

## Northern Water Supply Project – Site Selection Multi-Criteria Analysis (MCA) Summary

**Date:** 9 March 2023  
**Project name:** Northern Water Supply  
**Project no:** IW280700  
**Attention:** Alecia Wright; Josephine Telfer  
**Company:** Infrastructure SA (ISA)  
**Prepared by:** Rachel Barratt; Erin Vais

### 1. Purpose

The purpose of this memorandum is to provide Infrastructure South Australia (ISA) with an overview of the process and outcomes from a Multi Criteria Assessment (MCA) undertaken with stakeholders to assess and compare the merits of the three possible locations of the proposed desalination plant for the Northern Water Supply project.

The outcomes of the MCA will be used by ISA to inform a decision regarding the preferred location for siting the proposed desalination plant.

### 2. Background

Jacobs Group (Australia) Pty Ltd and GHD Pty Ltd have been engaged by Infrastructure SA (ISA) to provide engineering services in support of the Northern Water Supply (NWS) Final Business Case (FBC).

The NWS is a priority initiative for South Australia and offers a unique opportunity for significant economic growth in the north of the State. The NWS aims to provide a sustainable water supply to end-users that currently extract water from the Great Artesian Basin (GAB) and River Murray, water sources that support significant environmental and cultural values. The secure source of new water that will serve mineral production, defence, agriculture (pastoralists), and other emerging industries in northern SA, while also providing the opportunity to supply water to SA Water and its customers.

This project aims to deliver up to 260 megalitres per day (ML/d) of water from a seawater reverse osmosis desalination plant located in the Upper Spencer Gulf. Investigation and assessment of the NWS project in various forms has taken place over the past two decades, including by BHP, who progressed to a conditionally approved EIS in 2011 for a plant located at Point Lowly, and SA Water, who are considering long term plans to construct its own desalination plant in the region.

In its current form as a government-led scheme, the Strategic Assessment (Gate 0) was completed in August 2021, with the subsequent Options Analysis (Gate 1) completed in early 2022. The project is currently progressing towards a Final Business Case (Gate 2) in early 2023.

The Options Analysis report identified Point Lowly as the preferred location after 22 sites were considered, ranging from Fowlers Bay in the far west to Adelaide in the south east. Subsequent feedback from stakeholders and the community identified the need to re-examine the preferred location and undertake an MCA.

### 3. Scope of Services

The ISA team engaged Jacobs/GHD to assist in facilitating an MCA with a select group of stakeholders to better understand the costs and benefits (merits) of three possible desalination sites, namely Point Lowly, Crag Pont and Mullaquana Station.

The MCA was designed in line with the Infrastructure Australia guidelines and focused on providing a value to a range of non-quantifiable criteria.

The MCA was held over three meetings where the stakeholders came together to:

- 1 Inform the criteria to be used in the MCA in October 2022
- 2 Inform the weighting of the proposed criteria in September 2022
- 3 Undertake the MCA using the agreed criteria and weightings in January 2023

The Jacobs/GHD team provided input and commentary to the criteria developed Workshop 1, facilitated Workshops 2 and 3, and collated/analysed the inputs and outputs to the criteria weightings and scores.

## 4. Methodology

The methodology for each workshop is summarised in Table 4-1. For all three workshops the participants were provided with information for discussion, and in Workshops 2 and 3 used an online tool (Menti) to provide an anonymous score. At completion of scoring activities the scores were shared with participants and the opportunity to discuss. Following each workshop, the project team (ISA and Jacobs/GHD) reviewed the inputs and undertook sensitivity analysis to confirm and finalise the proposed criteria weighting and outcomes.

Appendix A provides the list of workshop attendees for Workshops 2 and 3 who provided input to scoring. Workshop 1 was held with a larger group of participants, who were asked to volunteer to be part of this smaller group for scoring.

