



Murrumbidgee to Googong Streamflow and Water Quality Management Plan

EN03.01.12

Version 6.2, 5 April 2018

Document management

Document summary

Title	Murrumbidgee to Googong Streamflow and Water Quality Management Plan
Version	6.2
Document status	Final
Date of issue	5 April 2018

Document development

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Version control

Version	Author	Date	Description	Approval
1	Simon Webber	23 Nov 11	Version approved by regulator	23 Nov 2011
2	May McDonald-Cox	28 Jan 14	Revision to reflect new Icon Water corporate governance arrangements & Feb 13 OEMP audit findings/recommendations	28 Jan 2014
3	Chris Pulkkinen	4 Sep 14	Administrative error amended	4 Sep 2014
4	Chris Pulkkinen	10 Mar 15	Administrative update providing clarity around gauging stations	28 Apr 2015
5	Chris Pulkkinen	15 July 15	Branding update	10 Jul 2015
6	John Hyam	22 May 17	Revised water quality operational limits. Reformatted for usability and consistency with related M2G Mgt Plans	30 May 2017
6.1	John Hyam	6 Sep 17	Incorporate feedback from ACT Government in Table 5	9 Oct 2017
6.2	John Hyam	5 Apr 18	Drought rule definition	5 Apr 2018

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Acronyms

ACT	Australian Capital Territory
ANZECC	Australian and New Zealand Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
d	day
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
GL	Giga Litre
hrs	hours
KPI	Key Performance Indicator
m	metre
min	minutes
ML	Megalitre
M2G	Murrumbidgee to Googong Water Transfer
NSW	New South Wales
OEMP	Operation Environmental Management Plan
s	second
SCADA	Supervisory Control and Data Acquisition
SFWQMP	Stream Flow & Water Quality Management Plan
SDLP	Sustainable Diversion Limits Plan

Register of changes to previous version

Subject	Description of change/addition	Reference within this plan
1. General	Reformatted in latest Icon Water template for consistency Throughout Plan with the other M2G Management Plans	
2. Flow Protection	<p>Limits to protect flows in the Murrumbidgee River have been revised based on availability of longer time series data. There is an increase in the base flow protection for each month.</p> <p>Step-up and step-down rules have been revised based on experience with M2G operations, environmental conditions and independent scientific review and are only applicable to Operating mode and not to Standby mode.</p>	Section 2
3. Water quality Management	<p>Management levels have been redefined to align with the Codex Alimentarius Hazard Analysis and Critical Control Point (HACCP) system terminology. Values have been changed based on the availability of longer time series data as recommended by the independent consultant's report.</p> <p>The water quality checks procedure has been changed to assess the impact of Murrumbidgee River water on the receiving water in Burra Creek.</p>	Section 4
4. Legislative compliance	A list of relevant legislation, regulations, licences and permits was moved to the Appendix.	Appendix B
5. Data analysis and reporting	Data analysis and reporting has been moved to the OEMP.	N/A

1. Introduction

1.1 Background

The Murrumbidgee to Googong (M2G) Water Transfer is one of the projects implemented by Icon Water for delivering improved security to the water supply for the ACT and region. It involves pumping water from the Murrumbidgee River (in the ACT) and transferring it via a 12km pipeline to the Burra Creek (in NSW) at a maximum rate of 100 ML/day. From the discharge point it flows for approximately 13km down Burra Creek to the Googong Reservoir.

Key infrastructure features of the project are described in the Operational Environmental Management Plan (OEMP).

1.2 Purpose of the SFWQMP

The purpose of the Stream Flow and Water Quality Management Plan (SFWQMP) is to outline how Icon Water will monitor, manage and report on stream flow and water quality in the Murrumbidgee River and Burra Creek during M2G operation and maintenance.

The SFWQMP defines a framework for the operation of the M2G pumps which is underpinned by a set of rules and conditions depending on base flows and water quality 'limits of operation' values.

