvium beneath the bridge site and are also exposed in the river bank upstream of the site. The marls are dark greenish grey, glauconitic, and contain numerous shell fossils. They are mainly strongly cemented, with some weakly cemented bands from 1 to 3 inches thick in the upper few feet.

Lignite exploration Bore No. 9, 1,600 feet northwest of the bridge site showed a similar sequence in its upper part. A summary of the full hole is as follows:

<u>Formation</u>	<u>Depth (Ft.)</u>		<u>Thickness (Ft.)</u>	<u>Description</u>
	<u>From</u>	<u>To</u>		
ALLUVIUM	0	53	53	Sandy clay
	53	62	9	Gravel - hard quartzite boulders
	62	65	3	Yellow clay
BLANCHE POINT MARLS	65	129	64	Dark grey fossiliferous limestone
TORTACHILLA LIMESTONE(?)	129	130	1	Grey to green limestone
SOUTH MASLIN SANDS and NORTH MASLIN SANDS	130	206	76 (total)	Sand and sandy clay. Lignite deposits occur between 181ft. and 197ft.
ADELAIDE SYSTEM	206	225	19	Decomposed purple slate.

The Formation names are interpreted from the succession and described nature of the core in the hole.

It is probable that a similar succession occurs below the bridge site, and thus the marls below the gravel would be about 60ft. thick.

Interpretation of structure contours of the top of the lignite in lignite exploration Bores 7, 8, and 9, a distance of 1,600ft. to beneath the bridge site, indicate that lignite would occur at a depth of 185ft. (Fig. 1).

RESULTS OF CABLE TOOL HOLE

Hole 1 was drilled to 59ft. from the left bank of the Onkaparinga River (Fig. 1). Sampling was carried out using an "SA" type sample tube, recovering core in 1ft. lengths, with two sealed tube samples being recovered at 55ft. and 57ft. The number of blows necessary to effect each foot of penetration was recorded and is shown graphically on the log (Appendix A).

A summary log is as follows:

<u>Formation</u>	<u>Depth (Ft.)</u>		<u>Thickness</u> (Ft.)	<u>Description</u>
	<u>From</u>	<u>To</u>		
ALLUVIUM	0	45	45	Organic sand and silt, fossiliferous.
	45	54.5	9.5	Gravel - poorly graded gravel-sand mixture - quartz and metasedimentary rocks.
BLANCHE POINT MARLS	54.5	59	4.5	Marl, weakly to strongly cemented, glauconitic, fossiliferous.

The gravel between 45ft. and 54.5ft. is a poorly graded gravel-sand mixture with few fines. The gravels are mainly
white/

to pink quartz, and fresh metasedimentary rocks, mainly from 0.1 to 0.2ft. in diameter with some up to at least 0.5ft. in diameter.

The underlying marl is dark green-grey, glauconitic, with numerous shells, and shell fragments. It is mainly strongly cemented with siliceous cement to form a hard material, but in the upper layers some bands up to 0.3ft. thick are only weakly cemented, and can be readily broken down by hand to a silt soil of medium plasticity. The strongly cemented material tends to break to platy fragments when struck.

W.R.P. Bouciant

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ENGINEERING GEOLOGY SECTION

WRPB:AGK:DLH
4/1/1967

REFERENCES

1. United States Bureau of Reclamation, Earth Manual,
1st Edition, 1963.

APPENDIX A

LOG OF CABLE TOOL HOLE

SERIAL No. 413/67.

PROJECT MAIN SOUTH. ROAD N°3

FEATURE ONKAPARINGA. RIVER. BRIDGE

LOCATION LEFT. BANK. ONKAPARINGA R.