Appendix B provides the details of the criteria, weightings, and scoring used. Assumptions identified and discussed at the workshop were documented and confirmed with participants and provided in Appendix C. These assumptions informed the scores for various criteria.

**Table 4-1 MCA Workshop Methodology**

| Workshop                 | Methodology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 – Criteria Development | <p>This workshop was focused on reviewing the draft categories, themes and objectives. The workshop participants were first presented with the desired outcomes, criteria and sub-categories. The participants were then broken into groups with direction to discuss:</p> <ul style="list-style-type: none"> <li>▪ What do you agree with?</li> <li>▪ Will they provide enough differentiation so that a clear site can be chosen?</li> <li>▪ What would you change/add?</li> <li>▪ Is there anything else you would be expecting to see?</li> </ul> <p>In the second activity participants were presented with proposed key performance measures and similarly asked to discuss:</p> <ul style="list-style-type: none"> <li>▪ Are these Performance Measures relevant?</li> <li>▪ Are there any Performance Measures missing?</li> <li>▪ Would you suggest any amendments?</li> <li>▪ What are possible qualitative measures for criteria?</li> <li>▪ Are any criteria or measure more relevant or higher priority?</li> </ul> <p>Subsequent to the workshop, the feedback was used to update and refine the criteria and performance measures which were then redistributed to the participants.</p> |
| 2 – Criteria Weightings  | <p>The purpose of this workshop was to gain input and feedback on the weightings for each criteria and sub-criteria. The participants were presented with the revised criteria and then asked to provide an anonymous score via an online tool (Menti). The scores were input on a scale of 1 (low importance) to 5 (very high importance).</p> <p>The median scores were used to remove the influence of outliers, and converted to a normalised percentage. Sensitivity scenarios to test the impact of alternate weighting</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Workshop             | Methodology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | outcomes were developed by the project team after the workshop and distributed to the workshop participants along with the baseline weightings for comment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3 – Criteria Scoring | <p>The final workshop was used to obtain stakeholder input on scoring of the three sites against the sub-criteria. Workshop participants were presented with the information aligned to the criteria performance measures followed by discussion. Participants were then asked to provide an anonymous score via an online tool (Menti). The scores were input on a scale of 0 to 5 as outlined in Appendix B. The median scores were used to remove the influence of outliers.</p> <p>The preliminary outputs for site selection ranking were reviewed with participants in the workshop. Subsequent to the workshop, the results were assessed, sensitivity scenarios tested, and the outputs distributed to the workshop participants for comment.</p> |

## 5. MCA Results

The MCA included 17 criteria across four categories:

1. Sustainability
2. Social Sustainability and Liveability
3. Financial Efficiency/Prudency
4. Technical Robustness

Mullaquana scored the highest across the three sites and scored equal or best for all categories in the MCA with the exception of construction cost. There was little differentiation between Point Lowly and Crag Point. **Table 5-1** below provides a summary of the MCA scores with the full detail provided in Appendix D.

