

## 4 Approach to environmental impact assessment

### 4.1 Environmental principles and objectives

In January 2008 the Environmental Protection Authority endorsed the Water Corporation's Environmental Scoping Document (Water Corporation 2007b) as an acceptable basis for the preparation of this PER. The Environmental Scoping Document reviewed the principles of environmental protection (reproduced from the Environmental Scoping Document below in Table 4.1) and considered their relevance to the proposal. How those principles would be incorporated into the proposal was also articulated. In addition to this assessment, Chapter 13 explores the principles of sustainability in more depth, particularly in regard to the Water Corporation's business principles. Table 4.2 summarises the Corporation's evaluation of significance of each potential environmental impact by classing each impact as either applicable or key for the EPA's assessment. Minor changes to Table 4.2 from the version contained in the Environmental Scoping Document have been made to reflect EPA and community views on the scope of the PER. The management of each of these factors during both construction and operational phases of the project is discussed more fully in Chapters 5 – 12. Where management plans are proposed to be developed, they are included as Appendices in this PER for assessment by the EPA and approval by the Minister for the Environment.

**Table 4.1 - Principles of Environmental Protection**

Principles of Environmental Protection	Relevant	If yes, consideration
<p>The Precautionary Principle.</p> <p>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</p> <p>In application of this precautionary principle, decisions should be guided by–</p> <p>(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</p> <p>(b) an assessment of the risk – weighted consequences of various options.</p>	Yes	<p>Investigations will be undertaken to provide information regarding the expected environmental impacts of the seawater concentrate discharge stream.</p> <p>Available literature will be reviewed and used together with field data and plume dispersion modelling to predict likely physical and ecological responses associated with the proposed brine disposal. The PSDP has been operating since November 2006 and no measurable impacts have occurred. A monitoring and adaptive management program will be proposed in the Environmental Review to track physical and ecological responses to the brine discharge.</p> <p>In addition, mitigation measures will be proposed as well as opportunities for environmental offsets if EPA objectives can not be met.</p> <p>A risk assessment framework of the various options will be developed, with the results of this assessment to be discussed in the PER.</p>
<p>Principle of Intergenerational Equity.</p> <p>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations</p>	Yes	<p>It is considered that this proposal can be developed to not adversely impact on the environment for future generations. The proposal itself is being proposed as one component of Water Corporation's drought response strategy - 'Security through Diversity'. This is a long-term initiative (to 2050) to ensure water sources are developed to meet future water demands. SSDP is being developed as a continuous, reliable supply for present and future residential and industrial users that is independent of climate. Other diverse water sources are being developed simultaneously to SSDP.</p>
<p>Principle of the conservation of biological diversity and ecological integrity.</p> <p>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	Yes	<p>While there will be an impact on the ecosystem within the terrestrial footprint of the plant, pipeline routes and marine Low Ecological Protection Area, the biodiversity and ecological integrity of the region will be maintained.</p> <p>Terrestrial and marine flora, fauna and habitat surveys will be conducted to support this.</p> <p>Permanently disturbed areas will be utilised where practicable. Environmental offsets present opportunities where some ecological losses are unavoidable.</p>
<p>Principles relating to improved valuation, pricing and incentive mechanisms.</p> <p>(1)Environmental factors should be included in the valuation of assets and services.</p> <p>(2)The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.</p> <p>(3)The user's goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</p> <p>(4)Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including marketing mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems.</p>	Yes	<p>Water Corporation recognises and accepts a range a costs of managing the operation and impacts of this proposal. As Water Corporation operates on a full cost recovery basis, these costs will be passed onto its customer base within the parameters of the Government's pricing policies for the provision of water supplies.</p> <p>The price that industrial customers pay for water is based on full cost recovery by Water Corporation. This provides an appropriate signal to business and represents the true cost associated with provision of water services.</p> <p>The Government sets the price that residential customers pay for water (currently on the basis of the Uniform Pricing Policy). In Western Australia the price of residential water is split into consumption brackets (tapers).</p> <p>This tapered system helps to send a clear conservation message to people who consume large quantities of water. The more water used, the greater the payment.</p>
