

WATERNSW NSW DRILLERS LICENCE EXAMINATION MODULE 'A'



NSW DRILLERS LICENCE EXAMINATION

MODULE A Standard Requirements for all Licences

Q1.	Under t	he Water Act, 1912, as Amended, a bore is defined as: (Tick the correct answer)
		A natural opening in the ground that gives access to underground water.
		An opening in the ground, excavated for some other purpose, but that gives access to underground water.
		Any excavation or other work capable of obtaining or used to obtain supplies of sub- surface water.

Q2. The following shows the NSW Licence Classes with the National Equivalent

NSW	NATIONAL	
Class 1	1	
Class 2	1	-
		-
Class 3	2	_
Class 4	2	
		-
Class 5	3	
Class 6	3	
		Page 1
	Total Ma	rk Module A



Q3. The penalty for constructing any groundwater work without a Driller's Licence or for having the wrong class of licence, is up to \$550. In addition, a daily penalty applies which is equal to: (tick the correct answer)

\$110.00
the cost of the bore,
clean up if the aquifer is polluted
\$1,100.00 or
10 demerit points towards licence cancellation.

Q4. The Act states that a Licensed Driller must fully complete certain information relating to the completed work. In NSW these details are supplied on a "Form A" and include which categories of data (tick four items):

Nature and thickness of strata drilled,
Materials used and cost,
Location, quantities and quality of all water supplies,
Proposed use,
The SWL of each supply relative to GL, and
Total cost of bore construction.

- Q5. A Driller's Licence may be cancelled for failure to provide the information requested on the "Form A". A \$220 fine may apply with an additional daily penalty of:
 - \$110.00
 - \$ 55.00 or
 - 5 demerit points?





- Q6. All Groundwater works must be licensed by the property owner before any construction commences. How long does the licence remain valid before it expires? (Tick the correct answer)
 - 1 year,
 until the bore is finished
 3 years, or
 indefinitely

Q7. A Bore Licence is required for works that extract groundwater but is a licence required for:

Works that only intercept (not produce) groundwater,	YES	NO	
Deepening, enlarging, or altering an existing work	YES	NO	
Disposal of waste into a hole that does not intersect groundwater, or	YES	NO	
To measure SWL and sample groundwater?	YES	NO	

Q8. High yield bores must not be drilled where their use interfere with neighbouring supplies. Restrictions on bore location are usually stated on the Bore Licence, but what are typical minimum distances from the following:

(a)	property boundary	m
(b)	a neighbour's irrigation bore	m
(c)	Town Water supply bore	m
(d)	a NOW piezometer,	m
(e)	the high bank of a river, creek or wetland	m



STANDARD REQUIREMENTS FOR ALL LICENCES

Q9. WaterNSW, Driller, and Landholder have different responsibilities in relation to groundwater works. Indicate (tick one box, each line) who is responsible for the following:

	WaterNSW	Driller	Landholder
Capacity for sand-free sustainable production			
Regional groundwater resource management (aquifer safe yields, allocations, ceilings, embargoes, etc)			
Issue of bore-construction permits			
Bore materials and construction appropriate to the expected service life			
Site access			
Test production estimates			
A bore free of introduced biological contamination			
Groundwater-extraction licences			
Permits/licences to discharge to groundwater's systems	;		
Driller licences/permits			
Unobstructed bore to full depth			
Contamination protection using grouting and seals			
Adequate bore development and minimum aquifer dama	age		
Disinfection			

Q10. Why must the annular space around the casing at the surface be sealed?

Page 4
To exclude oxygen from the bore that may promote bacterial growth
To prevent surface water from entering the bore
To prevent water from pressurised aquifers flowing from the annulus
To support the casing string



STANDARD REQUIREMENTS FOR ALL LICENCES

- Q11. Fill in the attached Bore Completion Report using the information provided below and on the attached diagram. (Note: For the purpose of this exercise, there is no need to complete details relative to the name or address of the Bore Licence, Bore Location or Licence Number, or Driller's Name and Licence Number)
 - The bore is to be used for Stock and Domestic purposes.
 - The drilling was carried out on 12/4/2010 using an Air Rotary Rig. Casing and screen installation and development took place on the following day.
 - Drilling was undertaken using a 222mm (8 ³/₄") blade bit and air blast to refusal at 4m and a Down-Hole Hammer with a 203mm (8") bottom bit for the full depth of the hole.