DEPARTMENT OF MINES -- SOUTH AUSTRALIA

LOG OF BORING

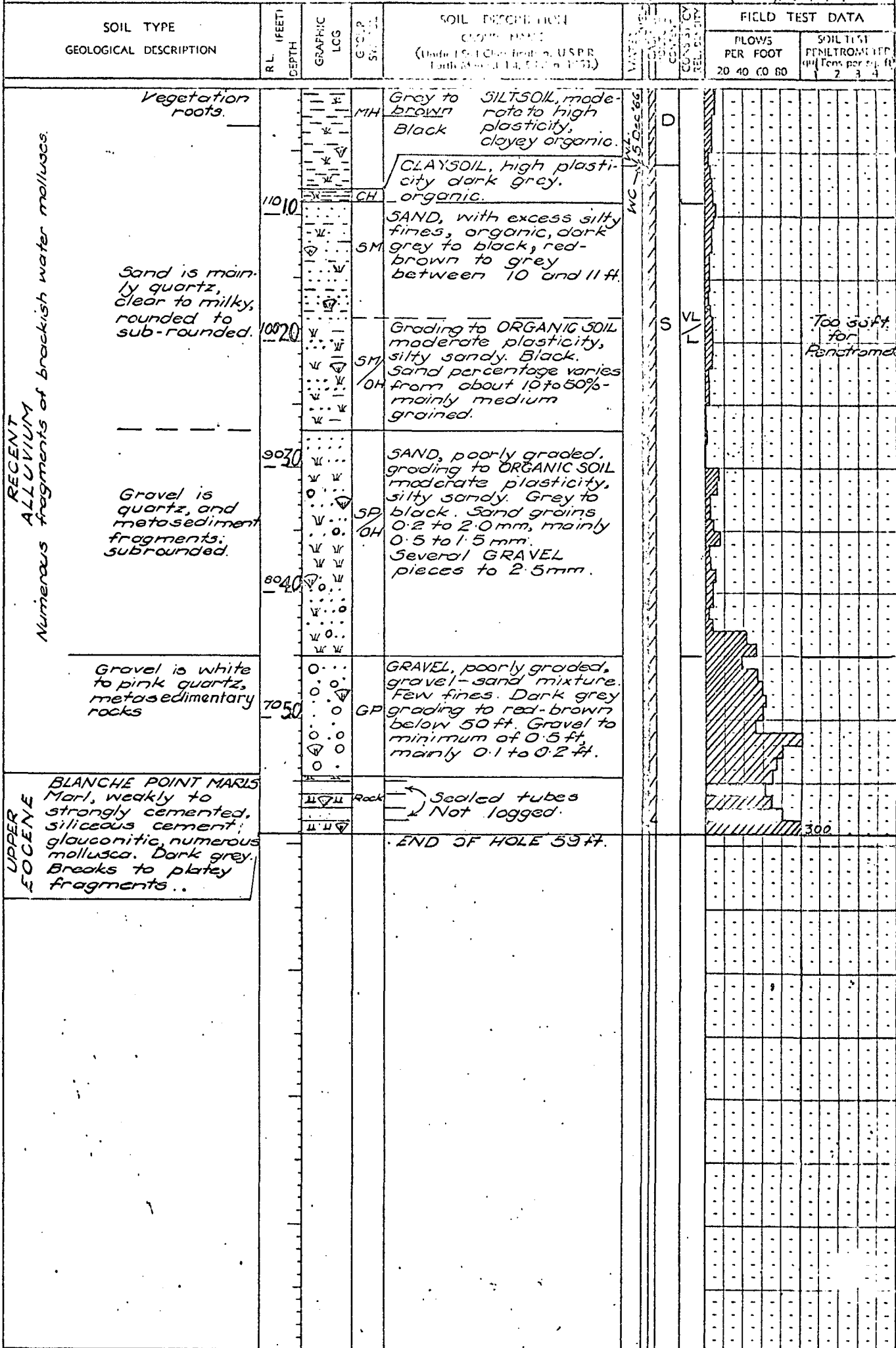
SECTION. 339.

HUNDRED NOARLUNGA.

HOLE
NO. 1

SHEET 1 OF 1

R.L. (Surface). 120 FEET



TYPE OF SAMPLE	CONSISTENCY	REL. DENSITY	MOISTURE CONTENT	ENGINEERING GEOLOGY SECTION
A shoe (SA)	VS. - Very Soft	VL - Very Loose	H - Humid	DRILL No 24
D " (SD)	S - Soft	L - Loose	D - Damp	TYPE RUSTON
E " (SE)	F - Firm	C - Compact	M - Moist	DATE 6 Dec 66
G " (SG)	Stiff	H - Hard	W - Wet	DRILLER ASH
Sealed Tube	VS. - Very Stiff	VD - Very Dense	S - Saturated	DRAWN W.B.
A shoe - S.A.L.	H - Hard			STARTED AS 66
Standard Penetration Test - SPT				FINISHED Dec 66
				THICKENED L.V.W.
				DRG. No. 55640
				Ho + C

APPENDIX B

REPORT ON PALAEONTOLOGICAL EXAMINATION

Sample No: P175/66

References: D.M. 1636/66

PALAEONTOLOGICAL EXAMINATION OF MATERIAL

Locality: County Adelaide Distance and direction from near-
Hundred Willunga est town or station: 200yds.
Section 339 E. of Nearlunga R.S.; W. bank
of Onkaparinga River.

Details: Collected from bore, outcrop etc.

Onkaparinga River Bridge, Nearlunga; Bore 1; open-tube
percussion core.

Depth: 57 feet.

Information required: Stratigraphic determination

Submitted by: W. Bousant

Address: Engineering Geology Section, Dept. of Mines

Date: 8th December, 1966.

