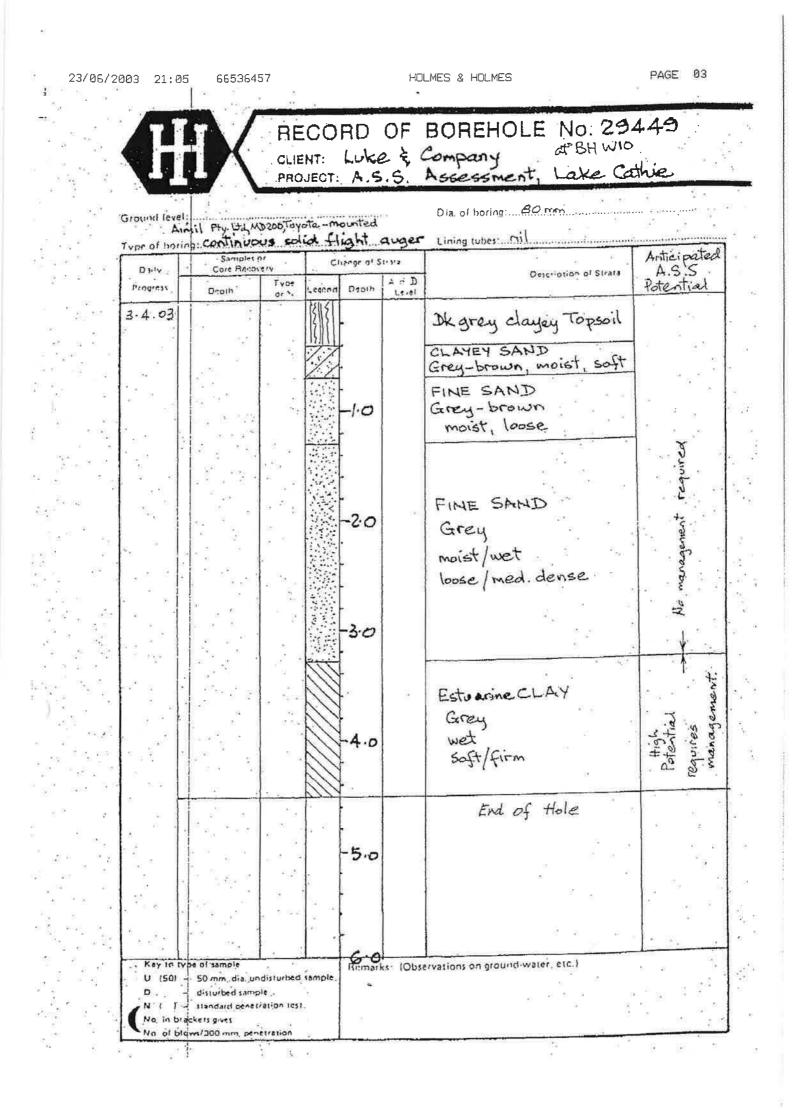
## Appendix 4

## Holmes and Holmes Pty Ltd

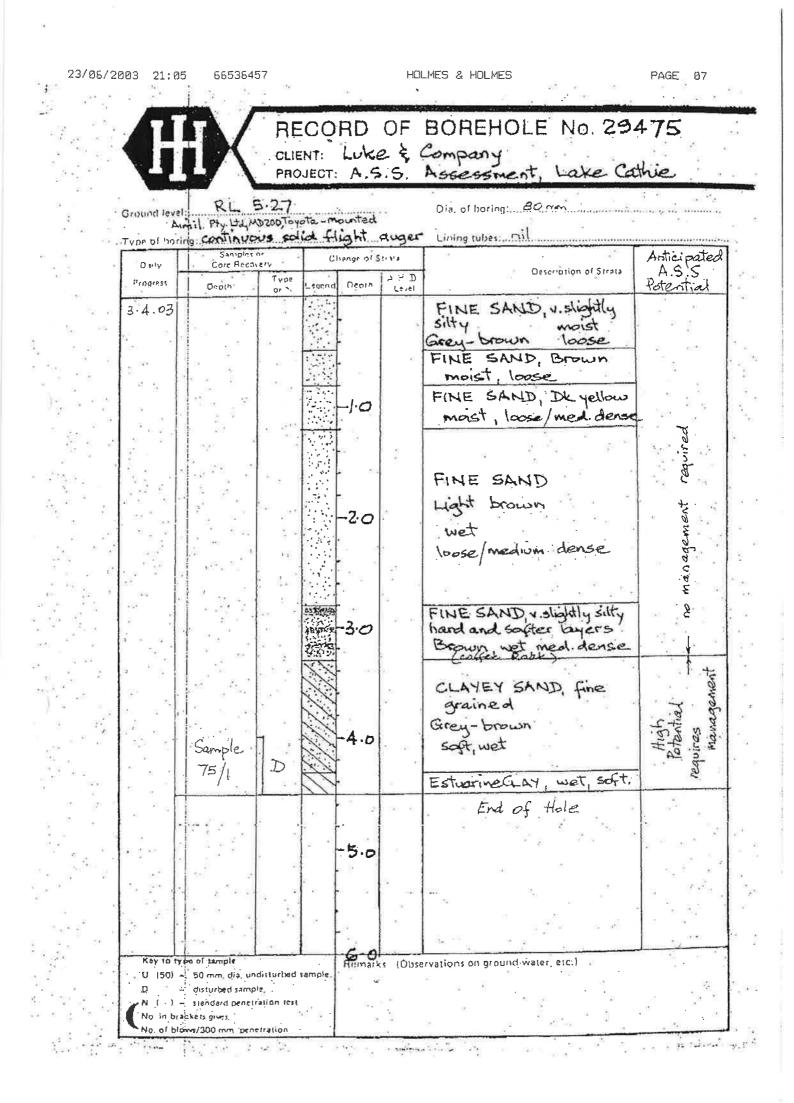
Acid Sulphate Soil Investigation April 2003

23/05/2003 21:0	5 66536457	НО	LMES & HOLMES	PAGE 02
G		Like E	BOREHOLE NO. 29 Company Assessment, Lake Ce	W17
Ground leve A	RL 5:38 mil Pty 122,40200 Toyota -1 ing continuous solid f	hounted Hight auger	Dia. of horing: 80 mm	
Dativ- Progress		Change al Siera	Description of Straig	Anticipated A.S.S Potential
3.4.03			Dk.grey clayey Topsoil	
			CLAY high plasticity Dk grey wet soft	
	Sample 48/1 D	-2.0	CLAY high plasticity Grey with yellow-br. mottlings	
		-3.0	wet saft	required
	$\begin{bmatrix} Sample \\ AB/2 \end{bmatrix} \mathcal{D}$	-4.0	FINE SAND Light grey saturated medium dense	lo mænanfanant
			CLAY mod plasticity net (residual) yell.br. firm	
		5.0	End of Hole	
U-(50) D N ( ) No in br	pe of sample 50 mm, dia, undisturbed sample disturbed sample: standard penetration test sekets given over/200 mm, penetration	Ritimarks IOUse	ervations on ground-water, étc:)	
		A		



23/06/2	003 21:0	6653645	7			KOL	MES & HOLMES	PAGE 05	2027
ATTA DECORD OF DOREHOUE No 284 CC									
RECORD OF BOREHOLE NO. 294 GG CLIENT: Luke & Company									
		$\mathbf{L}$	PROJ	ECT:	A.S	.5.	Assessment, Lake Ca	thie	ిం ా.
RI 5.72 Dia of boring BO rep									
Ground level Aintil Pty 132 Mozoo Tayota - mounted Dia of boring: 00 mm. Annull Pty 132 Mozoo Tayota - mounted Type of horing continuous colid flight auger Lining tubes: Mil									
