QGC
A BG Group business

9.0
Springs

9.0 Springs

Conditions 68 to 71

The importance of protecting GAB Springs from any possible impacts from CSG extraction is well-recognised by QGC. SEWPAC approval EPBC 2008/4398 lists conditions specific to springs assessment, mitigation and monitoring (Conditions 68 to 71). An initial survey is required to identify and confirm the existence of springs and significant or threatened species proximal to project areas. This is to be followed by a more detailed baseline study of relevant springs and then development of a management plan identifying Threshold Values, ongoing monitoring, response actions and a reporting program.

More specifically, Condition 68 requires QGC to conduct a springs survey proximal to the project area covering Dawson River 8, Cockatoo Creek and Scott's Creek Springs, with completion within nine months of approval.

SEWPAC approval was received 15 July 2011 for this survey to be managed by QWC pending QGC contributions as required by QWC and requiring a reporting responsibility of survey results from QGC by 30 November 2011. Ecological and hydrogeologic springs surveys of the Surat Cumulative Management Area (CMA) have been completed by QWC. SEWPAC's approval (Appendix B.2) considered a range of spring-related matters.

The Surat CMA includes the Surat and Southern Bowen Basin areas, as declared under the Queensland Water Act 2000 to provide management and oversight of overlapping underground water impacts from multiple petroleum tenures with CSG operations.

These surveys were completed for QWC but are not publicly available. An extension was granted by SEWPAC to report the QWC survey results reflecting uncertainty regarding release of the QWC Regional Model, UWIR and Springs reports. The draft UWIR has been released for public consultation. A summary of the findings is provided in Section 9.5.

QGC is committed to complying with Conditions 68 and 69 and with QGC's requirements under the draft Surat CMA Spring Management Strategy. QGC will incorporate the findings of the UWIR (once the QWC model and related reports have been made public and evaluated) in its preliminary Spring Management Plan.

Notwithstanding these issues, QGC has addressed its understanding of the EPBC listed springs of the Dawson Valley, namely Scott's Creek, Dawson River 8 and Cockatoo Creek.

QGC's GEN2 model showed estimated maximum drawdown at all EPBC listed springs as substantially less than 0.2 m with a 97.5% level of confidence – indeed the largest predicted maximum drawdown was just 0.02 m (with a 97.5% level of confidence).

Further, only the springs located in the outcrop areas of Hutton Sandstone and Precipice Sandstone (where these aquifers are recharged) were predicted to record a maximum drawdown in excess of 0.005 m. Seasonal/climatic fluctuations in rainfall patterns can potentially impact these springs by more than 0.005 m. For instance, QGC has observed fluctuations of up to 0.25 m in bores on QGC tenements since September 2011. It is possible these springs may represent perched local systems independent of the primary water table and therefore would be unaffected by any drawdown induced by CSG activity or any other groundwater extraction from deep aquifers.

Nevertheless, a rigorous monitoring program has been implemented as part of a response plan to ensure a very early warning threshold exists to trigger investigation and any necessary 'make good' actions. The objective is to ensure no undetected impact occurs at any MNES spring from QGC's CSG water extraction activities.

A collaborative industry approach to springs monitoring and management is being developed. A common industry approach to early warning and threshold groundwater level change monitoring in key aquifer units, is outlined in Section 12.6.4 and Appendix Q. QGC commits to implementing the agreed collaborative industry approach to springs monitoring and management.

9.1 SPRINGS INVENTORY

QGC prepared an inventory of springs within 100 km of QGC's GEN2 model predicted drawdown limits. Springs within 100 km of the drawdown limits are shown at Figure 30. Springs information derived from Fensham et al. 2005 are shown at Table 17. Several identified springs lie outside the Surat Basin in different geological formations and are not hydrogeogically linked to Dawson River/Surat Basin groundwater systems. These include springs 326 and 310 and would therefore potentially not be affected by QGC CSG water extraction.

Subsequently Santos has commissioned an independent survey to identify areas that could contain springs within a 100 km zone with the use of remote sensing techniques.

QGC has developed conceptual hydrogeological models (Figures 32 to 34) for the three springs (identified in Conditon 68), namely Scott's Spring, Dawson River 8 and Cockatoo Creek.

These conceptual models are detailed in Section 9.2. Section 6.0 describes the connectivity studies that QGC is undertaking. These studies will progressively yield new knowledge and understanding over the next few years. QGC commits to reviewing the results of the connectivity studies and evaluating how the monitoring and management of the springs assigned to QGC may be altered to reflect the results. This will be reported in the annual reports, due in October each year.

