

Minutes.

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Meeting Title: EP Desal Project – Site Selection Committee Meeting 14

Project Name: Eyre Peninsula Desalination Plant Project

Meeting Purpose: Provide an update on project activities

Date: Wednesday 9 November 2022

Time: 2.00pm – 5.00pm

Location: Port Lincoln Hotel

Attendance:

Name	Role	Present
Peter Treloar	Chair	Yes
Steve Dangerfield	Engagement Facilitator	Yes
Jemma Silvester	Community Engagement	Yes
Isaac Glonek	Minute Taker	Yes
Hazel Austin	Project Manager	Yes (online)
Nancy Nguyen	Assistant Project Manager	Yes
Shaun Ambrose	District Leader, SA Water	Yes
Dr Hazel Vandeleur	Senior Env Impact Assessment Officer, SA Water	Yes
Jeff Tyler	Principal Engineer, Water & Development, Tonkin	Yes
Dr Don Plowman	Chair, Independent Marine Science Review Panel	Yes
Dr John Luick	Member, Independent Marine Science Review Panel	Yes (online)

Committee:

SSC Member	Role	Present	Proxy
Andy Dyer	President, SA Mussel Growers Association	Yes	
Brad Flaherty	Mayor, City of Port Lincoln Council	Apology	
Brian Jeffriess	Chief Executive, Australian Southern Bluefin Tuna Industry Association Ltd	Yes	
Bryan Trigg	Chair, Regional Development Australia Eyre Peninsula	Yes	
Claire Webber	Executive Officer, South Australian Sardine Industry Association Inc.	Yes	
Clare McLaughlin	President, Eyre Peninsula Local Government Association	Apology	
Delfina Lanzilli	Chief Executive, District Council of Lower Eyre Peninsula	Yes	
Gary Neave	Independent Project Director, TSA	Apology	Peter Seltikas
Hannah Allen-Jordan	Acting Mayor, District Council of Tumby Bay	Apology	
Jack Ritchie	Member, Port Lincoln Chamber of Commerce and Tourism	Yes	
Jo-Anne Quigley	Mayor, District Council of Lower Eyre Peninsula	Apology	
Jonathan Clark	General Manager, Eyre Peninsula Landscape Board	Yes	
Mark Whitfield	Chair, Eyre Peninsula Landscape Board	Yes	
Matthew Morgan	Chief Executive, City of Port Lincoln Council	Apology	
Peter Scott	Executive Officer, Eyre Peninsula Local Government Association	Yes	
Rebecca Hayes	Chief Executive, District Council of Tumby Bay	Yes (online)	
Rob Gratton	Chief Executive, Clean Seas Seafood Limited	Yes	

Ryan Viney	Chief Executive, Regional Development Australia Eyre Peninsula	Apology	Trevor Smith (online)
Sam Telfer	Member for Flinders	Yes	
Shane Hodgins	Director, RecFish SA	Apology	
Thomas McNab	President, Abalone Industry Association of South Australia Inc	Yes	
Tom Hyde	Member, Australian Abalone Growers Association	Apology	

We acknowledge the Traditional Custodians of the Eyre Peninsula. We acknowledge their elders past and present, noting in particular their spiritual and cultural connection to the lands and coastal waters of the Eyre Peninsula.

Note: During the course of this meeting a power outage occurred and disrupted the meeting for in-person and online attendees, with access to the presentation temporarily interrupted.

1. Welcome and introductions

The Chair gave an Acknowledgement of Country and welcomed attendees.

Attendees were reminded that face masks are at the discretion of the individual.

The Chair noted the purpose of the meeting was to:

- Provide an update on designs and costings for all sites
- Provide an update on Working Group activities on funding
- Provide an update on the marine science reports reviewed by the MSRP
- Provide an update on the groundwater resource at Uley South.

2. Apologies and proxies

Brad Flaherty was noted as an apology.

Clare McLaughlin was noted as an apology.

Gary Neave was noted as an apology, with Peter Seltsikas attending as a proxy.

Hannah Allen-Jordan was noted as an apology.

Jo-Anne Quigley was noted as an apology.

Matthew Morgan was noted as an apology.

Ryan Viney was noted as an apology, with Trevor Smith attending as a proxy.

Shane Hodgins was noted as an apology.

Tom Hyde was noted as an apology.

3. Business arising

Nil noted.

4. Project activity update

Steve noted that in August 2022, after the SSC had determined its preferred site, the intention was for the project team to move to concept design on one site.