	(VD0 01:10	Samples C Core Recov			arige al S			Anticipated A.S.S.	ા સ સુભા
	Progress	Dapih	Type	egnad	Denih	2 - D Level	Orscription of Strata	Potential	¥
2 13	3.4.03		a , 1				FINE SAND, V. slightly sitty		5. 52
a a					a e		Dk. grey	1	а. 1
81 8 8 2 2	× .		2014 1				moist, loose		8
· · · ·	5. 7	1 6 8 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			10	2			<sup>si</sup> æ
		1 N 2. 8			-0	a i Net	FINE SAND	17 I.S.	2
a Kat								in the second	3
100 - 12 100 - 12					. e. 1		hight grey moist/wet		$= \frac{1}{2} p_{1}$
	а 						T	P.	5
ೈ ಸ್ಮಿತಿ					-20		loose	noba	1
					а алг			<u>ب</u>	
ැනීම පැව ම		8 - 10 - 10 - 10 - 10	. •		× 0			e v t	
				0.0		•	FINE SAND with some intermittent	3	
248 27			- <sub>20</sub>		-3.0		fine gravelly layers,	Ter al	
· . · · · ·	x <sup>a</sup> e	1 . A		0.0			Brown	E .	е 198
. ઈંગ્લ્							wet, medium dense	R	200 R
				111		-9	CLAYEY SAND, fine	1 4	1990 - E
	2 1	Sample	D	- M	-4.0	а	grained Grey, wet, soft	High Potential requires	2 H.
9 <sup>11</sup> x	* ÷.	6/1		<i>Ü</i>			EstrameCLAY, wet, soft	And Pate	
						2	End of Hole	1 a 3	
* <sub>3.</sub> a	5	1	. •						
a	÷			ļ.	-5.0	*		- w - e	8
100 M	· • •					÷			s.
			0	÷	* e		*************************************		ഷ്ം
9 8 80	9. CT	e e y e	*		GA				i e
	Key to U (50)	The second second second second second		mple,	Remark	s (Obse	rvations on ground-water, etc.)		
	D'	- disturbed sampl			*				ан 11 а 11 а
	and the second se	recketa givra Novvi/300 mm pene	tration	8	-	4) 			
a	अत्याज्येः हि स			91 <sup>(K)</sup>	***	(1) ( <b>1114</b> )7	an na an a		· ***.