<p>Principle of Waste Minimisation</p> <p>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</p>	Yes	<p>Apart from brine, which will be discharged to the ocean via an outlet and diffuser to ensure rapid mixing, the desalination process generates minimal wastes. If a coagulating process using iron salts is used, sludge disposal will be to a licensed landfill site. Otherwise sludge will be recombined with brine and discharged to ocean.</p>

**Table 4-2: Potential Environmental Impacts**

	<b>Factor</b>	<b>EPA's Environmental Objective</b>	<b>Potential Impacts</b>	<b>Additional Investigations</b>	<b>Proposed Management</b>	<b>Guidance &amp; Standards/ Decision making bodies and advisory groups</b>	<b>Environmental Significance</b>
<b>Over-Arching Principles</b>	Biodiversity	Maintain abundance, diversity, geographic distribution and productivity of life forms through the avoidance or management of adverse impacts and improvement in knowledge.  To avoid adverse impacts on biological diversity, comprising the different plants and animals and the ecosystems they form, at the levels of genetic, species and ecosystem diversity.  To comply with the Environmental Protection Act (1986) and the Environment Protection and Biodiversity Conservation Act (1999).	Vegetation clearing. Removal of ecological links. Reduction in fauna habitat. Weed invasion. Dieback disease spread through native vegetation areas.	Complete detailed biological surveys commenced in Spring 2006 identifying: Threatened Ecological Communities (TECs) Declared Rare and Endangered Flora and Fauna Priority Flora Weeds Dieback mapping	Retention of recognised ecological communities at levels that are below 30% of original extent. Protect TECs. Minimise clearing where practicable. Dieback hygiene plan included in the Construction Environmental Management Framework.	EPA Position 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection. EPASU DEC	Considered a key environmental factor for PER.
	Sustainability	To use, conserve and enhance the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.  To ensure, as far as practicable, that the proposal meets or is consistent with the sustainability principles in the National Strategy for Ecologically Sustainable Development.	Emissions of greenhouse gases from power supply (depending on power source – see separate entry for greenhouse gas impacts). Possible disruption of marine habitats from the seawater concentrate and filter backwash returned to the ocean. Possible reduction in community amenity	Prepare a sustainability statement for the project including an assessment of environmental, social and economic sustainability (triple bottom line).	Designing an effective diffuser to ensure sufficient dispersion.  Investigate opportunities to protect and enhance the vegetation on Lots 32, 33 and part Lot 8.	National Strategy for Ecologically Sustainable Development. Hope for the Future: The Western Australian State Sustainability Strategy ( Department of the Premier and Cabinet [DPC] 2003). EPA Guidance 55. Implementing Best Practice in proposals submitted to the EIA process. EPASU DEC	Considered a key environmental factor for PER.
<b>Terrestrial - Biological</b>	Terrestrial flora and vegetation (including Threatened Ecological Communities [TEC])	To maintain abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through avoidance or management of adverse impacts and improvement in knowledge.  Avoid, minimise or mitigate any likely adverse impacts, direct or indirect on regionally significant bushland, and System 6 areas.	Footprints of approximately (total remnant vegetation impacts unknown until plant layout and pipe route is finalised): 20ha for plant. 5 ha for construction laydown (to be rehabilitated after construction). Approximately 77ha for potable water pipeline route from plant to IWSS connection. Most of the route is within roads or cleared farmland, with approximately 5-7ha of native vegetation clearing estimated. No DRF or TECs present on the site or pipe corridor. Weed invasion following clearing. Dewatering impacts for buried pipe construction.	Undertake a desktop review of local and regional vegetation and flora. Undertake detailed baseline studies to identify existing flora species and vegetation communities for proposed plant sites and proposed pipeline routes commencing spring 2005 and to determine the total area of remnant vegetation that exists onsite and along pipelines. Investigate location and pipeline routes to avoid or minimise disturbance to flora and vegetation communities Identify possible rehabilitation plan and offsets for any unavoidable clearing.	Reduce area to be cleared by minimising plant footprint and optimising layout to minimise impact on high value vegetation. Develop and implement a Construction Environmental Management Framework, specifying Vegetation and Flora Management, Revegetation Management, and Weed Management. Develop and agree environmental offsets.	EPA Position 2 – Environmental Protection of Native vegetation in Western Australia. EPA Position 3 – Terrestrial Biological Surveys as an Element of Biodiversity Protection. EPA Position 9 – Environmental Offsets EPA Guidance 19- Environmental Offsets EPA Guidance 10: Level of Assessment for proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 Region. EPA Guidance 51: Terrestrial flora and vegetation surveys for EIA in WA. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DEC	Considered a key environmental factor for assessment in the PER.