Table 5-1 Summary of MCA scores

| Category |                                                                                        | Sub-category |                                                          |                                                       | Weighted Site Score |            |            |
|----------|----------------------------------------------------------------------------------------|--------------|----------------------------------------------------------|-------------------------------------------------------|---------------------|------------|------------|
|          |                                                                                        |              |                                                          |                                                       | Point Lowly         | Crag Point | Mullaquana |
| 1        | Sustainability<br>(considers environmental values)                                     | 1.1          | Land and Habitat impacts are avoided or minimised        | Bio-physical Environment                              | 0.23                | 0.23       | 0.30       |
|          |                                                                                        | 1.2          | Marine impacts are avoided or minimised                  | Bio-physical Environment                              | 0.18                | 0.14       | 0.36       |
|          |                                                                                        | 1.3          | Climate impacts are avoided or minimised                 | Greenhouse Gas Emissions                              | 0.18                | 0.18       | 0.18       |
|          |                                                                                        | 1.4          | Opportunity to offset climate dependent water sources    | Opportunity to offset climate dependent water sources | 0.23                | 0.15       | 0.30       |
|          |                                                                                        |              |                                                          |                                                       |                     |            |            |
| 2        | Social Sustainability and Liveability<br>(considers community needs and social values) | 2.1          | Heritage elements and sites are preserved and maintained | Aboriginal and Non-Aboriginal Heritage                | 0.10                | 0.13       | 0.20       |
|          |                                                                                        | 2.2          | Option enhances strategic intent for growth              | a. Tourism and Recreation                             | 0.04                | 0.08       | 0.11       |
|          |                                                                                        |              |                                                          | b. Economic Growth                                    | 0.15                | 0.10       | 0.20       |
|          |                                                                                        |              |                                                          | c. Business/Commercial                                | 0.10                | 0.05       | 0.15       |
|          |                                                                                        | 2.3          | Human Health and Well Being                              | a. Health                                             | 0.06                | 0.08       | 0.08       |
|          |                                                                                        |              |                                                          | b. Amenity                                            | 0.08                | 0.08       | 0.11       |
|          |                                                                                        |              |                                                          |                                                       |                     |            |            |
| 3        | Financial Efficiency/ Prudency                                                         | 3.1          | Whole of life cost                                       | a. Construction                                       | 0.30                | 0.30       | 0.10       |
|          |                                                                                        |              |                                                          | b. Operation                                          | 0.30                | 0.30       | 0.30       |
|          |                                                                                        |              |                                                          |                                                       |                     |            |            |
| 4        | Technical Robustness                                                                   | 4.1          | Constructability                                         | a. Construction complexity                            | 0.15                | 0.15       | 0.15       |
|          |                                                                                        |              |                                                          | b. Program                                            | 0.05                | 0.10       | 0.20       |
|          |                                                                                        | 4.2          | Operability                                              | Operational Maintenance                               | 0.15                | 0.13       | 0.18       |
|          |                                                                                        | 4.3          | Climate resilience                                       | Design and Operations                                 | 0.15                | 0.15       | 0.15       |
|          |                                                                                        | 4.4          | Opportunity for future expansion                         | Opportunity for future expansion                      | 0.08                | 0.13       | 0.20       |
|          |                                                                                        |              |                                                          |                                                       |                     | 2.51       | 2.44       |
|          |                                                                                        |              |                                                          |                                                       | 2                   | 3          | 1          |

## 5.1 Financial Efficiency

On review of the criteria and scores, following the MCA workshop, the project team recommended to the participants that adjustments be made to the scoring approach under Financial Efficiency Category as the inclusion of cost as a qualitative assessment reduced the defensibility of the MCA process. As a result, the scores were amended to reflect the relative costs based on site section.

The new scores applied were:

- 5 - Greater than 30% benefit from site selection
- 4- 10 - 30% cost benefit from site selection
- 3- Within +/- 10% cost impact from site selection
- 2 -10 - 30% cost impact from site selection
- 1- Greater than 30% cost impact on site selection

Using the above approach:

- From a capital perspective, Crag Point and Point Lowly have a 9% cost impact and Mullaquana 32% based on the Options Analysis cost estimate and the Jacobs/GHD site selection work. This results in Crag Point and Point Lowly scoring 1 and Mullaquana 3.
- For operational cost, they all scored 3 as there were very little operational differences between the three sites.

A summary of the results from the assessment have been included in the final overall scores.

## 5.2 Sensitivity Scenarios

The scores were tested using three sensitivity scenarios, developed by the project team and informed by a community sentiment survey undertaken by ISA. Under each scenario, Mullaquana scored the highest.