HOLMES & HOLMES PAGE 06 23/05/2003 21:05 66536457 RECORD OF BOREHOLE No. 29472 CLIENT: Luke & Company PROJECT: A.S.S. Assessment, Lake Cathie RL 5.37 \* 2000-221-23 Aimill Pty. 132, MD 200, Toyota - mounted Ground level Type of horing continuous solid flight auger Lining tubes: ........ Anticipated A.S.S Potential Samples M Change of Strata Core Recovery Otily Description of Strate 1 - D Tyc: Progress Ototh Depth 1 enend 01 1 SILTY SAND, fine grained 3.4.03 DK.grey moist, loose 1.0 SAND, fine grained Light grey-brown moist, becoming wet. 2.0 LOOSE. 3.0 SAND & fine/med gravel FINE SAND Grey - brown saturated, medidense SAND & fine/medigravel 4.0 FINE SAND (saft coffee rack) Brown, wet, med. dense Sample High Potential CLAYEY SAND Grey requires tanagement D saturated, loose 5.0 EstuarineCLAY Wet Soft. Remarks 10bservations on ground-water, etc.) Key to type of sample U (50) - 50 mm dia undisturbed sample - disturbed sample. 0 N ( ) - standard penetration test. No in brackets gives 8 383 No. of blows/300 mm penetration



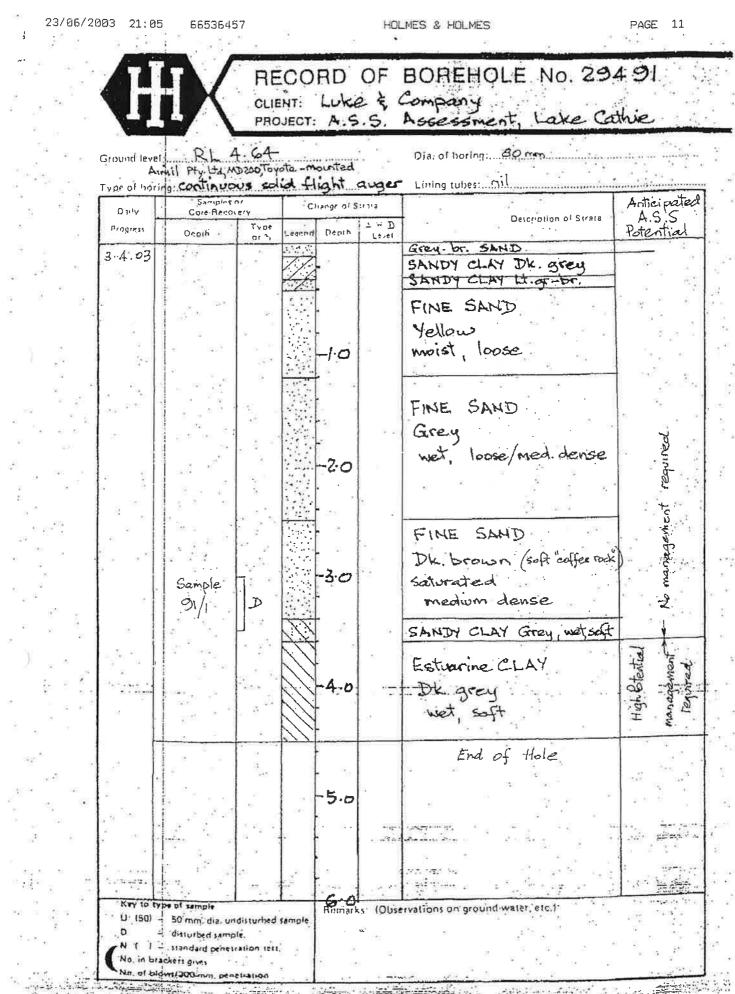
23/06/2003 21:05 PAGE 08 HOLMES & HOLMES 66536457 RECORD OF BOREHOLE No. 29482 CLIENT: Luke & Company PROJECT: A.S.S. Assessment, Lake Cathie RL 5.43 Dia, of horing: BOmm. Ground level: Aimil Pry 12 Mozoo Tayota - mounted Aimil Pry 12 Mozoo Tayota - mounted Type of horing continuous solid flight auger Lining tubes: ..... Anticipated A.S.S Potential Samples or · Change of Suna DINY Core Recovery Description of Strata 1 - D Tyde Progress Death trend Droth 1. t . el 01 3 3:4:03 FINE SILTY SAND Light grey moist loose 1.0 FINE SAND dirty white 2.0 moist becoming. wer LOOSE. 3.0 FINE SAND Gorey brown required FINE SAND . Brown & DK. Brown (soft coffee rock" 4.0 transmert wet Sample medium dense 82/1 D FINE SAND, Grey saturated 5.0 loose Grey estuarine CLAY anaquer Requires wet Soft Remarks: IObservations on ground Key to type of sample U .(50) - 50 mm, dia. undisturbed sample D - disturbed sample. N I 1 - standard penetration text. No. in brackers gives. No of Blaws/300 mm. penetration