With regard to site design status, Steve noted:

- Given the gaps in knowledge with respect to the preferred site (Sleaford West Variation), and the uncertainty with respect to price, concept design for the preferred site was delayed to enable various assessments (geotechnical, heritage, native flora and fauna) to occur

- Following the identification of several constraints at the Sleaford West Variation site (heritage, flora and fauna, geological formation), other options at Sleaford needed to be developed
- In addition, given the increasing uncertainty of the funding gap to the base case and the need for water security, the SA Water Board requested further due diligence be done at Point Boston and the base case site at Billy Lights Point
- The team therefore focused on developing marine designs for nine sites:
 - Sleaford West Variation
 - Sleaford West Variation – southern site
 - Sleaford West Variation – beach entry
 - Sleaford West – beach entry with the plant adjacent
 - Point Boston Commercial Precinct – near shore outfall
 - Point Boston Near Beach – near shore outfall
 - Point Boston Commercial Precinct – 13km outfall
 - Point Boston Near Beach – 13km outfall
 - Billy Lights Point – intake and outfall to the east, adjacent the Wastewater Treatment Plant
- As a consequence of the large number of sites considered, the marine design was unable to progress beyond the preliminary design phase, with limited opportunity to optimise the intake/outfall locations – this will be done for a preferred site in full concept design and assessed through the development application process.

Sleaford West Variation

Steve outlined the opportunities and risks identified for the Sleaford West Variation site since it was selected as the SSC's preferred site:

- Landowner very cooperative and willing to sell – very supportive of the project
- Good road access into site, above ground power possible
- Transfer main likely unable to proceed through preferred alignment which will require different alignment and surge vessels
- Majority neighbour support remains – some challenges
- Geological investigations revealed 140 MPa granite and a rare geological formation in coastal zone, which has drawn the interest of the Geological Society of Australia (SA Division)
- Areas of Aboriginal cultural heritage significance identified in coastal zone
- Nationally protected flora and fauna species recorded in coastal zone
- Challenging topography for marine entry given constraints
- Very difficult oceanic conditions (8-metre swell) potentially impacting construction timeframes and type of equipment needed
- Investigations and identification of constraints has meant other options and configurations in the Sleaford West Variation area have had to be investigated.

With regard to the marine engineering for the Sleaford West Variation site (and modified versions of the site), Steve noted that the engineering team has considered a range of options and determined that a tunnelling installation of the intake and outfall is the most appropriate given the ocean conditions and geotechnical realities of the location (140 MPa granite).

With regard to a beach entry option at Sleaford West, Steve noted:

- Given constraints and potential cost of marine engineering required for the Sleaford West Variation sites, the project team reassessed a Sleaford West Variation beach entry solution as a possible means of cost reduction
- Two options were considered:
 1. Plant remains at Sleaford West Variation site with long intake and outfalls to the beach
 2. Plant is relocated to Sleaford West adjacent to the beach
- Concerns raised by landowner about beach remediation once works are complete – would rethink land sale if this option proved viable
- This location would bring into focus the nearby ecotourism business, which would need to be carefully managed
- Outfall approximately 800m offshore
- Due to environmental, landowner and cultural heritage sensitivities associated with the beach at Sandy Point, tunnelling was adopted as the best methodology for constructing the marine pipework
- Tunnelling would allow the works to progress without impacting the beach or native vegetation north of the beach
- The cost of this option would be \$20-\$30 million more expensive than having the marine works adjacent the plant at the Sleaford West Variation site, as additional intake and outfall pipework would be required
- Therefore, a beach entry option for Sleaford West will not be pursued further.

Steve noted that at its last meeting, the SSC raised various questions related to marine engineering at Sleaford. Steve invited Jeff Tyler from Tonkin, who led the marine engineering team, to assist in answering the questions raised.

Outfall pipe discharging over cliffs as a possible means of cost reduction:

- Would not achieve the required dispersion and very difficult to model to address dispersion requirements.
- Wave movement would push the brine back towards the cliffs, eventually resulting in a significantly hypersaline area against the coast and likely significant impact on the health of the bay
- The force of the waves would also prevent the safe installation of a pipeline adjacent the coast
- The durability and robustness of such an installation cannot meet the design life required of these pipelines to ensure a secure and continuous water supply
- The outfall has been located to ensure the brine is dispersed throughout the bay rather than allowing it to aggregate and remain in a single location
- While the outfall pipes are a significant consideration for all sites, of greater difficulty at the Sleaford sites is the intake pipe and the challenge of pumping the seawater required up a cliff.