Water inflows were first encountered at 78m and a short (1/2 hour) air-lift test was carried out at 82m yielding 3L/s with 25m of Draw Down. A conductivity test gave a reading of 160 us/cm. Drilling was continued to 85m with no additional water.

- Flow rates from the bore were measured using a V-Notch Weir Board.
- At commencement of the second day, the SWL was measured at 40m below surface.
- In order to obtain maximum yield from the hole, a pipe size, stainless steel (Type 304), wire wound screen was used, its length being 40% of aquifer thickness. This screen was welded to the casing using appropriate weld rings.
- The completed bore was developed by air-lifting for 1 hour.
- A final one hour air-lift test conducted during development yielded 3 L/s with a Draw Down of 25m, and tests on water samples obtained provided the following results: pH = 7.8, conductivity = 160us/cm; Temp = 18 degree C. (Note: us/cm X 0.640 = mg/L or ppm)
- The bore was disinfected by adding a chlorine solution to the bore on completion.
- Both water and formation samples were obtained, to be passed on to the Water Authority.

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FORM A PARTICULARS OF COMPLETED BORE

Driller's Licence no: Class of Licence: Driller's Name: Assistant Driller's Name:					Work Licence No: Name of Licensee: Intended Use: Completion Date:	BL			2
New bore		Replacement bore		İ		D	RILLING DETAILS		3
Deepened Reconditioned		Enlarged Other (specify)			From (m)	To (m)	Hole Diameter (MM)	Drilling Method Code	
Final Depth		m							
New bore Deepened Reconditioned Final Depth		Replacement bore Enlarged Other (specify) m			From (m)	D To (m)	RILLING DE TAILS Hole Diameter (MM)	Drilling Method Code	_

									WATE	R BEARI	NG	ZONES								4
From	-	()	Thic	kness	s	WL	E	stimat	ed Yiel	d (L/s)		Test	DDL a	tend	Du	ratio	n	Salir	nity (Co or T	onductivity DS
(m)		o (m) (m		(m)	(m)		Individual Aquifer		С	Cumulative		code	of test	: (m)	Hrs	mm (u		Co (µS/	nd (cm)	TDS (mg/L)
																		U		
						1			CAS	ING/LINE	R DE	ETAILS								5
Material OD		Wall Thickne	ess	From		To	M	ethod of Fixing	Ca	sing Sup	port Meth	od	Code							
Code		(111	n)	(mm)	(11)		(11)		Code	Ту	pe of cas	ing botto	n	Code					
											Ce	ntralisers	installed	: No [□ Yes		(indic	ate or	sketcl	ו)
							_		Su	mp instal	led:	No I			From	n		m		
Casing													inenteu.			<u> </u>			_	111
Protector	r										Са	ising Prot	ector cer	nenteo	l in plac	e: N	lo 🗆	Yes		
						0			WA.	TER ENTR	RY D	ESIGNS	0		1		0	-+ D - 4	- 11 -	6
Gen			Genera	1			Opening				en				ot Det	alis				
Material Code OD (mm) T		Thickne s (mm)	cknes From (m)		1)	To (m)		type Code	Fixing Apertur Code (mm)		ure I)	Length (mm)		V (1	/idth mm)	4	Alignment Code			
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	• 7 •					Orade	From			-	To From			To	To L		Litre	Litres or m ²		
Rounded	ł			Grad	ded															
Crushed				Ung	radeo															
Bentonite	e/Gro	ut se	al: N		Yes				Codo											
	or pia	ceme	IL OI G	Tavel Pa	ICK				Joue			00005017	-							6
Chemica		d for h	roakin	a down	drillin	a mud	No	<u> </u>		Name:	VEL	OPMEN								8
Method	B	Bailing	/Surair	na 🗆		ettina			Airliftin			Backwa	shina [1	Pumpin	a		Ot	her:	
Duration		-sining	e ai gii	hr	s	o turig	hrs h				hrs hrs			hrs	rs I			3		hrs
									DISI	NFECTIO		OMPLET	ION							9
		Cher	nical/s	used				Quantity applied (litres) Method of application												
									PUMP	ING TES	TS C	ON COMP	LETION							10
						Pum		Initial	Water	Pumpir	ng	Water	Level at	Du	ration			Rec	overy	
Т	est T	ype		Dat	e	dept	= 1	Le	vel	rate		end of	pumping	of	Test	Wa	ater lev	/el	Tim	e taken
				(m)	-	(SWI	_) (m)	(Ls)		(DDI	_)(m)	((hrs)		(m)		(hrs)	(min)		
Multi stage	e _	Stage	<u>1</u>											_						
(Stepped drawdown	. F	Stage	2																	
Single sta		onstar	t rate)	1			-+													
Height of	f mea	suring	g point	above o	jroun	d level:	1	m Te	est Met	hod			Code			See	e Code	Table	e 4	1
For NOW u	use on	ly		G	W															