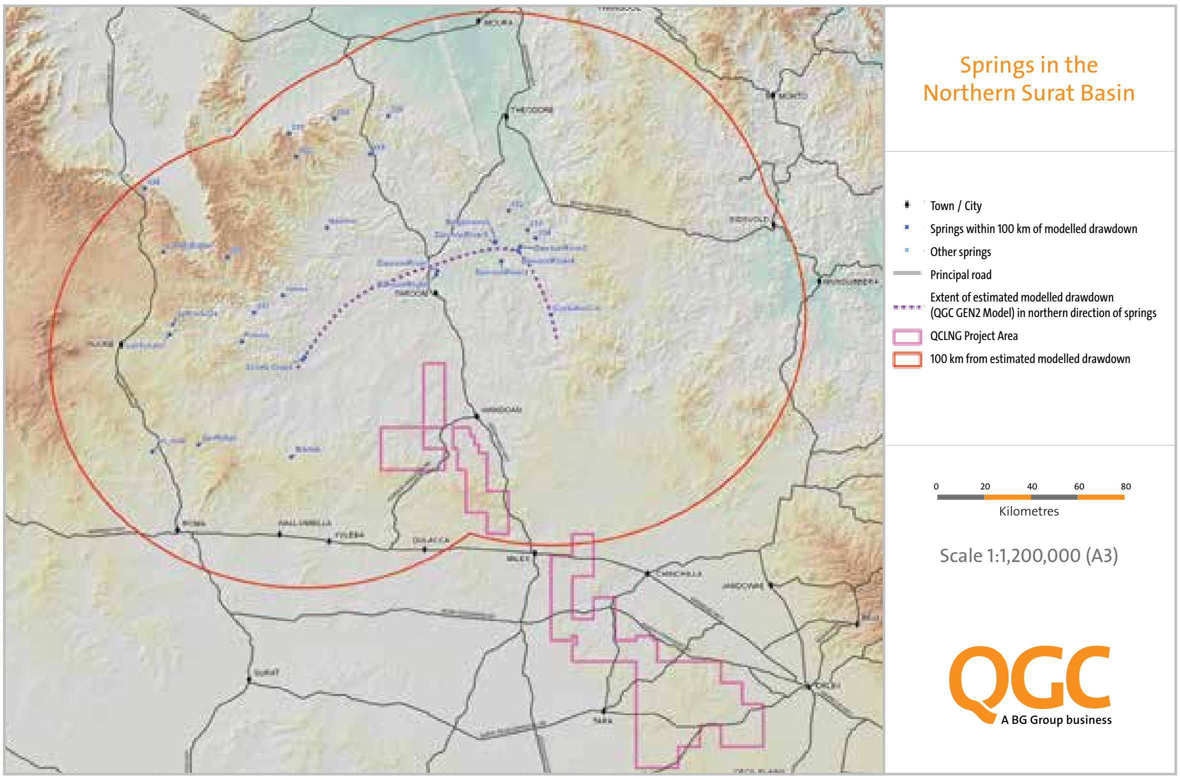
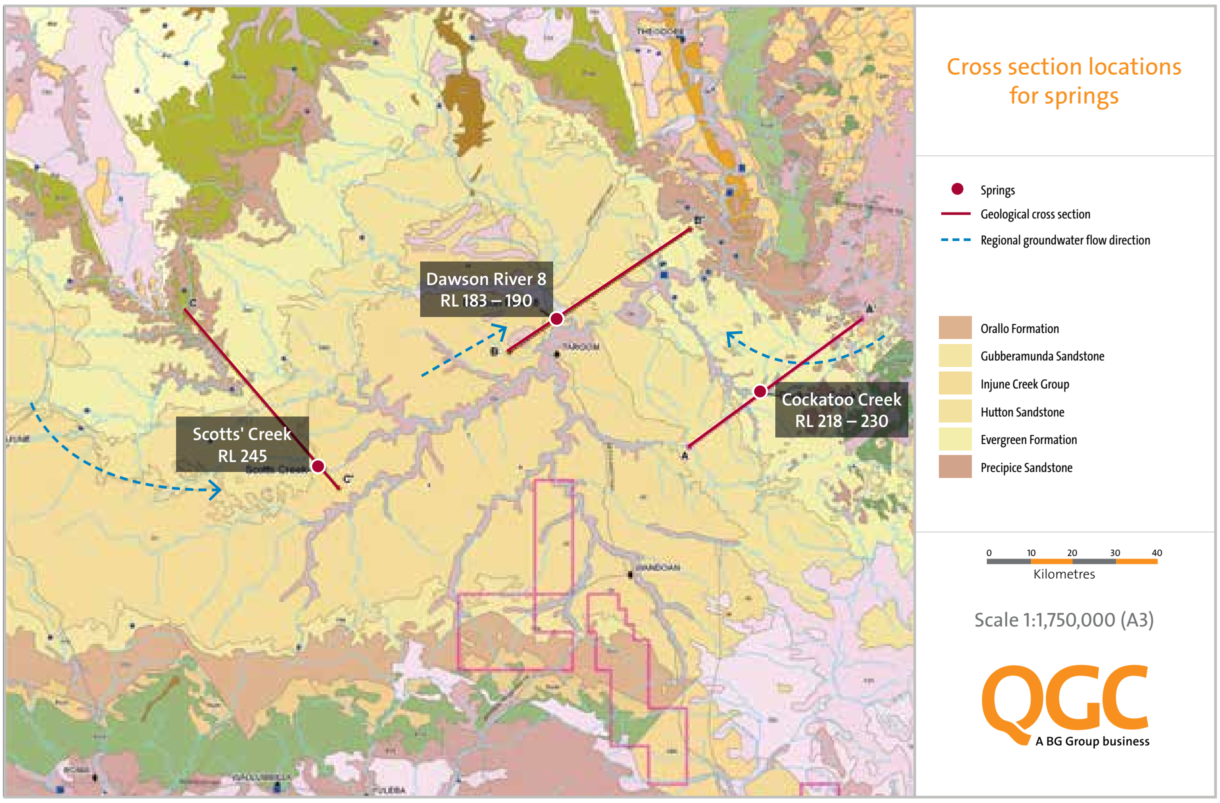


Figure 30 – Springs in the Northern Surat Basin

9.2 PRELIMINARY HYDROGEOLOGICAL CONCEPTUAL MODELS OF SPRINGS

Regional groundwater flow analysis for the GEN2 groundwater model produced for QGC (Golder Associates, 2011) indicates that Cockatoo Creek, Dawson River 8 and Scott's Creek Springs are located within the Dawson River catchment. Regional groundwater flow in this area flows from the north-west corner of the Surat Basin east (to the vicinity of Scott's Creek spring) then north-east toward the Dawson River (in the vicinity of Dawson River 8 and Cockatoo Creek Springs (Figure 31). Localised flowpaths of recharge and discharge occur in the northern Surat Basin.

