Our ref: DOC22/351933 Your ref: SSI 8609189

Nathan Heath
Planning Group
Department of Planning and Environment
4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150

24 May 2022

Subject: Upper South Creek Advanced Water Recycling Centre (SSI-8609189) Response to Submissions Report and Upper South Creek Advanced Water Recycling Centre Submissions Report – project amendments

Dear Mr Heath

I refer to your email received on 8 April 2022 via the planning portal requesting comments from the Environment and Heritage Group (EHG) regarding the *Upper South Creek Advanced Water Recycling Centre Submissions Report* (RtS report).

On 6 May 2021, EHG provided comments on the RtS report in relation to biodiversity, *Environment Protection and Biodiversity Conservation Act, 1999,* Matters of National Environmental Significance and flood risk management. In its response, EHG advised that comments regarding waterway health and the Growth Centres biodiversity certification would be provided separately, including comments on the *Upper South Creek Advanced Water Recycling Centre Submissions Report – project amendments* (Submissions Report- project amendments) provided on 5 May 2022.

EHG has now reviewed the relevant sections of the RtS report and Submissions Report – project amendments and provides comments on the Growth Centres biodiversity certification and waterway health in Attachment A. Additional information is requested regarding the issues that have not been adequately addressed.

The Department is advised that a separate submission may be made by the Heritage Division.

If you have any queries, please contact Marnie Stewart via marnie.stewart@environment.nsw.gov.au or 02 9995 6868.

Yours sincerely,

S. Harrison

Susan Harrison

Senior Team Leader Planning
Greater Sydney, Biodiversity and Conservation

Attachment A – EHG comments on the Upper South Creek Advanced Water Recycling Centre (SSI 8609189) Response to Submissions Report and Upper South Creek Advanced Water Recycling Centre Submissions Report – project amendments

Sydney Region Growth Centres Biodiversity Certification

As previously advised, the subject proposal area around Kemps Creek, including Lot 11 DP 1146142, contains relevant biodiversity measure (RBM) 12 red hatched land, RBM 17 black hatched land existing native vegetation (ENV) and non-certified land under the *Order to confer biodiversity certification on the State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (Biodiversity Certification Order). Most of the red-hatched land is zoned Public Recreation – Regional under the SEPP (Precincts - Western Parkland City) 2021 and its acquisition by the NSW government is a commitment under the Biodiversity Certification Order and the Commonwealth Growth Centres Strategic Assessment Approval.

Since EHG made its submission on the EIS, Sydney Water has advised that it approved a Review of Environmental Factors (REF) for the Prospect South to Macarthur Distribution System Link (ProMac) pipeline in February 2021 and subsequently constructed the pipeline in June 2021 which impacted non-certified ENV in the red-hatched land. EHG did not agree to the clearance of ENV in the red-hatched area as is required by RBM 12.

Response to Submissions report

RMB 12 red-hatched land

EHG notes that the RtS report refers to the proposed amendments to the route alignment at Kemps Creek outlined in the *Upper South Creek Advanced Water Recycling Centre Amendment Report* (Amendment Report). This includes the realignment of the subject pipeline in the red-hatched land along Kemps Creek to within the ProMac corridor.

Regarding the Kemps Creek area and creek crossing, the RtS states that the amendments have "resulted in a re-alignment to the impact area through the red hatched area crossing Kemps Creek, to avoid impact on existing native vegetation". Furthermore, the RtS also states that the "brine pipeline alignment and impact area were designed to ensure no impact to the red hatched area along Cross Street and this has not changed from the assessment in the EIS. The project will not remove existing native vegetation in the red hatched area in that location".

To ensure that the project avoids impacts to non-certified ENV within RBM 12 red-hatched lands at Kemps Creek and Cross Street, it is recommended that the following condition be imposed.

Recommended condition:

Under no circumstances shall the project directly or indirectly impact Existing Native Vegetation in the lands marked by a red hatching in the *Order to confer biodiversity certification on the State Environmental Planning Policy (Sydney Region Growth Centres) 2006* biodiversity certification maps during construction or operation.