FORM A	PARTICUL	ARS OF	COMPLETED	BORE
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					Work	Licence N	o: E	3L		
			WORK PARTLY BACK	FILLED OR ABAN	IDONED					11
Original depth of	work:n	netres la	s work partly backfilled:	No 🗆 Yes						
ls work abandon	ed: No □	Yes 🗆 Me	ethod of abandonment:	Backfilled 🗆 Plug	gged □	Capped D]			
Has any casing t	been left in the v	/ork: No □	Yes 🛛 From	(m) To .		. (m)				
Sealing / fill ty	pe Fro	m Depth	To depth	Sealing / Fill ty	/pe	From I	Depth		To dept	h
code		(m)	(m)	Code		(m	ı <u>)</u>		(m)	
Oite ab each bur				<u>N</u>						40
Site chosen by:	Hydrogeologis					1				12
Do	DRILLER'S I		DESCRIPTION (LITHO	DLOGY)				ICTDI		13
From (m)	To (m)	_	Description	on			SKE	ТСН		
			NORK NOT CONSTRU			01				44
Depth	Length	UI Back r	Diameter	Lining	Ing ⊔ Dimens	Other: sions of	From Dep	th	To D	epth
(m)	(m)	(m)	(m)	material	line	r (m)	(m) [']		(n	n)
	<u>,</u>	PLEASE	ATTACH COPIES OF			ABLE				15
Geologist log	No 🗆 Yes 🗆	Laboratory	analyst of water sample	e No 🗆 Yes 🗆		Pumping	g test (s)	No	□ Yes	□
Geophysical log	No 🗆 Yes 🗆	Sieve analy	vsis of aquifer material	No□ Yes □		Installed	pump detail	s No	□ Ye	s 🗆
		-	LOCATION	OF BORE		•				16

Lot No DP no					
Work Location Coordinates:	Easting		Northing	Zone	
GPS:	No 🗆 Yes 🗆	>>	AMG/AGD 🗆 or	MGA/GDA 🛛 (see explanation	on)

Please mark the work site with "X" on the DIPNR CLID map or supply a sketch map of the location. Attach the map to this Form A package.

 SIGNATURES
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 Driller Signature:
 Licensee Signature:

 Date:
 Date:

NOTE: If not enough space is provided use a separate piece of paper. Provide details of works location, Drillers Licence Number and Work Licence Number.