Factor	EPA's Environmental Objective	Potential Impacts	Additional Investigations	Proposed Management	Guidance & Standards/ Decision making bodies and advisory groups	Environmental Significance
Terrestrial Flora and Vegetation – Declared Rare Flora, Priority Flora and flora of conservation significance	To protect declared rare and priority flora consistent with the <i>Wildlife Conservation Act 1950</i> . Protect other flora species of conservation significance.	Footprints of approximately (total remnant vegetation impacts unknown until plant layout and pipe route is finalised): 20ha for plant plus 5 ha for construction laydown. Approximately 77ha for potable water pipeline route from plant to IWSS connection. Most of the route is within roads or cleared farmland, with approximately 5-7ha of native vegetation clearing estimated. No DRF or TECs present on the site or pipe corridor. Weed invasion following clearing. Dewatering impacts for buried pipe construction.	Undertake a desktop review of local and regional vegetation and flora. Undertake level 1 and 2 studies to identify any DRF and other species of conservation significance for proposed plant sites and proposed pipeline routes. Provide preliminary plant layout and pipeline routes to avoid or minimise loss of vegetation. Investigate environmental offsets.	Reduce area to be cleared by minimising plant footprint and optimising layout to minimise impact on high value vegetation. Develop and implement a Construction Environmental Management Framework, specifying Vegetation and Flora Management, Revegetation Management, and Weed Management. Develop and agree environmental offsets.	EPA Position 3 – General Requirements for Terrestrial Biological Surveys. EPA Position 9 – Environmental Offsets EPA Guidance 19- Environmental Offsets EPA Guidance 33: Draft environmental guidance for planning and development EPASU DEC	Considered a key environmental factor for PER.
Terrestrial Fauna	To maintain abundance, diversity, geographic distribution and productivity of fauna at species levels through avoidance or management of adverse impacts and improvement in knowledge.	Possible disturbance to nesting sites / burrows from clearing. Reduction in habitat from clearing. Possible interruption to habitat corridors from clearing. Noise and lighting affecting fauna movements.	Undertake a desktop review of local and regional fauna. Undertake field surveys in spring for plant sites and pipeline routes.	Prepare and implement a Construction Environmental Management Framework, detailing Fauna Management. Reduce area impacted by clearing by minimising plant footprint and optimising layout to minimise impact on high value vegetation. If significant habitat is reduced, enhance or protect partially degraded habitat in adjacent areas.	EPA Guidance 56: Terrestrial Fauna surveys for EIA in WA. EPA Position 2 – Environmental Protection of Native Vegetation in Western Australia. EPA Position 3 – General Requirements for Terrestrial Biological Surveys. EPASU DEC	Considered a key environmental factor for PER.
Specially Protected Fauna – Migratory birds, Specially Protected Fauna, Priority Fauna, endemic fauna, threatened fauna	To protect specially protected (threatened) fauna consistent with the <i>Wildlife Conservation Act 1950</i> .	Loss of habitat on which significant fauna rely.	Undertake a desktop review of local and regional fauna. Undertake field Level 2 fauna surveys in spring for plant sites and pipeline routes. Determine if any threatened fauna are likely to be affected by the plant and associated works.	Plant locations and pipe routes designed to avoid significant fauna habitats. If disturbance is unavoidable provide habitat or undertake translocations in consultation with DEC. Prepare and implement a Construction Environmental Management Framework, detailing Fauna Management. Minimise clearing habitat on which significant fauna rely. Develop and agree environmental offsets.	EPA Guidance 56: Terrestrial Fauna surveys for EIA in WA. EPA Position 2 – Environmental Protection of Native vegetation in Western Australia. EPA Position 3 – General Requirements for Terrestrial Biological Surveys. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DEC	Considered a key environmental factor for PER.

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	Subterranean Fauna	Maintain integrity, ecological functions and environmental values of karst ecosystems. To maintain abundance, diversity, geographic distribution and productivity of subterranean fauna	Dewatering and excavation of karst environments.	Identify any significant karst environments in project area. If present identify risk posed by dewatering.	Preliminary onshore geotechnical investigations and drilling (to 60m) indicate that there are no karst formations at the location of the proposed seawater pumpstation (the only site infrastructure requiring dewatering). For the pipeline construction any dewatering which may be required will be of a temporary and localised nature, therefore no significant impact on karst formations (or stygofauna) is expected. The Water Corporation will seek advice from the WA Museum to confirm this.	EPA Guidance 54: Consideration of subterranean fauna in groundwater and caves during environmental assessment in Western Australia. EPASU DEC	Only considered an applicable environmental factor if significant karst environments are identified.
