18.

18.4 Construction Implementation Plans

Table 18-1 Physical Environment

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Erosion associated with fabri - dam construction	☐ Reduce areas of bare soil exposed ☐ Install sediment traps around areas to be disturbed.	☐ Increase in TSS levels downstream of construction site not to exceed the operational requirements of water users.	☐ Visual inspection of sediment traps daily	☐ Install stormwater retention structures if turbid water released for 3 successive days	☐ Construction Contractor

Table 18-2 Surface and Groundwater

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Surface Water					
Potential for turbidity/ suspended solids increase during raising of the Weir downstream of wall	☐ Adopt management strategies outlined for minor earthwork activities immediately downstream ☐ Use fixture points and water release structures already in place ☐ Contain work on apron below weir ☐ Cease during heavy rainfall	☐ Turbidity and TSS levels do not exceed the operational requirements of water users. ☐ Water quality objectives met	☐ Monitor upstream and downstream turbidity during works program	☐ Cease works till spill or uncontrolled sediment contained or flow path redirected	☐ Construction Contractor

Table 18-3 Aquatic Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Aquatic Fauna					
☐ Platypus mortalities due to raised water level	☐ Burrows to be investigated immediately prior to filling	☐ Burrow investigation and relocation complete	☐ Search for active burrows and investigate potential to re-locate juveniles immediately prior to filling.	☐ Consult with Platypus ecologist regarding re-location of juveniles	☐ Proponent

Table 18-4 Waste Management

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Actions	Responsibility
Waste acids	☐ Collection in bunded area ☐ Discharge to licensed landfill	☐ N/A	☐ N/A	☐ N/A	☐ Construction Contractor
waste packaging	☐ Disposal at landfill licensed for tyre waste	☐ N/A	☐ N/A	☐ N/A	☐ Construction Contractor
Rubber off-cuts,	☐ Licensed transport ☐ Disposal at local landfill	☐ N/A	☐ N/A	☐ N/A	☐ Construction Contractor

Table 18-5 Hazard and Risk

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Crane is submerged during bag installation leading to loss of life or injury	☐ Construction phase during dry season ☐ Flood and wind monitoring/ warning system	☐ No deaths/near misses/or injuries	☐ Follow Work Place Health & Safety guidelines ☐ Monitor safety records weekly.	☐ Review Safety guidelines	☐ Construction Contractor
Major flood during construction resulting in 'wash out'	☐ Construction timed to occur during dry season.	☐ Minimal loss of works during flood	☐ Undertake weather monitoring.	☐ Review construction planning	☐ Weir Owner and Construction Contractor
Spill of fuel or chemicals degrading river water quality	☐ Construction activities to operate to approved EMP ☐ Provide spill clean up kits ☐ Provide means and guidelines for responsible disposal	☐ No spills to occur	☐ Strict supervision of construction	☐ Review location of spill kits/ disposal guidelines	☐ Construction Contractor

Table 18-6 Social and Economic

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Enhance employment options for locals	Local contractors encouraged	☐ Contractors assessed	☐ N/A	☐ Proponent to liaise with Department of Employment and Training.	☐ Proponent

18.5 Operational Implementation Plans

Table 18-7 Infrastructure

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Reduced flood immunity of Booyal Crossing of Burnett River	☐ Investigate options for bridge upgrade in consultation with local authorities ☐ Upgrade bridge	☐ Current flood immunity of bridge maintained ☐ No significant change to current road length	☐ Design based on historical monitoring data	☐ N /A	☐ Dam Operator in association with local Shire Councils
Old Bruce Highway crossing inundated and not operable. Safety Risk	☐ Identify preferred option, either demolish bridge, or upgrade and fully maintain	☐ Bridge either fully maintained or demolished	☐ N/A	☐ N/A	☐ Department of Main Roads
Inundation of local road crossings	☐ Realign roads around affected area ☐ Provide new crossings if necessary	☐ All properties have reasonable dry weather access ☐ Flood immunity of roads should not be decreased	☐ Design based on historical monitoring data	☐ N/A	☐ Dam Operator in consultation with Shire Councils
Cane tramway bridges affected by standing water – operable but reduced flood immunity and expected life.	☐ Upgrade bridges if necessary ☐ Assess level of risk	☐ Current flood immunity of bridges maintained ☐ Expected operable life of bridge not reduced	☐ N/A	☐ N/A	☐ Bundaberg Sugar in association with Dam Operator
Potential for telephone lines to be inundated (no currently identified lines at risk)	☐ Detail survey to identify any affected lines ☐ Approval of regional telecommunication supplier re preferred options ☐ Realign network	☐ Telephone poles not in standing water ☐ Existing flood immunity not diminished	☐ Design based on survey data	☐ N/A	☐ Dam Operator in association with Telstra
Electricity lines inundated at Scrubby Creek, (and potentially other sites)	☐ Detail survey to identify any affected lines ☐ Approval of regional power supplier re preferred options ☐ Realign network	☐ Power poles not in standing water ☐ Existing flood immunity not diminished	☐ Design based on survey data	☐ N/A	☐ Dam Operator in association Ergon Energy
Irrigation pumps inundated	☐ Survey to determine extent of impact ☐ Replace or relocate pumps, in consultation with landowners	☐ Operation of pumps not compromised at FSL ☐ Flood immunity of existing pumps not diminished	☐ Design based on survey data ☐ Landholder complaints	☐ Investigate complaint ☐ Action as appropriate	☐ Dam Operator

