Appendix E – Updated management and mitigation measures

Impact	Measure	Timing
Soils, Geology and Contamination		
Consultation with Subsidence Advisory NSW	Further consultation with Subsidence Advisory NSW, including review of the subsidence risk and any relevant design considerations, will be undertaken during detailed design.	Detailed design
Mobilisation and spread of contamination in soils	Hunter Water commits to undertaking a DSI prior to Project determination. The scope of the DSI will include analysis for heavy metals, TRH, BTEXN, PAHs, OCPs, PCBs and asbestos and has been based on existing contamination data and the low potential for significant contamination to be present on Project area. Hunter Water will also undertake a focused investigation within the area of TP204 to further assess potential asbestos impacts prior to construction. This assessment, and the outcomes of the DSI will inform the management measures in the Contaminated Site Management Plan (CSMP) and if remediation is required.	Pre-construction
	Include contamination mitigation measures in an overall Contaminated Soil Management Plan (CSMP) for the construction to describe excavation, validation and disposal requirements for potentially contaminated soils. The CSMP must be prepared by appropriately qualified specialists and form a sub plan to the CEMP and will include the following as a minimum: • Method of identification, separation, management and tracking of contaminated soils • Stockpile any contaminated soil as far away from waterways/drainage lines as possible • Keep contaminated and non-contaminated soils separate at all times • Testing of soils to assess suitability if they are to be placed near sensitive receptors	Pre-construction
Exposure to Asbestos Containing Materials	Include an asbestos finds procedure in the overall CSMP. The asbestos finds procedure will be prepared by suitably qualified person or a competent person as determined under the Work Health and Safety Regulation (2017), and include: • Guidance on the identification of asbestos containing materials (ACM) • Steps to be undertaken if ACM is identified during works • Management and remediation/removal procedures • Required health and safety controls • Waste disposal requirements • Ongoing site management	Pre-construction
UXO procedures	Management and safe guarding procedures for UXO waste to be included in construction safety documentation.	Pre-construction
Acid sulphate soils	Conduct ASS testing within the Project area to confirm presence of ASS. If the ASSMAC Assessment Guidelines action criteria are triggered an Acid Sulphate Soil Management Plan (ASSMP) will be prepared as part of the CEMP in accordance with the Acid Sulphate Soil Laboratory Methods and Manual (ASSMAC, 1998). Include the following as a minimum: • Method for spoil material testing to confirm presence of ASS during construction and prior to excavation in an area • Conduct laboratory testing to calculate and verify treatment of ASS spoil material if it is to be treated on-site • Locate ASS treatment area within the Project area, which is already disturbed and is outside of flood liable land • Measures to manage any stockpiles of ASS materials, including bunding and cover to minimise leachate • Supervision and certification of treatment prior to removal from treatment areas for re-use	Pre-construction

Impact	Measure	Timing
Exposure of soil to erosion	Prepare an Erosion and Sediment Control Plan (ESCP) as part of a SWMP in accordance with *Blue Book - Managing Urban Stormwater: Soils and Construction* (4th ed, Landcom, March 2004), which must include the following: • Establish all erosion and sediment control measures before ground disturbance work commences and these are to remain in place until all surfaces have been fully restored and/or stabilised • Outline the process for stabilisation and progressive revegetation of all disturbed area which will include species consistent with the dune restoration project to be undertaken within the greater Belmont WWTW site • Maintenance and inspection program and checklist including: – Conditions that would trigger watering of exposed and revegetated areas – Requirements for maintenance of revegetated areas – Maintenance of erosion and sediment controls including clean out before 30% capacity remaining • Limiting traffic movements on disturbed areas • Exposed areas that is susceptible to wind generated dust particles, shall be progressively vegetated or watered. Where vegetation is not yet possible, dust suppression by watering shall be provided • Install a 40% porous, open weave barrier fence as a wind-break on the eastern side of the Project area in accordance with Standard Drawing SD6-15 (Blue Book) • Provide a clean water diversion around disturbed areas • Procedures for how any sediment laden water will be treated prior to leaving the Project area The ESCP must be prepared by appropriately qualified specialists (e.g. *completed an International Erosion Control Association (IECA) endorsed course, or passed the examination for Certified Professional in Erosion and Sediment Control* (CPESC)) as a coordinated sub plan to the SWMP.	Pre-construction
Spoil Management	Include the management of material movements in the Soil and Water Management Plan, as follows: • Identification of materials during excavations including contaminated, ASS, ENM/VENM • Stockpiling and tracking of all materials throughout construction • Validation and certification of material stockpiles prior to re-use • Tracking of materials incoming and outgoing from site (e.g. as waste, quality of imported material) • Method of soil testing including number of samples and how samples will be taken to confirm any soil amelioration requirements. Testing to include as a minimum fertility, sodicity and aluminium toxicity • Waste classification of soils that require offsite disposal using the six-step process and criteria detailed in Waste Classification Guidelines – Part 1: Classification of Waste (NSW EPA 2014)	Pre-construction

Impact	Measure	Timing
Accidental contamination from leaks or spills of fuels / chemicals etc.	Prepare an incident emergency spill plan as part of the CEMP to be implemented during construction. Include procedures for the storage and handling of hazardous materials including fuel and chemicals within the CEMP, including: • No refuelling to occur on-site unless an appropriate bunded area is available • Storage of hazardous materials on-site to be kept to a minimum and will be in accordance with national guidelines and the Safety Data Sheets relating to bunding, coverage, storage of incompatible materials, etc. • Construct the bunded hazardous materials storage area within the desalination plant as early as possible within the construction schedule so that this area could be used for storage of any hazardous materials required during construction	Pre-construction
	• Locate chemical storage and delivery areas within bunded areas with a capacity of 110 per cent of chemical storage volume • Store chemicals in accordance with Australian Standards and maintain in accordance to equipment supplier recommendations • Implement safe work procedures for the handling of all chemicals including transfer, storage, spill prevention and clean up requirements • Develop an emergency response plan that includes dangerous goods spill scenarios	Operation
Unexpected discovery of contaminated soils	• Should unexpected contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA. Include contingency plans for unexpected finds protocols for contaminated soils in the CSMP.	Construction
Water Resources		
Sedimentation of waterways during construction	Vehicle wash down and/or cement truck washout will occur in a designated bunded area or offsite.	Construction
	Include provision in the ESCP for visual inspections of nearby waterways and drainage lines following rainfall events and corrective actions in the event of impacts.	Construction
	Revegetation will be undertaken in all areas subject to ground disturbance, in accordance with the requirements listed in Table 7-2 of the EIS. Sediment and erosion controls (including dust) will be maintained until vegetation cover is established.	Construction
Flooding	The soil and water management plan will include procedures to ensure that machinery, stockpiles, equipment, fuels and chemicals, and other facilities are not stored or left within areas subject to flooding.	Pre-construction
	An emergency response plan will be prepared to include a procedure for managing flooding due to natural events. This will include an emergency procedure for ensuring the health and safety of construction workers.	Pre-construction
Increased WWTW overflows	Manage operation of the desalination plant, including shutting down in extreme wet weather if necessary.	Operation
Groundwater take	Metering of fresh groundwater removed from excavations for all construction methods. Use of sheet piling, or similar, to support excavations and reduce groundwater inflow for all construction methods will be investigated during detailed design. This applies to all construction methods. The infiltration area will be set up with bund walls, or similar, around the entire perimeter to ensure no discharge of groundwater outside the area. Only fresh groundwater (EC less than 1,500 µS/cm) to be sent to the infiltration area.	Detailed design, Construction