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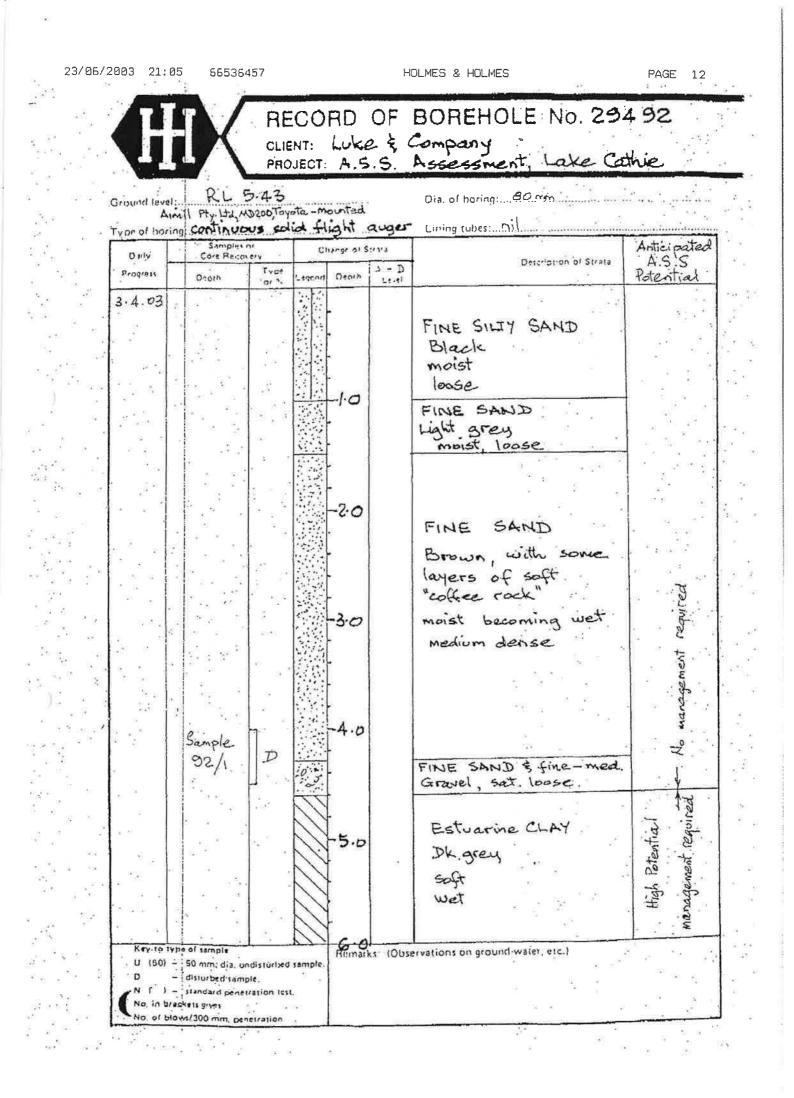
HOLMES & HOLMES PAGE 03 23/06/2003 21:05 66535457 RECORD OF BOREHOLE No. 29484 CLIENT: Luke & Company PROJECT: A.S.S. Assessment, Lake Cathie RL 5:39 Dia. of horing: 60 mm Ground level. KL 5. 5. Annih Pty. 151, MD200, Tayota mounted Type of horing continuous solid flight auger Lining tubes: ..... Anticipated Samples or Core Recovery Change of Strata Only A.S.'S Description of Strata A - D Tyce of 1 Potentia Progress Ototh Droth Legend 1.2.01 FINE SILTY SAND 3.4.03 Grey moist, loose 1.0 FINE SAND with some layers containing med. & coarse sand Lt. grey moist becoming wet 2.0 loose FINE SAND (soft coffee rock Brown 30 wet medium dense. nanaconan FINE SAND with finemedium rounded gravel saturated Sample . 4.0 84/1 loose D required Estuarine CLAY High Refertial Dk. grey 5.0 soft wet End of Hole ĝ. Rumarks: (Observations on ground-water, etc.) Key to type of sample U (50) - 50 mm dia undisturbed sample. D' . - disturbed sample. 21.75 N ( ) - standard penatration test No in brackets gives No. of blows (300 mm. perceivation .