Marine - Biological	Marine Flora (Benthic Habitat)	Maintain the ecological function, abundance, species diversity and geographic distribution of benthic habitat in order to protect ecosystem health. To protect marine flora consistent with the <i>Wildlife Conservation Act 1950</i> .	Temporary loss of benthic primary producer habitat due to preparation of seabed for buried pipeline laying and associated activities (eg: moorings, jetties, groynes). Possible temporary short-term impacts on habitat health due to turbidity generated during construction. Potential for habitat health impacts/losses resulting from elevated salinity in the vicinity of the brine discharge.	Undertake a desktop review of existing information on local benthic communities. Undertake a benthic habitat mapping survey. Undertake baseline surveys within vicinity of proposed intake and outlet facilities of benthic communities and sediment quality. Salinity dispersion model to determine risk posed by seawater concentrate on benthic communities. Undertake a study and modelling of cumulative impacts of discharge to the marine environment. Design marine pipeline route options to avoid or minimise disturbance to marine flora and habitat.	Final location of the intake and outlet structures and pipe routes minimise impacts on sensitive marine communities, including seagrass meadows. Development and implementation of a Construction Environmental Management Framework, detailing management of water quality for marine construction. Impacts of construction to be controlled by restricting working width to only that reasonably necessary.	EPA Perth Coastal Waters Environmental Values and Objectives. EPA Guidance 29: Benthic Primary Producer Habitat Protection for Western Australia's Marine Environment. EPASU DEC	Considered a key environmental factor for PER.
	Marine Fauna	Maintain the ecological function, abundance, species diversity and geographic distribution of marine fauna in order to protect ecosystem health, in accordance with the values and objectives identified in Perth Coastal Waters Environmental Values and Objectives. To protect marine fauna consistent with the <i>Wildlife Conservation Act 1950</i> .	Construction will temporarily impact localised habitat. Construction of the seawater intake and brine discharge diffuser pipelines may impact on behaviour of cetaceans (dolphins and whales). Operation of seawater intake structure may present a localised hazard to fauna. Operation of brine outlet diffuser may present a localised impact to resident fauna, within the mixing zone.	Identify Specially Protected and Priority Fauna and protected migratory species. Establish a biota baseline. Bio-monitoring via mussel deployment Determine if any threatened species are likely to be affected by the desalination discharge or associated marine infrastructure. Study and modelling on cumulative impacts of discharge to the marine environment. Design seawater intake and brine outlet diffuser to minimise impact on resident fauna. Undertake literature review of studies of marine larval nurseries in Binningup area.	Final location of the intake and outlet structures and pipe routes avoid sensitive marine communities. Design the seawater intake and brine outlet diffuser structures to minimise operational impact on fauna. Impacts of construction to be controlled by restricting working width to only that reasonably necessary. Implementation of Construction Environmental Management Framework to manage impacts on cetaceans.	EPA Guidance 29: Benthic Primary Producer Habitat Protection for Western Australia's Marine Environment. Perth Coastal Water Environmental Values and Objectives. EPASU DEC Department of Fisheries	Considered an applicable environmental factor for PER.

	Factor	EPA's Environmental Objective	Potential Impacts	Additional Investigations	Proposed Management	Guidance & Standards/ Decision making bodies and advisory groups	Environmental Significance
Terrestrial - Physical	Landscape and Landform	To maintain landscape and landform integrity, ecological functions and environmental values.	Landform modification resulting in altered local: Surface stability Erosion potential Drainage	Geotechnical survey including: A desktop review of regional geology Site investigations, with a particular emphasis on engineering design to avoid and/or minimise impacts.	Manage surface stability, erosion potential, drainage control requirements for roads and access tracks and rehabilitation issues through engineering design of plant and surroundings. Rehabilitation of disturbed areas not required for permanent structures. Implementation of Construction Environmental Management Framework to manage impacts	DEC Water Quality Protection Note: Roads in Sensitive Environments. WA Planning Commission Statement of Planning Policy No. 2. EPA Guidance 33: Draft environmental guidance for planning and development EPASU DEC	Considered an applicable environmental factor for PER.