1.3 Objectives of the SFWQMP

The objectives of the SFWQMP are to set operational target values as a means to protect the identified aquatic ecology values so that transfer pumping between catchments should not have an unacceptable impact on the extracting environment (Murrumbidgee River) and the receiving environment (Burra Creek). The SFWQMP is consistent with the Conditions of Approval in **Appendix A** and the relevant regulatory requirements in **Appendix B**.

1.4 Management framework

The SFWQMP has been developed based on the best currently available information about native fish and the environmental flow requirements including:

- the Commonwealth's *Sustainable Diversion Limit Plan (SDLP)*
- the ACT Government's *Environmental Flow Guidelines*
- data collected as part of Icon Water's ongoing *Murrumbidgee Ecological Monitoring Program (MEMP)*
- flow and water quality data measured at on-line gauging stations in the Murrumbidgee River and Burra Creek, and
- expert scientific advice from regulators, academics and industry consultants.

A research, monitoring and adaptive management approach is used to confirm, validate and update rules and ecological outcomes, as required. Updates to the flow protection and water quality values are based on an analysis of the latest time series data by an independent consultant and consideration of the environmental factors outlined in Table 1.

Table 1 – Environmental factors

Environmental Factor	Considerations
1. Provide suitable habitat and habitat diversity for native fish species	<p>Minimum depth and extent of key habitat pools are maintained in low flow conditions.</p> <p>Structural complexity of key reaches is maintained or improved, as measured by on-going presence of woody debris, riparian vegetation, and in-stream boulders.</p> <p>A range of instream depth and flow velocities are provided.</p>
2. Provide opportunities for native fish movement, as required	<p>In-stream barriers are drowned out at key times, on moderate to high flows.</p> <p>Minimum depth is maintained in key shallow reaches.</p>
3. Maintain clean and productive riffle habitats for native fish	<p>Riffle cleaning flows effectively scour riffles of sediment and algal films.</p>
4. Maintain and improve water quality and temperature in the river downstream of the abstraction point	<p>Water retention time in large pools does not result in hostile water quality conditions, particularly at depth.</p>
5. Avoid ecological and geomorphological impacts associated with cessation of M2G flows	<p>Flow step-down avoids fish stranding, vegetation modification and bank collapse.</p>
6. Avoid disruption associated with natural flooding events in Burra Creek	<p>Flow does not contribute to flooding in Burra Creek.</p>

Note 1: Analysis of factors may be limited by knowledge gaps.

Note 2: Factors relate specifically to the effects produced by the operation of M2G i.e. not naturally occurring circumstances.

2. Flow Protection

2.1 Flow Protection in the Murrumbidgee River

The protection of environmental flows in the Murrumbidgee River downstream of the abstraction point at Angle Crossing is a key governing factor around the operation of the M2G.

2.1.1 River and Abstraction Gauging

Icon Water's Supervisory Control and Data Acquisition (SCADA) system is the primary operational control system for the M2G system. The system includes alarms and automatic shut off if the water transfer is not being operated in accordance with the environmental flow rules or other requirements.

There are three measurement stations for measuring river flow, water abstraction volumes and the associated water quality parameters.

- **Upstream Angle Crossing Gauging Station (MURW2 / 41000270)**

This is a stream flow gauging station owned by Icon Water, located approximately 1km upstream of the abstraction point in the Murrumbidgee River. Water quality and flow data from this station is used to manage the abstraction regime during operation and maintenance activities. It is a primary measurement device for the management of the M2G.

- **Pipeline Flow Meter**

The pipeline infrastructure includes an electromagnetic flow meter which accurately measures and records the volume of water being transferred through the pipeline. It is a primary measurement device for the management of the M2G.

- **Lobbs Hole Gauging Station (410761)**

This is a stream flow gauging station owned by the ACT Government, located approximately 2km downstream of the abstraction point in the Murrumbidgee River. Lobbs Hole is not a primary device for the management of the M2G but serves as a backup to the Upstream Angle Crossing gauge as well as providing supplementary water quality and flow data.

M2G uses the flow measurement stations and SCADA to provide reliable data to inform management and operational decisions.