23/06	/2003_21	:05	66536	457			н	OLMES & HOLMES	PAGE 10	(#)
	A	1		RE	COI	7D	OF	BOREHOLE No. 2	294 85 A	
	<b>U</b>	Ī		CLIE	NT: JECT:	Luke A.S	2 & C .5.	Company 0/5 40m fi Assessment, Lake	Cathie	<u> </u>
2 e	Grijund lev	ėl:					<u></u>		× * *	
e e e La cere	Type of 100	ring:	continuo	D200,1440				Lining tubes:	Anticipated	Ĩ,
	Daily Progress		Samplet Core Rends	Type	Ch	Death	Level	Description of Str		8 2
	3.4.03		Dibin	<u>ðr "i</u>			<u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	SILTY SAND, fine gr		k Ja
			9 1 9 1			e -		Light grey		ř , z
		2	्र संख्य					noist loose/medium dense		े क देख
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	998 1997			ि तिज कर बर्द्य				FINE SAND		e si Jei
		14 - E 17	1					Light grey wet		с. П 
			an an San An			-2:0		loose	QUA.	2 (08) (19)
				e e <sup>n a</sup> e		-			2	æ ⊯
						- 			ement	į.
40 V 1. 1			Sample	1_	0	-3.0		FINE SAND with a little fine gravel	enag	
2000 - 100 2000 - 100 2000 - 100			85 A/1	[] <sup>. D</sup>	0	-		Brown wet	No m	27 IR 1
)	**************************************	-		, Iro	0	-		medium dense		
14.5	Z a sa s	ŀ			11	-4.0		CLAYEY SAND, fine Grey, wet, soft	2 5 2 2	
		-	ntin Milia Milia		14	-		Estuarine CLAY, grey	" met Helen	
				10				End of Hole		255 \$12
			1.000	3 a 00		-5.0				<sup>8</sup> .
						F				
		e V		an e						-
	: Key 6	a type	of sample S0 mm. dia. u	ndisturber	l sample,	-G-C Firmar	ks (06	servations on ground-water, etc.)		n
	N I	; =	disturbed sam Flandard pene kais gives	olė.		×		245 W		en e
	No. o	blow	d/300 mm, pe	netration	6 <b>8</b> 8		و هرواند و رساند.		<u> </u>	ine Nation Nation
¥5.	n mig		1 K S	1983				i da a	<u>8)</u> (8	21

