

Summary of Management Measures made in the EIS, SIS and SIS Addendum

	Pre-construction	During Construction	Post-Construction
<b>Landscape</b>	<p>Development a suitable Landscape Plan and specification in accordance with Main Roads /NSW RTA design guidelines and administrating authorities.</p> <p>Determine and develop translocation plan (terrestrial and aquatic) as a component of the Flora and Fauna Management Plan.</p> <p>Co-ordinate endemic seed collection (within footprint) and subsequent propagation prior to construction.</p> <p>Integrate requirements of approvals, licenses and/or permits.</p> <p>Define hydromulching specification including progressive staging.</p> <p>Require mulching of cleared and grubbed native vegetation.</p> <p>Integrate construction requirements into tender documents.</p> <p>Coordinate declared plant audit and eradication program three months prior to construction.</p> <p>A local nursery would be appointed to collect a representative sample of native seeds from the area of the footprint and to propagate them. These species would then be used for landscaping.</p>	<p>Implement, monitor and audit contract requirements.</p> <p>Areas for seedling/planting would be fully prepared, free of weeds, and with existing soil reused as extensively as possible.</p> <p>Soil used for seedling/planting, including both site soil and any imported topsoil, would be tested for quality before use. Any additives recommended to ensure optimal plant growth would be specified and included. It is expected that a slow-release fertiliser and a soil-saturation aid would be used to improve tree growth rates, if appropriate, and that tree guards would be used to protect plants as necessary.</p> <p>Road edges and any other areas disturbed during construction would be revegetated with local native plant species where practical.</p>	<p>Maintain in accordance with contract requirements.</p> <p>A 12 month maintenance program would be undertaken for all landscape works, and would include watering, weeding, pruning, mowing and replacement of any failed plants. If necessary, the program would continue until the landscaping is fully established.</p> <p>Following this initial establishment period, only minor annual maintenance and weed control would be required, this would form part of the 10 year maintenance program under the DCM contract.</p>
<b>Air Quality</b>	<p>Develop an Air Quality Management Plan as part of the Construction Environmental Management Plan.</p> <p>Ensure that all temporary facilities are designed to minimise generation of dust, smoke and other particulates.</p>	<p>Construction activities to be undertaken in accordance with the requirements of the Project Environmental Management Plan, the Air Quality Management Plan and any licence conditions relating to air pollution.</p> <p>Mitigation measures to manage air quality during construction would include:</p> <ul style="list-style-type: none"> <li>• applying water by truck sprays on all exposed areas as required to minimise dust emissions</li> <li>• restricting dust-generating activities, such as topsoil removal, during high winds or during stable conditions with winds blowing toward adjacent residences</li> <li>• siting the construction compounds away from existing dwellings</li> <li>• avoiding spillages and achieving prompt cleanup when required</li> <li>• covering haul vehicles moving outside the construction site</li> </ul>	<p>Undertake monitoring of air quality as part of the ongoing environmental monitoring program. Air quality monitoring would include carbon monoxide concentrations and visibility levels in the tunnel.</p>

	Pre-construction	During Construction	Post-Construction
		<ul style="list-style-type: none"> <li>• restricting the speed of construction vehicles, where required</li> <li>• checking particulate emissions from diesel vehicles and undertaking regular maintenance</li> <li>• prohibiting burning or incineration on site</li> <li>• monitoring dust near adjacent dwellings using dust gauges or other suitable ambient monitoring techniques to determine whether controls are being applied appropriately.</li> </ul>	
<b>Contaminated Land (including Tugun Landfill, Airport dump sites and sandblasting area)</b>			
	<p>A Contaminated Land Management Plan to be developed as part of the Construction Environmental Management Plan.</p> <p>Prior to the start of construction, soil at identified contaminated areas including the Tugun Landfill, Airport dump sites and the sandblasting area would be tested for polynuclear aromatic hydrocarbons, total petroleum hydrocarbons, tributyl-tin (sandblasting area only) and metals.</p> <p>The current landfill management concept plan to be refined with new data and included in the detailed design.</p>	<p>The exposed waste would be capped with clay to a thickness of 0.5 m.</p> <p>The excavated area would be backfilled to the top of the works for drainage purposes.</p> <p>Material used for backfilling would have a low permeability to prevent leachate seeping through to the surface.</p> <p>The work area would be surrounded with an impermeable bund and all surface water/leachate would be collected for treatment or appropriate disposal.</p> <p>All excavated waste would be disposed of to a suitable containment cell or disposed of off site to a suitable facility.</p> <p>Work method statements would be prepared detailing safe work practices for construction workers involved in the excavation and transport of solid waste and the environmental protection measures required. These would be prepared in consultation with the NSW Department of Environment and Conservation, Queensland Environmental Protection Agency and/or Gold Coast Airport Limited depending on jurisdiction.</p>	<p>Monitoring of groundwater conditions would continue during the site stabilisation phase.</p>