Impact	Measure	Timing
Groundwater monitoring	Groundwater monitoring at sites GW105 and GW108. The monitoring program will include continuous monitoring of groundwater levels and routine sampling for groundwater quality, in particular the change in EC associated with the fresh/ saline groundwater interface. Groundwater level and quality triggers will be established based on baseline monitoring data.	Construction
Groundwater drawdown	Use of sheet piling, or similar, to support excavation and reduce groundwater inflow for all construction methods will be investigated during detailed design.	Construction
Groundwater quality	Undertake additional Acid Sulphate Soil (ASS) sampling within the zone of groundwater drawdown during detailed design phase to confirm the risk of exposure of ASS due to drawdown.	Detailed Design
	Biodegradable drilling fluids will be used during drilling works for CM 1 (HDD). Undertake an ASS investigation in the vicinity of each excavation as part of the detailed design phase to determine the risk of exposure of PASS and prepare and implement an ASSMP if necessary. This is a modification of the mitigation measure identified in the EIS.	Construction
Discharge of dewatered groundwater and brine	Prior to construction, either a new EPL will be obtained or EPL 1771 will be modified to authorise the discharge of dewatered groundwater during construction and additional proposed discharges from the Project to the Belmont WWTW outfall during operation.	Detailed design
Terrestrial and Freshwater Biodiversity		
General	Site induction: All workers will be provided with an environmental induction prior to starting working on-site. This will include information on the ecological values of the area surrounding the Project area, key weed threats and measures to be implemented to protect biodiversity, particularly focussing on erosion management, and potential weed and pathogen spread.	Pre-construction, Construction
	Biodiversity offsetting would be undertaken in accordance with the findings of the BDAR.	Pre-construction
Proximity of adjacent native vegetation	Limit disturbance of vegetation to the minimum necessary to undertake the works.	Pre-construction
	Prior to the commencement of any work adjoining areas of native vegetation, clearly delineate the construction area marking the limits of clearing to avoid unintended clearing of adjacent native vegetation. Fencing and signage must be maintained for the duration of the construction period. Fencing will be designed to allow fauna to exit the site during clearing activities.	Pre-construction, Construction (daily inspections of exclusion zones during works in area)
	Install appropriate temporary fencing during the construction phase to exclude native ground fauna from adjacent native habitat entering construction areas (whether they are recorded during pre-construction survey or not). Fencing will remain in place until the completion of all construction activities including revegetation.	After completion of clearing activities/construction works
	Stockpiles of fill or vegetation will be placed within existing cleared areas (and not within areas of adjoining native vegetation).	Pre-construction, Construction
Soil erosion, sedimentation and runoff	Erosion and sediment controls will be installed and maintained in accordance with the measures outlined for soils, geology and contamination in this table.	Pre-construction, Construction, Operation

Impact	Measure	Timing
Soil erosion, sedimentation and runoff	A protocol for accidental spills will be developed and implemented in accordance with the measures outlined for soils, geology and contamination in this table.	Pre-construction, Construction, Operation
Acid sulphate soils	Additional Acid Sulphate Soil sampling would be completed during the detailed design phase to confirm the risk of exposure of acid sulphate soils due to drawdown. If this sampling identifies that there is a risk associated with an acid sulphate soil a management plan will be prepared In accordance with the measures outlined for soils, geology and contamination in this table.	Detailed Design
Introduction and/or spread of weeds and pathogens	Develop a weed species management sub-plan as part of Project CEMP to manage weeds and pathogens during the construction phase of the Project.	Pre-construction, Construction
	The location and extent of any priority and/or high threat environmental weeds within the site will be identified by a suitably qualified ecologist during pre-clearance surveys. The introduction and spread of weed species will be minimised by restricting access to areas of native vegetation and communicating the responsibilities of all Project personnel at site inductions and during regular toolbox meetings. All priority weeds identified on the Project area will be controlled and removed in accordance with the requirements of the *Biosecurity Act 2015* and Council's relevant Weed Control Manuals: Appropriate pesticides will be applied if required and a record of such application made in the pesticide application register. All noxious and environmental weeds will be cleared and stockpiled separately to all other vegetation, removed from site and disposed of at an appropriately licenced disposal facility. When transporting weed waste from the site to the waste facility, trucks must be covered to avoid the spread of weed-contaminated material. Disposal must be documented, and evidence of appropriate disposal must be kept.	Pre-construction, Construction
	All machinery entering the Project area must be appropriately inspected, and washed down and disinfected as required prior to work on site to prevent the potential spread of weeds, Cinnamon Fungus (*Phytophthora cinnamomi*) and Myrtle Rust (*Pucciniales fungi*) in accordance with the national best practice guidelines for Phytophthora (O'Gara et al, 2005) and the Myrtle Rust factsheet (DPI, 2015b) for hygiene control.	Pre-construction, Construction
	Incorporate control measures in the design of the Project to limit the spread of weed propagules off site. Sediment control devices, such as sediment fences, will assist in reducing the potential for spreading weeds.	Pre-construction, Construction
	All machinery entering the Project area must be appropriately inspected, and washed down and disinfected to prevent introduction or spread of Chytrid fungus as per the Office of Environment and Heritage Hygiene protocol for the control of disease in frogs (DECC, 2008b).	Pre-construction, Construction
Wind erosion	Erosion and sediment controls will be implemented in accordance with Table 7-2 of the EIS before commencement of ground disturbance work and will be retained until all surfaces have been fully restored and stabilised.	Pre-construction, Construction