	Acid Sulphate Soils (ASS)	Minimise the risk to the environment resulting from ASS.	Potential exposure of ASS by excavation and dewatering (note: there is a much greater potential for ASS on the pipeline route than for the plant site).	Field survey for ASS	Develop and implement a Construction Environmental Management Framework, detailing dewatering management.	DEC Acid Sulfate Soils Guideline Series. WAPC Bulletin No. 64. EPASU DEC WAPC	Considered an applicable environmental factor for PER.
	Groundwater and Surface Waterways	To maintain waterway integrity, ecological function and environmental values. To maintain the quantity and quality of water so that existing and potential environmental values, including ecosystem function, are protected. To ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	Temporary watertable drawdown from dewatering to enable construction. Waterways only expected to be temporarily affected during pipe burial.	Undertake a wetland study to characterise and define the presence of existing ground and surface water levels of nearby wetlands, including assessment of groundwater contours if any infrastructure is located within 200 m of a conservation category wetland.	Design plant location to avoid high water table and ASS. Bed and bank permits will be obtained from the Department of Water where applicable. Develop and implement a Construction Environmental Management Framework, detailing dewatering management.	Implementation Framework for Western Australia for the Australian and New Zealand. Guidelines for Fresh and Marine Water Quality and Water Quality Monitoring and Reporting. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DEC DOW	Considered an applicable environmental factor for PER.
	Wetlands	To protect the environmental values and functions of wetlands in the project area. To protect, sustain and, where possible, restore the biological diversity of wetland habitats in the project area. To protect the environmental quality of the wetland ecosystems of the project area through sound management.	Potential for wetlands and their buffers to be temporarily disturbed during pipe burial. Wetlands only expected to be temporarily affected during pipe burial. A highly degraded conservation category wetland partially extends into the southern tip of Lot 8 (with an area of less than 0.5 ha). Loss of wetland and dryland vegetation and fauna habitat. Hydrological impacts. Changes in geomorphology. Alteration of stratigraphy. Acid sulphate soils.	Undertake baseline studies to identify wetlands throughout the project area. Assess the potential impacts on wetlands and dependent vegetation, including hydrological linkages and potential impacts to systems of wetlands, as a result of development activities. Undertake wetland study if infrastructure is located within 200 m of a Conservation Category Wetland.	Pipeline routes to avoid wetlands and their buffers where practicable. Fully protect CCWs and their buffers. Protect and manage buffers between other wetlands and proposed project areas, including installation of fencing and other barriers to prevent access. Develop and implement a Construction Environmental Management Framework, detailing dewatering management.	EPA Position 4: Environmental Protection of Wetlands. WAPC, 1999 Coastal and Lakelands Planning Strategy – Dawesville – Binningup Shire of Harvey, 2006. Coastal Management Plan. EPA Guidance 33: Draft environmental guidance for planning and development. Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 EPA Position 9 – Environmental Offsets EPA Guidance 19- Environmental Offsets EPASU DEC DOW	Considered a key environmental factor for PER.
	Stormwater	To protect the built environment from flooding and waterlogging. To maintain the total water cycle balance within the project areas relative to the pre-development conditions. To retain natural drainage systems where practicable and protect ecosystem health.	Flooding of buildings and adjacent areas. Excessive drainage into protected wetlands. Interruption of local water flows.	Determine predicted volumes of stormwater based on site design. Investigation of storage and reuse options.	Safe passage of excess runoff from large rainfall events towards (non EPP) watercourses and wetlands. Development and implementation of a Construction Environmental Management Framework, detailing Stormwater Management. Plant design to cope with a 1:100 Annual Recurrence Interval Storm Event.	DEC Stormwater Management Manual for Western Australia. Australian Guidelines for Urban Stormwater Management (ARMCANZ/ANZECC 2000). Local government requirements. EPASU DEC Shire of Harvey	Considered an applicable environmental factor for PER.

