



# ICRC

independent competition and regulatory commission

## Compliance and performance survey 2011-12

### Water supply and sewerage

#### Part 3: Technical (dam safety)

##### Introduction

Instructions for completing the annual report

About the survey

**(Refer to Part 1: Non-technical survey for section 2 and Part 2: Technical (general) for section 2)**

#### Section 3: Technical regulation of water and sewerage

- 3.1 General responses
- 3.2 Corin Dam responses
- 3.3 Corin Dam responses - Supplementary information
- 3.4 Bendora Dam responses
- 3.5 Bendora Dam responses - Supplementary information
- 3.6 Cotter Dam responses
- 3.7 Cotter Dam responses - Supplementary information
- 3.8 LMWQCC Dam responses
- 3.9 LMWQCC Dam responses - Supplementary information
- 3.10 Googong Dam responses
- 3.11 Googong Dam responses - Supplementary information



## Instructions for completing the annual report

**Note :** This report should be completed after reading the separate explanatory notes and data dictionary for water supply and sewerage (dam safety).

### Completing the templates:

- 1 For instructions on completing Part 3 of the report, please refer to the explanatory notes provided on the first page of the '2012 Water and Sewerage - Pt3 Technical (dam safety) Dictionary'.
- 2 Please indicate where material provided is confidential and not for general public release.



**Tip :** Press Alt-Enter to start a new line in a cell.

### Legend and data validation

#### Legend

- Blue cells with white text indicate column headings
- Blank white cells beneath column headings can be used for additional comments
- Orange cells indicate qualitative inputs.
- Yellow cells indicate quantitative inputs
- Grey cells indicate information to note when completing the form
- Diagonal stripes indicate a value is not required
- Blue text indicates a link to another page

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|--|
| Column heading                         |
| Enter comments in these cells          |
| Enter qualitative data in these cells  |
| Enter quantitative data in these cells |
| Notes for completing questions         |
| These cells are locked                 |
| <a href="#">Link to another page</a>   |



[Contents](#)  
[Introduction](#)

## About the survey

Under section 25(2)(d) of the *Utilities Act 2000* (Utilities Act), utilities are required to report to the Independent Competition and Regulatory Commission (Commission) each financial year on the performance of their functions under the statute and their compliance with licence conditions. Reports must be submitted to the Commission within three months of the end of the financial year (i.e. by 1 October). The reported information forms the basis for the Commission's compliance reports and performance reports for licensed utility service providers. Parts 1 (Non-technical), 2 (Technical) and 3 (Technical - dam safety) of this template sets out the reporting requirements for 2011-12.

Part 3 (Technical - dam safety) is made up of general dam questions, and specific questions for the:

- Corin Dam
- Bendora Dam
- Cotter Dam
- LMWQCC Dam
- Googong Dam



[Contents](#)  
[Instructions](#)

## Section 3: Technical regulation of water and sewerage

## 3.1 General responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

The authorising officer may use an electronic signature.

| Number                         | Part | Question (short form)                | Utility 2012 response  |
|--------------------------------|------|--------------------------------------|--|
| <b>General</b>                 |      |                                      |  |
| DS1                            | a    | Corporate Approval (Y/N?)            | Yes  |
| DS1                            | b    | Authorising officer name             | Mark Sullivan  |
| DS1                            | c    | Authorising officer title / position | Managing Director  |
| DS1                            | d    | Authorising officer signature        |  |
| <b>Submission of Documents</b> |      |                                      |  |
| DS2                            | a    | Dam compliance report submission     | Corin Dam - June 12<br>Bendora Dam - June 12<br>LMWQCC - June 12<br>Googong Dam - June 12  |
| DS2                            | b    | Dam surveillance program submission  | Corin Dam - June 12<br>Bendora Dam - June 12<br>LMWQCC - June 12<br>Googong Dam - June 12  |
| DS2                            | c    | Draft DSEP submission                | 28 July 2011 and 7 May 2012 - Cotter River Dams and LMWQCC Bypass Storage Dam<br>22 July 2011 - Cotter River Dams Addendum 2 v2<br>14 December 2011 - Cotter River Dams Addendum 2 v3<br>17 January 2012 - Googong Dam |
| DS2                            | d    | Inundation mapping data submission   | Included in DSEP   |
| DS2                            | e    | DSEP contact list submission         | 1 July 2011<br>22 December 2011<br>28 May 2012   |