Impact	Measure	Timing
Fauna encounters during vegetation clearing	The construction contractor is to contact the Project ecologist for advice if any unexpected fauna are found during the construction period (i.e. before, during or following clearing of native vegetation where the Project ecologist is not on site).	Construction
	A procedure to manage unexpected threatened species finds will be included in the CEMP and is to be implemented in the event of any unexpected threatened species finds during clearing.	Pre-construction, Construction
	A post-clearing report will be prepared by the construction contractor and provided to Hunter Water documenting all animals that are handled, or otherwise managed, within the site. Data to be recorded includes: • Date and time of the sighting and details of the observer • Species • Number of individuals recorded • Adult/juvenile • Condition of the animal (living/dead/injured/sick) • Management action undertaken (e.g. captured, handled, taken to vet) • Results of any management actions (e.g. released, euthanised, placed with carer)	Construction
Native vegetation	Hunter Water would prepare a Native Vegetation Management Plan prior to works starting. The plan would outline the replacement planting required to compensate for the removal of native vegetation along the proposed pipeline route. The plan would include vegetation types and densities as well as locations of planting or other biodiversity improvement works (such as weed management).	Pre-construction
	The construction contractor must engage a suitably qualified bush regenerator with demonstrated experience in native revegetation in coastal areas. The bush regenerator must undertake progressive rehabilitation of the disturbance footprint (including laydown and compound areas) to maximise potential for re-establishment of native vegetation and to minimise the potential for long-term weed issues post-construction. Areas where native vegetation or invasive weeds are removed must be revegetated with species identified in the Native Vegetation Management Plan prepared separately by Hunter Water. The CEMP must detail the bush regeneration contractor to be engaged, stabilisation timeframes and species.	Construction
Marine Biodiversity		
Seawater	Standard industry obligations such as spill prevention and management measures and the implementation of standard guidelines for the onshore storage and management of waste and hazardous materials.	Construction, Operation and Decommissioning
Benthic and sediment	Continuation of the Ocean Outfall Monitoring Program (EPL 1771) throughout operation of the Project including benthic infauna and sediment quality testing.	Operation
Increased brine discharge	• Integration of pipeline ecology and fish assemblage monitoring into the Ocean Outfall Benthic Monitoring Program for better understanding of potential changes in the species abundance and diversity. • Water quality monitoring program will be developed and implemented to identify long-term impacts from the discharge of brine concentrate on water quality or the marine environment.	Operation

Impact	Measure	Timing
Seabed disturbance	Construction method will consider option with least disturbance to seabed area and break out of drilling fluids.	Detailed design
	Speed of drilling will be reduced prior to breakthrough to surface to minimise the volume of drilling fluids released into the marine environment.	Construction
	Visual observations during drilling for signs of increased turbidity and sedimentation.	
	Emergency Management Plan in place to support drilling activities.	
Artificial light emissions	• Employ Best Practice Lighting Design for infrastructure such as vessels and barges that require to be lit at night in accordance with DoEE (2020) National Light Pollution Guidelines. Measures could include modification of light wavelengths, prevention of upward light spill and limiting light intensity for seabirds and maintaining a dark zone between any turtle nesting beach and infrastructure, avoiding direct lighting onto nesting beach or screen barriers for marine turtles (DoEE, 2020). • Light spill from the nearshore vessel operations will be minimised where possible using directional lighting. Light shields could be considered to avoid spill if sensitive receptors (i.e. shorebirds, turtles) are determined during activities to be negatively affected. • Lighting on vessel decks will be managed to reduce direct light spill onto marine waters, unless such actions do not comply with navigation and vessel safety standards (AMSA Marine Orders Part 30: Prevention of Collisions; AMSA Marine Orders Part 21: Safety and Emergency Arrangements).	Construction
Artificial noise emissions	• Where activities that generate underwater noise cannot be timed to occur outside of peak migration months the following mitigation measures and controls may be implemented. Where this is not possible, the need for Marine Fauna Observers will be determined on the basis of construction timeframes. • Acoustic harassment/deterrent devices could be sounded prior to commencement of any underwater activity to provide opportunity for sensitive marine fauna to relocate temporarily. • Vessel machinery will be maintained in accordance with the manufacturer specifications to reduce noise emissions. • The interaction of all vessels with cetaceans and whale sharks will be compliant with Part 8 of the *Environment Protection and Biodiversity Conservation* (EPBC) Regulations (2000). The Australian Guidelines for Whale and Dolphin Watching (Commonwealth of Australia, 2017)) for sea-faring activities will be implemented across the entire Project.	Construction
Atmospheric emissions	• Compliance with MARPOL Annex VI (as implemented in Commonwealth waters by the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (PSPPS Act); and Marine Order 97: Marine pollution prevention - air pollution).	Construction
Pest introduction and proliferation	• Vessels will be sourced locally wherever possible. • All vessels working on the Project, whether internationally or locally sourced will adhere to Australian quarantine requirements. • The management of ballast water prior to entry to Australian waters must follow AQIS guidelines and compliance requirements in relation to marine pest introduction risk management for any internationally sourced vessel.	Pre-construction, Construction

Impact	Measure	Timing
Accidental release of solid wastes	• Appropriate waste containment facilities will be included on the vessel as well as onshore and managed to avoid overflow or accidental release to the environment. • No waste materials will be disposed of overboard; all non-biodegradable and hazardous wastes will be collected, stored, processed and disposed of in accordance with Regulation 9 of MARPOL Annex V. • Hazardous wastes will be separated, labelled and retained in storage onboard within secondary containment (e.g. bin located in a bund). • All recyclable and general wastes to be collected in labelled, covered bins (and compacted where possible) for appropriate disposal at regulated waste facility. • Solid non-biodegradable and hazardous wastes will be collected and disposed of onshore at a suitable waste facility or to a carrier licensed to receive the waste if required by legislation. • Intake pipe design is such that in the unlikely event of contact damage, the pipe does not break apart into segments or fragments, instead remaining intact to support recovery and repair of the affected segment.	Construction
Dropped objects	• All equipment and gear on the vessels will be securely fastened during mobilisation/demobilisation. • Lifting is to be carried out by competent personnel using equipment that is suitable, certified and maintained. • Waste management controls are to remain effective to reduce risk of release of wastes that could be ingested or cause entanglement. • During the activities, detailed records of equipment lost overboard or dropped will be maintained and reviews will be undertaken to reflect on methods to mitigate repetition of the incident.	Construction
Marine fauna collision and entanglement	• Operations of vessels will be commensurate with Part 8 of the EPBC Regulations (Interacting with Cetaceans and Whale Watching), DoEE (2016) National Strategy for Mitigating Vessel Strike of Marine Mega Fauna, NSW (2016) Marine Safety Regulation, and NSW (2017) Biodiversity Conservation Regulation. • A member of the vessel crew will act as a marine fauna observer (MFO) at all times during daylight works and will maintain vigilant watch in support of Part 8 of the EPBC Regulations to manage risk of vessel collision with any other vessels or marine fauna. The MFOs will be trained and experienced in whale identification and behaviour, distance estimation, and be capable of making accurate identifications and observations of whales in Australian waters. The MFO will provide advice on appropriate actions to be taken to mitigate risks should whales be encountered. • The Australian Guidelines for Whale and Dolphin Watching (Commonwealth of Australia, 2017) for sea-faring activities will be implemented across the entire Project.	Construction