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Marine - Physical	Marine Bathymetry (including coastal processes)	To maintain seascape and landform integrity, ecological functions and environmental values. Ensure the development does not significantly impact on coastal processes.	Construction of the intake and outlet will necessitate some disturbance and potentially temporary or small-scale permanent modification as a result of: Excavation and burial across the beach and dune, with subsequent rehabilitation. Excavation to an adequate depth and burial across the surf zone, so that the pipeline does not interfere with coastal processes; Potential for underwater blasting.	Determine detailed bathymetry of the project area via a bathymetric survey. Undertake baseline beach profiling study to assist in re-instatement. Undertake a refraction (geotechnical) study to determine subsurface geology. Current/long-shore drift study using an Acoustic Doppler Current Profile to study currents and coastal processes in order to determine the potential impacts from pipeline installation and any dredging on the coastal processes (including long-shore sediment processes, current movements and oceanic processes).	The Water Corporation will select preferred methods for pipeline installation to minimise impacts on marine processes. Rehabilitation to follow excavation and burial of pipelines across the beach and dunes. Blasting is not the preferred construction technique, however if blasting is necessary, an underwater blasting procedure will be developed such that any impacts on marine environment are minimised. Development and implementation of a Construction Environmental Management Framework. Regular pipeline inspections and maintenance as required.	EPA Guidance 29: Benthic Primary Producer Habitat Protection for Western Australia's Marine Environment. EPA Perth Coastal Waters Environmental Values and Objectives. WA Planning Commission Statement of Planning Policy no. 2.6 EPA Guidance 33: Draft environmental guidance for planning and development. WAPC Development Control Policy 6.1: Country Coastal Planning Policy. EPASU DEC Department of Fisheries	Considered a key environmental factor for assessment in the PER.
	Marine dilution and dispersion (hydrodynamics)	To ensure that the brine discharge is sufficiently dispersed so that there are no impacts on hydrodynamic processes outside of the Low Ecological Protecting Area (LEPA) resulting from the operation of the brine outlet facilities.	Brine dispersion impacting on water quality.	Implement a hydrodynamic model to characterise the likely dilution, advection, and far-field dispersion of the seawater concentrate from the proposed ocean outlet. Conduct a dye dispersion test and/or drogue study to confirm far-field mixing. Study and modelling on cumulative impacts of brine discharge to the marine environment. Investigate a variety of intake and outlet locations considering both environmental and engineering aspects. Investigate diffuser designs.	Develop and implement an operational Environmental Management Framework, covering marine dilution and dispersion. Intake and outlet located in environments with sufficient energy to enable discharge dispersion. Altering diffuser design to achieve required mixing.	EPA Perth Coastal Waters Environmental Values and Objectives. EPASU DEC Department of Fisheries	Considered a key environmental factor for assessment in the PER.
Pollution Management	Air Quality - Greenhouse Gas Emissions	Ensure that potential greenhouse gas emissions generated by the proposal are adequately addressed in the planning/design and operation of projects and that: best practice is applied to maximise energy efficiency; and a renewable energy source is used and/or appropriate offsets are implemented. Ensure that emissions to air do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards. Achieve the corporate goal of organisational carbon neutrality by 2030.	Nil, as the plant's energy requirements will be purchased from renewable sources, and no greenhouse gases or emissions to air will occur at the plant.	Investigate the feasibility of 20% of the plant's power requirements being sourced from unproven technologies (with 80% from proven renewable technologies), to encourage their development. If this is not possible, 100% of the power will be sourced from conventional renewables.	The plant's energy requirements will be purchased from renewable sources. Energy efficiency will be an important factor in the plant design.	EPA Guidance 12: Minimising Greenhouse gas Emissions. EPA Guidance 15: Emissions of Oxides of Nitrogen from Gas Turbines. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DEC	Considered an applicable environmental factor for the PER.

Factor	EPA's Environmental Objective	Potential Impacts	Additional Investigations	Proposed Management	Guidance & Standards/ Decision making bodies and advisory groups	Environmental Significance
Air Quality - Particulate Matter (Dust)	Protect the surrounding land users such that dust and emissions of particulate matter will not adversely impact upon welfare and amenity or cause health problems.	Localised temporary airborne dust and associated settlement during construction.	Identification and management of potential dust sources.	Reduce potential dust sources during construction by minimising clearing, thus minimising exposed surfaces. Rehabilitation of disturbed areas. Investigate and implement dust management measures such as watering and other dust suppressants. Development and implementation of a Construction Environmental Management Framework outlining management of dust.	EPA Guidance 18: Prevention of Air Quality Impacts from Land Development Sites. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DEC	Considered an applicable environmental factor for the PER.