|  |   |   |   |
|--|---|---|---|
| DS2  | f | Dam emergency event report submission                           | LMWQCC Bypass Storage Dam Discharge - 8 March 2012<br>Enlarged Cotter Dam flood event - 6 March 2012 (interim report), 26 April 2012 (final report)   |
| <b>Management of DSMSs</b>                     |   |   |   |
| DS3  | a | Responsible officer (name?)                                     | Javad Tabatabaei  |
| DS3  | b | Office for reporting (name?)                                    | Infrastructure Development and Asset Management   |
| DS3  | c | Qualifications and experience of responsible officer (describe) | PhD Civil Engineering - more than 30 years experience on dam design, construction and safety management   |
| DS3  | d | Documentation of responsibilities (Y/N?)                        | Yes   |
| <b>Quality management of DSMS</b>              |   |   |   |
| DS4  | a | Function level audit(Y/N?)                                      | Yes   |
| DS4  | b | Process and Validation level audits (Y/N?)                      | Yes   |
| <b>Training for dam safety</b>                 |   |   |   |
| DS5  |   | Training of personnel (list)                                    | Dam Engineers - ANCOLD Conference on 25 October 2011, Advanced Dam Safety training on 19/20 April 2010<br>Inspectors - Advanced Dam Safety training on 19/20 April 2010<br>Field Personnel - Advanced Dam Safety training on 19/20 April 2010<br>Maintenance Personnel - Advanced Dam Safety training on 19/20 April 2010 |
| <b>DSMS Documents</b>                          |   |   |   |
| DS6  |   | Preservation of documents (Y/N?)                                | Yes   |
| <b>Unscheduled or Unscheduled and New Dams</b> |   |   |   |
| DS7  |   | Unscheduled dams (Y/N? and list)                                | No  |
| <b>DSMSs Definition</b>                        |   |   |   |
| DS8  | a | Flood definition (describe)                                     | Googong Dam - probable maximum (PMF)<br>Corin Dam - 1:750,000<br>Bendora Dam - 1:160,000<br>LMWQCC Bypass Dam - 1:10,000  |
| DS8  | b | Earthquake definition (describe)                                | Maximum Credible Earthquake (MCE) for all dams  |

## 3.2 Corin Dam responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

| Number                                   | Part | Question (short form)                               | Utility 2012 response  |
|--|------|---|--|
| <b>Data file</b>                         |      |   |  |
| DS9                                      |      | Data file (Y/N?)                                    | Yes  |
| <b>Classification of dams</b>            |      |   |  |
| DS10                                     | a    | Sunny Day Consequence categories                    | Extreme  |
| DS10                                     | b    | Sunny Day Consequence Basis (PAR or PLL and value)  | PAR - 173<br>PLL - 134.7   |
| DS10                                     | c    | Sunny Day Consequence Review                        | Date of assessment - 2007<br>Date of next assessment - August 2012   |
| DS10                                     | d    | Flood Consequence categories                        | High A   |
| DS10                                     | e    | Flood Consequence categories (PAR or PLL and value) | Economic and water supply services. Failure of the downstream dams.<br>PAR - 146   |
| DS10                                     | f    | Flood Consequence categories Review                 | Date of assessment - 2007<br>Date of next assessment - August 2012   |
| <b>Operation and maintenance manuals</b> |      |   |  |
| DS11                                     | a    | O&M manuals (Y/N?)                                  | No   |
| DS11                                     | b    | Updating of O&M manuals (Y/N?)                      | No   |
| DS11                                     | c    | O&M manual is a controlled document (Y/N?)          | No   |
| DS11                                     | d    | Operations and Maintenance Log (Y/N?)               | Yes  |
| <b>Operations issues</b>                 |      |   |  |
| DS12                                     | a    | Flood events (Y/N? and list)                        | One significant flood - 4/3/12<br>Peak reservoir level - 956.412 m<br>Spillway level - 955.54 m<br>Peak inflow - 117 m3/s<br>Peak outflow - 107 m3/s |
| DS12                                     | b    | Earthquake events (Y/N? and list)                   | Most severe event - 19 April 2012  |

|                                |   |   |  |
|--------------------------------|---|---|--|
| DS12                           | c | Operating problems (Y/N? and describe)                | No   |
| <b>Maintenance performance</b> |   |   |  |
| DS13                           | a | Maintenance record (Y/N? and list)                    | Yes  |
| DS13                           | b | Deferred Maintenance (not required for 2012 report)   | n/a  |
| <b>Inspection of dams</b>      |   |   |  |
| DS14                           | a | Inspection regime (Y/N?)                              | Yes  |
| DS14                           | b | Inspection frequency (Y/N?)                           | Yes  |
| DS14                           | c | Inspection reports to suit dam (Y/N?)                 | Yes  |
| DS14                           | d | Minimum content of inspection reports (Y/N?)          | Yes  |
| DS14                           | e | Special/Emergency inspections (Y/N? and list)         | Yes<br>Trigger - flood event and earthquake<br>Dates - 4/3/12 and 19/4/12<br>Findings - no adverse findings                        |
| DS14                           | f | Completion of inspections (Y/N?)                      | Yes  |
| DS14                           | g | Inspection reports (Y/N?)                             | Yes  |
| <b>Surveillance reports</b>    |   |   |  |
| DS15                           | a | Latest Surveillance Report (state date)               | Jun-12   |
| DS15                           | b | Content of Surveillance reports (Y/N? and state)      | Yes  |
| <b>Instrumentation</b>         |   |   |  |
| DS16                           | a | Available instrumentation (list)                      | Leakage weirs<br>Groundwater boreholes<br>Open boreholes to the foundation<br>Topographical deformation<br>Seismic instrumentation |
| DS16                           | b | Calibration of instrumentation (Y/N? and state)       | Yes  |
| <b>Monitoring of dams</b>      |   |   |  |
| DS17                           | a | Monitoring that is undertaken (describe)              | Monitoring is undertaken of all instruments available at the dam   |
| DS17                           | b | Frequency of monitoring (Y/N? and state)              | Yes  |
| DS17                           | c | Monitoring of anchors (Y/N? and state)                | No - under reservoir level   |
| DS17                           | d | Mechanical and electrical monitoring (Y/N? and state) | Yes  |
| DS17                           | e | Preservation of monitoring records (Y/N?)             | Yes  |
| <b>Surveillance evaluation</b> |   |   |  |
| DS18                           |   | Surveillance evaluation (Y/N? and state)              | Yes  |
| <b>Safety review</b>           |   |   |  |
| DS19                           | a | Latest safety review (state)                          | Jun-11   |
| DS19                           | b | Comprehensive peer (Y/N?)                             | Yes  |