Table 18-8 Physical Environment

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Bank Slumping	☐ Minimise amount of slumping	☐ No slumping	☐ Photopoint observation/ assessment of slumping susceptible areas	☐ Appropriate engineering solutions	☐ Dam Operator
Sedimentation of proposed dam	☐ Remove coarse sediment from upstream extremities during low storage levels	☐ Follow DNRM stream extraction requirements	☐ Monitor sediment levels at dam upstream extremities at least every 3 years,	☐ Extract when economic volumes accumulate or greater than 2000 m^3	☐ Dam Operator
Reduced coarse sediment transport downstream	☐ Retain in stream snags and tributary sediment delivery	☐ N/A	☐ Monitor reaches below dam using site survey and photopoints	☐ License extraction of coarse sediment above the dam ☐ Stop coarse sediment extraction below the proposed dam	☐ Dam Operator ☐ DNRM
Potential bank instability	☐ Undertake Bank Stability study of existing conditions ☐ Avoid sudden change in water level	☐ Follow Operations and maintenance procedures	☐ Maintain photopoints	☐ Install bank stabilisation in line with erosion and sedimentation handbook as required	☐ Dam Operator
Potential salinity in irrigation area	☐ Do not irrigate recharge areas in land systems with perched water tables ☐ Provide interception drainage in areas with perched water tables ☐ Irrigate recharge areas where there is coastal saltwater intrusion ☐ Reduce seepage in delivery system ☐ Prepare Land and Water Management Plans for all lots receiving irrigation water to identify salinity hazard	☐ No increase in salinity	☐ Water table and annual wet season soil EC monitoring in saline hazard areas	☐ Identify areas of secondary salinity and the causal process. ☐ Manage water in these landscapes to reduce salinisation ☐ Maintain or lower water table	☐ Irrigators ☐ DNRM

Table 18-9 Surface and Groundwater

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Impact on water quality and aquatic ecosystems	☐ Development of a Storage and Environmental Flow Release Plan	☐ WRP and ROP	☐ As required under Part 6 WRP	☐ Revision of ROL	☐ Dam Operator
Eutrophication and deoxygenation (inflows to weir pool)	☐ Weir nutrient status monitoring ☐ Remove selected vegetation from inundation area to reduce organic load ☐ Catchment management plan to be implemented.	☐ Maintenance of ambient concentrations and Water Quality Objectives met ☐ DO exceeds 6 mg/L saturation	☐ Monthly monitoring of weir water quality at inflows, weir and offtake points ☐ Including Walla, Weir Headwater, Weir Tailwater, Ben Anderson inflow point	☐ Assess achievement or compliance with WQOs and catchment management plan goals	☐ Dam Operator (weir monitoring) ☐ All stakeholders ☐ Catchment management authorities ☐ EPA, DNR&M, DPI
Turbidity/ suspended solids and BOD (organic enrichment) may increase in weir pool after Inundation of river banks	☐ Control erosion and scour to limit suspended sediment loads from banks, and flooded exposed land & paddocks. ☐ Releases from weir made in the "filling" period to avoid times of possible high turbidity ☐ Prevent cattle from entering flood zone well before inundation process is to occur	☐ Turbidity and TSS levels do not exceed the operational requirements of water users. ☐ Long-term water quality within and downstream of weir meets water quality objectives. ☐ Increase in TSS or turbidity levels downstream of weir not to exceed 120% of background levels *Eg. turbidity not to exceed 24 NTU in downstream river pool when upstream weir is 20 NTU.* ☐ Cattle faeces absent	☐ Monthly monitoring of weir water quality ☐ Visual inspection of flood zone for cleanliness and preparedness prior to inundation	☐ Release from weir at times of relatively low turbidity and acceptable water quality ☐ Monitor water quality during first filling and release poor quality water with flushing flows if possible	☐ Dam Operator ☐ Riparian landowners ☐ Dam Operator
Deoxygenation of waters of shoreline	☐ Monitor effect of changing abundance and distribution of water plants. ☐ Decaying aquatic vegetation may affect aquatic values of weir and downstream pools	☐ DO exceeds 6 mg/L saturation	☐ Inspection of lake shoreline before and after large releases from dam ☐ Assess macrophyte status and test water quality	☐ Consider effects on weir aquatic fauna of significance ☐ Assess effect of water releases on downstream poolsReduce degree of water fluctuation	☐ Dam Operator