Above ground installation of marine pipework at Sleaford (as per Point Boston method):

- Wave conditions at Sandy Point beach don't allow a similar solution to Point Boston or Billy Lights Point, where the sea is far calmer.

Larger plant to deliver a better return on investment at Sleaford:

- The plant's size, as currently designed, accounts for SA Water's long-term forecast increases to demand
- Building a larger plant risks spending more money and not being able to sell the additional water (resulting in less return on investment).

Water supply to large projects planned for EP (e.g., mining projects):

- SA Water's primary responsibility is to secure a drinking water supply for SA Water customers currently connected to the network
- Mining projects are not considered part of SA Water's "regulated business"
- There would be significant costs incurred to increase network capabilities and capacity in order to pump water from the desalination plant to customers.

Jetty at Sleaford with the pipe running underneath rather than tunnelling into the seabed:

- This option has been tested with contractors and the design team
- Construction of a jetty capable of withstanding the marine conditions at Sleaford and piling into the hard rock under the seabed carries far greater construction risk than tunneling, and would therefore likely cost more and take longer.

Could the pipeline at Sleaford be shorter:

- The length of pipe is not a major driver of cost
- The cost is in setting up the tunnelling rig, which is required for any length of pipe at Sleaford – once set up, the incremental costs for additional length are minimal
- Notwithstanding cost considerations, the outfall needs to go out a minimum length to ensure sufficient dispersion, adequate water quality, and access to seabed geology suitable for a jack up barge. If the saline discharge is left to disperse over the rocks, it is likely to remain close to shore and not mix sufficiently – the EPA will require demonstration of adequate dispersion.

An SSC member asked if the construction method at Sleaford would be similar to the Adelaide desalination plant, in terms of the geography and ocean energy.

Jeff Tyler noted that the construction method is very similar, but the geology, geography and wave climate is very different. The size of the intakes and outlets in Adelaide are much larger, but the reality is that similar equipment would need to be used, of similar size, due to the ocean environment at Sleaford – specifically the geology. In Adelaide the seabed is underlaid by layers of sand, then clay, and then hard rock at depth. At Sleaford, there's a layer of sand (the thickness of which varies, but can be a couple of metres in places) which is then underlaid by very hard rock – which is what drives the need for such significant equipment.

An SSC member questioned whether construction at Point Boston would be simpler than at Sleaford or Adelaide.

Jeff Tyler confirmed that construction would be simpler at Point Boston, and noted that it was somewhat similar to considering the weather if going fishing – you'd be much more comfortable at Point Boston than at Sleaford.

An SSC member asked what depth pit would be required for the tunnel boring machine for installing the marine pipework at Sleaford.

Jeff Tyler noted that the depth required is a function of the geology and will vary based on the exact location of the pit. At the shoreline, the pit will need to be 5-10m below the seabed – depending on what the ground level is at the site (typically 20-30m), it may need to be 40m down before tunnelling out into the ocean. Jeff clarified that the tunnel into the ocean won't be horizontal, but will follow the gradient of the seabed at a depth of 5-10m below.

An SSC member asked whether the pit would then be used as the wet well when the desalination plant is operational.

Jeff Tyler confirmed that this is the intention – that what is effectively temporary works to get the tunnel boring machine to the right depth will become the permanent pumpstation well to be able to bring the water up to the plant.

Point Boston

Steve shared the various site configurations at Point Boston being investigated by the project team, including:

- Point Boston Commercial Precinct – near shore outfall

- Point Boston Near Beach – near shore outfall
- Point Boston Commercial Precinct – circa 13km outfall
- Point Boston Near Beach – circa 13km outfall

Jeff Tyler noted that the marine entry and direction of the pipes will be the same regardless of the plant location. The orientation and bearing of the outfall are determined by the predominant wave conditions – it is beneficial to have the pipework perpendicular to the wave environment.

Steve noted that there has been some discussion among the Point Boston community regarding opposition to a near beach plant location, with a preference for the plant to be located away from the residential area. The Point Boston Development Corporation Board has also emphasised that their preference would be for the plant to be located away from the residential area.

Steve noted that there would need to be careful consideration of where the pumpstation is located, due to sensitivity around built form near the beach at Point Boston.