	Pre-construction	During Construction	Post-Construction
<b>Flora and fauna</b>			
<i>Clearing of native vegetation</i>	<p>A Flora and Fauna Management Plan would be prepared during the detailed design phase to address vegetation protection issues. Protection measures would include installing temporary fencing to at least beyond the radius of the tree canopy (where possible), and minimising vehicle movements and preventing stockpiling within this vegetation zone. All contractors involved in construction would be thoroughly briefed on the importance and techniques of vegetation protection before any works.</p>	<p>Removal of vegetation would be restricted to the development footprint. Any additional clearing would be subject to future environmental impact assessment approval processes. Where possible, those areas that are already relatively disturbed would be used in preference to clearing nature vegetation.</p> <p>Where an area of native vegetation is required to be cleared and then revegetated post-construction the following measures would be applied:</p> <ul style="list-style-type: none"> <li>• the boundary would be fenced and the area cleared</li> <li>• seeds and other propagative material would be collected from native species present</li> <li>• where cleared vegetation is to be placed in windrows, these would not be allowed to abut those areas of native vegetation to be retained</li> <li>• topsoil would be stockpiled in long, low piles adjacent to works to maximise the viability of seed stock in the soil.</li> </ul> <p>Prior to clearing the footprint, the following protocol would be followed to check for species of conservation significance:</p> <ul style="list-style-type: none"> <li>• surveys targeting plant species of conservation significance would be undertaken by a qualified botanist</li> <li>• seeds from all threatened plants required to be removed would be collected once approval is obtained to enable potential propagation and re-establishment of threatened species in the area</li> <li>• marking of all threatened species, parawebbing and/or fencing of plants of significance or the footprint near the populations would be undertaken prior to construction to ensure that vehicles and other direct disturbances associated with road construction do not encroach into adjacent habitat containing significant species</li> <li>• a protocol for the removal and possible translocation of plants of conservation significance would be developed in consultation with the Queensland Environmental Protection Agency, NSW Department of Environment and Conservation and/or Commonwealth Department of Environment and Heritage, depending on jurisdiction.</li> </ul>	<p>Re-vegetated areas to be monitored until they are fully established.</p>
<i>Relocation of plant species</i>	<p>A strategy for the translocation of plants would be prepared by the NSW RTA in consultation with the Queensland Environmental Protection Agency, NSW Department of Environment and Conservation</p>	<p>All affected plant species of regional or state conservation significance would be translocated to areas of suitable habitat as close to their original location as possible. In the case of Chinese Burr, all plants would be removed</p>	<p>All relocated plant species to be monitored to ensure they are fully established.</p>