Table 5-2. Sensitivity Scenarios

| Sensitivity Scenario                             | Sustainability | Social Sustainability and Liveability | Financial Efficiency/Prudence | Technical Robustness | Point Lowly | Crag Point | Mullaquana |
|--------------------------------------------------|----------------|---------------------------------------|-------------------------------|----------------------|-------------|------------|------------|
| Workshop weighting                               | 30%            | 25%                                   | 20%                           | 25%                  | 2.51        | 2.44       | 3.27       |
| Sensitivity scenario 1 = Sustainability emphasis | 40%            | 30%                                   | 15%                           | 15%                  | 2.51        | 2.36       | 3.37       |
| Sensitivity scenario 2 = Financial               | 20%            | 15%                                   | 40%                           | 25%                  | 2.63        | 2.61       | 2.95       |
| Sensitivity scenario 3 = Community sentiment     | 38%            | 27%                                   | 13%                           | 22%                  | 2.49        | 2.38       | 3.39       |

## 6. Summary and Recommendation

The MCA process allowed stakeholders to consider and assess a range of criteria in a consistent and agreed manner. The scores clearly demonstrate that the proposed site at Mullaquana is likely to have the least negative impacts and deliver the greatest benefits when compared to both Point Lowly and Crag Point.

Based on this assessment, Mullaquana is the preferred site for further consideration.

## Appendix A – Attendees

**Table A 1 Workshop Attendees – Workshops 2 and 3**

| Attendee                        | Representing                                                                  | Workshop 2 |         | Workshop 3 |         |
|---------------------------------|-------------------------------------------------------------------------------|------------|---------|------------|---------|
|                                 |                                                                               | Attendance | Scoring | Attendance | Scoring |
| Michael Cresshull               | Whyalla Business and Tourism / PIRSA                                          | Y          | Y       | Y          | Y       |
| Karen Hollamby                  | PIRSA (Fisheries and Aquaculture)                                             | Y          | Y       | Y          | Y       |
| Andrew Freeman                  | Eyre Peninsula Landscape Board                                                | Y          | Y       | Y          | Y       |
| Jade Ballantine                 | Whyalla Council                                                               | Y          | Y       | Y          | Y       |
| Keith Rowling                   | Marine Scale Net Fishers Association<br>and Chartered Boat Owners Association | Y          | Y       | Y          | Y       |
| David Noonan                    | Conservation Council of SA                                                    | Y          | Y       | Y          | Y       |
| Mark Pierson /Steve Reynolds    | Marine Life Society                                                           | Y          | Y       | Y          | Y       |
| Alecia Wright                   | Infrastructure SA                                                             | Y          | Y       | Y          | Y       |
| Josephine Telfer                | Infrastructure SA                                                             | Y          | Y       | Y          | Y       |
| Mike Morgan                     | Infrastructure SA                                                             | Y          | N       | Y          | N       |
| Robran Cock                     | Infrastructure SA                                                             | Y          | Y       | Y          | Y       |
| David Winterburn                | Infrastructure SA                                                             | Y          | Y       | Y          | Y       |
| Antony Lockyer                  | Infrastructure SA                                                             | N          | -       | Y          | N       |
| Andrew Padgett                  | Regional Development Australia Far North                                      | Y          | Y       | Y          | Y       |
| Stephanie Hensgen               | Planning Futures                                                              | N          | -       | Y          | N       |
| Erin Vais                       | Jacobs/GHD                                                                    | Y          | N       | Y          | N       |
| Rachel Barratt<br>(Facilitator) | Jacobs/GHD                                                                    | Y          | N       | Y          | N       |