Steve noted the risks associated with a desalination plant at Point Boston:

- Extended outfall
 - \$100-120m additional cost
 - Significantly more pipework to clean and maintain (due to extended length), which is costly and requires divers
 - Significantly more frequent repairs (due to extended length), which is costly and requires divers
 - More risk of damage to seabed environment during construction
 - More risk of pipeline being damaged by sea vessels post construction
- Community
 - Increasing local resident concern about locating a desalination plant at Point Boston with some issues identified in relation to land acquisition
 - Social licence would be very difficult to obtain for an option that is close to the beach
 - Consequently, higher cost option would be the only opportunity to achieve social licence and further work will be needed with the local residents to achieve this
- Aquaculture
 - Ongoing concerns regarding risk of salinity accumulation and brand/reputation.

Jeff Tyler noted that an extended outfall would be challenging from a hydraulic perspective – the saline water needs to exit the pipe at a certain velocity to ensure adequate dispersion. While the water depth, approximately 24m, is more than adequate at that distance from the shore, it would need additional pumping to achieve the required exit velocity.

Jeff Tyler noted that there would need to be consideration of proximity to navigation channels into the bay – there could be a need for additional navigation markers to minimise the risk of large vessels damaging the plant's marine infrastructure.

Jeff Tyler noted that an outfall length of 13km would, as far as he knows, be the longest in the southern hemisphere. There certainly isn't a precedent for an outfall of this length in Australia.

An SSC member asked what the longest outfall is in Australia.

Jeff noted that most desalination plants have an outfall pipe of 2-5km in length.

Hazel Vandeleur noted that the key thing to consider in relation to pipe length is what is required to achieve the necessary dispersion – with science and data indicating the length required. Hazel also noted that while a longer outfall may achieve slightly better dispersion, the length may also result in greater construction impacts.

An SSC member noted that the suggestion of a longer outfall pipe is not to do with dispersion, but about offsetting the risk of saline accumulation within Boston Bay. It was noted that dispersion happens quite quickly regardless of the site. The SSC member questioned how the 13km length was determined for the extended outfall option at Point Boston

Steve noted that the 13km outfall option came out of previous SSC discussions.

An SSC member noted that the aquaculture industry has been told that beyond the 6-hour flushing line, the risk is substantially lower. The 6-hour flushing line would be considerably less than 13km offshore and they would like to see an option with the outfall at this line, to be consistent with how other industries are monitored in terms of the risk of accumulation.

Steve noted that the aquaculture industry is monitored on the risk of nutrient accumulation (to which the 6-hour flushing line relates), and while salinity accumulation is perceived as a risk by the aquaculture industry, it is monitored differently to nutrient accumulation and not comparable. The MSRP have been working hard to form a view and provide advice on the outfall length needed to sufficiently reduce marine risks related to the outfall. If Point Boston is taken forward to detailed design, there would need to be work undertaken to determine the outfall length required to adequately mitigate the risk associated with saline accumulation.

An SSC member questioned whether there has been consideration given to an alternative entry point to the ocean in order to reduce the length of marine-based pipework to reach the 6-hour flushing line.

Steve noted that for the purpose of building a cost estimate, this entry point was the one considered. The Point Boston Development Corporation Board have discussed different points as well.

Intake pipe format that would lessen entrainment of mussel spat with intake at southern end of Proper Bay and outfall at Sleaford:

- If the outfall is at Sleaford, the intake should also be built at Sleaford because the installation equipment is the same – a jack up barge will be mobilised to install the outfall diffuser, so it makes financial and engineering sense to install the intake structure there too
- If consideration was given to a plant at Point Boston or Billy Lights Point, the intake structure in the current design for these options would need to be aligned and designed to avoid impacting mussel spat
- An outfall at Sleaford (with the plant at a location in the Boston Bay area) would be more expensive than having the entire plant at Sleaford, due to the costs of pumping the outfall all the way to Sleaford.

Revisiting one of the innovative options, such as the subsurface intake:

- While this idea has technical merit, its benefit is limited by the timescales involved
- This option would require significant time (possibly years) to undertake a detailed geotechnical analysis of subsea ground conditions and drilling test bores to understand the resultant intake flow rates of each bore
- This option is also difficult to cost, as we have no information on how many bores would be required to sustain the plant intake rate
- This option was considered unfeasible during site selection from a time perspective, considering the tight project timeframes.

Can the plant be built at Cape Hardy instead:

- Approximate pipeline distance from North Side Hill Tanks to Cape Hardy would be 85km
- The pipeline construction cost alone would be \$200-250m.
- Reconfiguring the network to get desalinated water to Summit Tanks rather than down to North Side Hill Tanks would also be a significant and costly task – only reducing the pipeline distance to 70km, resulting in pipeline construction costs of \$160-200m
- Operating costs for a plant at Cape Hardy would also be significantly higher as pumping large distances requires more electrical power.