Impacts to non-certified ENV

Regarding ENV, the RtS states that "impacts to ENV as a result of the project are negligible and comprise a total of about 6m^2 of impact to PCT 849, on Existing Non-Certified land, at the southern access route into Western Sydney Parklands, and about 1.3m^2 of impact to PCT 849, on Existing Certified land, at Badgerys Creek". EHG notes that the RtS does not include a map depicting the location of the impacted non-certified ENV and while it is acknowledged that this is small amount, RBM 11 states:

"Where there are essential infrastructure proposals, including but not limited to proposals under Part 3A of the Environmental Planning and Assessment Act 1979, that involve clearing of existing

native vegetation in the non-certified areas and that do not require development consent under the SEPP, such clearing must be offset by applying the same requirements specified in condition 8 above".

As previously requested, EHG seeks additional information in the form of maps that depict the location of impacts to ENV (certified and non-certified) from the development in the Growth Centres covered by the Biodiversity Certification Order. The maps should also include the red and black hatched areas. This mapping is required to ensure that impacts within the Growth Centres can be adequately assessed as well as reconciled as part of the annual reporting required under the Order.

EHG also seeks a Growth Centres Offset Strategy detailing how it is proposed to meet requirements specified in RBM 8.

Submissions Report - project amendments

Impacts to non-certified ENV

In its submission on the Amendment Report dated 6 April 2022, EHG noted that Sydney Water proposes to realign and construct the pipeline to within the currently cleared ProMac corridor and sought confirmation that no further impacts to non-certified ENV would occur from the proposed amended realignment and the pipeline construction and operation. In response, the Submission Report – project amendments states that "Sydney Water confirms that the Kemps Creek realignment of the brine pipeline is located in areas previously cleared of ENV and would therefore not result in further direct impacts to existing areas of ENV during construction". As indicated above, EHG recommends that a condition of consent be imposed to ensure that the project avoids impacts to ENV within RBM 12 red-hatched lands at Kemps Creek and Cross Street.

EHG previously also requested revised maps that depict ENV in addition to the RMB 12 red hatched area. In response, the Submission Report – project amendments includes a revised map that depicts ENV and red-hatched land for the amended alignment at Kemps Creek only. As outlined above, and as requested in its submission on the EIS, EHG seeks revised maps depicting the location of ENV (certified and non-certified), red and black hatched land and the proposed impacts from the entire development in the Growth Centres area.

Rehabilitation of the RMB 12 red-hatched lands

Regarding the rehabilitation of the existing cleared corridor, EHG previously raised concern with the wording of GO5 as the proposed Rehabilitation Management Plan will restore the pipeline work site to 'pre-existing condition'. The current pre-existing condition of the corridor is a fully cleared site as a result of the ProMac REF works. EHG notes that the Submission Report – project amendments clarifies that rehabilitation of the cleared area will be on the basis that the pre-existing condition is native vegetation.

In its previous submission, EHG also advised that it requires a separate Rehabilitation Management Plan be prepared specifically for the red-hatched lands to revegetate and restore the corridor to its condition prior to the clearing undertaken for the ProMac pipeline. The plan should include the requirements detailed in Go5 and will need to be approved by EHG.

In response, Sydney Water states "Sydney Water will include a specific section for rehabilitating the red-hatched lands as part of the Rehabilitation Management Plan in management measure G05". EHG does not support this approach and continues to seek a separate Rehabilitation Management Plan be prepared specifically for the red-hatched lands to be approved by EHG. EHG considers that this requirement could be captured via a condition of consent.

Waterway health

Adequacy of RtS report in addressing previous comments on EIS

EHG previously commented that it was difficult to assess the adequacy of the EIS in quantifying the extent of impact of the AWRC operations on the receiving waterways and associated riparian corridors, due to the qualitative nature of the assessment and the lack of information on model development and calibration.

In response, Sydney Water provided extensive documentation on the development and calibration of the Hawkesbury-Nepean and South Creek Water Quality Response Models, independent expert reviewer assessment of the models (Appendix I) and a series of statistical plots to summarise the results of the scenario analyses.

This additional documentation has provided very good background on the model set-up/conceptualisation, parameters and inputs. It is very clear that considerable resourcing has gone into the development of the models, including extensive collection of field data. This has resulted in very detailed models, and Sydney Water should be commended for such a large modelling and monitoring program. One key point for consideration, however, is to assess whether there is a need for large complex water quality response models and whether there are opportunities to use the insights from the current modelling to produce simpler models that are still fit for purpose can be used for longer time series analysis.