## Appendix B – MCA Criteria, Weightings, and Scoring

**Table B 1 MCA Criteria and Weightings**

| Category                                           | Weighting | Criteria                                                 | Sub-category                                          | Performance measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Detailed Weighting |
|----------------------------------------------------|-----------|----------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Sustainability<br>(considers environmental values) | 30%       | 1.1<br>Land and Habitat impacts are avoided or minimised | Bio-physical Environment                              | <ul style="list-style-type: none"> <li>- Impacts to terrestrial flora and fauna, and/or habitats.</li> <li>- Proximity and risk to existing surface and groundwater resources (including critical water supplies) both during construction and operations including changes in flows/catchments.</li> <li>- Proximity to National and State parks, protected National and State species and habitats and other protected zones (such as water protection zones);</li> <li>- Significance of native vegetation on site and pipeline route.</li> <li>- Extent of native vegetation clearance and possible re-clearance for maintenance purposes required (and potential costs of clearance).</li> <li>-potential for terrestrial impacts on marine environment</li> </ul>                                                                                                                                                                                   | 25%                |
|                                                    |           | 1.2<br>Marine impacts are avoided or minimised           | Bio-physical Environment                              | <ul style="list-style-type: none"> <li>- Potential for direct environmental impact on benthic communities (biological communities living on the sea bed - algae, seagrass, mangroves and corals ; and molluscs, sponges and worms)</li> <li>- Potential for direct environmental impact on migration paths, breeding grounds including mangroves</li> <li>- Potential for the construction and operation of the desalination plant to impact on marine fauna.</li> <li>- Potential for the desalination plant to impact on coastal processes (currents, salinity gradients, water mixing, near shore environments).</li> <li>- Potential for the desalination plant to result in poor marine environmental quality (sediment, water, biota).</li> <li>- Proximity to State marine parks (and consideration of zoning within marine park), protected marine species and habitats and aquaculture industry, e.g., sanctuaries, protection zones.</li> </ul> | 30%                |
|                                                    |           | 1.3<br>Climate impacts are avoided or minimised          | Greenhouse Gas Emissions                              | <ul style="list-style-type: none"> <li>- Propensity of the project to emit greenhouse gas emissions:</li> <li>- Embedded emissions in construction materials</li> <li>- Emissions associated with the provision of electricity (electricity demand)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 20%                |
|                                                    |           | 1.4<br>Water supply impacts are avoided or minimised     | Opportunity to offset climate dependent water sources | Potential for offset climate dependent water sources including: <ul style="list-style-type: none"> <li>- Great Artesian Basin groundwater</li> <li>- Far North groundwater</li> <li>- Eyre Peninsula groundwater</li> <li>- River Murray</li> <li>- Other rainfall dependent surface water supplies</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 25%                |

| Category                                                                                      | Weighting | Criteria | Sub-category                                             | Performance measures                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Detailed Weighting |
|-----------------------------------------------------------------------------------------------|-----------|----------|----------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Social Sustainability and Liveability</b><br>(considers community needs and social values) | 25%       | 2.1      | Heritage elements and sites are preserved and maintained | Aboriginal and Non-Aboriginal Heritage | <ul style="list-style-type: none"> <li>- Maximises preservation and value to areas of Aboriginal heritage significance.</li> <li>- Minimise impact to land subject to Native Title.</li> <li>- Minimise impact to areas of European heritage significance.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20%                |
|                                                                                               |           | 2.2      | Option enhances strategic intent for growth              | A                                      | <b>Tourism and Recreation</b> <ul style="list-style-type: none"> <li>- Proximity to Tourism precincts, including townships, recreational fishing areas, nature-based tourist spots;</li> <li>- Extent to which recreational fishing may be affected (including exclusion zones)</li> <li>- Extent to which public perception may impact on shack owners</li> <li>- Potential for positive impacts on sporting facilities/city greening/liveability/amenity</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 15%                |
|                                                                                               |           |          |                                                          | B                                      | <b>Economic Growth</b> <ul style="list-style-type: none"> <li>- Ability for desalinated water customers to connect and realise social and economic benefits.</li> <li>- Ability to realise innovation / R&amp;D opportunities (i.e., re-use of salt, seaweed, future aquaculture and other complementary industries)</li> <li>- Ability to provide water for multiple uses (and minimise the need for multiple desalination plants in the region)</li> <li>- Economic opportunities for city / regional growth (including benefits of improved water pressure, ecotourism)</li> <li>- Economic opportunities for pastoral landholders and horticulture</li> <li>- Economic opportunities for Traditional Owners</li> <li>- Proposed land use is a beneficial use of the land or facilitates improvement of current condition, or the land use inhibits use for other beneficial high land uses such as grazing, agriculture or community uses.</li> </ul> | 20%                |
|                                                                                               |           |          |                                                          | C                                      | <b>Business/ Commercial</b> <ul style="list-style-type: none"> <li>- Extent to which either real or perceived direct or indirect environmental impact may have quantifiable consequences for the fishing and aquaculture industry;</li> <li>- Extent to which either real or perceived direct or indirect environmental impact may have quantifiable commercial consequences .</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 20%                |
|                                                                                               |           | 2.3      | Human Heath and Well Being                               | A                                      | <b>Health</b> <ul style="list-style-type: none"> <li>- Potential noise and vibration impacts to sensitive receptors both during construction and operations.</li> <li>- Consideration of visual and light intrusion to nearest neighbours and other user groups both during construction and operations.</li> <li>- Potential air quality impacts of nearest neighbours during construction.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 10%                |