Preliminary hydrogeological conceptual models of springs identified in SEWPAC's Condition 68 (Cockatoo Creek, Dawson River 8 and Scott's Creek) are presented below. These are based on QGC's recently updated geological model (Appendix D) and hydrogeological assessment of the region. These conceptual models will be updated following completion of the baseline monitoring (refer to Section 9.5). While there is no known structural influence on spring occurrence, fracturing and faulting are considered to be potential conduits for groundwater migration to spring vents at each location. This will be further investigated as additional seismic interpretations for these areas are completed by QGC and structural influences, groundwater quality and isotope data are analysed.



Injune Creek Group includes the Westbourne Formation, Springbok Sandstone, WMC and the Eurombah Formations where they occur.

Figure 31 – Inferred regional groundwater flow directions and spring elevations

QWC Number	Name	LatGDA94	LongGDA94	Radius*	Supergroup	EPBC listed**	Springs			Wetland area(ha)	Excavation damage	Fenced	Invasive plant species	Conservation Rank	Current flow (L/day)
							Active Number of Springs	Inactive	Active %						
283	Barton	-26.281333	149.234110	1	Springsure		1		100	0.0000		Not		3	0.00
507	VI_mile	-26.260010	148.689662	6	Springsure		4		100	0.1644	Total	Not		4	11149.51
506	SprRidge	-26.233891	148.869450	2	Springsure		3		100	0.1420	Partial	Not		2	11232.46
260	Scotts Creek	-25.890834	149.285606	2	Springsure	EPBC	4		100	2.1150	Negligible	Not		1b	489641.04
229	Ponies	-25.829336	149.040110	1	Springsure		1		100	0.0600	Moderate	Not		2	4404.95
230	Lucky Last	-25.801339	148.757316	3	Springsure	EPBC	5		100	0.6660	Negligible	Not		1b	96717.34
561	SpRockCrk	-25.762338	148.770114	1	Springsure		1		100	0.0200	Negligible	Fenced		3	931.30
9	Cockatoo Creek	-25.723472	150.251255	3	Springsure	EPBC	7		100	0.4045	Negligible	Not		1b	43609.13
311	311	-25.716099	149.087526	6	Springsure		12		100	1.1167	Negligible	Not		2	133987.52
74	Yebna	-25.648336	149.201105	1	Springsure		1		100	0.0000		Not		3	0.00
8	Dawson River 8	-25.567332	149.802093	1	Springsure	EPBC	1		100	0.2400	Negligible	Not		3	31297.62
7	Dawson River 7	-25.552332	149.807093	1	Springsure		2		100	0.0225	Negligible	Not		3	980.47
2	Dawson River 2	-25.514331	150.058114	1	Springsure	EPBC	1		100	0.2400	Negligible	Not		3	31297.62
327	327	-25.499338	148.983108	1	Springsure		1		100	0.0000		Fenced		3	0.00
339	Lonely Eddie	-25.478340	148.733113	1	Springsure		1		100	0.0000		Fenced		3	0.00
4	Dawson River 4	-25.472997	150.122946	2	Springsure		12		100	0.4673	Negligible	Not		3	45272.71
3	Dawson River 3	-25.458031	150.131513	4	Springsure		10		100	4.7500	Negligible	Not		3	883335.56
6	Dawson River 5	-25.441458	150.030487	11	Springsure	EPBC	16		100	10.4786	Negligible	Partial		1b	2905925.82
5	Boggomoss	-25.439732	150.034473	6	Springsure	EPBC	25		100	10.8904	Partial	Partial	*	1b	3040249.89
334	334	-25.423396	150.192562	1	Springsure		1		100	0.0000		Not		3	0.00
331	331	-25.392992	150.159988	3	Springsure		2		100	0.0000		Partial		3	0.00
85	Newton	-25.383337	149.372848	5	Springsure		2	2	50	0.2449	Negligible	Not		2	24837.74
332	332	-25.317550	150.085806	1	Springsure		1		100	0.0000		Fenced		3	0.00
326	326	-25.229184	148.660112	1	Springsure		1		100	0.0000		Not		3	0.00
302	302	-25.106339	149.253101	4	Springsure		2		100	1.0080	Negligible	Not		2	235845.07
335	335	-25.094343	149.542421	1	Springsure		1		100	0.0000		Not		3	0.00
310	310	-25.013339	149.224100	1	Springsure		1		100	0.0000		Fenced		3	0.00
328	328	-24.956338	149.403096	1	Springsure		1		100	0.0000		Fenced		3	0.00
336	336	-24.945336	149.614092	1	Springsure		1		100	0.0000		Not		3	0.00

**Radius (km) from centroid within which all known springs in the complex occur.*
***Identifies springs included within the definition of 'The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin' as listed under the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999.*