Large complex models are very difficult to calibrate and validate, have long run times, and require lots of field data that are unlikely collected at the extent required to assess whether the models are performing well and/or at the resolution of the model parameters (due to detection limit issues). These difficulties are reflected in the EIS, where the validation period is limited to 1-2 years, longer model runs to assess cumulative impacts were not completed, and post-processing via a 'zone analysis' was required to permit simpler comparison with field data. The latter zone analysis points to the feasibility of using a 'daisy chain' of relatively simper box models that can be run over longer time series.

Noting that NSW EPA has identified deficiencies in the model calibration and validation, the following comments are provided for consideration of the TUFLOW and AED2 models:

- Limited calibration and validation period reflects the complexity of the models, the limited data and long model run time, as highlighted above.
- Analysis of model errors requires further explanation, especially regarding the categorisation of poor, acceptable and accurate model performance. For example, Table 4-4 of the TUFLOW FV and AED2 calibration report, indicates that for Zone_4_Box_2 the model is acceptable despite an R = 0.21 and model bias of 156.77%. It is suspected that the categorisation may have been based on the RMS and NRMS results, but these are hard to interpret as the equations for their calculation are not provided (which was a recommendation of Sydney Water's independent reviewer).
- As highlighted in previous comments, a good understanding of the magnitude of model error is needed to assess the impact of the AWRC operations on the receiving waterways and riparian corridors. Indeed, the numerous longitudinal plots which were provided in the additional documentation are exclusive of the errors. Given the range in errors shown in Tables 4-2 to 4-5, it is very highly likely that the magnitudes of the errors are too high to permit a comparison of the scenarios.
- To add to the above dot point, the results of some of the sensitivity analysis show that model bias is much greater than the scenarios investigated. For example, Table 4-5 indicates that

the model bias in Zone_4_Box_2 and Zone_3_Box_3 is -44.25 and -56.7%, respectively. The sensitivity results on page 91 concluded that the model has a:

> 'higher sensitivity for the scenarios with higher nutrient inputs (scenarios of High, Mod High and Mod High + sed) compared to that with lower nutrient inputs (scenarios of Low, Mod Low and Mod Low + sed), possibly due to the background nutrient concentration in the water and the sediment loads.'

Rather than background concentrations, this result is likely due to the high model bias and means that even for assessments of relative trend change (%), it is very difficult to assess whether the models are reliable. On page 91, Sydney Water indicates that a 28% increase in nitrogen loading (High scenario) was predicted to lead to a 20-38% increase in water column TN concentrations in the wet year but based on the model bias, the change is TN concentration is likely to be underestimated. These issues can be inferred/observed from other examples described by Sydney Water for the sensitivity analysis.

- A general issue that needs to be highlighted (again) relates to the coupled nature of the models. If one model is deficient, then this 'deficiency' is propagated to other models. Sydney Water's own contractors have conditioned the quality and reliability of their specific impact assessments according to the adequacy of the modelled outputs used.
- It is noted that at this stage, the AED2 model cannot be run for long term series and hence cumulative impacts over time cannot be assessed/determined through this EIS. Further comment on this issue is provided in Table 1 below.

Table 1 below provides summary of the adequacy of the RtS report in addressing specific issues raised for the impact assessments for construction, hydrodynamics and water quality, ecohydrology and geomorphology, aquatic and riparian corridors and surface water runoff.

Table 1 Adequacy of RtS report in addressing specific comments

PREVIOUS COMMENTS	ADEQUACY OF RtS
Erosion and sediment impacts during construction will be managed through the standard control measures outlined in the Blue Book. However, the Blue Book is close to 20 years old and there are current efforts to strengthen provisions, such as those in the Mamre Road Precinct and the draft Aerotropolis DCPs, which requires compliance with construction phase targets, the use of high efficiency basins and certified practitioners with at least 5 years of experience.	The RtS provides additional information on new analyses to demonstrate compliance with the construction phase targets. Sydney Water has also maintained that the detention basins can be configured to meet a target basin volume of 196 m^3/ha, which is required for high efficiency sedimentation basin types during construction. It is recommended that a condition be imposed requiring that a Certified Professional in Erosion and Sediment Control (CPESC) with minimum 5 years' experience oversees all construction and sediment controls required for the AWRC.
Impacts of construction of the pipelines across waterways and through shallow aquifers must be revisited, with engineering works and methods of construction agreed by suitably qualified experts in consultation with relevant state and local authorities.	It is recommended that a condition be imposed to ensure that qualified experts have agreed to and oversee the engineering works and methods of construction, in consultation with relevant state and local authorities.