Impact	Measure	Timing
Hydrocarbon, chemicals and other liquid waste	Chemicals and hydrocarbons will be packaged, marked, labelled and stowed in accordance with MARPOL Annex I, II and III regulations. These include provisions for all chemicals (environmentally hazardous) and hydrocarbons will be stored in closed, secure and appropriately bunded areas. A Material Safety Data Sheet (MSDS) will be available for all chemicals and hydrocarbons in locations nearby to where the chemicals/wastes are stored. Vessel operators will have an up to date Shipboard Oil Pollution Emergency Plan (SOPEP) and Shipboard Marine Pollution Emergency Plan (SMPEP). All shipboard chemical and hydrocarbon spills will be managed in accordance with these plans by trained and competent crew. On board oily water disposal will be managed in accordance with the Marine Pollution Regulation 2006. The vessel operator will record the quantity, time and onshore location of the oily water disposal in the vessel Oil Record Book. If vessels are equipped with an oily water filter system, they may discharge oily water after treatment to 15 ppm in an oily water filter system (providing they have a current calibration certificate for the bilge alarm) as required by MARPOL Annex I Regulations (for the prevention of pollution by oil). To discharge, the vessels will require a current IOPP certificate for oily water filtering equipment, and a current calibration certificate for the bilge alarm.	Construction
Damaged fuel tank associated with vessel collision	Visual observations will be maintained by watch keepers on all vessels. Regular notification to the following Australian Government agencies before and during operations: • The AMSA RCC of proposed activity, location and commencement date to enable an AusCoast warning to be issued. • The Australian Hydrographic Office of proposed activity, location and commencement date to enable a 'Notice to Mariners' to be issued. • In the event of a spill resulting in notification to AMSA, other sea users (e.g. fishing industry) will be informed of the incident via Marine Notices to prevent vessels entering an area where hydrocarbons have been released. • Vessel will operate in compliance with all marine navigation and vessel safety requirements in the International Convention of the SOLAS 1974 and the Navigation Act 2012. This includes the requirement for all equipment and procedures to comply with the following AMSA Marine Orders: - Marine Order 30: Prevention of Collisions. - Marine Order 21: Safety and Emergency Arrangements. - Marine Order 27: Safety of Navigation and Radio Equipment: sets out ship requirements regarding radio installations, equipment, watch keeping arrangements, sources of energy, performance standards, maintenance requirements, personnel and recordkeeping. - Vessels will be equipped with appropriate navigational systems which may include an automatic identification system (AIS) and an automatic radar plotting aid (ARPA) system capable of identifying, tracking and projecting the closest approach for any vessel (time and location) within the operational area and radar range (up to approximately 70 km). - Marine diesel oil compliant with sulphur content of maximum 0.5% m/m) is the only engine fuel to be used by the vessels, compliant with MARPOL Annex VI. Oil spill responses will be executed in accordance with the vessel's SOPEP, as required under MARPOL.	Pre-construction, Construction

Impact	Measure	Timing
Maintenance activities	Design considerations such as burial of pipeline, sizing of the pipe and dosing of the intake structure are to be considered to reduce the need for maintenance activities.	Detailed design
	The pipe and intake structure will be inspected prior to undertaking any maintenance activities particularly for those slow moving species such as syngnathids. In the event that syngnathids are confirmed, syngnathids and the substrate they are attached to will need to be safely relocated away from the maintenance area prior to maintenance activities commencing.	Operation
Habitat creation	The pipe may be buried to reduce the area of exposure for encrusting communities, where possible.	Detailed design
	The pipe will be inspected during scheduled maintenance activities for any slow moving species such as syngnathids.	Operation
Species abundance and diversity	Continuation of the Ocean Outfall Benthic Monitoring Program (as part of EPL 1771) throughout operation of the Project. Integration of pipeline ecology and fish assemblage monitoring into the Ocean Outfall Benthic Monitoring Program for better understanding of potential changes in the species abundance and diversity.	Operation
Water quality	Water quality monitoring program will be developed and implemented to identify long-term impacts from the discharge of brine concentrate on water quality or the marine environment. Volume of chemicals in the aggregate, concentrations and discharge regimes (frequency) (inclusive of chlorine) that will be used during the desalination process will need to be adjusted and dosed in a manner so as to achieve desalination objectives and minimise harm to the marine environment to as low as reasonably practicable and/or as required by regulators.	Operation
Coastal Processes		
Disruption to dune vegetation systems, aeolian processes and associated dune stability leading to a potential increased rate of erosion	Implement a coordinated erosion monitoring and mitigation program in conjunction with the existing strategies and dune restoration project implemented for the adjacent WWTW, including: • Site profiling and revegetation following completion of civil works in accordance with the final design which is to comply with the Lake Macquarie Coastal Zone Management Plan (CZMP) (2015) and DLWC (2001). • Monitoring of recession and implementation of mitigation measures below as needed: - Beach management works such as beach scraping to reshape dunes and increase dune volume/recovery after storms if necessary. - Stabilisation of the frontal dune system by removing invasive species and replacing with locally indigenous dune vegetation. - Installation of sediment fences to minimise the movement of sands during construction. - Control offroad vehicle access and surface runoff. - Potential positive cumulative impact to align these works with Hunter Water's proposed dune protection and restoration project between the Belmont Golf Course and WWTW. • Ensure the public are prevented from entering works areas and potential areas of impact.	Construction, Operation

