# Checklist for Baseline Assessments: Private Water Bores

| | RESPONSIBILITIES | |
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| **STATUTORY OBLIGATION** | **RESPONSIBLE TENURE HOLDER (RTH)**<br>*The responsible resource company* | **BORE OWNER (OWNER)** |
| **Baseline Assessment Plan (BAP)** | | |
| ☐ BAP required prior to production of water on a resource tenure<br>☐ Submit to Department of Environment and Science (DES) for approval | ☐ Prepare a BAP (download the BAP guidelines here):<br>o identify the bores within the priority tenure area that will be assessed prior to the production of water<br>o provide a schedule for completion of Baseline Assessments for each bore<br>☐ Submit to DES for approval<br>☐ Implement BAP | ☐ If asked, provide the following information to assist the RTH to prepare the BAP:<br>o the location of any water bores on the land, and<br>o any other details relating to the bore |
| **Undertake the Baseline Assessment** | | |
| ☐ In accordance with the approved BAP<br>☐ If directed by DES (section 402 of the *Water Act 2000*)<br>☐ On bores outside the resource tenure area that are published as Long-term Affected Area (LAA) bores in an underground water impact report (UWIR) | ☐ Follow the BAP to complete Baseline Assessments:<br>o update the BAP if there are any changes to the schedule, and<br>o report progress and any changes to DES<br>☐ Undertake additional Baseline Assessments if:<br>o directed by DES, or<br>o required under a UWIR<br>☐ Comply with the Baseline Assessment Guidelines published by DES | ☐ Communicate with the RTH<br>☐ Enquire about potential for Baseline Assessments and timing<br>☐ Provide access to enable the RTH to undertake the Baseline Assessment<br>*Note: This is an activity under the Water Act 2000 and a conduct and compensation agreement (CCA) and/or compensation are not required* |

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| **Provide notice to Owner:**<br>□ State date the Baseline Assessment will be undertaken<br>□ Provide details of who will be undertaking the Baseline Assessment<br>□ At least 10 business days prior to undertaking a Baseline Assessment | □ Contact the Owner in advance of issuing a notice to undertake the Baseline Assessment:<br>○ explain what a Baseline Assessment is and why it is necessary<br>○ enquire about:<br>▪ whether equipment will need to be removed from the bore prior to the assessment<br>▪ how long the Owner needs to remove the equipment<br>▪ suitable dates to schedule the work<br>○ inform them that a notice will be provided detailing the:<br>▪ date, time and estimated duration<br>▪ who will do the assessment<br>▪ how costs of removal of infrastructure will be covered<br>□ Comply with the Baseline Assessment Guidelines published by DES | □ Assist the RTH in planning and scheduling the Baseline Assessment<br>□ If the proposed timing of the Baseline Assessment conflicts with planned activities such as mustering, harvesting etc, work with the RTH to reschedule as soon as practical<br>□ Comply with any reasonable request for information from the RTH if they possess the information.<br>□ Provide a copy of any invoice in relation to the removal of equipment that was requested by the RTH<br>□ If asked, provide:<br>○ the location of any water bores on the land; and<br>○ any other information the RTH reasonably requires to undertake a Baseline Assessment of any bores. |
| **Provide information collected during a Baseline Assessment**<br>□ On the DES form: Outcome of Baseline Assessment (ESR/2016/1918)<br>□ To the Owner and the Office of Groundwater Impact Assessment (OGIA) within 30 business days after undertaking the assessment<br>□ To DES if the Baseline Assessment was undertaken in response to a direction notice | □ Discuss the findings of the Baseline Assessment with the Owner<br>□ Inform the Owner of the date they will receive the Outcome of Baseline Assessment report<br>□ Provide a copy of the Outcome of Baseline Assessment report to the Owner, OGIA (and DES if required) within 30 business days of completing the Baseline Assessment<br>*Note: 30 business day period commences once laboratory results are received and this information has been analysed* | **N/A** |

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| Retain information collected during the Baseline Assessments. | ▯ Retain information collected by the RTH during a Baseline Assessment | ▯ Retain information collected during the Baseline Assessments. |
| **Collection of data and qualifications** | | |
| **Qualifications for persons conducting Baseline Assessments:**<br><br>Ensure that the person/s conducting the field measurements required for a Baseline Assessment possess:<br>▯ a minimum of two years prior experience in at least one of the following fields: underground water level monitoring programs; the conduct of underground water quality sampling programs; hydrogeology and/or engineering.<br>▯ has a practical knowledge of water bore construction and infrastructure<br><br>Can provide the Owner with evidence of the person(s) skills and expertise, when requested. | ▯ Engage appropriately qualified people to conduct the Baseline Assessment<br>▯ Inform the Owner about the people who will be conducting the Baseline Assessment<br>▯ Provide the Owner with evidence of the skills and expertise of the person(s) conducting the Baseline Assessment if requested | ▯ Request the RTH to provide evidence of the person(s) skills and expertise if concerned that the person(s) conducting the Baseline Assessment does not possess the appropriate skills and experience |