2.1.2 Base Flow Calculation

Base flow in the Murrumbidgee River will be protected by ensuring that the amount of water abstracted will not reduce the flow to below the specified flows for each month.

River flow to be protected is calculated daily as follows:

$$(Flow\ measured\ at\ MURW2) - (Flow\ measured\ by\ the\ Pipeline\ Flow\ Meter) > River\ flow\ to\ be\ protected\ specified\ in\ Table\ 2\ or\ 3\ for\ that\ month$$

The information obtained through the above calculation of river flow may be compared to the hydrographic records for Lobbs Hole Gauging Station, downstream of the abstraction point.

2.1.3 Base Flow Protection Rules

The following base flow protection rules apply to M2G pumping operations when in **Operating** and **Standby Mode** modes.

Base flow protection rule (normal conditions)

Protect natural flows in the Murrumbidgee River at the volumes shown below in Table 2.

Table 2 Base Flow Protection Rules under normal conditions (ML/d)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
33.7	24.1	22.1	37.5	54.1	66.8	89.3	133.6	200.1	145.9	161.6	61.4

Base flow protection rule (drought conditions)

Protect natural flows in the Murrumbidgee River when the following 'drought rule' is triggered – where average flow in at least 15 of the 18 (~80%) past dry season months (November to April inclusive) is below the flows shown in Table 2 above. Under these conditions, M2G pumping is required to protect the base flows in the Murrumbidgee River as shown in Table 3.

Table 3 Base Flow Protection Rules under drought conditions (ML/d)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
132.2	107.0	118.2	98.5	54.1	66.8	89.3	133.6	200.1	145.9	384.9	207.0

2.1.4 Riffle maintenance flow rule

During **operating** mode, protect a minimum of 250 ML/d of natural flow for riffle maintenance in the **Murrumbidgee River**, for a period of 24 hours, **once every 30 days**, measured at Lobbs Hole (410761).

2.2 Flow Protection for Burra Creek

To avoid contributing to flooding the M2G must not be operated if the natural flow in Burra Creek is greater than the 1 in 2 year flood value of 1,830ML/d.

In order to minimise impact on the receiving waters, the SFWQMP requires the pumps to be started and stopped in a defined sequence as far as the pump sizing and capacity allows, mimicking natural catchment runoff and flow events occurring within Burra Creek when M2G is in operating mode.

The pump step-up and step-down procedures are described in the operation procedures section of this plan.

3. Water Quality Management

3.1 Limits of Operation

Operational values (limits of operation) used for water quality management are consistent with HACCP terminology:

- **Target value:** These are the optimal range of values for operation
- **Action value:** These are acceptable for operation but indicate that a given water quality parameter is trending outside of the target range
- **Critical value:** These are unacceptable for operation as they pose a risk to ecology based on water quality.

The actions related to the limits of operation are defined in Table 4.

As a check prior to operation, the water quality at the Murrumbidgee River abstraction point (MURW2 / 41001701) should be compared to the Burra Creek limits of operation values in Table 5. If water quality is within the acceptable values specified for Burra Creek, operations can proceed.

Water quality should continue to be monitored for the duration of that operational run. Should values fall outside the target range in Table 5 then the recommended actions in Table 4 should be instigated.

Table 4 - Limits of operation actions

Term	Action for values outside of limit
Target values	<ul style="list-style-type: none">• If values are inside range, no action required. If outside, the target values then refer to Action or Critical values below.
Action values	<ul style="list-style-type: none">• Continue monitoring. This may include in-situ sampling and / or grab sampling to validate online data.• Cross-check data accuracy. Use data from alternative gauges, if available.• Cross-check that M2G pumping meets operational plan requirements.• Check for abnormal catchment-wide activities e.g. rainfall events.
Critical values	<ul style="list-style-type: none">• Shut down operation.• Notify the Regulators and key stakeholders.• Conduct further monitoring and a detailed investigation by subject matter experts as to the cause of the critical values exceedance.

