

Notice

Water Act 2000

Decision to approve with conditions an underground water impact report

This statutory notice is issued by the delegate of the Chief Executive administering the Water Act 2000 in accordance with section 385 of the Water Act 2000, to advise you of the decision to approve with conditions an underground water impact report (UWIR).

Santos SWQ Ltd
Santos Centre Ground Floor
60 Flinders Street
Adelaide SA 5000

Your reference: UWIR_ Cooper Basin Oil and Gas Fields SWQ

Our reference: BNE 489261

Attention: Elizabeth Dunlop

Dear Ms Dunlop,

Re: Approval of an Underground Water Impact Report for Cooper Basin Oil and Gas Fields SWQ

The delegate of the chief executive has approved the underground water impact report (UWIR) for Cooper Basin and Gas Fields SWQ with conditions. Please find attached:

- the conditions of approval (Attachment A); and
- a statement of reasons for the conditions (Attachment B).

The UWIR takes effect on **14 March 2017**

If you require more information, please contact Brendan Tyndall on the telephone number listed below.

Signature

Date

William Inonda
Delegate of the Chief Executive
Water Act 2000

Enquiries:
Brendan Tyndall
Ph: (07) 3330 5618
Fax: (07) 3330 5634
Email: brendan.tyndall@ehp.qld.gov.au

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Attachment A - Conditions for Santos SWQ Ltd.'s UWIR for Cooper Basin Oil and Gas Fields SWQ

Annual Review

- (1) The **responsible entity** must submit to the **chief executive** a summary of the annual review required under s376(e)(ii) of the *Water Act 2000*, within 20 business days after each **anniversary day**, or another date agreed to in writing by the chief executive. The annual review must provide an analysis and a statement of whether there has been a material change in the information or predictions used to determine the IAA.

Monitoring

- (2) All monitoring required of the responsible entity under the UWIR must be undertaken by a **suitably qualified person**.
- (3) All laboratory analyses and tests of monitoring undertaken under the UWIR must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests.
- (4) Notwithstanding condition (3), where there are no laboratories that have NATA accreditation for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.
- (5) The methods of groundwater sampling required by the UWIR must comply with the latest edition of the Queensland Monitoring and Sampling Manual, AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on sampling groundwater, and the Australian Government's Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat #6890.1) as relevant as may change from time to time.
- (6) For each bore listed in Table 14 of the 2016 UWIR, water quality monitoring must be undertaken on a quarterly basis for the analytes listed in Table 1.

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Table 1 – Monitoring Suite Analytes

| Parameter |
|--|
| Colour |
| Gases (C1 – C4) (inc Methane) |
| Unionised Hydrogen Sulphide (not NATA Accredited) |
| Free and Total CO ₂ |
| Free Chlorine |
| Bromide |
| Temperature |
| pH |
| Conductivity |
| Total Dissolved Solids |
| Alkalinity Total Alkalinity as CaCO ₃ Bicarbonate as CaCO ₃ Carbonate as CaCO ₃ Hydroxide as CaCO ₃ |
| Chloride |
| Fluoride |
| Silica |
| Residual Alkali (calc) |
| Ionic Balance |
| Major Cations – Ca, Mg, Na, K |
| Major Anions – Cl, SO ₄ |
| Sodium Adsorption Ratio (SAR) |
| Total Hardness (calc) |
| Reactive Phosphorus |
| Nitrite |
| Nitrate |
| Ammonia as N |
| Total Nitrogen (inc TKN/NO _x) |
| Total Phosphorus as P |
| Total Organic Carbon |
| Dissolved Organic Carbon |
| Standard Plate Count (21°C and 36°C) |
| Sulphate reducing bacteria** |
| Hg |
| Total Metals (including digest) As, Ba, Be, Cd, Cr, Co, Cu, Mn, Ni, Pb, V, Zn |
| Additional Metals – Fe, Se, B, Sr, Al, Mo, Sn, U, Li |
| Ethanol |
| TPH(C6-C9) & TRH (C6-C10)/BTEX |
| TPH (C10-C36) & TRH (C10-C40)/PAH |

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DEFINITIONS

Anniversary day means each anniversary of the day the first UWIR took effect – 8 July

Chief executive means the Director-General of the department responsible for administering Chapter 3 of the *Water Act 2000* or the persons delegated the powers of the chief executive as stated in the *Water Act (EHP- Chief Executive) Delegation (No. 1) 2016* or subsequent versions.