Preliminary cost estimates

Steve shared the preliminary cost estimates for the base case site at Billy Lights Point (re-orientated to the east), Point Boston (both Near Beach and Commercial Precinct plant locations), and Sleaford West Variation (southern site).

Peter Seltikas explained how the cost estimates were built and the multitude of factors that were considered.

An SSC member asked whether the escalation costs included in the cost estimates are calculated on the basis of construction starting in 2023 and the desalination plant being operational by 2025.

Steve noted that with the additional work undertaken, the schedule has changed, but the aim is still to deliver first water by 2025 – which will require the approved site to be confirmed by the end of 2022.

Peter Seltikas noted that the escalation costs in the cost estimate have been modelled based on current escalation trends and what is expected to happen in the future. The escalation costs included are for a plant to be delivered in 2025 and if it takes another six months for a decision to be made, the costs will continue to increase.

5. Funding pathway update

Due to time constraints, this agenda item was not addressed.

6. MSRP update

Update on activities of the Independent Marine Science Review Panel

With respect to the hydrodynamic model, Don noted:

- The report is still a draft with SARDI currently addressing the MSRP comments
- The MSRP requested that SARDI undertake some sensitivity analysis of the brine release into the water column where they compare the current conservative 'worst-case' release into the bottom layer against the release into more realistic scenarios of one, two and three layers from the bottom)
- The MSRP requested extension of the current particle tracking modelling to aid in communication and clarity
- Animations as were provided previously with the interim modelling memo were requested.

With respect to habitat video analysis, Don noted:

- The report is still a draft as the consultant is currently addressing the MSRP comments, with the MSRP requesting edits so that the report is more easily understood by the reader
- Good scientific data
- Provides a good baseline for future planning and monitoring.

With respect to the ecotoxicity data review, Don noted:

- Report concluded that a dilution requirement of 40:1 is appropriate, as previous studies have indicated that if this performance criteria is met there will be negligible impacts on the receiving habitat and species
- MSRP has requested the integration of information available on the salinity tolerance of species within the report
- MSRP also recommended the inclusion of chronic mussel larval testing (2-week test) to supplement the existing acute 48-hour mussel larval testing.

Previous report to the SSC

Marine habitat video:

The SA Water Environmental Performance Criteria stipulates minimisation of impacts upon marine flora, fauna, and habitats during all stages of development. The Habitat Mapping Report should be included within decision making around the location of the intake and outfall pipelines if a site is selected at Billy Lights Point or Point Boston.

Until SA Water have a project site and a construction methodology, the MSRP have no oversight for how much of a footprint and consequent impact on the marine environment is likely.

Separately, any removal of (or impact on) seagrass will require calculation and inclusion within a Native Vegetation Clearance Application (under the Native Vegetation Act 1991) submitted separately from and discussed within the Development Application. Key to the Native Vegetation Clearance Application will be the requirement to demonstrate the avoidance of impacts on all native vegetation including seagrass.

Ecotoxicity data review:

In relation to the potential impacts from the chemicals used for antiscaling and membrane cleaning, the finding of the Ecotoxicity Review was that there would be no appreciable negative impact on the marine environment from these substances, provided that dilution ratios calculated for each chemical tested previously are met and that appropriate management procedures are followed. This was based on the small amounts of chemical used and the low toxicity of the chemicals once they had been neutralised before discharge. This advice was supported by MSRP members with experience in management of plants similar to the proposed plant and the body of information in the published literature.

SARDI Oceanographic modelling:

Preliminary results provided within the SARDI oceanographic modelling report show the far-field salinity levels of the Bays with the addition of the full-scale 8GL/yr desalination plant to be well below the Australian / NZ water quality guideline limits. It is important to note that the preliminary assessment assumed all brine was expelled from one port (i.e., a single grid cell) in the bottom layer of the model. This represents a worst-case scenario, as in practice, a multi-port diffuser will be used to discharge brine. This negligible increase was within background salinity variation under all conditions (including 'dodge' tides) and when modelled over the 5-year timeframe showed minimal increase to salinity in the Bays (and well within any guideline value).

A further observation from the SARDI modelling was that the natural seasonal variation in salinity within the bays was greater than the variation in salinity due to brine release and dispersion from the plant.

