Department of Health and Human Services
Population Health

Radiation Protection Act 2005 – Section 17

CERTIFICATE OF COMPLIANCE:

STANDARD FOR SEALED RADIATION SOURCE -

MOBILE BORE HOLE LOGGING

SECTION 1: REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR CLASSES OF RADIATION SOURCES

SECTION 2: PARTS OF STANDARDS AND CODES OF PRACTICE ADOPTED BY THIS STANDARD

This information can also be accessed at
http://www.dhhs.tas.gov.au/peh/radiation_protection

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Section 1 – REQUIREMENTS FOR CERTIFICATES OF COMPLIANCE FOR CLASSES OF RADIATION SOURCES.

This Standard is to be used when assessing Radiation Sources, classified by Radiation Protection Act 2005 licences as "Sealed mobile bore hole logging", for the purpose of issuing a certificate of compliance.

In order for a certificate of compliance to be issued the Radiation Source must be shown to fully comply with the requirements in Section 2.

† **Where an item was demonstrated to comply at the time of manufacture or supply, ongoing compliance for that item may be stated only if it is reasonable to assume there has been no change, modification, damage or unacceptable wear and tear to that item since the time of manufacture.**

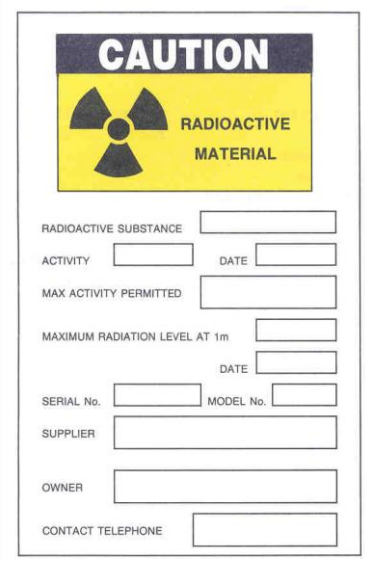
The requirements in Section 2 are taken from the following:

RHS 28	*National Health and Medical Research Council "Code of Practice for the Safe Use of Sealed Radioactive Sources in Bore Hole Logging (1989)"*
RPS 2	*ARPANSA Code of Practice for the Safe transport of radioactive material (2001)*
RAR	*Regulatory Authority Requirement, Department of Health and Human Services*

Section 2 - PARTS OF STANDARDS AND CODES OF PRACTICE ADOPTED BY THIS STANDARD OF COMPLIANCE

Only appropriate sources †	Only radioactive substances, which emit radiation of the type and energy appropriate for the particular application, must be used. ***RHS 28 3.1.2***
Toxicity †	Radioactive substances, which are very highly radiotoxic, must not be used unless no other suitable lower radiotoxicity substance is available or unless the radioactive substance is necessary to cause the production of neutrons. ***RHS 28 3.1.2***
Radium not a preferred material †	Alpha radiation sources used to cause the production of neutrons must not contain radium-226 (^{226}Ra) and must contain Americium-241 (^{241}Am). ***RHS 28 3.1.4***
Chemical and physical form †	The radioactive substances must have physical and chemical properties, which minimise corrosion and the build up of internal pressure, and if the source encapsulation is breached, minimize dispersal or dissolution. ***RHS 28 3.1.5***
Minimum activity †	The radioactive sources used in borehole logging must, where there is a choice, incorporate only radioactive substances, which have the minimum activity and half-life consistent with the expected logging to be undertaken. ***RHS 28 3.1.1***
Radioactive source encapsulation †	Each radioactive source used in a mobile borehole logging gauge must be "special form radioactive material" as specified in the Transport Code (***RPS 2***). ***RHS 28 3.2.1*** The supplier of the radioactive sources shall ensure that the sources are, or have been, tested to demonstrate compliance with the relevant standards and are marked, in the required manner, in accordance with the standards (for "special form radioactive material") ***RHS 28 3.2.2***

Source Containers	The source holder must be securely enclosed within a shielded housing under all operational, transport or storage conditions other than those where the probe is deployed in the borehole. ***RHS 28 3.3.1***
Construction requirements for a source container (gauge)	
Shielding†	The shielded containers must be designed and constructed so as to meet the requirements of the Transport Code (***RPS 2***) for type A packages. ***RAR***
Exposure rates	When the sources are in the shielded storage/ transport containers the dose rates must not exceed: (a) 2000 micro Sv/h at any point 5 cm from the container surface; (b) 100 micro Sv/h at any point 100 cm from the container surface; ***RHS 28 3.4.1 and RAR***
Source container resistant to heat†	The shielding should be constructed of fire resistant material. Shielding materials which are not fire resistant, such as solid paraffin, must be used only if enclosed in a fire resistant vessel, which will prevent the loss of the shielding material in the event of fire. ***RHS 28 3.4.3***
Source assembly fixed within source container	The source must be fixed and locked in the source holder in such a manner to prevent loss, dislodgement or removal of the source by unauthorised persons. ***RHS 28 3.3.2***
Compatibility of materials used in constructing the source container†	All components of the equipment, including the sources, source assembly and shielding, must be constructed of physically and chemically compatible materials, which perform satisfactorily under irradiation conditions. ***RHS 28 3.3.6***
Withstand dust and corrosion vibration†	3.3.3 The borehole logging equipment must be designed to minimize wear, corrosion, dust, moisture, vibration, heat, or any other external factor from adversely affecting the integrity of the source encapsulation, source holder, source container or shielding, or from interfering with the ease of attachment of the source holder to the tool. ***RHS 28 3.3.3***

Source securely fixed in source assembly	3.3.4 The mechanism for attaching the source holder or subassembly containing the source to the tool must be designed to be foolproof, protected against unintentional release of the tool and must be made of wear resistant material. ***RHS 28 3.3.4***
Positive location of source assembly	3.3.5 Where applicable, the source holder must be positively located in the shielded housing to allow 'hands off' attachment and detachment of spacers and/or tool. ***RHS 28 3.3.5***
Labels and markings required on the source container	
Durable label on gauge and transport case	In addition to any requirements of the transport code **(RPS 2),** the source storage/ transport/ container must have a durable label in general compliance with the following figure:  and be durably labelled, marked or engraved in a conspicuous location on the exterior surface with: (a) name of the user or organisation and telephone number; (b) names of the radioactive substances; (c) activities of the radioactive substances and the dates of measurement; (d) maximum dose rate at the shield surface when the sources are shielded and the date this measurement was made; (e) name and address of the supplier or manufacturer and (f) identification number of the container and source ***RHS 28 3.3.7 and RAR***

Test for non fixed contamination	
	The gauge housing is to be wipe tested for the presence of non-fixed radioactive contamination. **A wipe test taken and analysed 3 months prior to issuing a certificate of compliance is acceptable for the purpose of complying with this requirement.** ***RAR***
Contamination Level	Non fixed contamination levels are not to exceed those specified for transport in **RPS 2**
Preventative maintenance	The gauge must be inspected to ensure all control mechanisms operate correctly and the gauge is generally mechanically sound. ***RAR***