Impact	Measure	Timing
Consolidating or 'locking up' of coastal dunes by built infrastructure, removing the buffer for coastal erosion and increasing the risk of inland erosion	The amended design situates the desalination plant behind the foredunes. Avoid locating the water treatment process plant and intake structures more seaward than is currently proposed in the concept design and minimise hardstand areas or structures that would consolidate the coastal dunes.	Detailed Design
Exposure of the subsurface transfer pipeline by coastal processes including beach level fluctuation and storm bite	Ensure that infrastructure installed within the active portion of the beach profile is of sufficient depth such that it is below the limit of scour. Alternatively, modify the infrastructure design such that it can be exposed to wave action during extreme events, or ensure plant is decommissioned prior to risk levels increasing under future scenarios.	Detailed Design
	Monitor weather forecasts when working on the intake infrastructure and halt works when extreme coastal warnings are issued by the Bureau of Meteorology. Prepare and implement a Natural Event Response Plan as part of the Construction Environment Management Plan (CEMP).	Construction
Risk of coastal erosion impacting the plant and associated pipelines under long term future or rare events	Ensure that infrastructure does not extend into areas of present day erosion and recession risk without appropriate design measures and that the future risk level applied allows for the most conservative operational and decommissioning timeframes.	Detailed Design, Construction and Operation
	Conduct consistency reviews at major design milestones against the EIS, AR, approval conditions and latest available literature including the Lake Macquarie CZMP (2015). It is understood that the EIS will have a 10 year validity period if approved, and as such it is likely that updated sea level rise guidance and coastal risk maps will be available in the interval between concept design and Project implementation. The review is required to ensure that the Project area remains acceptable from a coastal erosion risk perspective.	
Aeolian sand ingress into the plant leading to operational maintenance issues	Implement a coordinated erosion monitoring and mitigation program and update if required.	Operation
Wave overtopping impacting the desalination plant	Design infrastructure and landscaping to minimise the likelihood and extent of wave overtopping. Minimise the impact on the plant should wave overtopping occur by maintaining appropriate drainage and designing the plant to withstand an overtopping event.	Detailed Design

Impact	Measure	Timing
Localised scour and modified nearshore wave transformation behaviour due to seabed infrastructure	Adopt pipeline and intake designs which minimise impacts to wave reflection and transformation, generation of localised eddy currents and obstructions to longshore transport. Where risks cannot be mitigated through design, implement a coordinated erosion monitoring and management program and update if required in conjunction with the adjacent WWTW and the existing approaches outlined within the Lake Macquarie CZMP (2015).	Detailed Design, Operation
Social		
Amenity and character	Ongoing consultation will be undertaken with key stakeholders prior to and during construction and operation of the Project to identify potential issues as they arise. This will include: • Notifying affected residents about planned Project activities, duration of activities, and expected impacts. Consultation will target vulnerable community members, who may include older residents and people experiencing disability. Notification will be provided to users of Nine Mile Beach and Belmont Cemetery as well as residents including those living along: - Williams Street - Marriot Street - Hudson Street • Maintain a register of stakeholders who would like to receive updates about the Project and email/write to these stakeholders at appropriate intervals. • Communicate Project information to relevant stakeholders previously identified, including local businesses and community groups. • Communicating Project information through Hunter Water's communication channels, such as a Project website and community update. • Providing a feedback mechanism for residents to contact the Project.	Pre-construction, Construction, Operation
Access and connectivity	As part of ongoing community engagement, the heavy vehicle movements will be communicated in community information materials along local residential streets such as Beach Street, Ocean Park Road and Hudson Street.	Construction, Operation
	I**ntake structure** – As a minimum to consider public safety, an Access Management Plan for navigable waters would be prepared to address access to the waterway for construction and recreational use, in consultation with Roads and Maritime.	Pre-construction, Construction
Sustainability		
Management systems and Procurement and purchasing	Develop and implement a Sustainability Management Plan (SMP) which establishes governance, structures, processes and systems to ensure integration of all sustainability considerations, initiatives, monitoring and reporting during the detailed design and construction phases of the Project. The SMP will include the following: • Sustainability objectives and targets • Roles and responsibilities for sustainability management, including adequate resourcing of sustainability • Inspection, monitoring and auditing requirements • Provisions for sustainability reporting and review by senior management • Provisions for the assessment and management of supplier sustainability performance	Detailed design

Impact	Measure	Timing
Energy and carbon	Incorporate the following measures into future stages of design to improve sustainability performance: • Adopt a target of 10 per cent energy reduction compared to business as usual for a desalination plant, as per the NSW GREP, and integrate this target into Project contracts, in accordance with the Hunter Water GEMP • Procure a desalination module which incorporates energy recovery • Procure a minimum 6 per cent GreenPower for operation of the Project, in alignment with the requirements of the NSW GREP. • Consider offsite renewable energy procurement as part of the procurement process to contribute to meeting the requirements of the NSW GREP • Incorporate all financially viable measures to reduce greenhouse gas emissions and energy use into detailed design, in accordance with the Hunter Water GEMP • Design operational lighting in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting	Detailed design
	Incorporate the following measures into construction and operation in alignment with the requirements of the Hunter Water GEMP: • Develop an energy management plan for Project operation • Monitor and report within Hunter Water energy consumption and greenhouse gas emissions • Communicate energy and greenhouse gas management objectives and performance internally and externally • Provide training and raise awareness of energy and greenhouse gas emissions procedures, initiatives and conservation opportunities to employees responsible for operation of the plant	Construction Operation
Water	Monitor water use throughout construction and operation and report as part of Project sustainability reporting, in accordance with the NSW GREP.	Construction Operation
Materials	Incorporate the following measures into future stages of design to improve sustainability performance: • Consider selection of concrete mixes with low carbon cementitious materials to achieve a reduction in imbedded carbon • Source steel which has an accompanying Environmental Product Declaration (EPD) and has been produced using an energy-reducing production process, such as polymer-injection technology • Undertake value engineering exercises during detailed design to identify opportunities to reduce construction materials use • Incorporate materials reduction initiatives into the sustainability 'lessons learned' for the Project	Detailed design
Discharges to air, land and water	Incorporate the following measures into procurement to improve sustainability performance and comply with the requirements of the NSW GREP: • Consider EU or US EPA standards when purchasing or leasing non-road diesel plant and equipment • Consider air emissions from contractor-supplied non-road diesel plant and equipment	Pre-construction
	Monitor the quality of brine discharge against water quality objectives as recommended in Table 7-9 of the EIS.	Operation
Land	Implement the contamination measures recommended in Table 7-2 of the EIS.	Detailed design