| Category                       | Weighting | Criteria               | Sub-category                     | Performance measures                                                                                                                                                                                                                                                                                                                                                                             | Detailed Weighting |
|--------------------------------|-----------|------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                                |           |                        | B                                | <b>Amenity</b> <ul style="list-style-type: none"> <li>- Extent to which accessibility to coastal areas is maintained or enhanced and connectivity to landscape is managed.</li> <li>- Extent to which building design blends with existing landscape and minimises visual amenity and noise issues to neighbours.</li> <li>- Project is consistent with surrounding land uses</li> </ul>         | 15%                |
| Financial Efficiency /Prudency | 20%       | 3.1 Whole of life cost | A                                | <b>Construction</b> <ul style="list-style-type: none"> <li>- Cost of construction (including cost impact of additional length of pipeline from Roxby Downs)</li> <li>- Cost of obtaining approvals (ability to obtain Social Licence)</li> </ul>                                                                                                                                                 | 50%                |
|                                |           |                        | B                                | <b>Operation</b> <ul style="list-style-type: none"> <li>- Cost of operation</li> <li>- Impacts / risks from adjacent land uses during O&amp;M (i.e. Santos, hydrogen)</li> </ul>                                                                                                                                                                                                                 | 50%                |
| Technical Robustness           | 25%       | 4.1 Constructability   | A                                | <b>Construction complexity</b> <ul style="list-style-type: none"> <li>- Geotechnical conditions.</li> <li>- Proximity to roads and telecommunications infrastructure, and logistical and population centres to support construction and ongoing operation.</li> <li>- Assessment of existing power supply or possibility for installation of power supply infrastructure.</li> </ul>             | 20%                |
|                                |           |                        | B                                | <b>Program</b> <ul style="list-style-type: none"> <li>- Ability for the design, construction and commissioning to meet first water by mid-2027.</li> <li>- Degree to which there is a program risk associated with works (including ability to gain social licence)</li> <li>- Risks in acquisition of the land within a suitable timescale that would impact delivery of the project</li> </ul> | 20%                |
|                                |           | 4.2 Operability        | Operational Maintenance          | <ul style="list-style-type: none"> <li>- Ability for maintenance staff to safely access assets for maintenance; Suitability of vehicle access for continued operations; Repair complexities and response times.</li> <li>- Ability to access assets and defend against bush fire.</li> </ul>                                                                                                     | 20%                |
|                                |           | 4.3 Climate resilience | Design and Operations            | -Ability of the project design to consider and respond to projected climatic conditions as a result of climate change (e.g. seal level rise, climate-change induced changes to salinity in the USG, integrity of the pipeline at higher ambient temperatures).                                                                                                                                   | 20%                |
|                                |           | 4.4 Future Proofing    | Opportunity for future expansion | - Biophysical constraints to the expansion beyond Stage 2 including available land, adjacent land uses/industry, tolerance of the marine environment, tolerance of the terrestrial environment,                                                                                                                                                                                                  | 20%                |