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| **Quality assurance and quality control**<br><br>Comply with the Baseline Assessment Guidelines published by DES regarding quality assurance and control | Develop a formal quality assurance program and undertake Baseline Assessments in accordance with the formal quality assurance program.<br><br>Ensure the formal quality assurance program includes quality control procedures consistent with the principles of the following documents:<br>o AS/NZ 9000 Quality management system series;<br>o quality assurance/quality control of AS/NZS 5667.11:1998 Water quality - Sampling - Guidance on sampling of groundwaters (Joint Technical Committee EV/8, 2016), and<br>o Monitoring and Sampling Manual 2018 — Environmental Protection (Water) Policy 2009 (DES).<br><br>Provided the quality assurance program to DES upon written request within the requested timeframe. | **N/A** |

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| **Independent third-party certification**<br><br>Comply with the Baseline Assessment Guidelines published by DES regarding independent third-party certification<br><br>Baseline Assessment must be completed by an independent third party or be certified by an independent third party. | Obtain certification from a qualified independent third-party who:<br>o Is not an employee<br>o Does not have a conflict of interest<br>o Has a degree in a relevant science or engineering discipline<br>o Has a minimum of five years' experience in at least one of the following fields:<br>▪ groundwater level monitoring programs<br>▪ groundwater quality sampling programs, or<br>▪ groundwater hydrogeology and/or engineering, and<br>▪ has a practical knowledge of water bore construction and infrastructure.<br><br>If certified by an independent third party, the certification must include a statement that:<br>o quality assurance and quality control procedures are being implemented<br>o the Baseline Assessment is compliant with the guideline<br>o verifies the minimum qualifications, training and experience of all persons who conducted the Baseline Assessment | **N/A** |

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| **ESSENTIAL ELEMENTS OF A BASELINE ASSESSMENT** | | |
| **A. Document identification and bore site information** | | |
| Record:<br>- a unique identifier for the bore (Bore ID).<br>- a local name for the bore if the Owner has one<br>- the location of the bore site | - Obtain all relevant information from the Department of Resources groundwater database (GWDB) including water authorisation, prior to visiting the site.<br>- Request and obtain additional information from Owner within reason<br>- Prior to visiting the bore site obtain all relevant information from GWDB including water authorisation | - Provide a local name and registration number for the bore if the bore has one for cross-reference<br>- Provide other information reasonably requested by the RTH |
| **B. Bore construction details** | | |
| Request and record bore construction details | - Record:<br>  - name of drilling contractor<br>  - date of construction<br>  - type of casing<br>  - casing diameter<br>  - perforated intervals and/or screens installed<br>  - details of any seals and cement grouting installed in the bore annulus, and<br>  - bore strata log<br><br>*Note:* Refer to the Commission's ***Bore Assessment Checklist*:**<br>- Also record the source aquifer for the bore (where the supply source is uncertain or unknown, analyse and provide reasons for the uncertainty, including confidence level) | - Provide information on bore construction details (if available) as requested<br><br>*Note: Refer to the Commission's* ***Bore Assessment Checklist*** |

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| **C. Bore equipment and condition details** | | |
| ☐ Request and obtain bore equipment and condition details<br>☐ Provide photos of the bore and bore equipment | ☐ Record pumping equipment information including:<br>○ if the bore is in operating condition or has been decommissioned<br>○ the pump type and make<br>○ pump setting depth<br>○ if the bore is metered<br>○ the power source for the bore<br>○ details on the riser, and<br>○ details on the headworks<br><br>*Note:* Refer to the Commission's ***Bore Assessment Checklist***<br>☐ Take a photo of the bore and bore equipment<br>☐ Attach photos to the Bore Assessment Outcome report | ☐ Provide bore equipment and condition details to the RTH<br>☐ Provide details about any repairs or maintenance that has previously been undertaken on the bore e.g. who has carried out the maintenance on the bore, when and what sort of maintenance was undertaken<br><br>*Note: Refer to the Commission's* ***Bore Assessment Checklist*** |
| **D. Bore supply information** | | |
| Request and obtain bore supply information | ☐ Consult with Owner regarding:<br>○ Authorised use or purpose<br>○ Use of the water extracted from the bore e.g.<br>▪ stock watering (type, head)<br>▪ domestic use (number of households supplied, area of gardens watered)<br>○ Frequency of bore use (hrs/day)<br>○ Operating capacity and any associated commentary on the operating capacity, including any seasonal variation in use<br>○ Peak usage information (including maximum volumes extracted and period of peak extraction) | ☐ Provide the RTH:<br>○ Bore supply information that the RTH reasonably requires to conduct a Baseline Assessment<br>○ Historical water use records (if available)<br><br>*Note: Refer to the Commission's* ***Bore Assessment Checklist*** |