**Dam safety emergency plans**

|      |   |                                       |   |
|------|---|---------------------------------------|---|
| DS20 | a | Is there a DSEP (Y/N?)                | Yes   |
| DS20 | b | Date of latest DSEP update (state)    | 28/7/11 and 7/5/12  |
| DS20 | c | Latest DSEP test (state and describe) | Cotter River Dams desktop flood exercise conducted on 22/2/11<br>Agencies - John Holland, GHD, ACTEW, ActewAGL, ACTPLA<br>Lessons learned - inter-agency communication and coordination needed to improve; enlarged Cotter Dam alliance had robust procedures |

**Security of dams**

|      |   |  |        |
|------|---|--|--------|
| DS21 | a | Is there a security plan (Y/N?)                | Yes    |
| DS21 | b | Latest test or review of security plan (state) | Jun-12 |
| DS21 | c | Latest security assessment (state)             | 2010   |

**Dam safety incidents**

|      |   |  |     |
|------|---|--|-----|
| DS22 | a | Dam safety incidents (Y/N? and describe) | No  |
| DS22 | b | Incident reports (Y/N? and state)        | n/a |

**Dam safety developments**

|      |  |   |   |
|------|--|---|---|
| DS23 |  | Developments affecting dam safety (Y/N? and describe) | Construction of the Enlarged Cotter Dam impacts the consequences category for Corin Dam |
|------|--|---|---|

**Modification of dams**

|      |  |                      |    |
|------|--|----------------------|----|
| DS24 |  | Modifications (Y/N?) | No |
|------|--|----------------------|----|

**Key documents**

|      |   |   |    |
|------|---|---|----|
| DS25 | a | Design reports or safety reviews (Y/N?) | No |
| DS25 | b | Construction reports (Y/N?)             | No |
| DS25 | c | WAE drawings (Y/N?)                     | No |

**Safety status of dams**

|      |  |                                  |   |
|------|--|----------------------------------|---|
| DS26 |  | Safety status (choose a, b or c) | A |
|------|--|----------------------------------|---|









[Contents](#)  
[Instructions](#)

## Section 3: Technical regulation of water and sewerage

## 3.4 Bendora Dam responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

| Number                                   | Part | Question (short form)                               | Utility 2012 response   |
|--|------|---|---|
| <b>Data file</b>                         |      |   |   |
| DS9                                      |      | Data file (Y/N?)                                    | Yes   |
| <b>Classification of dams</b>            |      |   |   |
| DS10                                     | a    | Sunny Day Consequence categories                    | High B  |
| DS10                                     | b    | Sunny Day Consequence Basis (PAR or PLL and value)  | environmental damages<br>PAR - 62   |
| DS10                                     | c    | Sunny Day Consequence Review                        | Date of assessment - 2007<br>Date of next assessment - August 2012  |
| DS10                                     | d    | Flood Consequence categories                        | High B  |
| DS10                                     | e    | Flood Consequence categories (PAR or PLL and value) | Failure of the water supply system, economic major damage and<br>environmental damages<br>PAR - 65<br>PLL - 2 |
| DS10                                     | f    | Flood Consequence categories Review                 | Date of assessment - 2007<br>Date of next assessment - August 2012  |
| <b>Operation and maintenance manuals</b> |      |   |   |
| DS11                                     | a    | O&M manuals (Y/N?)                                  | No  |
| DS11                                     | b    | Updating of O&M manuals (Y/N?)                      | No  |
| DS11                                     | c    | O&M manual is a controlled document (Y/N?)          | No  |
| DS11                                     | d    | Operations and Maintenance Log (Y/N?)               | Yes   |
| <b>Operations issues</b>                 |      |   |   |