NATA accreditation means accreditation by the National Association of Testing Authorities Australia.

Responsible entity means Santos SWQ Ltd in accordance with s368 of the *Water Act 2000*.

Suitably qualified person means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature.

UWIR means the underground water impact report prepared by Santos SWQ Ltd for Cooper Basin Oil and Gas Fields SWQ dated December 2016.

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Attachment B - statement of reasons for conditions for Santos SWQ Ltd.'s UWIR for Cooper Basin Oil and Gas Fields SWQ

Section 385 of the *Water Act 2000* (Water Act) states that the chief executive may decide to approve, approve with conditions, or require that an underground water impact report (UWIR) be modified and resubmitted.

As a delegate of the chief executive by instrument of appointment dated 6 January 2017 with powers under s. 385 of the Water Act, I have carried out an assessment of the UWIR, and consider that it satisfies the requirements of the Water Act, subject to compliance with the outlined conditions.

Table 2 below is my statement of reasons for the outlined conditions. In deciding whether to impose these conditions, my considerations included but were not limited to:

- the submitted UWIR;
- the requirements of section 376-383 of the Water Act;
- the purpose of Chapter 3 of the Water Act, which focuses on 'the management of the impacts on underground water caused by the exercise of underground water rights by petroleum tenure holders.'

Table 2 – UWIR approval conditions and statement of reasons

| Condition | Statement of reasons |
|---|--|
| (1) The responsible entity must submit to the chief executive a summary of the annual review required under s376(e)(ii) of the Water Act 2000, within 20 business days after each anniversary day , or another date agreed to in writing by the chief executive. The annual review must provide an analysis and a statement of whether there has been a material change in the information or predictions used to determine the IAA. | This condition is necessary in order to clearly state the day by which the annual review summary required under s376(e) of the Water Act must be submitted to the chief executive as this is not stated in the Water Act. The anniversary day means each anniversary of the day the first UWIR took effect. |
| (2) All monitoring required of the responsible entity under the UWIR must be undertaken by a suitably qualified person . | This requirement ensures that monitoring is conducted by a suitably qualified person who has the necessary skills and training to carry out that monitoring. |
| (3) All laboratory analyses and tests of monitoring undertaken under the UWIR must be carried out by a laboratory that has NATA accreditation for such analyses and tests. | This requirement is necessary to ensure that laboratory analyses and tests are carried out with appropriate analytical rigour. |
| (4) Notwithstanding condition (3), where there are no laboratories that have NATA accreditation for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation. | This requirement is considered necessary to provide a process for laboratory analysis where NATA accreditation does not exist for a specific analyte or substance. |
| (5) The methods of groundwater sampling required by the UWIR must comply with the latest edition of the <i>Queensland Monitoring and Sampling Manual, AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on sampling groundwater</i> , and the Australian | This condition is necessary to ensure that monitoring is conducted to recognised sampling methodologies and protocols. It is appropriate to ensure that accepted and recognised methodologies are followed when taking samples so that results are accurate and that they can be |

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| Condition | Statement of reasons |
|--|---|
| <p>Government's <i>Groundwater Sampling and Analysis – A Field Guide</i> (2009:27 GeoCat #6890.1) as relevant as may change from time to time.</p> | <p>meaningfully interpreted.</p> |
| <p>(6) For each bore listed in Table 14 of the 2016 UWIR, water quality monitoring must be undertaken on a quarterly basis for the analytes listed in Table 1.</p> | <p>The requirement to conduct monitoring on a quarterly basis is required to obtain a sufficient understanding of the condition of groundwater. <i>The Interim Groundwater Monitoring Plan</i> developed by Santos in 2013 outlined a quarterly monitoring frequency to establish a 'robust baseline'. As a total of four sampling events have occurred, the continuation of quarterly groundwater monitoring is considered necessary to establish trends over time that will provide a meaningful dataset which appropriately reflects the condition of groundwater, both spatially and temporally. The analytes listed in Table 1 are consistent with those outlined in the <i>Interim Groundwater Monitoring Plan</i>.</p> |