Table 5 – Burra Creek - water quality target, action and critical values

Location	Season	Temperature (°C)			EC (µs/cm)			pH (pH units)			Turbidity (NTU)			Dissolved Oxygen (% Sat)		
		Target value	Action value	Critical value	Target value	Action Value	Critical value	Target values	Action values	Critical values	Target value	Action value	Critical value	Target values	Action values	Critical values
Burra Creek	Autumn / Winter	>5	<5	<2.5	<600	>600	>1400	6.5-8.5	<6.5 or >8.5	≤6 or ≥9	<80	>80	800 ^Δ NTU for no more than 48 consecutive hours	70-110	<70 or >110	<40 or >140
	Spring / Summer	<24	>24	>32							<100	>100		60-110	<60 or >110	<30 or >160

Notes:

Δ Burra Creek is periodically exposed to high turbidity following rainfall events; but being a small catchment, high flow events and the corresponding increase in turbidity tends to be flashy and does not remain high for any length of time (usually not more than 24 hours). 800NTU on its own, does not pose a risk to the system since values at this magnitude and above are not uncommon in Burra Creek. However, because of the size of the catchment, high values that remain for days on end are considered to be abnormal and are deemed to be an unacceptable risk to the ecology of the system.

4. Operational Procedures

4.1 M2G pre-start up checks (Standby and Operating modes)

The following rules must be met prior to pump start-up for both standby and operating modes. Allowance is to be made for the validity of the data, and expected trends over the next 24 hours based on predicted rainfall events and flows.

- Googong Reservoir must be below 80% capacity (for full operation only, not standby), as measured at the dam wall gauge (410748).
- The water transfer must not cause Burra Creek flow to exceed 1,830ML/d, measured at the 410774 gauge.
- Environmental flow protection conditions in the Murrumbidgee River can be met at the time of starting the pumps and for the next 24 hours, as specified in Section 2.1. Use the mean daily flow for this check.
- The water quality at the Murrumbidgee River abstraction point (MURW2 / 41001701) should be compared to the Burra Creek values in Table 5. If these are within the acceptable ranges, operations can proceed, subject to the limits of operation actions defined in Table 4.
- Fish egg filtration screens must be fully functional.
- Management actions required to be taken to address any incident since the last flow episode must have been completed.

4.2 Procedures during water transfer (Standby and Operating modes)

Once water transfer has commenced (in operating mode), pumping must be managed in accordance with the following rules:

- Fish egg filtration screens must be fully functional.
- The water transfer must not cause Burra Creek flow to exceed 1,830ML/d, measured at the 410774 gauge.
- Flow in the Murrumbidgee River must be protected in accordance with the rules in Section 2.1. Use the instantaneous flow values for this check.
- The water quality at the Murrumbidgee River abstraction point (MURW2 / 41001701) should be compared to the Burra Creek values in Table 5. If these are within the acceptable ranges, operations can continue, subject to the limits of operation actions defined in Table 4.
- Where practical, flow levels should be varied to mimic natural flows variability. A constant flow shall not be maintained for a long period of time that would negatively impact a healthy ecological system.

4.3 Pump step-up and step-down procedure (Operating mode only)

The step times are designed to mimic natural events occurring within Burra Creek. The procedures are defined in Table 6.

The timing should provide as smooth a transition as possible, with the switching down of pumps tapering off gradually to simulate the slow tapering off in the tail end of a natural hydrograph.

Step-up and step-down are *not* required in Standby mode as these pump runs are generally of short duration and emulate the natural flow events in Burra Creek.