Conservation Rank
Category 1a: Contains at least one endemic species not known from any other location.
Category 1b: Contains endemic species known from more than one spring complex; or have populations of threatened species listed under State or Federal legislation that do not conform to Category 1a.
Category 2: Provides habitat for isolated populations of plant and/or animal species.
Category 3: Contains intact springs without identified biological values. However, it includes springs that are not highly degraded and may have important biological values with further study.
Category 4: All springs are highly degraded, i.e. completely excavated.
Category 5: All springs inactive

Table 17 – EPBC listed springs characterisation

9.3.1 COCKATOO CREEK SPRINGS COMPLEX

The Cockatoo Creek Spring complex lies in the northern Surat Basin in the Cockatoo Creek valley that feeds into the Dawson River about 35 km to the north/north-west (about 50 km north-east of QGC's QCLNG northern-most tenements). Regional groundwater flow is thought to be in a northerly direction based on potentiometric surface mapping interpretation for the GEN2 modelling. The springs lie near the Surat sedimentary basin's north-eastern margin. Abrupt thinning and cessation of the Precipice Sandstone occurs along a north-south alignment in this area which is likely to be the result of steepening along the regional Burunga Fault west of the springs (QGC 2012). The Evergreen Formation also thins out in this area exposing the Carboniferous basement outcrop rock to the east. The Walloons and the Eurombah Formation, thin out 20 km west of Cockatoo Creek.

Cockatoo Creek Springs are inferred to be fed from the Precipice Sandstone and or Evergreen Formation.

The spring vents are located in a topographical depression near Cockatoo Creek at between 218 m AHD and 230 m AHD. Their groundwater is likely to be sourced from the Precipice Sandstone and/or the Evergreen Formation and is thought to have an intermediate (sub-regional) flow path on the order of tens of kilometres, pending confirmation by isotopic age dating. Local linear features indicate that fracturing or faulting may influence the groundwater flowpath. A hydrogeological conceptual model for this spring complex is presented in Figure 32. This indicates the absence of Gubberamunda, Springbok and Walloon Formation sediments at these locations.

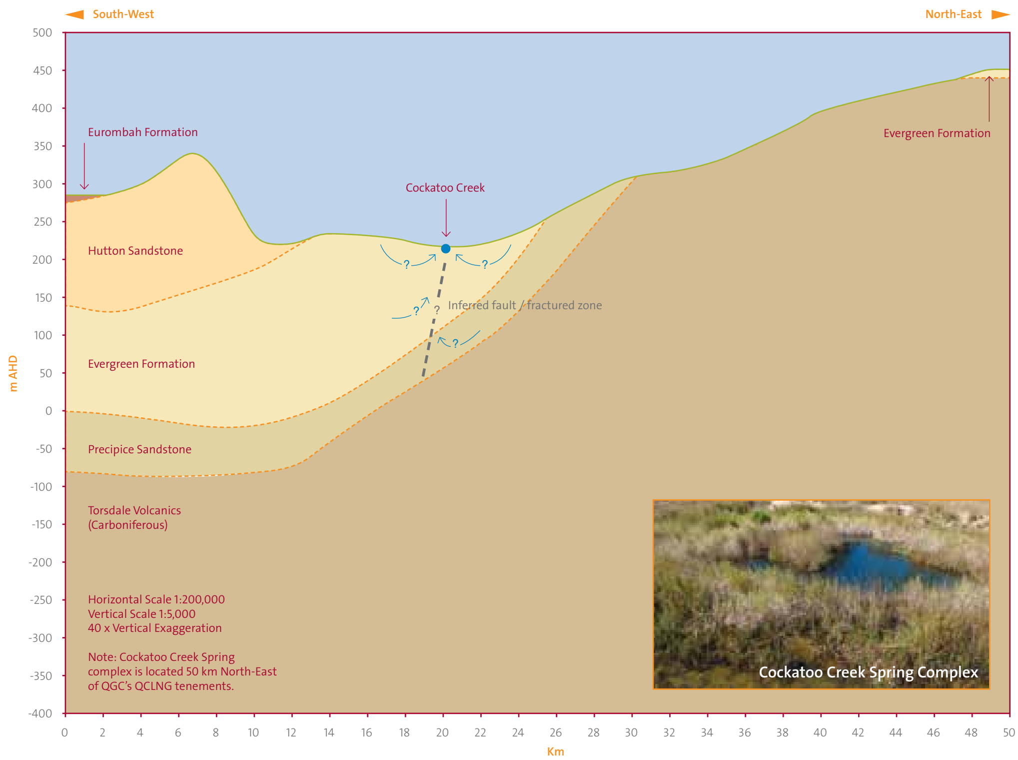


Figure 32 – Cockatoo Creek Springs conceptual model

9.3.2 DAWSON RIVER 8 SPRINGS COMPLEX

Dawson River 8 Springs complex is inferred to be fed from the Hutton and/or WCM Formations.

The Dawson River 8 springs complex lies in the northern Surat Basin in the Dawson River valley near the confluence of Palm Tree Creek and Dawson River (approximately 40 km north of QGC's QCLNG northern-most tenements). Regional groundwater flow here is thought to be in the north-east direction, following the topography of the Dawson River Valley. The Dawson River 8 springs occur east of the northern tip of the Mimosa Syncline near where the Precipice Formation is at its thickest (approximately 100 m beneath the area of Dawson River 8 springs). The overlying Evergreen Formation is 300 m thick below the springs, reaching their thickest of up to 500 m some 20 km north-west of the springs. The Hutton Sandstone outcrops near the Dawson River 8 springs where the outcrop edge of the Walloons (referred to as the Birkhead Formation in that area) and Eurombah Formations end and the formations thin out (QGC, 2012). The Gubberamunda and Springbok Formations are absent.