PREVIOUS COMMENTS	ADEQUACY OF RtS
It is expected that the EIS will be significantly revised to accommodate a reticulated harvesting system to ensure the integrated water cycle management strategy is implemented.	The RtS states 'Stormwater harvesting across the Western Parkland City is out of scope for this project.' However, in response to the NSW EPA concerns on wet weather discharges to South-Creek, the RtS indicates that the AWRC will likely treat stormwater quality, and the addition of a reticulated harvesting system (third/purple pipe) will help reduce the volume of stormwater ingress to the AWRC pipelines and hence discharges. In this regard, and especially in context of comments raised by the NSW EPA on wet weather overflows, a condition should be imposed to assess the benefits of the stormwater harvesting system once plans have been finalised.
Table ES1 needs to include data on the drainage areas to permit comparisons with objectives. This seems at odds with the impact assessments for ecohydrology and geomorphology.	Explanation provided in RtS to indicate why it is not suitable to divide by drainage area but also provided information to show how a comparison to the objectives has been achieved
Some conclusions in the Executive Summary appear to have watered down the findings of the specific impact assessments – for example, construction impacts on waterway crossings and shallow aquifers are stated as being easily managed through standard controls, yet Appendix H has identified the high and real ecological impacts that can only be minimised through extensive mitigation measures including limitations to timing of construction.	It is recommended that a condition be imposed to ensure that qualified experts have agreed to and oversee the engineering works and methods of construction, in consultation with relevant state and local authorities.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix F – Hydrodynamics & Water Quality Impact Assessment – Part 1 Summary of the model reviews, numerical performance statistics and uncertainty estimates is needed. Information needed to determine whether the level of uncertainty outweighs/masks the exceedance above the objectives, and/or the models may not capture the flow processes correctly and hence relative changes among scenarios are incorrect.	Extent of documentation was comprehensive, and transparent in terms of the model conceptualisation, parameters and inputs. Model errors and sensitivity analyses were also provided in Appendix D of the TUFLOW and AED2 calibration report. These show a comparison of the modelled outputs with the observed/field data. There are also plots against the error metrics, which tend to demonstrate that the model error is too large to determine whether there is an impact (positive or negative) of the AWRC on the receiving waterways and riparian corridors. The model errors were not carried through to the presentation of results (i.e. longitudinal plots) that compare the changes to ambient water quality among scenarios. It is recommended the plots be amended to include the model errors. EHG considers that it is unlikely that the models could be recalibrated and validated, and re-configured (i.e., simplified) within the timeframe of the proposed start to construction. It is recommended that if the project is approved, it should be conditioned to ensure Sydney Water explores all options for mitigation of discharges (e.g., UV treatment, as highlighted by the NSW EPA) and identifies any contingent infrastructure such as integration with the stormwater harvesting system (i.e., extra detention).