Impact	Measure	Timing
Waste	Incorporate the following measures into future stages of design to improve sustainability performance: • Develop a plan for waste management, including targets for waste avoidance, waste handling and disposal requirements, monitoring requirements, and reporting of the top three waste streams as per the NSW GREP • Develop a plan for decommissioning and deconstruction which considers the principles of Designing for Deconstruction (DfD; Guy, 2006)	Detailed design
Community health, wellbeing and safety	Incorporate the Crime Prevention Through Environmental Design (CPTED) principles into detailed design.	Detailed design
Hazards and Risk		
General hazards and risk	Review proposed transport of dangerous goods logistics. If notable differences to what was assessed are proposed, repeat the screening process to determine if a route evaluation is required.	Detailed design and construction
	Review the proposed types and quantities of dangerous goods to be stored on site. If notable differences to what was assessed are proposed, repeat the screening process to determine if the changes affect the PHA and outcome.	Detailed design and construction
	Conduct an independent review of the hazardous chemical elements associated with the proposal, including location of storages, compatibility of adjacent chemicals and bunding requirements. The review will be undertaken by an expert in hazardous chemical storage. Any recommendations will be incorporated into the detail design.	Detailed design
Dangerous goods spill	• Locate chemical storage and delivery areas within bunded areas with a capacity of 110 percent of chemical storage volume. • Store chemicals in accordance with Australian Standards and maintain in accordance to equipment supplier recommendations. • Appropriately label, separate and dispose of each chemical in accordance with Australian Standards. • Provide access to the Material Safety Data Sheet (MSDS) register of all chemicals that are located on-site for worker and emergency services reference. • Implement safe work procedures for the handling of all chemicals including transfer, storage, spill prevention and clean up requirements. • Spill kits to be available on-site in appropriate areas. • Develop an emergency response plan that includes dangerous goods spill scenarios.	Operation
Delivery of dangerous goods	• Develop and implement a traffic management plan including standard traffic rules, site speed limits, signage and designated pedestrian areas. • Ensure transport of dangerous goods complies with the Australian Dangerous Goods (ADG) code, including driver competency. • Develop a construction management plan.	Construction, Operation
Fuel spill	• Fuel store to be designed to appropriate standards. • Fuel to be stored in an intrinsically safe hazardous area as per appropriate standards. • Implement appropriate fire protection systems.	Construction, Operation
Natural hazards	• Appropriately design site drainage for the site. • Develop a fire prevention vegetation management procedure for the site.	Detailed design, Construction, Operation

Impact	Measure	Timing
Aboriginal Heritage		
Salvage of artefacts	Hunter Water will develop a care agreement in consultation with Aboriginal parties for the long-term care of Aboriginal objects. This will be integrated into the ACHMP.	Pre-construction, Construction
Unexpected Finds Procedure	An unexpected finds procedure will be prepared to provide a method to manage potential heritage constraints and unexpected finds during construction. If suspected Aboriginal objects are identified during construction, work should stop immediately and Bahtabah Local Aboriginal Land Council, DPIE and an archaeologist contacted to identify and record the objects. This procedure will be made accessible to all relevant employees and contractors working within the Project area via toolbox talks and display in break out rooms/ sites offices.	Pre-construction, Construction
Aboriginal Cultural Heritage Management Plan (ACHMP)	An Aboriginal Cultural Heritage Management Plan (ACHMP) will be formulated following approval of the Project to provide management and protection process for known and unknown Aboriginal objects and places.	Pre-construction, Construction
ACHMP Provisions	The ACHMP will include provision for the completion of the following activities. Additional inspection described within this Recommendation is referring to either further site inspection of A horizon soils after vegetation clearance or the monitoring of ground disturbance works during the works: • Surface collection of AHIMS #45-7-0397 (RPS BEL IF01) and AHIMS #45-7-0402 (RPS_IF2). • Additional inspection and surface collection of any artefacts exposed in the area mapped in Figure 5 of Appendix O as containing A horizon soils in a disturbed context. The opportunity to undertake the additional inspection and surface collection should be provided to an archaeologist and Aboriginal party representatives following vegetation clearance and respreading of A horizon soils currently within the bunds and adjoining area. • Additional inspection of the areas with the potential for intact A horizon soils mapped in Figure 5 of Appendix O, with the opportunity to undertake the additional inspection to be provided to an archaeologist and Aboriginal party representative following vegetation clearance and during earthworks (where the earthworks will occur within A horizon soils). Methodologies should be included for collection of surface artefacts.	Pre-construction, Construction
Site induction	All Hunter Water personnel and subcontractors involved in the proposed works will be advised of the requirements of the NPWS Act 1974 that it is an offence for any person to knowingly destroy, deface, damage or permit destruction, or defacement to an Aboriginal object or place without a relevant approval.	Pre-construction, Construction
Human Remains Protocol	In the event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, DPIE must be contacted on Enviroline 131 555. A DPIE officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence.	Construction
Non-Aboriginal Heritage		
Unexpected finds	If, during the course of the works, unexpected archaeological items or relics, as defined by the Heritage Act 1977 (as amended), are uncovered, work will cease in that area immediately. The Heritage Branch, Office of Environment and Heritage (Enviroline 131 555) will be notified and works only recommence when an approved management strategy developed.	Construction
Remnant tank traps	The exact location of the tank traps would be identified during detailed design to ensure potential impacts during construction are appropriately mitigated including provision of buffer zones.	Detailed design

Impact	Measure	Timing
Traffic and Transport		
Additional traffic generation due to Project construction	In consultation with Lake Macquarie City Council, a Construction Traffic Management Plan (CTMP) will be prepared and include detail with respect to: • Appropriate Traffic Control Plans • Traffic control measures in works areas • Controls associated with the delivery of heavy plant and materials to site during peak traffic periods • Appropriate entry/exclusion points for the proposed construction compound areas • Advising motorists of the change in traffic conditions associated with the work	Pre-construction
Traffic control	Appropriate exclusion barriers, signage and site supervision is to be employed so that the Project site is controlled and that unauthorised vehicles and pedestrians are excluded from the works area.	Construction
	All traffic control devices are to be in accordance with AS 1742.3-2009 – Manual of uniform traffic control Devices: Traffic control for works on roads and Roads and Maritime Traffic control at worksites manual.	Construction
	Hunter Water would ensure relevant requirements of *AS 2890.2-2002 Parking facilities - Off-street commercial vehicle facilities* are considered and documented in the CEMP for the Project	Construction
Creation of additional roads or access tracks	Only existing roads and access roads are to be utilised.	Construction
Misinformation or an uninformed community	The community is to be kept informed about the Project through appropriate means such as advertisements in the local media, Hunter Water website, notices and/or signs.	Pre-construction, Construction
Maritime traffic	Pipe-laying related activities will be undertaken in accordance with all marine navigation and vessel safety requirements under the International Convention of the Safety of Life at Sea (SOLAS) 1974 and *Navigation Act 2012*. For the vessels, this requires equipment and procedures to comply with AMSA Marine Order - Part 30: Prevention of Collisions, and Marine Order - Part 21: Safety of Navigation and Emergency Procedures. Stakeholder consultation (local councils, fishing bodies, etc.). Notification to the following Australian Government agencies will be made prior to moving the pipe laying vessel on location: • The Australian Hydrographic Office of proposed activity, location (i.e. vessel location) and commencement date to enable a Notice to Mariners' to be issued. • The Australian Maritime Safety Authority (AMSA) Rescue Coordination Centre (RCC) of proposed activities, location (i.e. vessel location) and commencement date to enable an AusCoast warning to be issued. Vessels will also be equipped with all navigational and safety requirements for operation in Australian waters. These may include an automatic identification system (AIS) and an automatic radar plotting aid (ARPA) system capable of identifying, tracking and projecting the closest approach for any vessel (time and location) within radar range (up to approximately 70 km). Visual observations will be conducted by trained watch keepers on all vessels 24 hours per day to support management of collision risk or entanglement/interference with other users.	Pre-construction, Construction