The Dawson River 8 Springs are located in a depression between 183 m AHD and 190 m AHD with elevated land rising to over 300 m AHD some 10 km to the west and to over 250 m AHD some 10 km to their east. The springs groundwater is likely to be sourced from the Hutton and/or WCM Formations. It is considered likely that the springs may also be sourced from a localised flow path originating 'up slope' from one or both of these elevated nearby landscapes with a short residence time prior to discharge at the break of slope. Nearby faulting and fracturing may also influence the groundwater flow path. A hydrogeological conceptual model for this spring complex is presented in Figure 33.

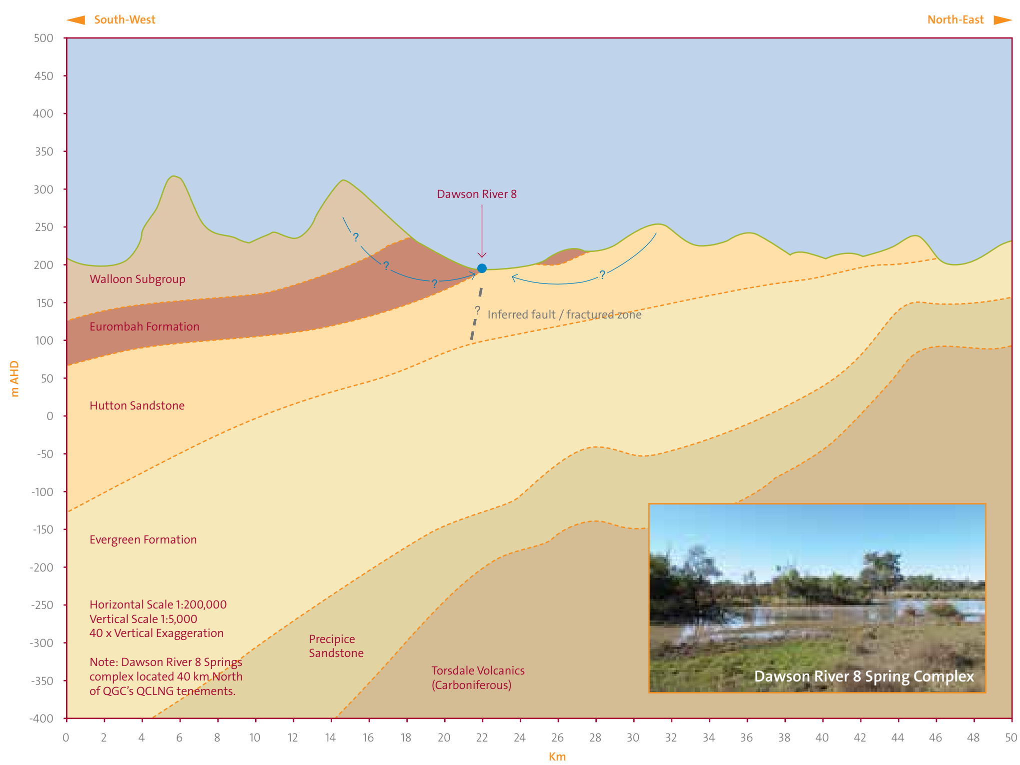


Figure 33 – Dawson River conceptual model

9.3.3 SCOTT'S CREEK SPRINGS COMPLEX

Scott's Creek Springs complex lies in the north-central Surat Basin within the Dawson River catchment (about 45 km west/north-west of the northern-most QCLNG tenements). Regionally, groundwater flow here is expected to come from the west/north-western Surat toward the east, then in the vicinity of Scott's Creek, flow changes to north-east following the Dawson River catchment topography. The Precipice Sandstone outcrops about 55 km north-west of the springs and the Evergreen Formation about 30 km north-west. Both beds thicken toward the north and then downdip toward the south. Scott's Creek lies on the northern outcrop edge of the Eurombah Formation over the thickest regional section of Hutton Sandstone (about 450 m thick), which outcrops a few kilometres to the north-west. No Gubberamunda or Springbok Formations are present.

The Scott's Creek Springs complex is in a local depression at 245 m AHD between Hutton Sandstone highlands of over 400 m to the west/north-west and Walloons highlands of up to 300 m to the north and south of Scott's Creek. The groundwater flow path is considered to be locally sourced from either or both the Hutton and Walloon Formations with possible faulting and fracture conduits. A hydrogeological conceptual model for this springs complex is presented in Figure 34.

Scott's Creek Springs complex is inferred to be fed from the Hutton and/or WCM Formations.