	Pre-construction	During Construction	Post-Construction
	<p>and/or Commonwealth Department of Environment and Heritage, depending on jurisdiction and incorporated into the Flora and Fauna Management Plan.</p> <p>Where possible, plants of conservation significance would be incorporated into rehabilitation plans for the road corridor. In particular the Little Wattle and Match Sticks would be considered in areas adjacent to the NSW Crown Land (north of Boyd Street) and Chinese Burr would be spread in the Paperbark Regrowth and Woodland Communities near the Tweed Interchange.</p>	<p>during clearing and transplanted into appropriate habitats nearby and the topsoil containing the seed bank would be spread in adjacent areas.</p> <p>In the case of Little Wattles and Match Sticks, individuals requiring removal would be translocated to suitable nearby habitat.</p>	
<i>Relocation of animals</i>	<p>A relocation plan would be developed as a component of the Flora and Fauna Management Plan. This would include a protocol for the removal and treatment of injured animals.</p> <p>The plan would be developed in consultation with the Queensland Environmental Protection Agency, Commonwealth Department of Environment and Heritage and the NSW Department of Environment and Conservation.</p>	<p>Before the removal of any vegetation begins, measures would be taken to remove as many mammals as possible to safety. These include:</p> <ul style="list-style-type: none"> <li>• surveys targeting mammals and other species would be undertaken by a qualified ecologist</li> <li>• traps would be set to capture as many individuals as possible. Captured individuals would be relocated to suitable areas of habitat nearby</li> <li>• a fauna rescue framework for clearing has been developed by the NSW RTA in consultation with the NSW Department of Environment and Conservation and would be used as the basis during this project</li> <li>• during pre-clearing surveys bark would be removed from old growth paperbarks after bats have left roost sites (i.e. under the bark) to begin foraging at dusk to prevent individuals from being injured or killed during clearing</li> <li>• once cleared, the footprint would be fenced with animal-proof fencing.</li> </ul>	<p>Requirements for post release monitoring to be agreed with the Queensland Environmental Protection Agency, Commonwealth Department of Environment and Heritage and the NSW Department of Environment and Conservation, depending of jurisdiction.</p>
<i>Hollow bearing trees</i>	<p>Protocols for the removal of hollow bearing trees and the relocation of hollows would be developed as a component of the Flora and Fauna Management Plan.</p>	<p>The hollow-bearing portion of the trees be removed after felling and re-instated in adjacent areas. If any hollows are damaged or destroyed during clearing, then appropriately designed nest boxes would be affixed to standing trees in the vicinity.</p> <p>All hollow-bearing trees to be felled would be clearly marked, and their species and approximate dimensions catalogued so that hollows and nest boxes can be affixed to similar standing trees.</p> <p>Reinstated hollows and nest boxes would be placed in intact forest near the preferred alignment. The actual placement would taken into account the density and dispersion of existing hollows, would be examined in</p>	<p>Use of relocated hollows and nest boxes to be monitored until area has stabilised after completion of construction.</p>

	Pre-construction	During Construction	Post-Construction
		<p>detail in the Flora and Fauna Management Plan, and would be discussed with relevant landowners and the NSW Department of Environment and Conservation.</p> <p>Medium-sized hollows would be replaced with nest-boxes designed for Squirrel Gliders and Brush-tailed Phascogales.</p> <p>Nails used to attach nest boxes would not be galvanised or coated and would not contain zinc to avoid poisoning the trees. Metal strapping that allows for tree expansion would be used to attach nest boxes.</p> <p>Boxes would be placed between 4 and 8m above the ground and oriented to minimise penetration by rainfall and sunlight. Boxes would be placed away from main access tracks to minimise the chances of them falling and injuring anyone.</p>	
<p><i>Wallum Sedge Frogs</i></p>	<p>Develop a species management plan for the Wallum Sedge Frog as a component of the Flora and Fauna Management Plan.</p>	<p>Artificial frog ponds would be built up with materials taken from the alignment. This would ensure that suitable substrate materials form the base of the ponds. This would also minimise the depth of the excavations below ground level so avoiding saline intrusion from the Cobaki Broadwater.</p> <p>The minimum size of the ponds would be 15-20m in length and 5-8m in width.</p> <p>Ponds would be constructed to a minimum depth of 1.5m with a gradient sloping to 0.3m at the pond edges.</p> <p>A slow release liner, similar to those used in dam construction and sedimentation traps, would be used in the ponds to increase the permanency of surface water (&gt;80% time).</p> <p>Construction works would be undertaken during a dry period (spring) leading up to a pronounced rainfall event (normally summer).</p> <p>Edges of the ponds to be planted with edges and rushes (such as <i>Restio</i> species) from the alignment. Vegetation would be removed by a process known as “slabbing”.</p> <p>Slabbing depth would be at least 30 cm to ensure organic layers are collected. The source sites for slabbing would include any existing <i>Restio</i> vegetation at the artificial pond sites and where applicable, augmented from areas with dense <i>Restio</i> along the proposed alignment.</p> <p>The existing frog pond to the west of the alignment is only sparsely vegetated and would be enhanced by supplementary planting of appropriate vegetation, predominantly rushes such as <i>Restio</i> and <i>Baumea</i> species. Planting would be done by hand to minimise damage to the pond.</p>	<p>A Wallum Sedge Frog monitoring program to measure effectiveness of ponds, fencing and underpasses would be developed in consultation with GCAL, the Queensland Environmental Protection Agency, Commonwealth Department of Environment and Heritage and the NSW Department of Environment and Conservation, depending on jurisdiction and detailed in the Operation Environmental Management Plan.</p>