Feedback on reports provided to the MSRP by the aquaculture industry:

Don noted that some of the journals and reports referred to the MSRP were for very different conditions to Boston Bay.

Don noted that it was the MSRP's view that:

- It is not the Panel's role to provide detailed comments on these reports, however the panel consider that the key issues have been extracted, summarised, and addressed
- The SSC is welcome to raise specific issues relating to the feedback.

Dodge tides

The MSRP's response to the issue of dodge tides was summarised as follows:

- The engineering diffuser design must meet the required dilution (dilution of 40:1 by the seabed) under all conditions
- The far-field hydrodynamic modelling looked at continuous discharge of the ultimate plant (i.e., 8 gigalitres per annum) for a period of 5 years – meaning that the 'dodge tides' that occurred in that period were included. The 5 years of data is from the Bureau of Meteorology and the 12-month Bay specific validation data also included a number of 'dodge tides'
- The modelling indicated that under all conditions, salinity levels did not exceed background variability. Further to this, the 'worst-case' salinity increase predicted (0.4 PSU at 300m from the diffuser) was well below the Australian / NZ Water Quality guideline of maximum 5% change in ambient salinity (with a 5% change equal to approximately 1.8 PSU in this system).

Feedback from the SSC

An SSC member suggested that in their opinion there seems to be limited value in the hydrodynamic modelling, given that the salinity change as a result of the outfall would be minimal even when dodge tides are present. The SSC member noted that, regarding references to a baseline salinity, if the discharge is adding up to 0.4 PSU to the system, that will increase the baseline salinity – and the effects of that are unknown.

Hazel Vandeleur explained that the modelling works by examining the difference from background, so a figure of 0.4 PSU refers to the anomaly away from the background. When the model predicts a 0.4 PSU change, that's the maximum anomaly at any point you can choose. The model has been run for 5 years of data and anything can be output within this. The report presents the maximum levels predicted over five years, across the different seasons, and for the three days around a dodge tide. Under all of those conditions with an 8 giganlitre per annum plant, at no point was the salinity greater than 0.4 PSU above the background. The model is ultra-conservative, with the full 8 giganlitres per year and the outfall only at the bottom layer (which would be the worst-case scenario). From this modelling, we are seeing that we get sufficient dilution (if we meet the performance criteria of 40:1 dilution by the time it hits the seabed) under all conditions, including dodge tides, spring tides, and low winds.

An SSC member noted that when dodge tides and 0.4 PSU are referred to, the readings are in and around the vicinity of the diffuser, and primarily relates to dispersal. The concern is whether Boston Bay, as a relatively closed system, can clear those elevated salinity levels – and this is more to do with the location of the diffuser than the design of the diffuser.

Hazel Vandeleur explained that the diffuser design is at a preliminary stage and hasn't gone to concept design yet. The far-field model assumes that the diffuser design will meet the 40:1 performance criteria and looks at what will happen in the wider system (across the Bays) with the desalination plant operating at full capacity. The model looks at a number of locations at all times and measures what the salinity readings are at those locations – by 1km, the readings from the preliminary model are between 0.01 and 0.02 PSU above background levels.

An SSC member questioned whether Hazel's response was referring to a diffusion metric.

Hazel Vandeleur explained that it is an oceanographic model that takes the additional salinity and looks at where it has already dissipated down to background levels and where it is still discernable within the model.

An SSC member asked about the difference between the dissipation and the buildup of salinity in the system that is not being cleared away.

Don noted that there was a lot of work done to validate the model as a first stage. The second stage was to use that model to determine what happens if you discharge brine into the bay. At present, the modelling has the brine discharging at a single point in one layer. The MSRP is confident that the hydrodynamic model gives good results. The MSRP is saying that if you put all of the brine for an 8 giganlitre per annum plant through one pipe into one layer and get nowhere near the maximum threshold of the guideline, the Panel is confident that conditions that are required to be met can be met.

An SSC member noted that their interpretation of the previous question from another SSC member is that the concern isn't about dilution, but about build-up of salinity over six months, one year, or two years.

An SSC member confirmed that this is their concern. You can put these quantities of brine into the system and may not be able to notice a discernable difference in the immediate term, but in a low-energy location it is the cumulative impact over a longer period. Dispersal happens very quickly.

Hazel Vandeleur reconfirmed that the model is showing what happens over five years of continuous operation of an 8 giganlitres per annum plant – so it is looking at the cumulative impact.