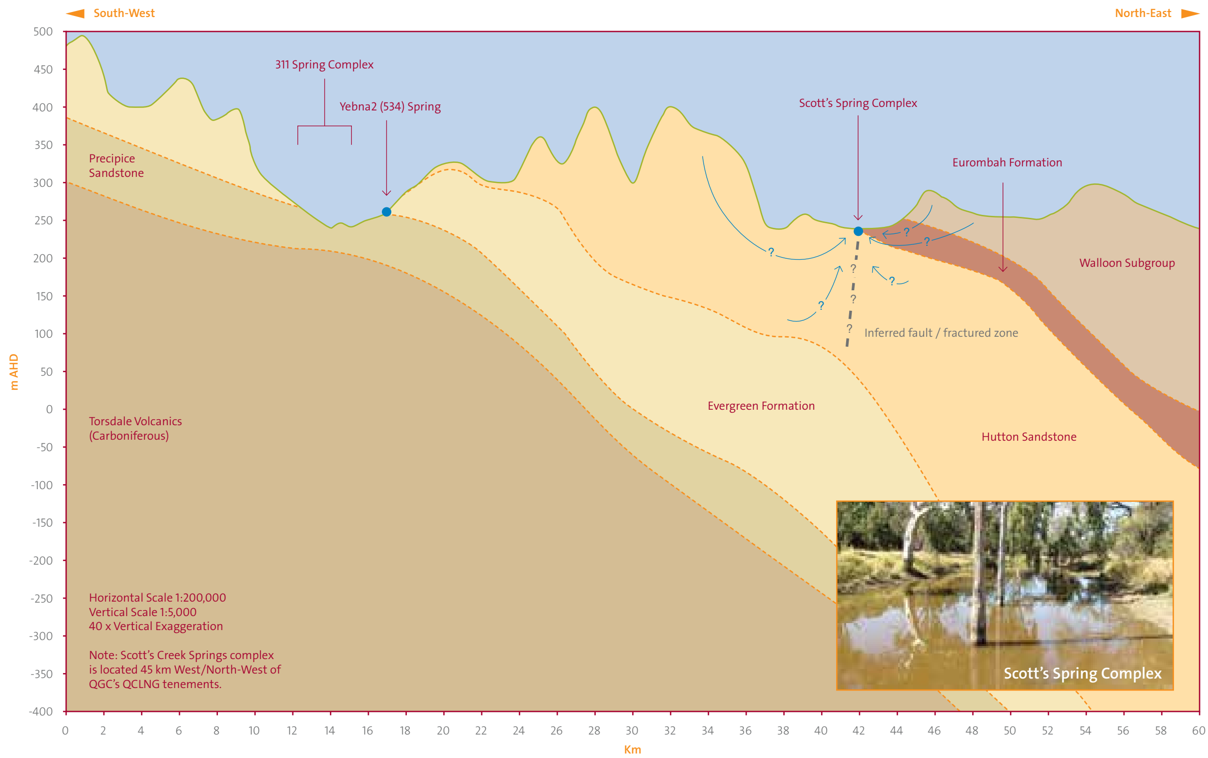


Figure 34 – Scott's Creek Springs conceptual model

9.4 SURAT CMA SPRINGS MANAGEMENT STRATEGY – BACKGROUND

In April 2010, DEHP (now DEHP) released new policy arrangements to protect groundwater resources in CSG extraction areas. These arrangements declared QWC responsible for Underground Water Impact Reports (UWIR) for Cumulative Management Areas (CMA) (Section 376 of the Queensland Water Act 2000). UWIRs must include a Spring Impact Management Strategy (SIMS). The QCLNG Project area lies within the Surat CMA. As such, QWC has developed a UWIR and SIMS for the Surat CMA. Public release of this report has been delayed, a matter beyond QGC's control. QGC understands that QWC has developed the SIMS for the Surat CMA according to the flow diagram in Figure 35.