	Pre-construction	During Construction	Post-Construction
		<p>Two culverts would be constructed under the bypass to maintain connectivity between areas of Wallum Sedge Frog habitat on either side of the alignment. These culverts would be 1m high and 3m wide, with their length varying between 50 and 60m. The design of the base of the culverts would need to encourage the use of these structures by frogs. One option is to include a central channel in the culvert that would hold water.</p> <p>Frog exclusion fencing would be constructed to keep frogs off the road and direct them into the culverts. This fencing would consist of a solid sheet of durable material measuring approximately 400mm high, with a small overhang at the top.</p>	
<b>Groundwater</b>	<p>A Groundwater Management Plan would be developed as a sub component of the Construction Environmental Management Plan. The plan would detail measures to control groundwater drawdown. Further geotechnical bores to be sunk and pump testing to be undertaken to aid detailed design.</p>	<p>Groundwater drawdown would be managed by a series of re-injection spikes along either side of the working area. These would pump groundwater collected from the working area back into the ground so ensuring that the pre-construction levels of groundwater are maintained. The number of spikes can be varied to take account of inflows of groundwater and the pace of construction can be regulated to ensure that it doesn't overwhelm the re-injection system.</p> <p>This system would ensure that groundwater lowering would not extend beyond 5m either side of the construction area.</p> <p>All other water collected in the excavations such as rainfall and seeping groundwater would be pumped to a holding pond. The water would be tested prior to discharge to ensure that its pH is similar to the receiving water.</p>	<p>Cross-tunnel drains would allow free groundwater movement across the tunnel to maintain existing flows and levels.</p> <p>Monitoring of groundwater levels and movement to be undertaken.</p>
<b>Soils and Water</b>	<p>A Soil and Water Management Plan, which includes an Erosion and Sediment Control Plan would be developed as part of the Construction Environmental Management Plan, prior to the start of construction. This would include:</p> <ul style="list-style-type: none"> <li>• adopting best management practices for the control of erosion sediments and pollution during the construction period</li> <li>• ensuring that the construction of the proposal minimises impacts on existing water quality of surrounding catchments.</li> </ul> <p>All erosion and sediment controls (including sedimentation basins) would be designed to be consistent with the requirements of <i>Managing Urban Stormwater – Soils and Construction</i> (NSW Landcom 2004). They would also be designed to dry</p>	<p>Obtain necessary licenses for the installation of pollution control devices.</p> <p>Prior to construction commencing, diversion drains or diversion channels would be formed around the disturbed area.</p> <p>Clear water would be diverted away from the disturbed areas.</p> <p>Drainage structures such as waterways catch drains and sediment basins would be installed prior to the commencement of bulk earthworks in order to allow existing flows to pass through the construction zone without mixing with flows from the site.</p> <p>The contractor would be required to protect all stockpiles of erodible material against erosion by temporary seeding, together with the provision of other</p>	<p>Routine maintenance of constructed wetlands to be undertaken. This would include:</p> <ul style="list-style-type: none"> <li>• collecting litter from swales</li> <li>• periodic removal of excess silt</li> <li>• cutting and planting of reeds.</li> </ul>