|                                |   |   |  |
|--------------------------------|---|---|--|
| DS12                           | a | Flood events (Y/N? and list)                        | One significant flood - 4/3/12<br>Peak reservoir level - 779.429 m<br>Spillway level - 778.20 m<br>Peak inflow - 108 m3/s<br>Peak outflow - 107 m3/s |
| DS12                           | b | Earthquake events (Y/N? and list)                   | Most severe event - 19 April 2012  |
| DS12                           | c | Operating problems (Y/N? and describe)              | No   |
| <b>Maintenance performance</b> |   |   |  |
| DS13                           | a | Maintenance record (Y/N? and list)                  | Yes  |
| DS13                           | b | Deferred Maintenance (not required for 2012 report) | n/a  |
| <b>Inspection of dams</b>      |   |   |  |
| DS14                           | a | Inspection regime (Y/N?)                            | Yes  |
| DS14                           | b | Inspection frequency (Y/N?)                         | Yes  |
| DS14                           | c | Inspection reports to suit dam (Y/N?)               | Yes  |
| DS14                           | d | Minimum content of inspection reports (Y/N?)        | Yes  |
| DS14                           | e | Special/Emergency inspections (Y/N? and list)       | Yes<br>Trigger - flood event and earthquake<br>Dates - 4/3/12 and 19/4/12<br>Findings - no adverse findings  |
| DS14                           | f | Completion of inspections (Y/N?)                    | Yes  |
| DS14                           | g | Inspection reports (Y/N?)                           | Yes  |
| <b>Surveillance reports</b>    |   |   |  |
| DS15                           | a | Latest Surveillance Report (state date)             | Jun-12   |
| DS15                           | b | Content of Surveillance reports (Y/N? and state)    | Yes  |
| <b>Instrumentation</b>         |   |   |  |
| DS16                           | a | Available instrumentation (list)                    | Deformation survey<br>Groundwater boreholes<br>Jointmeters   |
| DS16                           | b | Calibration of instrumentation (Y/N? and state)     | Yes  |
| <b>Monitoring of dams</b>      |   |   |  |

|                                   |   |   |   |
|-----------------------------------|---|---|---|
| DS17                              | a | Monitoring that is undertaken (describe)              | main dam, abutments<br>Right abutment rock movement<br>Parts of the reservoir rim<br>Gallery<br>Intake Tower<br>Toe area<br>Cone valve<br>Right bank cut BGM bench<br>Mini hydro<br>Downstream bridge deck and piers<br>Diesel generator                      |
| DS17                              | b | Frequency of monitoring (Y/N? and state)              | Yes   |
| DS17                              | c | Monitoring of anchors (Y/N? and state)                | No post-tensioned anchors   |
| DS17                              | d | Mechanical and electrical monitoring (Y/N? and state) | Yes   |
| DS17                              | e | Preservation of monitoring records (Y/N?)             | Yes   |
| <b>Surveillance evaluation</b>    |   |   |   |
| DS18                              |   | Surveillance evaluation (Y/N? and state)              | Yes   |
| <b>Safety review</b>              |   |   |   |
| DS19                              | a | Latest safety review (state)                          | Jun-12  |
| DS19                              | b | Comprehensive peer (Y/N?)                             | Yes   |
| <b>Dam safety emergency plans</b> |   |   |   |
| DS20                              | a | Is there a DSEP (Y/N?)                                | Yes   |
| DS20                              | b | Date of latest DSEP update (state)                    | 28/7/11 and 7/5/12  |
| DS20                              | c | Latest DSEP test (state and describe)                 | Cotter River Dams desktop flood exercise conducted on 22/2/11<br>Agencies - John Holland, GHD, ACTEW, ActewAGL, ACTPLA<br>Lessons learned - inter-agency communication and coordination needed to improve; enlarged Cotter Dam alliance had robust procedures |
| <b>Security of dams</b>           |   |   |   |
| DS21                              | a | Is there a security plan (Y/N?)                       | Yes   |
| DS21                              | b | Latest test or review of security plan (state)        | Jun-12  |
| DS21                              | c | Latest security assessment (state)                    | 2010  |
| <b>Dam safety incidents</b>       |   |   |   |
| DS22                              | a | Dam safety incidents (Y/N? and describe)              | No  |
| DS22                              | b | Incident reports (Y/N? and state)                     | n/a   |
| <b>Dam safety developments</b>    |   |   |   |
| DS23                              |   | Developments affecting dam safety (Y/N? and describe) | Construction of the enlarged Cotter Dam has an impact on the Bendora Dam failure consequence  |

**Modification of dams**

|      |  |                      |    |
|------|--|----------------------|----|
| DS24 |  | Modifications (Y/N?) | No |
|------|--|----------------------|----|

**Key documents**

|      |   |   |     |
|------|---|---|-----|
| DS25 | a | Design reports or safety reviews (Y/N?) | Yes |
|------|---|---|-----|

|      |   |                             |    |
|------|---|-----------------------------|----|
| DS25 | b | Construction reports (Y/N?) | No |
|------|---|-----------------------------|----|

|      |   |                     |    |
|------|---|---------------------|----|
| DS25 | c | WAE drawings (Y/N?) | No |
|------|---|---------------------|----|