Table 6 Step-up and step-down operating sequence

Step-up Sequence

Peak Pumping rate	High Lift Pumps required for peak rate	Operating Sequence	Minimum Step-up time (Hr)
21 ML/d	1 small pump	Start anytime	0
49 ML/d	1 large pump	<ul style="list-style-type: none"> Run Small for 0.5 hr Start Large and stop Small 	0.5
68 ML/d*	1 small pump and 1 large pump	<ul style="list-style-type: none"> Step-up to 49 ML/d and run for 0.5 hr Start Small 	1
94 ML/d*	2 large pumps	<ul style="list-style-type: none"> Step-up to 68 ML/d and run for 0.5 hr Stop Small, start Large 	1.5
109 ML/d*	2 large pumps and 1 small pump	<ul style="list-style-type: none"> Step up to 94 ML/d and run for 0.5 hr Start second Large 	2

Step-down Sequence

Peak Pumping rate	High Lift Pumps required for peak rate	Operating Sequence	Minimum Step-down time (Hr)
109 ML/d*	2 large pumps and 1 small pump	<ul style="list-style-type: none"> Stop Small Run for 1.0 hr @ 94 ML/d 	8
94 ML/d*	2 large pumps	<ul style="list-style-type: none"> Stop Large Start Small Run for 2 hrs @ 68 ML/d 	7
68 ML/d*	1 small pump and 1 large pump	<ul style="list-style-type: none"> Stop Small Run for 2 hrs @ 49 ML/d 	5
49 ML/d	1 large pump	<ul style="list-style-type: none"> Stop Large Start Small Run for 3 hrs @ 21 ML/d 	3
21 ML/d	1 small pump	Turn off anytime	0

The minimum time intervals between a pump stopping and re-starting is 15 minutes.

The minimum time interval between stepping up and stepping down the flows is 30 minutes due to transient surges in the pipeline.

Note: Utilising more than the capacity of one large pump is not normally required for a maintenance standby run as the large pumps can be run consecutively. Flow rates above 49ML/d are expected during operating mode water transfer only.

5. References

GHD, (2016). *Review of water quality values in relation to M2G and the streamflow and water quality management plan*. August 2016.

GHD (2017). *M2G: Stream Flow and Water Quality Management Plan*. May 2017.

Appendix A: M2G Conditions of Approval

Commonwealth Conditions of Approval

The SFWQMP responds primarily to two Commonwealth Conditions of Approval outlined below. It is important to note that the required plans were submitted and approved by the Minister; however the new SFWQMP consolidates these plans, and is the living document for the ongoing adaptive management of the M2G.

1. *The person taking the action must submit an Extraction and Gauging Plan (now SFWQMP) that describes in detail how river flow and water abstraction will be gauged, measured and reported in the Murrumbidgee River, to the Minister for approval. The plan must address the following requirements:*
 - a) *How river flow will be measured at Lobbs Hole gauging station and other relevant locations;*
 - b) *How base flow in the Murrumbidgee River will be maintained to abide by the conditions of this approval;*
 - c) *Reporting of water abstraction data; and*
 - d) *Reporting of any breaches of this approval.*

The project may not operate until an Extraction and Gauging Plan is approved by the Minister. The approved plan must be implemented.

2. *The person taking the action must submit a Sustainable Diversion Limit Plan (now SFWQMP) to the Minister for approval to ensure the long-term protection and recovery of listed threatened fish species in the Murrumbidgee River, including the Murray Cod (*Maccullochella peelii*), the Trout Cod (*Maccullochella macquariensis*) and Macquarie Perch (*Macquaria australasica*).*

The SDL Plan must be developed in consultation with expert(s) approved by the Department, and in accordance with Terms of Reference submitted for the Department's approval within four weeks of the date of this approval decision. The Terms of Reference must address the matters outlined in Attachment B for this decision.

The project may not operate without an approved SDL Plan. The approved SDL Plan must be implemented.

New South Wales Conditions of Approval

Part 3a Planning Approval Conditions (NSW) relating to M2G stream flow water quality flow management are shown below:

1. The Proponent shall comply with section 120 of the Protection of the Environment Operations Act 1997 which prohibits the pollution of waters.
2. As part of the Operation Environmental Management Plan required under condition 6.4, the Proponent shall prepare and implement a Flow Management Plan that identifies the

quantity, timing, duration and velocity of water transfer flows to Burra Creek. The Plan shall be developed in consultation with the DECCW.