	Pre-construction	During Construction	Post-Construction
	<p>out quickly after rainfall events.</p> <p>Design of constructed wetland treatment systems to be finalised and incorporated into detailed design.</p> <p>Program construction activities to minimise the area of disturbed ground, which is exposed to erosion at any one time.</p>	<p>standard erosion and sediment control measures.</p> <p>Batters would be vegetated as soon as practicable after excavation to mitigate any erosion potential.</p> <p>Erosion control would be necessary on any steep fill embankments and on road excavation that leave a cut surface. These embankments would require treatment to ensure stability. Where seeding/planting is proposed on banks that are steeper than two horizontal to one vertical, prior to landscaping the banks would be stabilised by erosion-control matting and covered with mulch to improve their final appearance.</p>	
<i>Topsoil</i>	<p>Locations for all topsoil stockpiles and procedures required for management would be included as a component of the Construction Environmental Management Plan.</p>	<p>Following appropriate testing, all topsoil suitable for reuse would be removed to temporary locations along the alignment.</p> <p>Any topsoil stripped from the site during construction would be stored in a way that retains maximum soil quality. Measures to achieve this includes, the establishment of vegetative cover for stabilisation during storage, and protection from traffic. Any soil imported to the site would be from an approved source.</p> <p>All stockpiles of potentially erodible material would be protected by temporary seeding, together with standard erosion control measures.</p>	
<i>Water Quality</i>	<p>A water quality monitoring program would be prepared as part of the Soil and Water Management Plan.</p> <p>Safeguards developed to ensure safe storage of fuel and chemicals.</p>	<p>The contractor would develop emergency procedures that would minimise the effects of any spills of hazardous materials.</p> <p>All fuel or chemicals would be stored in a bunded area capable of holding at least 110% of the volume of the materials stored and would be at a level above a 1:10 year flood.</p> <p>Wastewater from on-site amenities to be pumped to sewer.</p> <p>Monitoring of surface water would continue during the construction phase and would maintain the program established during the pre-construction phase. In addition it would have the objectives of identifying if water quality problems are occurring as a result of the construction activities and of demonstrating compliance with legal and other monitoring requirements.</p> <p>In the event that any results are elevated more frequent monitoring would be undertaken and would trigger an investigation into its cause and remedial measures if necessary.</p> <p>Parameters monitored during the construction phase would be considered in the Construction Environmental Management Plan in consultation with regulatory agencies</p>	<p>Water quality monitoring would continue after opening of the bypass. The objectives for this stage of the monitoring program would be to assess and manage impacts on receiving waters as the site stabilises, and to assist in determining when the site has stabilised any criteria imposed as part of the approval conditions are being met. Sampling frequency would be monthly until results show that all or parts of the site have stabilised, at which point the monitoring frequency may be reduced or monitoring discontinued.</p> <p>Parameters monitored during the operational phase would be considered in the operational Environmental Management Plan in consultation with regulatory agencies.</p>

	Pre-construction	During Construction	Post-Construction
<i>Acid Sulfate Soils</i>	<p>An Acid Sulfate Soils Management Plan would be prepared, based on guidelines devised by the Acid Sulfate Soil Management Advisory Committee. This would be a sub-plan within the Construction Environmental Management Plan. The plan would include:</p> <ul style="list-style-type: none"> <li>• establishing background trends in groundwater chemistry, as site-specific criteria need to be developed, rather than relying on guideline levels.</li> <li>• controlling soil pH by treatment with agricultural lime in banded areas, and regular testing of pH levels and rates of acid generation</li> <li>• controlling groundwater pH based on regular monitoring to determine the level of treatment necessary</li> <li>• maintaining existing low pH conditions as suitable for 'acid' frogs.</li> </ul>	<p>If suitable, materials excavated from the tunnel construction would be used as road embankment materials and would therefore require treatment to control acid generation. Acid neutralisation is considered the most effective treatment option. The treatment process would be as follows:</p> <ul style="list-style-type: none"> <li>• A site-specific sampling and testing program would be established before construction. The program would follow the guidelines from the Acid Sulfate Soils Management Manual and the Queensland Acid Sulfate Soils Investigation Team.</li> <li>• Liming rates would be based on the results of the testing program. The amount of lime required would be based on the formula <math>\text{kgCaCO}_3/\text{tonne soil} = \text{kg H}_2\text{SO}_4/\text{tonne soil}</math>. In estimating the lime requirement, a factor of safety would be allowed for inefficient mixing of lime.</li> <li>• Stockpiles of lime would be kept on site at all times. The supply would be covered and stored in a banded area. Similarly, a supply of lime would be kept to treat any acid leachate.</li> <li>• Before placement of excavated materials, the base of the embankment pad would be limed with a precautionary amount of fine agricultural lime at a minimum rate of 2.5 tonnes/ha.</li> <li>• Excavated material would be placed in the embankment area within one day of excavation.</li> <li>• Material would be spread to a maximum thickness and covered with the required amount of lime as determined from the acid sulphate soil analysis.</li> <li>• Soils would be dried out to allow trafficking and mixing. Thorough mixing and aeration is essential and testing trials would be conducted before the layer is compacted.</li> <li>• The final profile of the embankment would be covered with topsoil and vegetated to restrict the ingress of water to minimise the possibility of leachate being generated in the embankment.</li> <li>• Naturally low pH conditions in the south of the airport would be maintained.</li> </ul> <p>Toe drains would be constructed along embankments where treated acid sulfate soil materials have been placed. These would collect any run-off or leachate and direct it to a holding pond. Any discharge from the holding pond would be tested for pH before release. If the pH of the pond is lower than the receiving water, the pond would</p>	<p>Incorporation of cross-tunnel drains to allow free groundwater movement across the tunnels to maintain existing flows and levels. Monitoring of placed material during site stabilisation phase to ensure all controls are effective.</p>