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix F – Hydrodynamics & Water Quality Impact Assessment – Part 1 The WQRMs were developed and calibrated using only a 1-year time series, and an additional 2 month warm up period for the model run. The rationale for a limited time series needs to be better explained, given that typical periods for good model development are between 5-10 years.	It is noted that the calibration period is 1 year, and validation is 1-2 years. It is good practice to run the model for longer time periods as part of the validation stage of model development. It is noted that the models are complex, and the run times of the models are long. Hence, it is strongly recommended that the need for a complex AED2 be reviewed, as using a complex model should not be mistaken for best practice. The models need to be fit for purpose, and in this context, they are not as they cannot provide a time series prediction of the scenarios. Moreover, the plots in Appendix D (of the TUFLOW and AED2 calibration report) shows high variability in the field data used for model calibration and validation. It is very hard to infer trends over time from just two years of field data, exacerbating the difficulty in calibration.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix F – Hydrodynamics & Water Quality Impact Assessment – Part 1 Unclear as to whether the cumulative impacts of the AWRC releases over time have been assessed. The modelled outcomes are presented for only the 1-year time spans for which the model was tested. It is important to clarify whether the 2036 and 2056 scenario outputs reflect the potential impact of the cumulative releases from 2020 (baseline), or whether the scenario outputs just reflect the change in population growth and development. If the latter, then it is recommended that the models are run to produce the time series to allow the cumulative impacts over time to be assessed.	The basis for the initial model conditions for the 2036 and 2050 scenarios should be explained in detail. It is acknowledged that there are no dry weather discharges in South Creek but during wet weather there will discharges of mostly untreated sewage. In this regard, the project should be conditioned on the basis that a cumulative impact assessment over time (for periods longer than 2 years) is provided. If issues regarding long model run times cannot be solved, it is recommended that the model errors be investigated and presented with the medians or averages of modelled outputs that impacts of wet weather discharges as well as scenarios.
Appendix F – Hydrodynamics & Water Quality Impact Assessment – Part 1 The analysis of the extent of impact is qualitative, making it difficult to determine whether the impacts are indeed 'slight', 'marginal' or 'minor' as reported by Sydney Water.	Definitions for 'slight', 'marginal' or 'minor' have not been provided in the additional documentation. There are a series of tables (Tables 4-2 to 4-5) in the TUFLOW and AED2 report that provide error statistics, but as indicated above, the basis for the categorisation into poor, acceptable and accurate has not been provided.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix F – Hydrodynamics & Water Quality Impact Assessment – Part 1 The analysis of the extent of impact does not appear to be comparing 'apples with apples'. The water quality objectives (guideline values) are for long term ambient conditions and ideally not compared to individual release events as shown in the various plots. It is recommended that in addition to the existing plots, the annual median over an extended time series (to represent the ambient condition) be calculated and be compared to the objectives.	Appendix D of the TUFLOW and AED2 calibration report adequately provides the additional information requested.
Appendix F – Hydrodynamics and Water Quality Impact Assessment – Part 1 The analysis of the extent of impact needs to be extended to identify the change in the biogeochemical regime as a result of the releases. Changes to the 'water quality regime' could affect primary productivity and subsequent upper trophic levels.	The TUFLOW and AED2 calibration report and the responses in the RtS provide the additional information requested.
Appendix F – Hydrodynamics and Water Quality Impact Assessment – Part 1 It is important to recognise that the various nutrient forms making up the total concentrations for nitrogen and phosphorus in the EES water quality objectives. The ratio of totals to the bioavailable (inorganic) forms (e.g. TN:DIN) in the AWRC releases should be used to inform the overall impact assessment.	Appendix D Supplementary Analysis of Dissolved Total Nutrient Ratios, adequately provides the additional information requested.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix F – Hydrodynamics and Water Quality Impact Assessment – Part 1 Sydney Water has identified the impacts (on water quality) of primary treated sewage releases from the AWRC to South Creek during severe wet weather events are minor and temporary given that the events are rare and will be diluted. However, without a longer-term time series analysis of these severe wet weather events, it is difficult to assess whether there are any cumulative impacts of this strategy. EES notes that there are impacts related to elevated toxicants and bank effects at the site of release of primary treated sewage during the wet weather events.	See comments above. Without defaulting to models. it is intuitive to state that the wet weather discharges will have an impact over time. Indeed, this reflects the current situation in many waterways, and a cause of poor ecological health and water quality. Efforts to minimise the discharges to South Creek, should be re-visited especially given the opportunity to build from scratch. The integration with a reticulated stormwater harvesting system may be of benefit as highlighted in Sydney Water's response to the NSW EPA – for example, minimising stormwater ingress but not unlikely to reduce the volumes during wet periods as the harvesting system (including wetlands and storage ponds) are also likely to be at capacity.
Appendix F – Hydrodynamics and Water Quality Impact Assessment – Part 1 Flow volume releases are presented in this appendix but are not compared to EES's flow related objectives, in manner consistent with the water quality objectives comparisons. It is recommended that this comparison be included in the revised EIS.	Not addressed