3. The Proponent shall design, construct, operate and maintain the project to avoid impacts on bank stability within the Burra Creek riverine corridor and Googong Reservoir outlet and does not increase local flooding risk.
4. The Proponent shall not transfer water when Burra Creek is in flood based on a one in two year event or greater nor should the Proponent operate the pipeline where it results in water levels in Burra Creek being greater than the one in two year flood level.
5. The Proponent shall implement the aquatic ecology management measures committed to in the documents set out in condition 1.1c) or elsewhere in these conditions of approval, including;
 - a) monitoring and subsequent maintenance of flow transfer volumes to reasonably and feasibly mimic the natural flow regime based on the stochastic data refined in the Preferred Project Report of Burra Creek during the native fish breeding season in order to protect any spawning populations of threatened fish species;
 - b) design measures to prevent the spread of invasive fish species;
 - c) design measures for the protection of natural ponding habitat. If the current natural ponds along Burra Creek are lost as a result of increased flows, the Proponent is required to re-establish natural ponding habitat and
 - d) regular review of aquatic ecology monitoring results for any trends toward significant impacts in Burra Creek or Googong Reservoir.
6. Prior to the commencement of construction, the Proponent shall consult with the Department of Industry and Investment regarding the final design of the fish egg screens and proposed operating procedures of the pump stations. The pumping station shall be designed and operated in such a way that pumping cannot occur when adequate fish egg screens are not in place.
7. Prior to the commencement of construction, the Proponent shall prepare and implement an Ecological Monitoring Program to monitor the impact of the project on the ecology that may be impacted by the proposal. The program shall be developed in consultation with the DECCW and Department of Industry and Investment NSW and shall include but not necessarily be limited to:
 - a) set out monitoring requirements as detailed in the documents referred to in condition 1.1 c), in order to assess the impact of the project on Ecology present along the easement and at Burra Creek at the pipeline outlet location and downstream including the Googong Reservoir;
 - b) baseline monitoring prior to the introduction of flows through Burra Creek in order to establish any ecological changes resulting from the project.
 - c) provisions for monitoring trench areas for any native fauna impacts likely to result from this work. Any native fauna found in the open trench shall be recorded and managed in consultation with DECCW;
 - d) provisions for monitoring during construction, operational and non-operational phases;
 - e) mechanisms for immediately investigating any anomalous monitoring results;
 - f) mechanisms for the management and mitigation of any impacts on the waterways including cessation of flows where necessary; and

g) details of how the monitoring results will be reported to the Director-General and the DECCW and the Department Industry and Investment NSW.

The Program shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director-General, accompanied by evidence that the DECCW has been consulted regarding the Program. Construction shall not commence until written approval has been received from the Director-General.

8. Prior to the commencement of construction, the Proponent shall prepare and implement a Surface Water Monitoring Program to monitor and manage the impact of the project on the waterways into which any abstracted Murrumbidgee River water is discharged. The Program shall be prepared in accordance with sections 8.2.3.3 and 8.2.3.4 of Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Volume 2: Aquatic Ecosystems (ANZECC & ARMICANZ, 2000). The Program shall be developed in consultation with the DECCW and shall include but not necessarily be limited to:

- a) the monitoring framework detailed in the documents referred to in condition 1.1;
- b) a baseline monitoring program;
- c) an evaluation of the discharges in terms of temporal and spatial scales;
- d) a comparison of discharge data with baseline data;
- e) sampling and data collection at representative sites, both impact (downstream of the discharge point) and control (upstream of the discharge point) sites;
- f) sampling and data collection for the discharges and immediate receiving environment to quantify the changes in ecosystem health and water quality with specific reference to phytoplankton, aquatic vegetation, macro invertebrates, fish, temperature, salinity, dissolved oxygen, iron and manganese;
- g) provisions for the review of the Program within six months of commencement of the first full operational flow into Burra Creek;
- h) identification of key water parameters including but not limited to flow rate, temperature, pH, salinity, total dissolved solids and nutrient parameters for the operation of the project;
- i) management actions for the parameters identified in h) should they be breached; and
- j) details of how the monitoring results will be reported to the Director-General and DECCW.