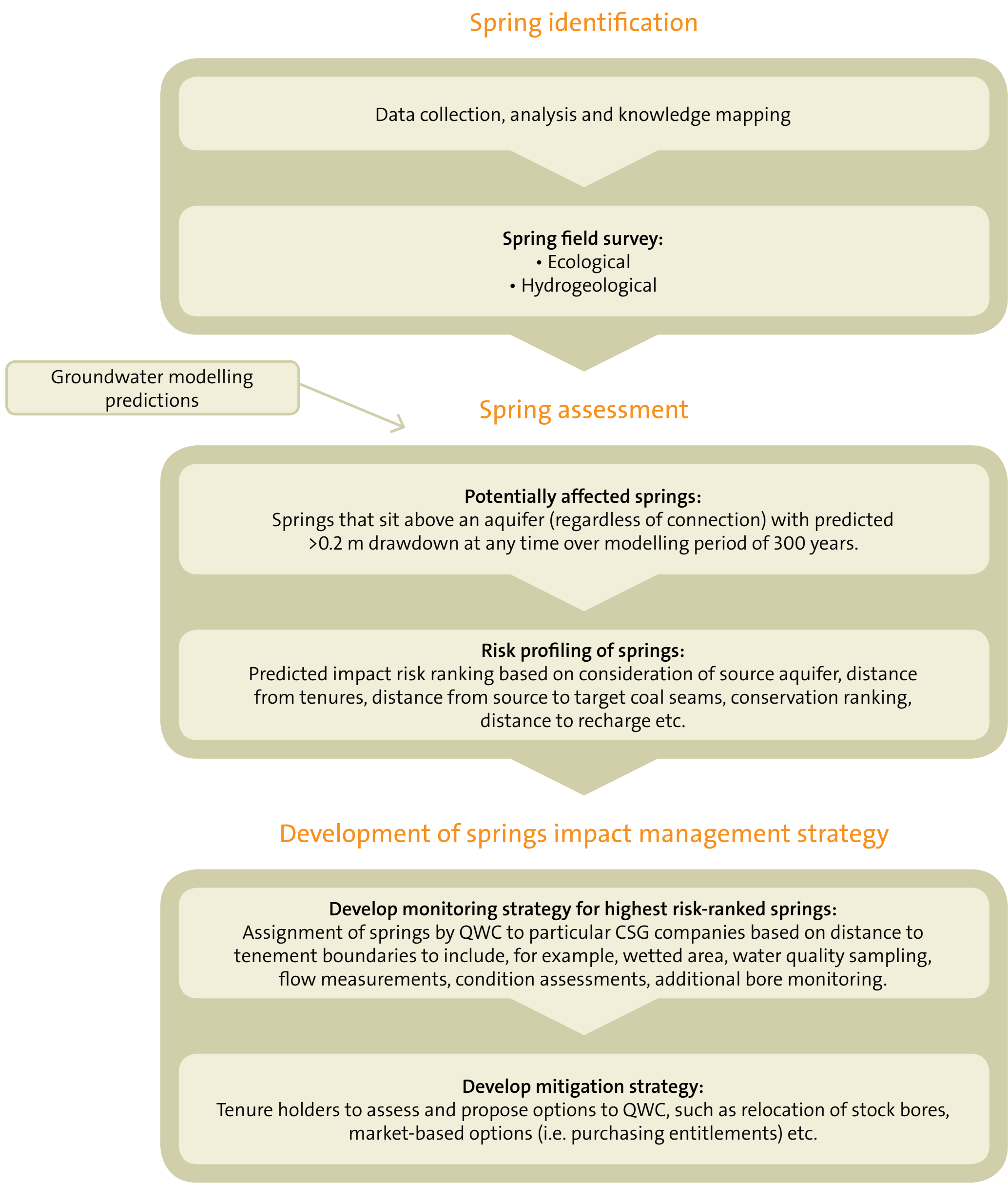


Figure 35 – Outline of QWC's methodology for development of the Surat CMA Springs Impact Management Strategy (SIMS)

In general terms, QGC agrees with the methodology QWC used for development of the SIMS and will participate in the endorsed final SIMS which incorporates a monitoring and mitigation strategy. However the strategy must recognise that spring water level changes may be due to factors other than CSG extraction influences. SEWPAC will be requested to endorse the SIMS as addressing QGC's requirements under Condition 69.

9.4.1 QWC DRAFT SPRING MANAGEMENT STRATEGY

The QWC as part of the development of the draft Underground Water Impact Report has prepared a Spring Impact Management Strategy for MNES and water course springs. Details of the Spring Impact Management Strategy are outlined in Appendix H of the UWIR.

The QWC's Cumulative Impact Model also assessed the potential extent of source aquifer drawdown in the vicinity of EPBC listed springs. The modelled drawdowns were used to identify potentially affected springs (Appendix H-2) and inform a risk assessment of each spring vent (Appendix H-3).

The QWC has described (Appendix H-2) the identification of potentially affected springs as follows:
"Under the Queensland regulatory framework, a spring is a potentially affected spring if it overlies an aquifer where the long term predicted impact on water levels at the location of the spring resulting from the extraction of water by petroleum tenure holders, exceeds 0.2 m. The QWC also included high value springs that are located up to 10 km beyond that limit to allow for the uncertainties associated with modelling very small changes in water level at the boundaries of impact areas."

The risk assessment considered the likelihood of a reduction in flow of water at the spring and the consequences on known spring values if a reduction in flow was to occur.

Key findings and actions arising from the Spring Impact Management Strategy in relation to QGC's requirements under Condition 52, 68 and 69 are:

- Based on the QWC modelling Scott's Creek (QWC site number 189, 190, 191, 192, 192.1) and Dawson River 8 (QWC site number 38) are considered to be potentially affected spring vents (UWIR Table H-2)
- The Cockatoo Creek, Boggomoss and Dawson River 2 vents are not considered to be potentially affected spring vents since they lie outside the area of potentially affected springs and consequently were not included in Table H-2 of the UWIR
- The connected source aquifer for the Dawson River 8 spring and the Scott's Creek spring complex is considered to be the Hutton Sandstone (refer Figure ES2)
- QWC has designated that a spring monitoring program be established for the Dawson River 8 spring by QGC
- QWC has designated that a spring impact mitigation program be established for the Scott's Creek spring complex by APLNG.

9.5 QGC'S SPRINGS BASELINE MONITORING STRATEGY

CSG proponents (Arrow Energy, Origin Energy, QGC and Santos) are in the process of developing a joint industry approach to springs monitoring and management which will include baseline monitoring. There are multiple company management requirements at particular springs but this approach is aimed at developing monitoring and data collection programs that:

- Provide a single approach to monitoring and management
- Meet all proponents sampling and testing requirements
- Ensure a consistent quality of data collection
- Avoid duplication
- Allow for a single contractor to undertake baseline monitoring.

This approach will be finalised when the QWC SIMS has been released.

Notwithstanding this overall approach, QGC has outlined below an indicative proposed monitoring strategy to meet both QWC's and SEWPAC's requirements for those springs required to be investigated by QGC for SEWPAC and QWC. Note: This approach was prepared prior to the release of the QWC Springs Management Strategy. QGC commits to revising and upgrading it monitoring strategy once the QWC UWIR has been publicly released.

An initial baseline analysis of four three-monthly ecological and hydrogeological samplings will be completed on QGC's responsible springs, having been endorsed by QWC and SEWPAC following the release of the UWIR and SIMS. This baseline analysis will provide a clear understanding of the hydrogeologic conceptual model for the spring(s), including source aquifer(s), groundwater-surface flow paths and potential impact risks to each spring's short and long-term health.

The baseline monitoring program will provide essential data for input into the further development of QGC's Springs Monitoring Plan which will provide the mechanism for review and reassessment of QGC's response plans for aquifer drawdown in the vicinity of springs (refer Section 12.6.5).