Marine Water Quality and Sediment Quality	Maintain the overall marine water and sediment quality. Protect objectives defined in ANZECC water and sediment quality guidelines.	Construction activities temporarily increasing local turbidity. Discharge of brine to ocean altering local water quality. Discharge of chemicals used in the plant processes may adversely alter local water and sediment quality. Possible cumulative impacts in the marine environment from this proposal in conjunction with a number of existing disposal streams.	Undertake Baseline Water and Sediment Quality Surveys. Undertake ecotoxicity studies using the discharge from the existing Perth Seawater Desalination Plant. In consultation with the EPASU, define a Low Ecological Protection Area (LEPA) and predict concentrations of substances in the brine at the boundary of the LEPA.	Minimising operational area during construction. Development and implementation of a Construction Environmental Management Framework. Outlet located and designed to ensure water quality is not significantly affected by discharge. Water quality based on existing background water quality and ecotoxicity requirements being met within the LEPA boundary. Develop and implement an operational Environmental Management Framework, covering marine dilution and dispersion.	Australian and New Zealand Water and Sediment Quality Guidelines. Australia for the Australian and New Zealand Guidelines for Fresh and Marine Water Quality and Water Quality Monitoring and Reporting. EPA Perth Coastal Waters Environmental Values and Objectives. EPA Guidance 29: Benthic Primary Producer Habitat Protection for Western Australia's Marine Environment. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DEC Department of Fisheries	Considered a key environmental factors for assessment in the PER.
Audible Amenity (Noise and Vibration) - Plant and Pipe Construction	To protect the amenity of the community from noise/vibration impacts associated with the development of land by ensuring compliance with Environmental Protection (Noise) Regulations and other acceptable standards. To avoid unnecessary adverse impacts on the natural environment, including endemic fauna.	Localised intermittent construction noise and vibration – heavy machinery, traffic, fabrication, reversing beepers affecting amenity at nearby premises.	Identify noise and vibration sensitive premises in the area.	Develop and implement a Construction Environmental Management Framework for all potential construction methods, detailing Noise and Vibration Management. Adherence to Australian Standard for construction and building site noise. Maintenance of noise buffers for the plant site. Consultation with nearby residents during proposal assessment.	EPA Guidance 8: Environmental Noise Australian Standard AS 2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites Environmental Protection (Noise) Regulations 1997. EPASU DEC	Considered an applicable environmental factor for assessment in the PER.
Audible Amenity (Noise and Vibration) - Plant Operation	To protect the amenity of nearby residents from noise/vibration impacts resulting from operation. Comply with Environmental Protection (Noise) Regulations.	Ongoing localised continuous operational noise and vibration affecting amenity at nearby premises.	Noise report by qualified acoustic professional including noise modelling to demonstrate that requirements of the Environmental Protection (Noise) Regulations can be met during operation. Investigate plant design and engineering controls for noise and vibration attenuation.	Plant design to incorporate engineering noise and vibration attenuation controls, including buffer design.	EPA Guidance 8: Environmental Noise Environmental Protection (Noise) Regulations 1997. EPASU DEC	Considered a key environmental factor for assessment in the PER.

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	Waste Management	To maintain the integrity, ecological function and values of the environment and to ensure that emissions do not adversely affect health, welfare and amenity of people and land uses. Manage wastes in accordance with the Waste Hierarchy. All reasonable and practical measures to be taken to minimise generation of wastes and discharge into the environment.	Indirect impacts from day-to-day workplace waste. If a coagulating process is used and iron salts added, sludge disposal will be to landfill. Otherwise sludge will be recombined with brine and discharged to ocean.	Minimise the amount of sludge generated by reducing the amount of drifting organisms which end up in the treatment processes.	No on-site waste disposal. Construction waste management will be addressed in the Construction Environmental Management Framework.	Department of Environment Landfill Waste Classification and Waste Definitions 1996. State Strategic direction for waste management in Western Australia. EPASU DEC	Considered as an applicable environmental factor for assessment in the PER.
Social	Indigenous Heritage and Native Title	Ensure changes to the biophysical environment do not adversely affect indigenous historical or cultural heritage sites. Ensure project is compliant with the <i>Aboriginal Heritage Act 1972</i> and the <i>Native Title Act 1993</i> .	Disturbance of sites of indigenous significance. Possibility of uncovering unlisted material during construction.	Identify indigenous cultural and heritage sites of significance through archaeological and ethnographic surveys of the project area and through consultation with the Gnaala Karla Booja Native Title claimant group, the DIA and the SWALSC	Demonstrate that any concerns raised by indigenous people will be adequately managed and this process is communicated to the relevant indigenous people. Avoid disturbance to identified heritage sites. Submit section 18 (of Aboriginal Heritage Act) applications as required.	EPA Guidance 41: Assessment of Aboriginal Heritage ATSIC Consulting Citizens: Engaging with Aboriginal Western Australia. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU DIA	Considered applicable environmental factors for assessment in the PER.