The Program shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director-General, accompanied by evidence that the DECCW has been consulted regarding the Program. Construction shall not commence until written approval has been received from the Director-General.

9. Prior to the commencement of construction the Proponent shall prepare and implement a Geo-Morphological Monitoring Program to monitor the impact of the project on the present morphology of Burra Creek at the pipeline outlet location and downstream to Googong Reservoir. The Program shall be developed in consultation with the DECCW and shall include but not necessarily be limited to:

- a) Set out monitoring requirements in order to assess the impact of the project on the present geo-morphology of Burra Creek at the pipeline outlet location and downstream to Googong Reservoir.

- b) Baseline monitoring prior to the introduction of flows through Burra Creek in order to establish any geo-morphological changes resulting from the project.
- c) Provisions for monitoring during construction, operational and non-operational phases;
- d) Mechanisms for immediately investigating any anomalous monitoring results;
- e) Mechanisms for the management and mitigation of any impacts on the waterways including cessation of flows where necessary; and
- f) Details of how the monitoring results will be reported to the Director-General and the DECCW.

The Program shall be submitted for the approval of the Director-General no later than one month prior to the commencement of construction, or within such period otherwise agreed by the Director-General, accompanied by written evidence that the DECCW has been consulted and that the DECCW is satisfied with the Program. Construction shall not commence until written approval has been received from the Director-General.

10. As part of the Operation Environmental Management Plan required under condition 6.4, the Proponent shall prepare and implement a Flow Management Plan that identifies the quantity, timing, duration and velocity of water transfer flows to Burra Creek. The Plan shall be developed in consultation with the DECCW.

Australian Capital Territory Conditions of Approval

The ACT conditions of approval relating to stream flow and water quality were captured through the Development Application Process, and are shown below

1. Sourcing water – long term: Under the Water Resources Act 2007, the proponent is required to hold an appropriate Water Access Entitlement and Licence To Take Water prior to abstraction of any water from Murrumbidgee River for delivery to Googong Reservoir.
2. The *Licence to Take Water* will be in keeping with environmental flow guidelines. This commitment was made by the proponent during the preparation of the EIS. The condition must take into account the effects of abstraction on, and by, downstream users. It should also consider any new information which may be forthcoming as a result of ecological investigations that may be used to maintain or enhance the ecological values of the Murrumbidgee River in an adaptive management forum.

Appendix B: Regulatory Framework

Outlined below are the legislation, guidelines and standards that are relevant to the SFWQMP.

2.1 Relevant Legislation

Table 7 - Legislation relating to water abstraction at Angle Crossing

Legislative Jurisdiction	Relevant Act
Territory (ACT)	Environmental Protection Act 1997 Environment Protection Regulation 2005 Nature Conservation Act 2014 Water Resources Act 2007
Commonwealth	Environment Protection and Biodiversity Conservation Act 1999 Australian Capital Territory (Planning and Land Management) Act 1998 Water Act 2007 Canberra Water Supply (Googong Dam) Act 1974
New South Wales (NSW)	Protection of the Environment Operations Act 1997 Environment Planning and Assessment Act 1979

2.2 Relevant Guidelines and Standards

Table 8 - Guidelines and Standards relating to water abstraction at Angle Crossing

Guideline or Standard	Description
Water Quality	ANZECC and ARMCANZ 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra, ACT. These guidelines form the central technical reference of the National Water Quality Management Strategy, which the Federal, State and Territory governments have adopted for managing water quality.
National Water Plan	The total amount of water the Territory is allowed to use or divert from the Murray Darling Basin (the ACT Water Cap) as approved by the Murray-Darling Basin Ministerial Council is: <ul style="list-style-type: none">• 40 GL net• Climate-adjusted• Reviewed and increased by 0.75 % of the current per capita consumption of water for population growth

River flow

ACT Government's Environmental Flow Guidelines (2013)
Commonwealth Sustainable Diversion Limit Plan (SDLP)