Impact	Measure	Timing
Noise and vibration		
Noise and vibration – Site inductions	All employees, contractors and subcontractors will receive an environmental induction. The induction will include: • All relevant Project specific and standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Location of nearest sensitive receivers • Employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures	Pre-construction, Construction
Noise and vibration – Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.	Pre-construction, Construction
Equipment selection	Use quieter and less vibration emitting construction methods where reasonable and feasible.	Pre-construction, Construction
Noise and vibration – Community consultation	Ongoing stakeholder consultation will occur including: • Establishing contact with local residents and the construction program and progress communicated on a regular basis, particularly when noisy activities are planned. • Notifying affected receivers of the intended work, its duration and times of occurrence. This may include a local community update letters for specific construction activities and a Project info line. • Specific notifications will be provided to receivers where the highly noise affected level of 75 dB(A) is predicted to be exceeded.	Pre-construction, Construction
Use and siting of plant	Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers.	Construction
Noise and vibration – Traffic noise	• Comply with the recommended standard construction hours. • Plan traffic flow, parking and loading unloading areas to minimise reversing movements within the site. • Loading and unloading of materials/deliveries is to occur during standard construction hours. • Contractors are to avoid dropping materials from height where practicable, during loading and unloading. • Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. • No truck movements before 7.00 am or after 6.00 pm.	Construction
Noise and vibration – Vibration monitoring	Vibration monitoring will be undertaken where equipment is being used within the safe working distances detailed in Table 7-41 of the EIS or when a complaint is received. Vibration monitoring will be conducted during these activities at the most susceptible buildings close to the construction sites. Any vibration measurement will be undertaken by a qualified professional and with consideration to the ICNG guidelines.	Construction

Impact	Measure	Timing
Noise and vibration – Complaints management	Complaints will be managed in accordance with the CEMP and the procedure outlined below. Signage will clearly and visibly provide a contact number and name to receive complaints and enquiries about construction. Potential complaints specific to these works could include: • Vibration impacts from works that significantly affect structures or dwellings • A cluster of noise and/or vibration complaints Works have the potential to cause noise complaints from nearby receivers. The response will be to: • Verbally respond to complainant • Provide a written response within seven calendar days if the complaint cannot be resolved verbally • Log the complaint, and any actions taken with regards to the complaint within a complaints register • Undertake monitoring at the complainant's residence(s) • Investigate the nature and reasons of the impact • Investigate and implement further mitigation measures to minimise the impact	Construction
Noise and vibration – high noise intensive works	Hours for highly noise intensive works will be undertaken in accordance with the EPA's requirements detailed in Section 2.4.8.5.	Construction
Noise and vibration – conditions of approval	Hunter Water will commit to undertaking the required Noise and Vibration specifications in the conditions of approval.	Design
Noise – Respite periods	High noise generating activities may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block. High noise refers to construction noise impacts which exceed the highly affected noise management level of 75 dB(A) LAeq(15-min) during standard construction hours.	Construction
Sleep disturbance – Annoying characteristics	Any annoying characteristics (such as tonality, low frequency, impulsiveness, etc.) generated by the site will need to have corrections factors applied, as per the NPI. This will need to be assessed as part of the detailed design stage where specific operational equipment are selected.	Detailed design
Operational noise – Detailed design	The following design strategies will be incorporated into the detailed design of the desalination plant: • Selection of equipment and plant items to limit noise emissions. Where practical and feasible, motor drives, gear boxes, pumps, etc. will be specified and selected to achieve a noise level of less than 85 dB(A) at a distance of one metre, consistent with occupational health and safety requirements. • Purpose built acoustic enclosures to be provided where required for large plant items in order to achieve noise levels of less than 85 dB(A) at one metre.	Detailed design

Impact	Measure	Timing
Waste Management		
General	Obtain modification to EPL 1771 to provide for discharge of brine, commissioning flows and dewatered groundwater (if applicable) via the Belmont WWTW HCS.	Pre-construction
	Follow the resource management hierarchy principles: • Avoid unnecessary resource consumption as a priority • Re-use materials, reprocess, recycle and recover energy • Dispose as a last resort (in accordance with the *Waste Avoidance and Resource Recovery Act 2001*)	Throughout the Project duration
	Manage all waste material in accordance with the POEO Act and Waste Classification Guidelines (EPA 2014) and the Waste Avoidance Resource Recovery Strategy for NSW (NSW EPA).	Throughout the Project duration
	Manage and track waste in accordance with Hunter Water specifications, including recording of the total waste generated per month and the percentage recycled.	Throughout the Project duration
	Tracking of vehicles transporting waste will be undertaken, including the origin and destination of the waste. Records will be kept for a minimum of four years.	Throughout the Project duration
Spread of contamination through inappropriate waste management	Include waste classification, sampling and analysis in the Contaminated Soil Management Plan. Manage materials in accordance with the Contaminated Soil Management Plan. Dispose of waste to an appropriately licensed facility with supporting waste classification documentation.	Construction
Generation of general construction waste	Provide labelled waste receptacles to promote the segregation of waste and recycle materials where appropriate.	Construction
	Conduct and record site inductions as specified in the CEMP to ensure staff are aware of waste disposal protocols.	Construction
	Preferentially procure materials with no or minimal packaging, or those where packaging is recyclable or able to be returned for re-use to the supplier.	Construction
	Maintain all working areas by keeping free of rubbish and cleaning up at the end of each working day.	Construction
	Do not accept waste from outside of the Project site.	Construction
	Follow mitigation measures for weed disposal as defined in Section Table 7-7 of the EIS.	Construction
	Provide portable toilets for construction workers and manage to ensure the appropriate disposal of sewage (i.e. removed by a licensed supplier). Portable toilets will be located away from drainage lines.	Construction
Generation of wastewater from dewatering	Collection and testing of dewatered groundwater to be included in the CEMP. If of suitable quality, reinject, use for dust suppression or discharge in the vicinity of the works. If unsuitable for reuse or reinjection, or discharge dispose of via the Belmont WWTW HCS in accordance with conditions of EPL 1771.	Construction
Generation of wastewater during commissioning of intake and desalination plant	During commissioning, test any wastewater that is to be disposed of to the WWTW or to the outfall to ensure that parameters will not exceed the conditions of EPL 1771 or relevant marine water quality guidelines. Calculations will need to reflect dilution with the existing WWTW effluent.	Commissioning
	Treat chlorinated water prior to release into the HCS to prevent chlorine impacts to fauna.	Commissioning
	Release commissioning wastewater as slowly as possible to minimise the impact on the WWTW effluent quality and quantity.	Commissioning