	Pre-construction	During Construction	Post-Construction
		<p>be dosed with slaked lime until the pH is brought to acceptable levels.</p> <p>In order to minimise the oxidation of potential acid sulfate soils during construction of the tunnel, groundwater pumped from the excavation would be reinjected into the ground immediately adjacent to the works. This would ensure that the surrounding soils remain saturated and free of oxygen. The pumping system would be sealed to minimise the possibility of oxidation of the groundwater</p> <p>All other water collected in the excavations, such as rainfall and seeping groundwater would be pumped to a holding pond. The water would be tested before discharge to ensure that its pH is similar to the receiving water.</p>	

<b>Cultural Heritage</b>	
<p>Development, in consultation with Traditional Owners, of a Cultural Heritage Management Plan to deal with any existing or new material that might be discovered during the sub-surface testing or during construction. The Cultural Heritage Management Plan would contain specific procedures for responding to cultural heritage matters. This plan would include:</p> <ul style="list-style-type: none"> <li>• emergency measures to be adopted in the event of an unexpected find during construction</li> <li>• on-site training for construction and site staff with respect to their cultural heritage responsibilities</li> <li>• the preparation of detailed site plans showing areas which must not be disturbed</li> <li>• required mitigation measures if burial sites are found</li> <li>• specific communication procedures for response to cultural heritage matters.</li> </ul> <p>A diesel-powered sand auger could be used to its maximum depth (at least 2m) at intervals of approximately 50m. If cultural materials are identified, further open-area excavation and salvage may be required. This would be undertaken only after consultation with the appropriate Traditional Owners and the relevant state agency.</p>	<p>Measures agreed in the Cultural Heritage Management Plan to be implemented.</p> <p>Activity within the National Estate would be limited to the disturbed eastern edge. There would be no disturbance within the fenced-off, vegetated area of the site. Traditional Owners would be kept fully informed of any further issues that arise from subsequent changes to the proposed alignment.</p> <p>If any unexpected European cultural heritage items are encountered during the course of construction works, works would cease and the Queensland Department of Natural Resources Mines and Energy (Cultural Heritage Coordination Unit) and/or NSW Heritage Office would be contacted, depending on jurisdiction.</p>

	Pre-construction	During Construction	Post-Construction
<b>Waste Management</b>	<p>Specific requirements for waste minimisation and management during construction and operation of the proposed bypass would be set out in the construction and operation environmental management plans. The Construction Environmental Management Plan would specify waste management measures to be followed during the construction period by the contractor as a condition of contract. It would also propose that the contractor be required to reuse material, wherever possible, and incorporate recycling programs as appropriate.</p> <p>The reduction of waste generated by the proposal would involve:</p> <ul style="list-style-type: none"> <li>balancing of earthworks, as far as possible, thereby minimising the import of extra fill</li> <li>ensuring that existing roads adjacent to the proposal would, where possible, remain intact, to reduce the need for additional pavement</li> <li>encouraging and educating employees to reduce waste wherever possible.</li> </ul> <p>In line with NSW RTA <i>QA Specification G36</i> – contractors would be required to purchase and use recycled content materials where cost and performance competitive, or at least the environmental equivalent of the non-recycled alternative.</p>	<p>Any waste generated in the project would be contained within the compound boundaries. Waste, which could not be reused or recycled, would be removed at regular intervals to an appropriate location authorised to reuse, recycle or dispose of the waste material.</p> <p>The re-use of waste products during construction would include:</p> <ul style="list-style-type: none"> <li>chipping and mulching vegetation cleared for road construction purposes and reusing it as an organic base for revegetation</li> <li>ensuring that topsoil, stripped before the earthworks phase of the construction period, is free of weeds and then stockpiled</li> <li>reusing topsoil as part of a landscape strategy, using appropriate management techniques</li> <li>placing selected vegetation around environmental significant areas</li> <li>ensuring that any soil unsuitable for use in road embankments is used in mounding for noise mitigation, where practical.</li> </ul> <p>The recycling of waste products during construction would include:</p> <ul style="list-style-type: none"> <li>Recycling waste created during construction of the proposal would involve; providing on-site rubbish-sorting facilities by the contractor, and recycling wastepaper, metals and glass; collecting and delivering disused or damaged concrete kerbs, medians, asphalt and similar material to crushing and recycling plants.</li> </ul> <p>If excess or unsuitable material is to be disposed of off-site, sampling/analysis would be undertaken if materials are suspected to be contaminated. If contaminants are found it would be disposed of to an authorised facility.</p>	
<b>Traffic and Access</b>	<p>A Traffic Management Plan will be prepared as part of the Construction Environmental Management Plan. Traffic management measures to be incorporated in the traffic management plan include:</p> <ul style="list-style-type: none"> <li>control of access points for construction vehicles to reduce the likelihood of conflicts with other road users, where possible</li> <li>designing access points with appropriate speed controls to minimise disruption to other road</li> </ul>	<p>Traffic management measures, to ensure safe passage of vehicles around the site, would be put in place by the construction contractor.</p> <p>The main access to the John Flynn Hospital and Medical Centre would be maintained and the movement of emergency vehicles not hindered or subjected to delays.</p> <p>Partial road closures and diversions at the proposed Tweed Heads Bypass interchange would be managed by the use of diversions, the two-way service road near</p>	<p>Changes in traffic flows resulting from the implementation of the proposed bypass are expected to require the introduction of management measures in two areas:</p> <ul style="list-style-type: none"> <li>along the Gold Coast Highway</li> <li>in areas where traffic flows are expected to increase to gain access to the bypass.</li> </ul> <p>Both these would require further study in</p>