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix G – Ecohydrology and Geomorphology Assessment Impact Assessment The upland drainage area should be included in Table 30 for transparency of calculations when comparing to the EES flow related objectives. The modelled (scenario) daily flow volumes in Table 30 are significantly lower than the EES flow objectives, and it is hard to determine from the text whether the modelled daily flow volumes are for the AWRC releases only or whether they include the stormwater discharges too or even whether the calculations are correct. This section of the document needs to be better explained.	Sydney Water has identified that an incorrect drainage area was used, and this has been rectified in the RtS. The results show an impact of the AWRC in South Creek, through exceedances of the flow objectives in almost all scenarios. Sydney Water also state that 'there is little difference between the background and impact scenarios which highlights that the main contribution is the predicted changes in land use and associated increase in stormwater flows. The AWRC releases make a negligible contribution to overall flow volumes.' As indicated above, the model error is too large to infer any differences (or lack of) among the scenarios. In other words, the 'little difference' may be simply be due to the model error.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix G – Ecohydrology and Geomorphology Assessment Impact Assessment The extent of impacts is based on a risk assessment matrix, where it is identified that '…the expert opinion informing the risk assessment detailed in this report was based on the technical expertise of the senior staff within Streamology and was not tested with a broader expert group'. Given the nature of this assessment, it is recommended that the document be updated with details of how the modelled and field data were translated into the likelihood and consequence criteria in the matrix. Typically for expert opinion-based approaches, a range of stakeholders that are affected by the decision and/or have subject matter expertise should be consulted. Given that there are modelled data, it is strongly recommended that Streamology scope options to make the risk assessment quantitative rather than qualitative. For example, the modelled outcomes could be categorised according to quartiles, and for each quartile to represent one of the unlikely to almost certain scores in the risk matrix.	Additional information in the RtS has been provided to demonstrate that the risk assessment includes a quantitative element. The rationale for the likelihood and consequence criteria are well explained.
Appendix G – Ecohydrology and Geomorphology Assessment Impact Assessment Terminology on the percentiles are not intuitive for those that are unfamiliar with flow exceedance curves e.g. 10th percentiles are identified as high flows and the 90th percentiles as low flows	Explanation provided in RtS on terminology.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix G – Ecohydrology and Geomorphology Assessment Impact Assessment Difficult to determine whether the assessment of low impact is correct given the qualitative nature of the assessment	Additional information in RtS has been provided. Regarding the risk assessment of South Creek, RtS indicates there is no impact yet the previous Table 30 shows exceedances from the flow objectives. Further information is required here.
Appendix H – Aquatic and Riparian Ecosystem Assessment One main point raised in the impact assessment is the relative impact of urban developments compared to the AWRC releases. It is unclear whether the modelling has taken into account stormwater controls for South Creek, which is expected to be achieved for all new developments.	The modelling does not take into account the stormwater controls/targets but has used a Parkland scenario in which perviousness is 30%. This is approach is acceptable as this level of perviousness (depending on development type) achieves the water quality and flow objectives.
Appendix H – Aquatic and Riparian Ecosystem Assessment The assessment has used new water quality objectives for comparing current water quality in the South Creek catchment. The comparisons need to be extended to the dissolved fractions of nutrients (not just total) where the data are available.	Additional information has been adequately provided in the TUFLOW and AED2 calibration report.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix H – Aquatic and Riparian Ecosystem Assessment Assessment extended to include comment (and if relevant assessments) on schedule 4 of the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011. Mapping of high ecological value waterways and water dependent ecosystems in Greater Sydney, and this mapping/GIS layer can be used as a diagnostic tool to help assess whether other values need to be considered in the assessment (see High Ecological Value Waterways and Water Dependent Ecosystems - GREATER SYDNEY REGION).	Additional information has been adequately provided in the RtS and Appendix E Aquatic Ecology Maps. Impacts are considered minor and mostly occurring during the construction phase. The definition for minor is still not explained.
Appendix H – Aquatic and Riparian Ecosystem Assessment The impact assessment needs to include a section on the timing of changes to the ambient flow regime and potential impacts on the breeding, feeding and migration cycles of aquatic species.	Additional information has been adequately provided in the RtS.
Appendix K – Surface Water Impact Assessment Construction phase targets have been developed by EES to strengthen existing provisions in the 'Blue Book', and these targets have been adopted in the Mamre Road Precinct DCP and the draft Aerotropolis DCP. It is recommended that the impact assessment be extended to demonstrate how these targets are achieved during the construction phase.	Sydney Water has undertaken additional assessment using the calibrated MUSIC modelling toolkit and draft technical guide to assess the performance of stormwater management measures described in Appendix K.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix K – Surface Water Impact Assessment Headers for Table 7-3 needs to be updated to be consistent with those shown in Section 4.7 of this document. Note also the changes to the frequency and duration of the various flow metrics, which affect the comparisons with the freshes. It is however recommended that the compliance assessment be revised to demonstrate compliance with EES's stormwater flow targets, which are now publicly available in the Mamre Road Precinct DCP and the draft Aerotropolis DCP – Phase 2. Compliance with these targets, especially the 95% percentile will help manage erosive flows more effectively than the specified stream erosion index of 3.5 (shown in Tables 7-5, 7-6).	Sydney Water completed additional assessment in Appendix F to compare stormwater performance at the AWRC site with the stormwater flow targets in the draft Aerotropolis Phase 2 DCP. The modelled results show that: • daily flows of 5,871 L/d/ha occur 95% of the time, demonstrating the 95%ile 3,000-15,000 L/d/ha target range is met. • the 10%ile, 50%ile, and 75%ile flow duration and cease to flow targets are also met.
Appendix K – Surface Water Impact Assessment Compliance with EES water quality objectives should be based on achieving the EES load reduction targets specified in the Mamre Road Precinct DCP and the draft Aerotropolis DCP – Phase 2. It is noted that the Gross Pollutant and TN load reductions achieved at the AWRC site comply with the respective EES targets. The TSS and TP load reduction targets at the site do not comply	Additional assessment in Appendix F shows that new pollution load reduction targets, as specified in the draft Aerotropolis Phase 2 DCP are achieved. The modelled results demonstrate compliance with these targets by: • 93% load reduction in total suspended solids (TSS kg/yr) • 81% load reduction in total phosphorus (TP kg/yr) • 65% load reduction in total nitrogen (TN kg/yr).