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| | ☐ Request evidence from the Owner to confirm stocking rates to support the estimated volumes<br>*Note:* Refer to the Commission's ***Bore Assessment Checklist*** | |
| **E. Water level measurement** | | |
| Record water level details for the bore | ☐ Record:<br>o A standing water level (SWL)<br>o The height of the datum above ground level<br>☐ Where a SWL cannot be recorded, as it is not practical for the Owner to cease pumping, record the following:<br>o duration of pumping and rest periods, and<br>o maximum pumping rates<br>☐ Take and attach a photograph of the bore to the Outcome of Baseline Assessment report, clearly showing the following:<br>o a datum for SWL<br>o the unique identification number of the bore and the GWDB registered number if available<br>o the Owner's name<br>o property name, and<br>o the date of the photograph.<br>☐ Request and obtain additional information from Owner within reason<br>*Note:* Refer to the Commission's ***Bore Assessment Checklist*** | *Note:* Refer to the Commission's ***Bore Assessment Checklist*** |

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| **F. Water quality assessment** | | |
| **Collect water quality samples**<br>☐ Obtain water quality samples according to the Baseline Assessment Guidelines<br>☐ Sample collection must occur as close to the water bore as possible, and where possible, before any other pipework joins the bore discharge pipework<br>☐ Identify and avoid potential sources of contamination when taking samples<br>☐ When taking samples, disturbance to the existing infrastructure must be minimised | ☐ Document the location of the sampling point.<br>☐ Where the sampling point is not within 15m of the bore:<br>o Provide a photograph of the sampling point, and<br>o Record the location<br>☐ Prior to sampling a water bore, calculate the volume of stagnant water within the bore casing and discharge piping (upstream of the sampling point)<br>☐ Only collect water quality samples:<br>o after three times the volume of stagnant water in the bore casing and the discharge piping (including a sufficient additional volume to account for any error in volume calculations) have been discharged, and<br>o when the field water quality parameters have stabilised<br>☐ Where full purging is not practical, but a meaningful sample can still be collected, record the pumping history of the bore, including when the bore was last used<br>☐ Take and attach photographs showing the bore and sampling setup when:<br>o water quality samples are taken, and<br>o there is no pumping equipment in place in the bore | ☐ Provide access to obtain water quality samples |

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| **Field parameters and laboratory analytes**<br><br>□ Sample the minimum water quality analytes as specified in the Baseline Assessment Guideline<br><br>□ The limit of detection must be sufficient for assessment against current and relevant guidelines, including but not limited to:<br>○ the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000), and<br>○ the Australian Drinking Water Guidelines (National Health and Medical Research Council, 2011) | □ Record field parameters and analyse water quality samples according to the Baseline Assessment Guidelines<br><br>□ Analyse all samples for Baseline Assessments at National Association of Testing Authorities (NATA) accredited laboratories | **N/A** |
| **Presence and analysis of gas**<br><br>□ Measure bore for presence of carbon dioxide, methane and hydrogen sulphide using a multi-parameter gas detector in compliance with the latest version of the Code of practice for coal seam gas well head emissions detection and reporting (Department of Natural Resources and Mines, 2011) | □ Collect dissolved gas samples through a flow-through cell where present<br><br>□ Collect dissolved gas samples using the methods outlined in section 7.2 of Groundwater Sampling and Analysis—A Field Guide (Sundaram, *et al.*, 2009) if a flow-through cell cannot be used<br><br>□ Record the pumping regime prior to assessing the presence or absence of gas | □ Advise the RTH if gas is present in the bore<br><br>□ Provide details of the pumping regime prior to assessing the presence or absence of gas |

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| **Sample identification, preservation and transportation**<br><br>Ensure that sample identification, preservation and transport adheres to best practice industry standards | Water quality samples must have a unique identification number that can be cross-referenced to the monitoring location and time of sampling<br><br>Document sample preservation measures to comply with the laboratories requirements and relevant standards (e.g. AS/NZS 5667.1:1998)<br><br>Maintain sample integrity - use chain of custody procedures and documentation in accordance with section 3.7 of the Monitoring and Sampling Manual 2018 — Environmental Protection (Water) Policy 2009 (DES) | **N/A** |
| **Rescheduling of water sampling**<br><br>Should sampling of the water from the water bore not be feasible at the time of the initial field visit, the Owner and RTH may choose to agree on another time for obtaining a sample | If water sampling needs to be rescheduled, agree on a timeframe with the Owner and record the details<br><br>The rescheduled timeframe should be within the timetabled date in the relevant approved BAP or if not possible, the BAP should be amended to account for the new agreed timeframe<br><br>If the Owner chooses not to reschedule a time for water quality sampling, record this within the results of the Baseline Assessment | If water sampling needs to be rescheduled, agree on a timeframe with the RTH and record the details |
| **G. Assessment field officer details** | | |
| Record the person responsible for conducting the Baseline Assessment | Record details of the person responsible for conducting the Baseline Assessment | **N/A** |

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| **H. Declaration** | | |
| ☐ The RTH declaration must be completed by an officer accountable for "sign off" on the data collected during the Baseline Assessment | ☐ Ensure a person with the appropriate authority completes the declaration relating to the data collected during the Baseline Assessment | **N/A** |
| **I. Bore owner details** | | |
| ☐ Record the contact details of all persons who provided information for the Baseline Assessment | ☐ Record the contact details of:<br>o Owner; and<br>o Any other person who has provided information about the bore for the Baseline Assessment | ☐ Facilitate provision of details to RTH if necessary |