	Pre-construction	During Construction	Post-Construction
	<p>users</p> <ul style="list-style-type: none"> <li>• providing appropriate signage and safety devices (such as temporary concrete barriers) in accordance with the relevant standards and guidelines</li> <li>• avoiding excessive construction vehicle access during peak travel times</li> <li>• minimising disruption to through traffic to maintain consistent travel times where possible.</li> </ul>	<p>Kennedy Drive and limited construction activities at night. Local residents would be kept informed of scheduled road works in their vicinity.</p> <p>All existing pedestrian and cycle routes would be maintained with minor diversion where required.</p>	<p>collaboration with the communities affected. Implementation would be the responsibility of Main Roads and Gold Coast City Council.</p>
<b>Hazard and Risk</b>	<p>A Hazard and Risk Management Plan would be prepared detailing safe working practices for construction workers involved in the excavation and transport of the solid waste. The management plan would provide details of protective clothing required, hygiene procedures and any action to be taken should accidental exposure occur.</p>	<p>All health and safety requirements to be implemented by the contractor.</p>	<p>In the event of a spill of hazardous material in the tunnel this would be collected in the sumps. The traffic control centre monitoring the traffic in the tunnel would have a cut off switch, which would disable the pumps in the sumps. The spilt material would then be pumped out of the sumps and disposed of to an appropriate treatment facility.</p>
<b>Construction Facilities</b>	<p>In identifying sites for construction compounds and temporary batching facilities the following criteria would be addressed:</p> <ul style="list-style-type: none"> <li>• central to a substantial portion of the works</li> <li>• located with ready access to the local road network</li> <li>• within the road reserve or in areas where this type of land use is permitted</li> <li>• separated from the nearest residence by at least 200 m, or in a location where it can be demonstrated that no adverse impact would occur at the nearest residence</li> <li>• not located within 100 m of any drain that discharges into the wetland, or mitigation measures that are provided</li> <li>• located in excess of 100 m from a designated wetland</li> <li>• of low conservation significance for flora and fauna</li> <li>• sufficiently large to allow effective operation of the plant</li> <li>• located above an appropriate flood level</li> <li>• on relatively level ground</li> <li>• selected so that the use of construction facilities does not affect land use of adjacent properties.</li> </ul>	<p>Each construction compound would be lit at night for security and protection.</p> <p>All work undertaken on temporary sites would be subject to satisfying site-specific environmental criteria, implementing mitigation measures, and meeting local authority requirements.</p> <p>Temporary facilities would be for the exclusive use of the proposed bypass project, and would be removed on completion of the project. Once the facilities are no longer required, the sites would be restored to acceptable conditions, as agreed with the land owner.</p>	