**Safety status of dams**

|      |  |                                  |   |
|------|--|----------------------------------|---|
| DS26 |  | Safety status (choose a, b or c) | A |
|------|--|----------------------------------|---|









## 3.6 Cotter Dam responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

| Number                                   | Part | Question (short form)                               | Utility 2012 response |
|--|------|---|-----------------------|
| <b>Data file</b>                         |      |   |                       |
| DS9                                      |      | Data file (Y/N?)                                    |                       |
| <b>Classification of dams</b>            |      |   |                       |
| DS10                                     | a    | Sunny Day Consequence categories                    |                       |
| DS10                                     | b    | Sunny Day Consequence Basis (PAR or PLL and value)  |                       |
| DS10                                     | c    | Sunny Day Consequence Review                        |                       |
| DS10                                     | d    | Flood Consequence categories                        |                       |
| DS10                                     | e    | Flood Consequence categories (PAR or PLL and value) |                       |
| DS10                                     | f    | Flood Consequence categories Review                 |                       |
| <b>Operation and maintenance manuals</b> |      |   |                       |
| DS11                                     | a    | O&M manuals (Y/N?)                                  |                       |
| DS11                                     | b    | Updating of O&M manuals (Y/N?)                      |                       |
| DS11                                     | c    | O&M manual is a controlled document (Y/N?)          |                       |
| DS11                                     | d    | Operations and Maintenance Log (Y/N?)               |                       |
| <b>Operations issues</b>                 |      |   |                       |
| DS12                                     | a    | Flood events (Y/N? and list)                        |                       |
| DS12                                     | b    | Earthquake events (Y/N? and list)                   |                       |
| DS12                                     | c    | Operating problems (Y/N? and describe)              |                       |
| <b>Maintenance performance</b>           |      |   |                       |
| DS13                                     | a    | Maintenance record (Y/N? and list)                  |                       |
| DS13                                     | b    | Deferred Maintenance (not required for 2012 report) |                       |
| <b>Inspection of dams</b>                |      |   |                       |
| DS14                                     | a    | Inspection regime (Y/N?)                            |                       |

|                                   |   |   |  |
|-----------------------------------|---|---|--|
| DS14                              | b | Inspection frequency (Y/N?)                           |  |
| DS14                              | c | Inspection reports to suit dam (Y/N?)                 |  |
| DS14                              | d | Minimum content of inspection reports (Y/N?)          |  |
| DS14                              | e | Special/Emergency inspections (Y/N? and list)         |  |
| DS14                              | f | Completion of inspections (Y/N?)                      |  |
| DS14                              | g | Inspection reports (Y/N?)                             |  |
| <b>Surveillance reports</b>       |   |   |  |
| DS15                              | a | Latest Surveillance Report (state date)               |  |
| DS15                              | b | Content of Surveillance reports (Y/N? and state)      |  |
| <b>Instrumentation</b>            |   |   |  |
| DS16                              | a | Available instrumentation (list)                      |  |
| DS16                              | b | Calibration of instrumentation (Y/N? and state)       |  |
| <b>Monitoring of dams</b>         |   |   |  |
| DS17                              | a | Monitoring that is undertaken (describe)              |  |
| DS17                              | b | Frequency of monitoring (Y/N? and state)              |  |
| DS17                              | c | Monitoring of anchors (Y/N? and state)                |  |
| DS17                              | d | Mechanical and electrical monitoring (Y/N? and state) |  |
| DS17                              | e | Preservation of monitoring records (Y/N?)             |  |
| <b>Surveillance evaluation</b>    |   |   |  |
| DS18                              |   | Surveillance evaluation (Y/N? and state)              |  |
| <b>Safety review</b>              |   |   |  |
| DS19                              | a | Latest safety review (state)                          |  |
| DS19                              | b | Comprehensive peer (Y/N?)                             |  |
| <b>Dam safety emergency plans</b> |   |   |  |
| DS20                              | a | Is there a DSEP (Y/N?)                                |  |
| DS20                              | b | Date of latest DSEP update (state)                    |  |
| DS20                              | c | Latest DSEP test (state and describe)                 |  |
| <b>Security of dams</b>           |   |   |  |
| DS21                              | a | Is there a security plan (Y/N?)                       |  |
| DS21                              | b | Latest test or review of security plan (state)        |  |
| DS21                              | c | Latest security assessment (state)                    |  |
| <b>Dam safety incidents</b>       |   |   |  |
| DS22                              | a | Dam safety incidents (Y/N? and describe)              |  |
| DS22                              | b | Incident reports (Y/N? and state)                     |  |
| <b>Dam safety developments</b>    |   |   |  |

|                              |   |   |  |
|------------------------------|---|---|--|
| DS23                         |   | Developments affecting dam safety (Y/N? and describe) |  |
| <b>Modification of dams</b>  |   |   |  |
| DS24                         |   | Modifications (Y/N?)                                  |  |
| <b>Key documents</b>         |   |   |  |
| DS25                         | a | Design reports or safety reviews (Y/N?)               |  |
| DS25                         | b | Construction reports (Y/N?)                           |  |
| DS25                         | c | WAE drawings (Y/N?)                                   |  |
| <b>Safety status of dams</b> |   |   |  |
| DS26                         |   | Safety status (choose a, b or c)                      |  |