Impact	Measure	Timing
Generation of brine	Dispose of brine via the Belmont WWTW HCS in accordance with the conditions of EPL 1771.	Operation
Generation of pre-treatment sludge waste	Dispose of pre-treatment sludge waste via the Belmont WWTW in accordance with the conditions of EPL 1771.	Operation
Decommissioning	Where possible sell or repurpose components and materials for use on other projects. Where reuse is not possible, recycle materials at an appropriately licenced facility. Dispose to a licenced landfill only after re-use and recycling options have been exhausted.	Decommissioning
Visual Amenity		
Minimise visual impact for receptors	Existing large trees and vegetation will be maintained and protected wherever possible.	Operation
Minimise light spill into any adjoining landholding or dwelling	During operation, lighting will be provided at the desalination plant, given that it will be operational on a continuous basis. Lighting will be provided in accordance with AS 4282 – Control of the obtrusive effects of outdoor lighting.	Operation
	Lighting of the temporary barge for intake pipeline and intake structure construction methods will be required as per NSW Roads and Maritime Night Safety guidelines. This is required as to mitigate issues out at sea, ensuring that other vessels/water activity are able to clearly identify the equipment's location.	Construction
Minimise visual impact on residential areas	Following completion of the minor upgrade to the power connection at the intersection of Hudson Street and Marriot Street, Belmont South, the existing footpaths and road surfaces will be reinstated to original condition prior to the works.	Construction
Minimising visual impact on the adjoining dwellings	During construction of the Project, the works area will be kept tidy and any lighting during night time will be used over a short duration and directed to avoid spill into any adjoining properties.	Construction
Contrast of structures against the surrounding vegetation	A muted colour palette will be utilised for the desalination site structures.	Detailed Design

Impact	Measure	Timing
Air quality		
Generation of dust	Include a procedure for effective dust control in the CEMP, including: • Limit earthmoving activities during periods of high winds • Implement dust suppression using water carts or binder sprays if required • Specify height and cover of stockpiles • Minimise vehicle movements and limit maximum speed on site to 40 km/h • Cover loads during transport • Assign haulage routes and minimise vehicle and equipment movements outside of sealed roads/areas	Pre-construction
	Limit the areas of clearing and ground disturbance to the minimum required.	Construction
	Investigate any dust complaints and implement correction as soon as possible. Define the complaint procedure within the CEMP.	Construction
	Stabilise and revegetate disturbed areas progressively where disturbed areas will be left for longer than 21 days. Revegetate in accordance with the mitigation measures provided in Table 7-7 of the EIS.	Construction
	Maintain dust suppression controls including weave barrier fence as wind breaks on up wind of disturbed areas until rehabilitation is completed with appropriate vegetation coverage.	Construction
Exhaust emissions	Turn off plant and machinery when not in use and fit with emission control devices complying with Australian Design Standards.	Construction
	Maintain construction plant and equipment in good working condition in accordance with manufacturer requirements. Stand down any equipment found to be emitting excessive exhaust emissions (such as excessive visible diesel smoke) until repaired.	Construction
Combustion emissions	Prohibit burning of any materials on-site.	Construction
Impact on sensitive receivers	Advise local residents of hours of operation and duration of work and provide a contact name and number for queries regarding air quality.	Pre-construction
Odour	Maintain a clean and tidy site with waste removed frequently, particularly sewage and putrescible waste.	Construction
Greenhouse Gas		
Electricity use	Turn power tools and electrical equipment off when not in use.	Construction
	The operations of the Belmont Desalination Facility will follow the guidelines stated in the Hunter Water Greenhouse Gas and Energy Management Policy. The following measures will be undertaken to minimise/reduce greenhouse gas emissions and energy use during operations: • Incorporate specific energy management targets and KPIs • Review and audit energy management systems and their performance	Operations

Impact	Measure	Timing
Fuel consumption	Develop options during the detailed design for optimising construction and transport activities and minimising fuel usage (e.g. reduce the number of vehicle trips required). Mitigation of greenhouse gas emissions will follow a hierarchical approach: • Avoid emissions source • Reduce consumption • Improve energy efficiency • Replace with low emissions alternative • Offset	Pre-construction
	Develop a fuel management strategy that incorporates project planning, logistics, operator education and maintenance.	Pre-construction
	Investigate use of biodiesel for vehicles, equipment and machinery used during the Project.	Pre-construction
	Adopt sustainable procurement practices where feasible.	Pre-construction
	Maintain construction plant and equipment in good working condition in accordance with manufacturer requirements. Stand down any equipment found to be emitting excessive exhaust emissions (such as excessive visible diesel smoke) until repaired.	Construction
	Turn off plant and machinery when not in use and fit with emission control devices complying with Australian Design Standards.	
	Reduce fuel consumption through the use of efficient plant and vehicles. Modern vehicles, equipment and machinery only will be used. These are more fuel efficient and have better emission controls than older models.	
Human Health		
Encounter contamination during construction.	Should unexpected contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA. Include contingency plans for unexpected finds protocols for contaminated soils in the CSMP.	Construction
Exposure to chemicals during operation of the desalination plant	Locate chemical storage and delivery areas within bunded areas with a capacity of 110 per cent of chemical storage volume. Store chemicals in accordance with Australian Standards and maintain in accordance to equipment supplier recommendations. Implement safe work procedures for the handling of all chemicals including transfer, storage, spill prevention and clean up requirements. Develop an emergency response plan that includes dangerous goods spill scenarios.	Operation
Human health impacts at recreational swimming sites	Monitor enterococci levels in the discharge stream and nearby recreational swimming sites once the plant is operational to confirm the predicted low human health risk.	Operation
Potable water quality.	Manage potable water quality in accordance with the requirements of the Australian Drinking Water Guidelines (NHMRC, 2011) and NSW Health.	Operation
Cumulative impacts		
Cumulative impacts	Cumulative impacts will be considered as part of consistency reviews at major design milestones for the Project against the EIS, approval conditions and latest available Project information at the LMCC and DPI&E websites	Construction