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix K – Surface Water Impact Assessment Regarding salinity impacts and associated irrigation rates at the AWRC site, EES recommends that a soil and salinity assessment be undertaken to confirm that the impact is low (as specified in the impact assessment).	Sydney Water has undertaken soil and groundwater sampling and has established the potential impact of the salty groundwater could elevate soil salinity. To manage the impacts, Sydney Water has proposed an irrigation rate equivalent to the difference between local rainfall and potential evapotranspiration.
Appendix K – Surface Water Impact Assessment Replace Table 2-2 in the Low Flow and Water Quality Assessment with the final EES flow objectives provided in Section 4.7 of this document.	The RtS indicates that Appendix F now supersedes Table 2-2.
Appendix K – Surface Water Impact Assessment Sydney Water's MUSIC modelling for the stormwater assessment was based on an uncalibrated model, with rainfall-runoff parameters different from those specified in EES's MUSIC modelling toolkit. It should be noted that EES provided this toolkit to Sydney Water in preparation of this EIS. The differences in the model parameters means that it is difficult to determine whether the assessment represents true compliance with EES's objectives. It is strongly recommended that the assessment be revised using the rainfall runoff parameters in the toolkit, and the parameters for WSUD treatment nodes specified in EES's draft technical guide for achieving the objectives. Sydney Water was provided access to the draft technical guide during the preparation of this EIS.	Sydney Water has undertaken additional assessment using the calibrated MUSIC modelling toolkit and draft technical guide to assess the performance of stormwater management measures described in Appendix K.

PREVIOUS COMMENTS	ADEQUACY OF RtS
Appendix K – Surface Water Impact Assessment Tables 4-3, 4-4 in the Low Flow and Water Quality Assessment are empty.	The RtS indicates that Appendix F now supersedes Table 2-2.

End of Submission