Contents  
Instructions

Section 3: Technical regulation of water and sewerage

### 3.7 Cotter Dam responses - Supplementary information

**Note:** Please reference each item with the relevant question.

| Number | Part | Utility 2012 response  |
|--------|------|--|
| All    |      | Cotter Dam has been decommissioned and is under the Enlarged Cotter Dam reservoir. No surveillance of the dam is possible.<br>Underwater inspection may be carried out in the future at a frequency of 20 years. |
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## 3.8 LMWQCC Dam responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

| Number                                   | Part | Question (short form)                               | Utility 2012 response  |
|--|------|---|--|
| <b>Data file</b>                         |      |   |  |
| DS9                                      |      | Data file (Y/N?)                                    | Yes  |
| <b>Classification of dams</b>            |      |   |  |
| DS10                                     | a    | Sunny Day Consequence categories                    | Low  |
| DS10                                     | b    | Sunny Day Consequence Basis (PAR or PLL and value)  | Environmental and economic damage<br>PAR - 0   |
| DS10                                     | c    | Sunny Day Consequence Review                        | Date of assessment - 1994<br>Date of next assessment - reviewed annually as part of risk assessment  |
| DS10                                     | d    | Flood Consequence categories                        | Low  |
| DS10                                     | e    | Flood Consequence categories (PAR or PLL and value) | Environmental and economic damage<br>PAR - 0   |
| DS10                                     | f    | Flood Consequence categories Review                 | Date of assessment - 1994<br>Date of next assessment - reviewed annually as part of risk assessment  |
| <b>Operation and maintenance manuals</b> |      |   |  |
| DS11                                     | a    | O&M manuals (Y/N?)                                  | No   |
| DS11                                     | b    | Updating of O&M manuals (Y/N?)                      | No   |
| DS11                                     | c    | O&M manual is a controlled document (Y/N?)          | No   |
| DS11                                     | d    | Operations and Maintenance Log (Y/N?)               | Yes  |
| <b>Operations issues</b>                 |      |   |  |
| DS12                                     | a    | Flood events (Y/N? and list)                        | One significant flood event - 1-5 March 2012<br>% level in dam - 105<br>Max daily inflow - 325 ML/d<br>Max daily outflow - 325 ML/d<br>Peak inflow - 5 m <sup>3</sup> /s<br>Peak outflow - 5 m <sup>3</sup> /s |

|                                |   |   |   |
|--------------------------------|---|---|---|
| DS12                           | b | Earthquake events (Y/N? and list)                     | Most severe event - 19 April 2012   |
| DS12                           | c | Operating problems (Y/N? and describe)                | No  |
| <b>Maintenance performance</b> |   |   |   |
| DS13                           | a | Maintenance record (Y/N? and list)                    | Yes   |
| DS13                           | b | Deferred Maintenance (not required for 2012 report)   | n/a   |
| <b>Inspection of dams</b>      |   |   |   |
| DS14                           | a | Inspection regime (Y/N?)                              | Yes   |
| DS14                           | b | Inspection frequency (Y/N?)                           | Yes   |
| DS14                           | c | Inspection reports to suit dam (Y/N?)                 | Yes   |
| DS14                           | d | Minimum content of inspection reports (Y/N?)          | Yes   |
| DS14                           | e | Special/Emergency inspections (Y/N? and list)         | Yes<br>Trigger - flood event and earthquake<br>Dates - 4/3/12 and 19/4/12<br>Findings - no adverse findings |
| DS14                           | f | Completion of inspections (Y/N?)                      | Yes   |
| DS14                           | g | Inspection reports (Y/N?)                             | Yes   |
| <b>Surveillance reports</b>    |   |   |   |
| DS15                           | a | Latest Surveillance Report (state date)               | Jun-12  |
| DS15                           | b | Content of Surveillance reports (Y/N? and state)      | Yes   |
| <b>Instrumentation</b>         |   |   |   |
| DS16                           | a | Available instrumentation (list)                      | Groundwater boreholes<br>Leakage weirs<br>Piezometers   |
| DS16                           | b | Calibration of instrumentation (Y/N? and state)       | Yes   |
| <b>Monitoring of dams</b>      |   |   |   |
| DS17                           | a | Monitoring that is undertaken (describe)              | Leakage<br>Thermometers<br>Piezometers<br>Deformation survey<br>Groundwater level changes                   |
| DS17                           | b | Frequency of monitoring (Y/N? and state)              | Yes   |
| DS17                           | c | Monitoring of anchors (Y/N? and state)                | No anchors  |
| DS17                           | d | Mechanical and electrical monitoring (Y/N? and state) | Yes   |
| DS17                           | e | Preservation of monitoring records (Y/N?)             | Yes   |
| <b>Surveillance evaluation</b> |   |   |   |
| DS18                           |   | Surveillance evaluation (Y/N? and state)              | Yes   |