**Table B 2 Scoring for sustainability, social sustainability and liveability and technical robustness categories**

| MCA Rating                | Colour | Score | Description                                      |
|---------------------------|--------|-------|--------------------------------------------------|
| Strong positive           |        | 5     | High positive support for meeting the criteria   |
| Moderate positive         |        | 4     | Medium positive support for meeting the criteria |
| No significant impact     |        | 3     | Low positive support for meeting the criteria    |
| Moderate, negative impact |        | 2     | No support for meeting the criteria              |
| Strong, negative impact   |        | 1     | High negative support for meeting the criteria   |
| Does not apply            |        | 0     | Criteria/measure does not apply to this option   |

**Table B 3 Scoring for Financial Efficiency/Prudence category**

| MCA Rating                | Colour | Score | Description                                    |
|---------------------------|--------|-------|------------------------------------------------|
| Strong positive           |        | 5     | Greater than 30% benefit from site selection   |
| Moderate positive         |        | 4     | 10- 30% cost benefit from site selection       |
| No significant impact     |        | 3     | Within +/- 10% cost impact from site selection |
| Moderate, negative impact |        | 2     | 10-30% cost impact from site selection         |
| Strong, negative impact   |        | 1     | Greater than 30% cost impact on site selection |
| Does not apply            |        | 0     | Criteria/measure does not apply to this option |