An SSC member noted that the salinity in the modelling should be compared to the baseline level, rather than the background level. If the salinity level is increasing over time, and the variation is 0.4 PSU above the background level but the background level is increasing over time, then the overall salinity level will have risen by more than 0.4 PSU.

Hazel Vandeleur noted that the anomaly is against the point in time that is determined. The model can be run for the full five years, and then the anomaly as an average can be assessed, or it can be considered as a period of time (e.g., when dodge tides are occurring).

An SSC member questioned how the membrane is flushed, with regard to nutrient being discharged.

Hazel noted that the desalination plant will need to always meet the water quality guidelines, so nothing will be discharged that doesn't meet the water quality guidelines (whether that's suspended solids or nutrients). It will also be a more modern plant, with backwash occurring every 20 minutes and a very small amount of nutrient being put back into the bay.

An SSC member noted that for desalination plants around the world, the accepted knowledge is that they're better in higher-energy areas of coastline, and that the MSRP rated the Sleaford sites above Point Boston and Billy Lights Point previously.

Don noted that the MSRP did rate the Sleaford sites above Point Boston and Billy Lights Point in relation to a few of the SSC's assessment criteria, however the MSRP has maintained that there are viable engineering solutions for Point Boston and Billy Lights Point that would adequately address the marine risks and ensure that the necessary guidelines and standards are met.

7. Uley South – ground water resource update

Jonathan Clark, General Manager, Eyre Peninsula Landscape Board, noted that the formal state of the basin report won't be released by the Department for Environment and Water for approximately 6 months. Jonathan noted that the Department will wait until the groundwater levels are at their lowest and have had a chance to even out, which is around April.

Jonathan noted that monitoring occurs 3-4 times a year on average, and there is recent data about the water levels in Uley South Basin. The most recent data suggests that it has been an average recharge year.

Jonathan noted that you need several very heavy rainfall events over several days to have effective groundwater recharge, and that the same amount of water over a longer period of time with small showers of rain won't lead to effective groundwater recharge.

Jonathan noted that the status of the Uley South Basin will likely remain the same and a desalination plant for Eyre Peninsula is a high priority and should not be delayed. There are three critical factors, including:

1. The short-term seasonal trends that effect groundwater recharge
2. The long-term trend – in all of the aquifers and surface water catchments in the Eyre Peninsula region, the long-term trend is less water (regardless of whether they're being extracted from or not), which is an indication of the climate changing
3. The robustness of Uley South Basin – it is a robust, significant and unique resource. It can take short-term shocks because of its size, its shape, and the number of sinkholes. It's really important that it's looked after, because it needs to remain as a viable supply of drinking water to the region for the long term.

Jonathan noted that a desalination plant is needed because some years ago, drilling revealed that an area of the basin assumed to be saturated with water was actually dry. All of the assumptions about the overall size of the resource, which is the basis for all of the modelling and forecasting, had to be revisited – and the long-term average yield is now estimated to be no more than 5 gegalitres per annum, where it used to be around 9 gegalitres per annum.

Jonathan noted that over-extracting water from Uley South Basin for a sustained period risks sea water incursion. The basin is bound at its southwestern edge by the coast, where there is a seawater-groundwater interface. There are a number of wells drilled into that interface, which indicate that the interface is currently stable. If too much groundwater is extracted, the basin could contract from the top end and draw the seawater-groundwater interface in. Once that interface is drawn in, it will damage the basin permanently.

Jonathan noted that in his view, to be confirmed with the modelling, is that Uley South Basin can be sustained through short-term natural delays in the desalination plant project (e.g., a three-month delay due to labour shortages or another four months because of material shortages, etc.), but delaying the project by years would be a significant risk to the basin.

The Chair questioned whether, following rainfall throughout winter, the Uley South Basin could be referred to as stable.

Jonathan noted that the basin is stable, but data from the last 30 years demonstrates a steady decline in the available water resource.

The Chair asked whether the Iron Knob-Kimba pipeline is at capacity.

Shaun Ambrose noted that the Iron Knob-Kimba pipeline is operating at its capacity of 1.7 gigalitres per annum.

An SSC member asked what the implications of a drought would be on the Uley South Basin.

Jonathan noted that the basin has experienced drought before and another drought on Eyre Peninsula would add to the urgency of supplementing the region's drinking water supply.

An SSC member noted that given the risk factors to do with the Uley South Basin, there are implications on the timing for delivery of a desalination plant as well as the capacity of the desalination plant. As such, the idea of building a desalination plant at Point Boston that has the ability to operate flexibly when drought tides are present, but still supply the amount of water required, is unfeasible.