**Safety review**

|      |   |                              |        |
|------|---|------------------------------|--------|
| DS19 | a | Latest safety review (state) | Jun-12 |
| DS19 | b | Comprehensive peer (Y/N?)    | Yes    |

**Dam safety emergency plans**

|      |   |                                       |   |
|------|---|---------------------------------------|---|
| DS20 | a | Is there a DSEP (Y/N?)                | Yes   |
| DS20 | b | Date of latest DSEP update (state)    | 28/7/11 and 7/5/12  |
| DS20 | c | Latest DSEP test (state and describe) | LMWQCC Bypass Dam Storage Discharge on 1/3/12<br>Agencies - ACTEW Corporation, ActewAGL, ACT Health, ESDD<br>Lessons learned - everything worked well; lack of understanding of communication protocols |

**Security of dams**

|      |   |  |        |
|------|---|--|--------|
| DS21 | a | Is there a security plan (Y/N?)                | Yes    |
| DS21 | b | Latest test or review of security plan (state) | Jun-12 |
| DS21 | c | Latest security assessment (state)             | 2010   |

**Dam safety incidents**

|      |   |  |     |
|------|---|--|-----|
| DS22 | a | Dam safety incidents (Y/N? and describe) | No  |
| DS22 | b | Incident reports (Y/N? and state)        | n/a |

**Dam safety developments**

|      |  |   |    |
|------|--|---|----|
| DS23 |  | Developments affecting dam safety (Y/N? and describe) | No |
|------|--|---|----|

**Modification of dams**

|      |  |                      |    |
|------|--|----------------------|----|
| DS24 |  | Modifications (Y/N?) | No |
|------|--|----------------------|----|

**Key documents**

|      |   |   |     |
|------|---|---|-----|
| DS25 | a | Design reports or safety reviews (Y/N?) | No  |
| DS25 | b | Construction reports (Y/N?)             | No  |
| DS25 | c | WAE drawings (Y/N?)                     | Yes |

**Safety status of dams**

|      |  |                                  |   |
|------|--|----------------------------------|---|
| DS26 |  | Safety status (choose a, b or c) | A |
|------|--|----------------------------------|---|





[Contents](#)  
[Instructions](#)

Section 3: Technical regulation of water and sewerage

## 3.9 LMWQCC Dam responses - Supplementary information

**Note:** Please reference each item with the relevant question.

| Number | Part | Utility 2012 response |
|--------|------|-----------------------|
|        |      |                       |
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## 3.10 Googong Dam responses

**Note:** Responses should be provided in accordance with the Explanatory Notes and the List of Questions.

| Number                                   | Part | Question (short form)                               | Utility 2012 response  |
|--|------|---|--|
| <b>Data file</b>                         |      |   |  |
| DS9                                      |      | Data file (Y/N?)                                    | Yes  |
| <b>Classification of dams</b>            |      |   |  |
| DS10                                     | a    | Sunny Day Consequence categories                    | Extreme  |
| DS10                                     | b    | Sunny Day Consequence Basis (PAR or PLL and value)  | environmental impact.<br>PAR - 15,000  |
| DS10                                     | c    | Sunny Day Consequence Review                        | Date of assessment - 1988<br>Date of next assessment - 2012/13<br>The flood hydrology, development downstream of the dam and Googong risk status have changed and requires a review of the assessment. |
| DS10                                     | d    | Flood Consequence categories                        | Extreme  |
| DS10                                     | e    | Flood Consequence categories (PAR or PLL and value) | PAR - major economic and environmental damage. Water supply and environmental impact.<br>PAR - 15,000  |
| DS10                                     | f    | Flood Consequence categories Review                 | Date of assessment - 1988<br>Date of next assessment - 2012/13<br>The flood hydrology, development downstream of the dam and Googong risk status have changed and requires a review of the assessment. |
| <b>Operation and maintenance manuals</b> |      |   |  |
| DS11                                     | a    | O&M manuals (Y/N?)                                  | No   |
| DS11                                     | b    | Updating of O&M manuals (Y/N?)                      | No   |
| DS11                                     | c    | O&M manual is a controlled document (Y/N?)          | No   |
| DS11                                     | d    | Operations and Maintenance Log (Y/N?)               | Yes  |