	Non-indigenous Heritage	Ensure changes to the biophysical environment do not adversely affect historical or cultural associations and comply with relevant heritage legislation. Comply with <i>Heritage of Western Australia Act (1990)</i> . Comply with <i>Maritime Archaeology Act (1973)</i> .	Disturbance of sites of non-indigenous significance. Possibility of uncovering unlisted material during construction. Potential impact from discharge on marine shipwrecks, however initial investigations show no shipwrecks in the region.	Identify sites in project area on world, national, state and municipal heritage registers. Benthic marine studies are expected to provide additional confirmation of no shipwrecks in the region.	Compliance with <i>Heritage of Western Australia Act (1990)</i> . Avoid disturbance to identified heritage sites.	WA Heritage Council's Caring for Your Community's Heritage. Shire of Harvey Heritage Advisory Committee. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU	Considered an applicable environmental factor for assessment in the PER.
	Visual Amenity	Ensure that visual amenity is considered and measures are adopted to reduce adverse visual impacts on the surrounding environment are as low as reasonably practical.	Impacting the amenity of the current landscape / streetscape. The proposed maximum height of the tallest structure (the lime storage towers) is 18m. The reverse osmosis buildings will be approximately 14m tall. Lighting impacts (both construction and operational phases).	Investigate building locations and designs that are of appropriate scale, climate sensitive and utilise architectural styles, construction materials and colours that reflect local character and are harmonious with surroundings. Viewshed modelling will be developed, including lighting. Liaise with the community, the Shire of Harvey and stakeholders on layout.	Rehabilitate disturbed areas towards natural state. Pipelines buried where practicable. Make use of natural landscape features to conceal infrastructure. Incorporate landscape design techniques during plant design, such as planting, choice of textures and colours, breaking solid lines.	Local Government Regulations. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU Shire of Harvey	Considered an applicable environmental factor for assessment in the PER.
	Recreation	To ensure that existing and planned recreational uses of the environment are not compromised.	Temporary and localised restriction of access by vessel and to beach from construction of marine facilities. Temporary and localised restriction of access to land during burial of pipelines. Permanent restriction of access to Lots 32, 33 and part Lot 8.	Determination of current recreational uses at the plant site, pipe routes and intake and outlet locations. Review of potential impacts to existing recreational uses including access to the coast and other recreational areas.	Consultation with relevant management agencies and user groups to assist with the evaluation of management strategies to mitigate impacts. Staging construction activities which restrict beach access and/or provide alternative access. Ongoing management of vehicles in local dune system on Water Corporation owned site.	DoE Interim Industry Guide to Community Involvement. EPA Guidance 33: Draft environmental guidance for planning and development. EPASU	Considered an applicable environmental factor for assessment in the PER.

Factor	EPA's Environmental Objective	Potential Impacts	Additional Investigations	Proposed Management	Guidance & Standards/ Decision making bodies and advisory groups	Environmental Significance
Public Safety and Risk	To ensure public risk associated with construction and operation of the proposal is as low as is reasonably achievable.	<p>Potential for chlorine and other chemicals to escape.</p> <p>Potential public safety risks at construction sites.</p> <p>Explosives and dangerous goods storage.</p> <p>Construction traffic impacts.</p>	Investigate appropriate location and buffer for chemicals storage.	<p>Locate chemical storage facilities with appropriate buffer.</p> <p>Development of a Construction Environmental Management Framework, detailing hazardous materials management and public safety measures such as temporary restriction on access.</p> <p>Ensure compliance with Dangerous Good Regulations and Australian Standard AS 3780 (The Storage and Handling of Corrosive Substances).</p>	<p>Australian Standard AS 3780: The storage and handling of hazardous chemical materials.</p> <p>WAPC: Statement of Planning Policy 4.1 State Industrial Buffer Policy</p> <p>EPA Guidance 33: Draft environmental guidance for planning and development.</p> <p>EPA Position 2 – Environmental Protection of Native vegetation in Western Australia.</p> <p>EPA Position 3 – General Requirements for Terrestrial Biological Surveys.</p> <p>EPASU</p>	Considered an applicable environmental factor for assessment in the PER.