The Chair noted that the best estimate for sustainable extraction from the Uley South Basin is no more than 5 gigalitres per annum, and if the desalination plant is built with a capacity of 5.3 gigalitres per annum, then the total supply available will be 10.3 gigalitres per annum – which is more than demand.

Jonathan noted that the modelling undertaken takes into account the current climate projections as part of a risk-based approach. This process involves predicting climate conditions for an extended period – usually 30 to 50 years – and applying the predicted rainfall patterns to the resource to model how it will respond. Jonathan noted that models aren't always perfect, but the Uley South Basin is one of the most intensely monitored sites in South Australia, and on that basis he has reasonable confidence that the basin can sustain up to 5 gigalitres per annum extraction.

Peter Seltsikas noted that the desalination plant isn't being built as the sole source of drinking water but to supplement the existing ground water supply. If there are operational constraints from time to time, like drought tides, there is flexibility because it's a broader network and water can be drawn from other sources and stored as required.

An SSC member asked whether the capacity of the Iron Knob-Kimba pipeline is constrained due to the size of the pipes or the size of the pumps.

Shaun Ambrose noted that the pipes are at capacity.

An SSC member noted that their understanding was that the purpose of the desalination plant was to reduce the amount of water extracted from Uley South Basin.

Jonathan Clark noted that it's important to remember that the Uley South Basin continuously experiences leakage and has a renewal rate of around 10 years, which means that you don't find water in the basin older than 10 years. Essentially, you can't save the water for future use – if the water isn't used, it will be lost. Jonathan noted that the basin could withstand increased pumping for a short period if the desalination plant isn't able to operate for a time, but it is the annual average of no more than 5 gigalitres per annum that will be important to maintain in order to preserve the sustainability of the resource.

Peter Seltsikas noted that SA Water's intention is to reduce pumping from the Uley South Basin to approximately 3.5 gigalitres per annum, with the remainder of demand to be supplied by a desalination plant.

An SSC member asked how adequately the network modelling accounts for variables like drought, reduced River Murray flows, regional population growth, emergence of new industries with water demand, etc.

Peter Seltsikas noted that the original plan was for a desalination plant with an initial capacity of 4 gigalitres per annum. SA Water has modelled water demand in the Eyre Peninsula network approximately 30 years into the future, as is normal practice for SA Water across the state, and the initial 5.3 gigalitres per annum capacity will be sufficient to reduce pumping from Uley South Basin to

sustainable levels and meet network demands. The modelling also suggests that an ultimate desalination plant capacity of 8 gegalitres per annum will meet future demand.

8. Media update

Nil noted.

9. Other business

With regard to potable water usage and production on the Eyre Peninsula, the Chair noted the following:

- Current usage is approximately 7.0 gegalitres per annum (excluding Whyalla)
- Current extraction from the Uley South Basin is approximately 5.0 gegalitres per annum
- Approximately 1.7 gegalitres per annum is currently brought into the network from the River Murray
- Less than 1.0 gegalitre per annum is currently extracted from the Lincoln and Uley Wanilla Basins.

The Chair noted that with a desalination plant capacity of 5.3 gegalitres per annum and continued extraction of 5.0 gegalitres per annum from the Uley South Basin, the total water available would be 10.3 gegalitres per annum – which is 47% above current usage.

The Chair noted that with a desalination plant capacity of 5.3 gegalitres per annum and reduced extraction from Uley South Basin to no more than 3.5 gegalitres per annum, the total water available would be 8.8 gegalitres per annum – which is 25% above current usage.

The Chair noted that in both of the above scenarios, there is room for further growth in demand.

An SSC member noted that with an ultimate plant capacity of 8.0 gegalitres per annum, there will be significantly more room for growth in the future.

10. Next meeting and close

An agenda for the next meeting will be circulated prior to the next meeting when convened by the Chair.

With no further comments, the meeting closed at 5.08pm.

Open action items register

No.	Action Description	By Whom	Date Raised	Date Due	Status
1	Seek advice on alternative construction methodologies – concept design team to consider and engage with industry to identify synergies and leverage knowledge.	Project Team	03/03/22	TBC	Defer to when a site is selected
2	Assessment of the Northern Precinct as a separate project – independently from the functions of the SSC – to look at the viability of supporting economic development in the northern region.	Project Team	07/03/22	TBC	Open
3	Prepare a visual representation of the desalination plant and pumping station.	Project Team	07/06/22	TBC	Defer to when a site is selected