### Operations issues

|                                |   |   |  |
|--------------------------------|---|---|--|
| DS12                           | a | Flood events (Y/N? and list)                        | One significant flood - 1/3/12<br>Peak reservoir level - 664.084 m<br>Spillway level - 663.00 m<br>Peak inflow - 331 m3/s<br>Peak outflow - 250 m3/s   |
| DS12                           | b | Earthquake events (Y/N? and list)                   | Most severe event - 19 April 2012  |
| DS12                           | c | Operating problems (Y/N? and describe)              | No   |
| <b>Maintenance performance</b> |   |   |  |
| DS13                           | a | Maintenance record (Y/N? and list)                  | Yes  |
| DS13                           | b | Deferred Maintenance (not required for 2012 report) | n/a  |
| <b>Inspection of dams</b>      |   |   |  |
| DS14                           | a | Inspection regime (Y/N?)                            | Yes  |
| DS14                           | b | Inspection frequency (Y/N?)                         | Yes  |
| DS14                           | c | Inspection reports to suit dam (Y/N?)               | Yes  |
| DS14                           | d | Minimum content of inspection reports (Y/N?)        | Yes  |
| DS14                           | e | Special/Emergency inspections (Y/N? and list)       | Yes<br>Trigger - flood event and earthquake<br>Dates - 4/3/12 and 19/4/12<br>Findings - no adverse findings. Recent upgrade of dam successfully managed discharge of flood.  |
| DS14                           | f | Completion of inspections (Y/N?)                    | Yes  |
| DS14                           | g | Inspection reports (Y/N?)                           | Yes  |
| <b>Surveillance reports</b>    |   |   |  |
| DS15                           | a | Latest Surveillance Report (state date)             | Jun-12   |
| DS15                           | b | Content of Surveillance reports (Y/N? and state)    | Yes  |
| <b>Instrumentation</b>         |   |   |  |
| DS16                           | a | Available instrumentation (list)                    | <ul style="list-style-type: none"> <li>• Deformation survey points on both dams and on raised section</li> <li>• Leakage collection and measuring points at main dam, saddle dam and tunnel</li> <li>• Hydrostatic settlement gauges in the main embankment (out of service)</li> <li>• Groundwater boreholes at the main embankment and the saddle dam</li> <li>• Ground motion recorders</li> <li>• Piezometers installed at the spillway</li> </ul> |
| DS16                           | b | Calibration of instrumentation (Y/N? and state)     | Yes  |
| <b>Monitoring of dams</b>      |   |   |  |

|                                   |   |   |  |
|-----------------------------------|---|---|--|
| DS17                              | a | Monitoring that is undertaken (describe)              | Leakage<br>Piezometers<br>Deformation survey<br>Groundwater changes<br>(as per ANCOLD publication and Googong Dam surveillance procedures)   |
| DS17                              | b | Frequency of monitoring (Y/N? and state)              | Yes  |
| DS17                              | c | Monitoring of anchors (Y/N? and state)                | Yes  |
| DS17                              | d | Mechanical and electrical monitoring (Y/N? and state) | Yes  |
| DS17                              | e | Preservation of monitoring records (Y/N?)             | Yes  |
| <b>Surveillance evaluation</b>    |   |   |  |
| DS18                              |   | Surveillance evaluation (Y/N? and state)              | Yes  |
| <b>Safety review</b>              |   |   |  |
| DS19                              | a | Latest safety review (state)                          | Jun-12   |
| DS19                              | b | Comprehensive peer (Y/N?)                             | Yes  |
| <b>Dam safety emergency plans</b> |   |   |  |
| DS20                              | a | Is there a DSEP (Y/N?)                                | Yes  |
| DS20                              | b | Date of latest DSEP update (state)                    | 17/01/2012   |
| DS20                              | c | Latest DSEP test (state and describe)                 | Desktop exercise involving an explosion initiated failure of Googong Dam on 27/3/12<br>Agencies involved - ActewAGL, ESA, Department of Recovery, Justice and Community Safety, ESDD, ACT Health, ACT Policing, NSW Policing, SES, Red Cross, Emergency Management Australia<br>Lessons learned - lack of understanding of the impact of dam failure; lack of understanding of communication protocols; difference of opinion about responsibilities of agencies |
| <b>Security of dams</b>           |   |   |  |
| DS21                              | a | Is there a security plan (Y/N?)                       | Yes  |
| DS21                              | b | Latest test or review of security plan (state)        | Jun-12   |
| DS21                              | c | Latest security assessment (state)                    | 2010   |
| <b>Dam safety incidents</b>       |   |   |  |
| DS22                              | a | Dam safety incidents (Y/N? and describe)              | No   |
| DS22                              | b | Incident reports (Y/N? and state)                     | n/a  |
| <b>Dam safety developments</b>    |   |   |  |
| DS23                              |   | Developments affecting dam safety (Y/N? and describe) | Changes in the Queanbeyan city and flood hydrology. It is required to have a review of the risk and consequences of the failure.   |
| <b>Modification of dams</b>       |   |   |  |

|                              |   |   |     |
|------------------------------|---|---|-----|
| DS24                         |   | Modifications (Y/N?)                    | No  |
| <b>Key documents</b>         |   |   |     |
| DS25                         | a | Design reports or safety reviews (Y/N?) | Yes |
| DS25                         | b | Construction reports (Y/N?)             | Yes |
| DS25                         | c | WAE drawings (Y/N?)                     | Yes |
| <b>Safety status of dams</b> |   |   |     |
| DS26                         |   | Safety status (choose a, b or c)        | A   |