Water	ANSW						CC	DDE	Ξ Τ/	AB	LE								
							DRIL	LIN	GM	IETI	HOD								3
1	Auger	- Hollow Fli	ght	-		-		-	9	Rota	ary - Per	cuss	sion	- (Dow	n Ho	le H	lamı	mer)	
2	Auger	- Solid Fligh	nt						10	Rotary - Percussion - Foam injection									
3	Cable	Tool - Drill	and Dri	ve Ca	asing				11	Rota	ary - Rev	/erse	e circ	culation	- Ai	r			
4	4 Cable Tool - Mud stabilised						12	Rota	ary - Rev	/erse	e circ	culation	- M	ud					
5	5 Rotary Air							13	Rota	ary - Co	ing								
6	Rotary	/ - Air/foam							14	Jett	ed - Air								
7 Rotary - Mud 8 Rotary - Water							15	Jetted - Water											
8 Rotary - Water								16	Oth	er - See	page	e 2,	N0 11						
						N	ATER	RBE	EAR	NG	ZONE								4
		TE	EST ME	THO							F	LOV	V ME	EASURI					
	Airlift			6		ump -	Helical	Rotor	A		ontainer o	t kno	wn v	volume	F	N N	/eir	- Rectang	jular
2	Baller	Contrifugal				ump -	Jel		В		JW Meler				G			V Notch	- 60°
3	Pump	- Cellinder				unp -		;			ifice plat	- & n	nanc	meter	-	0		- V NOLCH	- 90-
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3	Concr	ete cylinder	8	PV	C - Cli	ass 18	8	13	Stee	l - St	ainless 3	16	3	Packe	er		8	Other	-
4	Fibre o	glass (FRP)	9	Ste	el - El	RW		14	Othe	r			4	Rivete	ed				
5	PVC -	Class 9	10	Ste	el - G	alvani	ised			5 Screwed									
		CASING	SUP	POR	RT N	1ETH	IOD				Т	YPE	E 0	F CAS	INC	βB	ОТ	том	
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1 2 3 4 1 2 3 4 5 6 1 1 2 8 6	Driven Seated Seated Ceme Casing Casi	CASING a into small he d on bottom d on backfill nted g - Bridge slo g - Drilled hol g - Hand saw g - Louvre slo g - Machine s g - Oxy cut sl d or shovelle WORK F nt grout ete 1 Rock type	SUPI Dele C t es n slot ot d into au ot PARTI	POR GR/ nnulu -Y I 3 4 D r (RT M 5 6 9 11 11 11 IS 2 BACC Bent Drille 3 Grain 3	HETH Hell Oth Oth TYPE Case Case </td <td>IOD d in clar her VATER asing - F asing - F creen - c creen - r creen - r creen - v ACK - aced the LED tings S ROC</td> <td>mp Plasm Perfor gauze round wedge rough OR OR</td> <td>NTR na-cut rated wire e wire ETH(h trem AB, 5 6 6 5 TRA To s follo</td> <td>1 2 3 4 Y D slot sh in ho sh D D D ANII C S ANII ave e wing</td> <td>T Open e End cap Plug - c Plug - v PESIGN PE</td> <td>YPE nd ooncr vood H V F P P H V F C P a C I 3 - (3 - (3 - (3 - () , writh , da</td> <td>EMI EMI EMI TIO</td> <td>F CAS SLC agonal orizontal ertical ATERIA E refer Content Cont</td> <th>ING 5 6 7 8 OT <i>A</i> to C.</th> <td>ALIC ALIC ALIC ALIC AS/</td> <td>OT aasin /ash /ash /ash /ash /ash /ash /ash /ash</td> <td>TOM Ig shoe a down sh enting shoe IENT IENT NG Code DETAILS IAL stone and abbre</td> <td>0e be 6 5 5 5 5 7 11 11 15 viate the</td>	IOD d in clar her VATER asing - F asing - F creen - c creen - r creen - r creen - v ACK - aced the LED tings S ROC	mp Plasm Perfor gauze round wedge rough OR OR	NTR na-cut rated wire e wire ETH(h trem AB, 5 6 6 5 TRA To s follo	1 2 3 4 Y D slot sh in ho sh D D D ANII C S ANII ave e wing	T Open e End cap Plug - c Plug - v PESIGN PE	YPE nd ooncr vood H V F P P H V F C P a C I 3 - (3 - (3 - (3 - () , writh , da	EMI EMI EMI TIO	F CAS SLC agonal orizontal ertical ATERIA E refer Content Cont	ING 5 6 7 8 OT <i>A</i> to C.	ALIC ALIC ALIC ALIC AS/	OT aasin /ash /ash /ash /ash /ash /ash /ash /ash	TOM Ig shoe a down sh enting shoe IENT IENT NG Code DETAILS IAL stone and abbre	0e be 6 5 5 5 5 7 11 11 15 viate the