PALAEONTOLOGIST'S REPORT

The sample consists of dark greenish grey marl, silty, slightly sandy, very glauconitic, shelly, with prominent Territella aldingae. Bands of hard siltstone, spicular and with siliceous patches, are interbedded with the soft marls from 55 feet to the bottom of the bore at 59 feet.

The microfauna includes Globigerinella index and Asterigerinella adalaidensis.

The sample is from the Blanche Point Banded Marls Member of Blanche Point Marls, Aldinga Stage and Upper Eocene age.

J. M. Lindsay
PALAEONTOLOGIST

JML:DLH:EMA
9.12.66

APPENDIX C

LOGS OF LIGNITE EXPLORATION DRILL HOLES

No. 7

CARLUNGA.

WILLUNGA.

336

See Locality Plan

Vertical

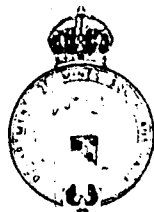
DEPTH IN FEET	SECTION	THICKNESS	DESCRIPTION OF ROCK	REMARKS
0		3-0	Soft and Friable Nodular Limestone	
35-6			Soft Yellow Clay	
44-6			Yellow Sandy Clay with Quartz Grit	
59-6		11-6	Yellow Clay with Pebbles and Turritella	
		37-0	White shell Limestone with Turritella	
108-0				
115-0		7-0	Dark Sandy Clay	
122-0		7-0	Ferruginous Clay Sandstone with Marine Fossils	
134-0		12-0	Dark Sandy Clay with Fossils	
146-0		12-0	Iron Stained Sandstone with Marine Fossils	
158-0		12-0	Medium Grained Dark Sand	
163-0		5-0	Dark Sandy Clay with Marine Fossils	
		85-0	Soft Grey Clay with Marine Fossils	
248-0				
		56-0	Green Fossiferous Limestone	
304-0				
314-0		10-0	Grey to Green Shell Limestone	
326-0		12-0	Calcareous Sandstone with Quartz and Slate Grains	
		47-0	Carbonaceous Clay Sandstone with Marine Fossils	
367-0		4-0	Lignitic Clay with Fine Sandy Partings	
372-0		5-0	Lignite	
379-0		7-0	White Clay	
394-0		15-0	White Sandy Clay with Pyrites	
409-0		14-0	Decomposed Green Slate Bedrock	

C. F. Duffield

Leith Ward
Superintendent of Boring Operations

SOUTH AUSTRALIA
DEPARTMENT OF MINES

No. 8 BORE, NOARLUNGA



Vertical *Measured at* WILLUNGA *Location* Section No 336-339 See Locality Plan

DEPTH FROM SURFACE	SECTION	THICKNESS	DESCRIPTION OF ROCK	REMARKS
9.0		9.0	Soft & Friable Nodular Limestone	
44.0		44.0	Soft Red clay with Ironstone & Quartz Grit	
22.6		22.6	Yellow clay with Ironstone and Quartzite Boulders	
33.6		33.6	Sandy clay with thin layers of fossiliferous Limestone Bars	
84.0		84.0		
		69.0	Soft Green clay Limestone with Fossils	
146.0		146.0		
		61.6	Soft Green fossiliferous Limestone	
208.0		208.0	13.6 Green clay with Fossils Limestone	
225.0		225.0	7.6 Clay with Ironstone and Quartz and Slate Grains	
232.6		232.6	14.0 Dark Sil. clay	
240.0		240.0	1.6 Black Sandstone	
		31.6	Black Clay with thin Sandy Partings	
272.6		272.6	1.6 Argillite	
		6.2	Carbonaceous Shale	
		19.3	Argillite	
		7.0	Light Sandstone with Argillite Fragments	
		26.6	White top of Dark Red rock	

th. W.

SOUTH AUSTRALIA

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No. 9

BORE, NOARLUNGA.

WILLUNGA

Vertical

No. 337

Location

See Locality Plan



DEPTH FROM SURFACE	DESCRIPTION OF ROCK	REMARKS
11 0	Red Clay with Nodules of Limestone	
24 0	Red Silty Clay	
35 0		
52 6	Yellow Silty Clay with Limestone Bars	
62 0	Hard Quartzite Bedded	
65 0	Yellow Clay	
80 0	Grey Clay	
85 0	Grey Clay	
95 0	Grey Clay	
105 0	Grey Clay	
115 0	Grey Clay	
125 0	Grey Clay	
135 0	Grey Clay	
145 0	Grey Clay	
155 0	Grey Clay	
165 0	Grey Clay	
175 0	Grey Clay	
185 0	Grey Clay	
195 0	Grey Clay	
205 0	Grey Clay	
215 0	Grey Clay	
225 0	Grey Clay	

Duffield

Keith, Leonard
Supervisor of Boring Operations