## Appendix C – Assumptions

Table C 1 Assumptions for each criterion

| Category                                                                                       | Criteria |                                                          | Assumptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sustainability<br/>(considers environmental values)</b>                                     | 1.1      | Land and Habitat impacts are avoided or minimised        | <ul style="list-style-type: none"> <li>-Assumed impacts are based on the existing ecological information and may change if sensitivities are identified in further ecological assessments.</li> <li>-It is assumed that the clearance footprints are as per the provided values, and that a new access track would be required for each of the sites.</li> <li>-It is assumed that offsets will be direct offsets, and as such Mullaquana has the advantage of available space for offsetting close to the impact site.</li> <li>-Assumed none of the sites will directly impact EPBC species.</li> <li>Shale/Shingle beaches were assessed as a Heritage Item.</li> </ul>                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                | 1.2      | Marine impacts are avoided or minimised                  | <ul style="list-style-type: none"> <li>-It is assumed that the inlet and outfall design are the same and entrainment impacts are similar across all sites.</li> <li>-Whilst plume dispersion modelling is not available for all three sites, the SARDI die tracer models are used to represent hydrodynamic conditions at each site and at a wider scale.</li> <li>-It is assumed that the pipes will be tunnelled/under-bored from the desalination plant to the inlet/outlet, and that no direct impacts are anticipated to benthic/intertidal marine habitats.</li> <li>-Assumed impacts are based on the existing ecological information and may change if sensitivities are identified in further ecological assessments</li> <li>-Assumed none of the sites will directly impact EPBC species</li> </ul>                                                                                                                                                                                                               |
|                                                                                                | 1.3      | Climate impacts are avoided or minimised                 | <ul style="list-style-type: none"> <li>-Desalination plant is powered by renewable energy – this is the same across all of the sites.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                | 1.4      | Water supply impacts are avoided or minimised            | <ul style="list-style-type: none"> <li>-Each plant is intended to supply water to relieve reliance on climate dependant sources. Scoring is based on the site with the best potential to be approved, and that has opportunities for expansion and connections.</li> <li>-It is assumed that all three sites get approval for stage 1, but stage 2 and 3 may be limited.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Social Sustainability and Liveability<br/>(considers community needs and social values)</b> | 2.1      | Heritage elements and sites are preserved and maintained | <ul style="list-style-type: none"> <li>-There is no option that doesn't impact Native Title Land. Impacts to native title are not necessarily bad (i.e. compensation and economic opportunities aboriginal communities).</li> <li>-Whilst cultural heritage is of significant importance to the project, the working group did not feel that they could score each of the sites/proposed routes on their impact to cultural heritage due to a lack of data. Whilst it was considered, a decision on scoring could not be reached and as such "Heritage elements" were scored based on State, European and natural heritage.</li> <li>-State Heritage – Lighthouse at Lowly – assumption is no direct impact to.</li> <li>-Natural Heritage – Shingle Beaches Crag – assumption is that this will be tunnelled under.</li> <li>-"Friends of the shingles"</li> <li>-Consideration: Mullaquana has more capacity to move the plant/route to avoid any unknown heritage sites. Limited capacity for change at Lowly.</li> </ul> |
|                                                                                                | 2.2      | Option enhances strategic intent for growth              | <p><b>Tourism and Recreation</b></p> <ul style="list-style-type: none"> <li>-Lowly – Tourism precinct and likely to have cumulative impacts from multiple industries.</li> <li>... only recreation beach withing 100km of lowly</li> <li>-Nudie Beach – Mullaquana</li> </ul> <p><b>Economic Growth</b></p> <ul style="list-style-type: none"> <li>-Likelihood of long-term success of the project.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Category             | Criteria |                             | Assumptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|----------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |          |                             | <b>Business/Commercial</b><br>-Not sure of the impact to Aquaculture but aware that each of the sites presents a risk. Mullaquana may present more of a risk to the prawn fisheries as the inlet/outfall are situated within a trawling block.<br>-Aquaculture zones mapped off of point lowly are actually exclusion zones.                                                                                                                                                                                                                                                                                                                                                                                |
|                      | 2.3      | Human Health and Well Being | <b>Health</b><br>-Assumption is that current land use will remain as is during the lifespan of the plant. i.e. Mullaquana is a private working sheep station.<br>-Point Lowly and Crag are closer to residents.<br><b>Amenity</b><br>-During construction Lowly and Crag will require rock hammering, Mullaquana will not. Thus, greater noise and vibration impacts during construction to local residents. Operational noise and vibration would be the same across sites.                                                                                                                                                                                                                                |
| Technical Robustness | 4.1      | Constructability            | <b>Constructability Complexity</b><br>-Lowly and Crag have deep shafts through solid rock.<br>-Mullaquana does not require rock hammering as it is anticipated the ground is softer. However, this will mean that tunnelling will be slower as there are more shoring requirements.<br>-All sites require a new transmission line.<br>-Lowly - Any overlap of clearances with the Santos gas pipeline would be designed out prior to construction.<br><b>Constructability Program</b><br>-Assumption that all land owners support the project and are on board.<br>-No difference in native title between sites.<br>-Consideration: ability to gain social licence to operate, EIS timeframes and approval. |
|                      | 4.2      | Operability                 | -Mullaquana can provide access from both the North and South for emergency services.<br>-Single routes for emergency services at PL and Crag.<br>-No real difference in bushfire risk<br>-Increased traffic north of Whyalla<br>-Increased risk from adjacent facilities at PL.                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                      | 4.3      | Climate Resilience          | -Crag Point and Point Lowly are situated at a higher elevation, which has advantages for sea level rise. However, this is why the desalination plant is further in shore at Mullaquana and so this risk is designed out.<br>-More susceptible to changes in water quality (inc. salinity) further up the gulf.<br>Mullaquana likely has more surface water flows                                                                                                                                                                                                                                                                                                                                            |
|                      | 4.4      | Future Proofing             | 260 ML/day stage 2 scheme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### Table D 1 Survey responses and final weighted scores

It should be noted that scores for Category 3- Financial Efficiency/Prudence have been removed and replaced with scores as discussed in Section 5.2.

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