The Springs Monitoring Plan will be submitted to SEWPAC and QWC following completion of the baseline analysis.

The importance of protecting Great Artesian Basin Springs is well-recognised.

9.5.1 HYDROGEOLOGICAL BASELINE SPRINGS INVESTIGATION

Baseline hydrogeological investigations will include:

- Hydrogeochemical sampling (physio-chemical parameters of temperature, electrical conductivity and pH, major ions and isotopes) of spring waters collected as near as practicable to the surface outlet point and nearby single-source bores from appropriate aquifers and appropriate surface waters. The purpose of hydrogeochemical sampling is to gain confidence in the geochemical signatures of various potential sources and assess any mixing occurring prior to reaching the spring outlet. This chemical baseline is critical for assessing the causes of any future recorded changes.
- Wetted area measurements and/or visual flow observations to estimate spring discharge and inundation frequency (to determine the permanency of springs some visits will follow significant dry periods)
- Potentiometric surface level measurements from nearby single-source bores for comparison with spring discharge elevations
- Assess potential anthropogenic processes (e.g. artesian bores, pumping frequency and rates of nearby bores, flooding conditions through anecdotal evidence and observations). Temporal changes in groundwater levels and pumping in underlying aquifers will be compared against temporal patterns of groundwater discharge from springs.
- Evapotranspiration (ET) measurement or judgement: Using various methods ranging from desktop approaches through to field-based measurement for baseline and long-term monitoring through evaluating cost, accuracy and applicability.

Four three-monthly hydrogeological investigation will include:

- Measurement of spring physical parameters including seasonal variation, depth, flow rate
- Hydrochemical and isotopic analysis to assess aquifer source
- Comparison of water levels with respect to source aquifer potentiometric surface.

Data assessment and interpretation will include the following:

- Develop hydrogeological conceptual model, considering key water balance component variability as determined during baseline analysis and ratios of spring discharge to incident rainfall.
- Complete a water balance for the spring catchment at appropriate temporal and spatial scales. Temporal scale will consider long-term average, end of dry season conditions. The spatial scale will consider groundwater flow paths and determine if small scale (e.g. 100 m by 100 m) or recharge to discharge scale (e.g. several kilometres) or regional scale (e.g. hundreds of kilometres) or combination as appropriate.
- Evaluate the sensitivity of changes in the water balance due to all possible processes. Identify key drivers of spring discharge.
- Consider ecological impacts
- Develop a long-term groundwater level monitoring program that addresses potential groundwater level changes, both close to the spring(s) (i.e. depth and location of monitoring bores and surface water monitoring points, if applicable), and regionally between QGC tenements and springs.

9.5.2 ECOLOGICAL BASELINE SPRINGS INVESTIGATION

Baseline ecological investigations will include:

- Location and elevation of the highest saturated point of mounded spring wetlands or most prominent vent location or central point
- Surveyed spring area measurements including wetland area, mound length, width and height, soak length and width
- Spring status as active or inactive (inactive based on lack of wetland vegetation present, free water or soil moisture as well as historical anecdotal information (i.e. from landowners)
- Inundation frequency (including anecdotal, known or inferred inundation history and floristic composition indicative of permanency)
- Estimated spring flow based on wetted area measurements and/or visual flow observations
- Landscape description, including situation, element, erosional pattern, landform pattern and surface geology
- Surface damage from excavation and stock
- Flora and fauna (micro-invertebrate, mollusc, fish) survey to include endemic species, EPBC community, EPBC and NCA species, disjunct/isolated species
- Conservation ranking at complex level and spring wetland/vent level based on categories defined in Queensland Herbarium 2012 Surat CMA final report.

Four three-monthly ecological investigations will include:

- Existence, distribution and extent of listed threatened species
- Aquatic macro-invertebrate surveys
- Aquatic plant surveys

9.6 SUMMARY

- QGC does not expect any impact on springs from its QCLNG operations
- A collaborative industry approach to springs monitoring and management is being developed. A common industry approach to early warning and threshold groundwater level change monitoring in key aquifer units, is outlined in Section 12.6.3 and Appendix Q.
- The baseline monitoring program will provide essential data for input to QGC's Springs Monitoring Plan which will provide the mechanism for review and reassessment of QGC's response plans for aquifer drawdown
- Since the Gubberamunda and Springbok Formations are not present at any of the spring complexes attributed to QGC for management purposes, the early warning default drawdown limits of 0.2 m should not apply to these formations.
- Based on QWC's UWIR and the collaborative industry approach, it is proposed to:
    - Ensure single proponent accountability for the springs
    - Identify a single CSG operator for each suite of early warning and trigger monitoring bores
    - Align spring management

  As a consequence, QGC will be accountable for monitoring the Dawson River 8 Spring complex with APLNG taking accountability for Scott's Creek. Under the UWIR there is no requirement for QGC to monitor the Cockatoo Creek Springs. QGC will formally request endorsement of this approach from SEWPAC. However early warning and Trigger Monitoring Bores provided by Santos and the QGC trigger monitoring bore (CHAR1584) will be used to monitor regional groundwater conditions for the protection of Cockatoo Creek Springs.

Commitments	Target completion date
Completion of preliminary Springs Monitoring Plan incorporating findings of UWIR, Santos Regional Springs Survey and the collaborative industry proposed EPBC Spring Monitoring Scheme	April 2013
Submission of report on Baseline Spring Program	April 2014
Completion of Springs Monitoring Plan incorporating input from connectivity studies	October 2014