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23/06/2003 21:05 ;	5 66536457	H	OLMES & HOLMES	PAGE 13			
ſ		CORD OF NT: Luke & Ject: A.S.S.	BOREHOLE No. 29 Company Assessment, Lake Ca	493 thie			
Ground level RL 4.94 Dia of horing: 80 mm. Annil Fty USL Mazzoo Tayate - mounted Type of horing: continuous solid flight auger Lining tubes: nil							
Darly	Core Recovery	Change of Stinia	Description of Strata	Anticipated A.S.S			
Progress	Droth Type	Legena Depin Level		Potential			
3-4-03			FINE SAND Grey moist, loose FINE SAND				
)		-1-0	Yellow-brown loose FINE SAND Lt. brown moist, loose				
			FINE SAND Grey moist/wet loose	paulo			
		-2.0	FINE SAND, slightly silty Brown & dk. brown	ne nt rec			
		-3:0	wet, medium dense	manager			
	Sample ]		CLAYEY SAND, fine graine	to the second			
	33/1 D	-4.0	Grey - brown Soft, wet	Mederate Refertial Sequires Manageme			
			Estuarine CLAY, grey, wet End of Hole	Pot test			
		-5.0		1000 and 1000			
	NPs of sample	Hilmarks (Öl	uservations on ground water, etc.)				
No in b	50 mm dia, undisturized disturbed sample, standard penetration test brackets gives slows/300 mm, penetration	2) *					
Warder to war to Martha	and in the second	a internet of the second	hali daga shekara na kara ka	1.200 A			

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PAGE 14 HOLMES & HOLMES 23/06/2003 21:05 66536457 RECORD OF BOREHOLE No. 29496 CLIENT: Luke & Company PROJECT: A.S.S. Assessment, Lake Cathie 4.92 Ground level: KL 4. J2 Annul Pty UL Mozoo Tayota - mounted Type of bioring Continuous colid flight auger Lining tubes: ..... Anticipated A.S.S Potential Chinge of Stinia Samples de Core Recovery Oply Description of Strara 1 + D Type Depth Progress Droth 01 % Dk grey clayey Topsoil 3.4.03 CLAY, mod. plasticity Greey-brown 1.0 wet Soft SANDY CLAY wet, soft Grey 2.0 Jinba CLAYEY SAND fine grained Grey wet loose 3.0 SAND slightly clayey Sample D 96/1 Grey-brown, wet, loose BUDINS MANAGENO CLAY, high plasticity 4.0 Lt. grey, estuarine? v. wet, v. saft CLAY moderate plasticity (residual) 5.0 Yelbu brown wet, soft, becoming firm with depth. Good End of He Kay to type of sample U (50) - 50 mm, dia, undisturbed sample - disturbed sample, . D 1 1 - standard penetration last. N No. in brackets gives No. of blows/300 mm, penetration

23/06/2003 21:05	66536457		HOLMES & HOLMES	PAGE 15
E		INT: LUKE	F BOREHOLE NO. & Company Ols 21mgra 5. Assessment, Lake	29498 A m 29498 towards 29474. e Cathie
Ground level Au Type of hori	estimated P mil Pty. 42, 40200, Tor 19 continuous 50	ul 5:4 nota-mounted lid flight au	Dia. of boring:	
D srly	Samples or Core Recovery	Change of Strat	3	Anticipated
Pragress	Dooth Type	Lagrad Depth A	- D eret	STRATA A.S.S. Potentiat
3.4.03		12000		20
3.4.00			FINE SAND v. slightly silty Grey moist, loose	
		1.0	FINE SAND Browny grey moist/wet	
		-2.0	noist/wet loose	الدوم
		30	FINE SAND with some intermittent fine gravely layer	ement requ
)	Sample 98A/1 D	-4.0	Light brown-grey wet medium dense CLAY, mod plasticit Brown wet, saft	
		-5.0	End of Hole	
	. <sup>1</sup>		s <sup>2</sup>	
U 150) 	pe of sample 50 mm, dia, undisturbed disturbed sample, standard penetration tost contexts gives pws/ 300 mm, penetration	sample.	(Observations on ground-water, etc.)	
			2 3 e <sup>8</sup> in	

. B. HOLMES MES DLMES & HOLMES PTY. LTD. CHARTERE RS (AUSTRALIA) P.O. Boy J 159, Coffs Harbour Jetty, 2450. Telephone: (066) 53 6457 Laboratory: Rippingale Road, Kororo, 2450. 931492 25/11/93 at thil Luke Lake and Company Global at Lake whee Here is text of report on developmental I would be happen if we had options :--a continue ple and particips sketch on it preliminary limitations to define areas worthy of more intense investigation. Also the whole thing needs to be tied into the hystraulics of the area and possibilities for filling flood prone hand without adverse effects on hydramin . when all these different inputs can be Regards R-06 PS. I am doing site classification of that fill & natural ground section at south west end of site as a report so that it can be presented to Council for subase of land for sale. list.