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Vertical stratification of weir pool	☐ Seasonal thermal stratification ☐ Note specific physical and chemical conditions of surface and deep layers – release waters from surface layer	☐ Maintenance of ambient water quality concentrations and WQOs met in epilimnion ☐ Australian Drinking Water Guidelines (only should potable supply be made)	☐ Minimum frequency of monthly monitoring by depth profile (DO, pH, temp, EC) (or thermistor string weir wall). Also profile with distance away from wall (eg. 1 km centres) ☐ Test water samples from above and below thermocline for iron and turbidity	☐ Note the presence and depth of thermocline and make releases accordingly from surface layer. ☐ Consider need and feasibility of mixer to enhance water turbulence to suppress thermocline.	☐ Dam Operator
Algal Blooms (Blue-Green algae) on weir pool	☐ Seasonal; likely repeatable effect during hot dry condition ☐ Possible toxic effect of B/G algae noted in devlopment of Recreation Management Plan ☐ Monitor and respond accordingly ☐ surface harvesting is priority for management ☐ Develop Algal Management and Contingency Plan	☐ Cell densities less than 15-20 000 cells/mL ☐ No toxic cyanobacteria forms ☐ Queensland Health, Environmental Health Guidelines Cyanobacteria in Recreational and Drinking Waters	☐ Minimum frequency of weekly especially during the warmer months ☐ Species identification and enumeration ☐ Toxicity testing at high blue-green algal densities	☐ When blue-green densities exceed trigger thresholds, implement Contingency Plan for additional testing (including toxicity) and assess against water use acceptibility criteria. ☐ Contingency plan to include shareholder warning process	☐ Dam Operator
Groundwater					
Expansion of existing mound around Weir	☐ None	☐ None	☐ Monitor waterlevels in select, existing privately owned bores adjacent Weir for evidence of rising waterlevels	☐ To be addressed should issues arise	☐ Catchment Management Authorities ☐ Dam Operator
Change in hydraulic gradient around Weir resulting in waterlogging	☐ Minimise seepage around Weir	☐ Minimal impact	☐ Visually monitor land downstream of Weir for evidence of waterlogging and development of wetlands	☐ Assess and implement seepage engineering controls	☐ Dam Operator
Risk of landslide around margin of Weir resulting in increased turbidity	☐ See surface water quality	☐	☐	☐	☐
Increase transmissivity and storage of aquifer around Weir	☐ None. Considered a beneficial impact	☐	☐	☐	☐
Inundation of bores	☐ Effect change from groundwater to surface water use	☐ User change from groundwater to surface water use	☐ Identify affected landholders ☐ Visually monitor rising inundation areas adjacent to Weir	☐ Provide temporary supply equivalent to normal use	☐ DNR&M ☐ Dam Operator

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Irrigation Areas					
Increased groundwater discharge to surface waters in irrigation areas	☐ Application of irrigation water should be managed to minimise expansion of the groundwater mounds	☐ Expansion of the mounds is minimised	☐ Monitor bores adjacent to and distant from irrigation areas for changes in waterlevels	☐ Irrigation application rates are adjusted to reverse or minimise expansion of the mounds	☐ Irrigators ☐ DNR&M
Soil waterlogging and soil & groundwater salinisation in irrigation areas	☐ Application of irrigation water should be managed to minimise deep percolation and consequent rising watertables	☐ Where rising watertables are identified they are monitored	☐ Monitor bores adjacent to irrigation areas for changes in waterlevel, salinity, evidence of waterlogging and development of wetlands	☐ Irrigation application rates are adjusted to reverse or minimise rising watertables	☐ Irrigators ☐ DNR&M
Groundwater contamination in irrigation areas	☐ Dam water quality not expected to introduce contaminants	☐	☐	☐	☐
Decreased seawater intrusion	☐ Increased surface water use will reduce seawater intrusion - significant beneficial impact	☐	☐ Existing bore networks	☐	☐ Groundwater Rescue Package

Table 18-10 Aquatic Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
☐ Potential reduction in lungfish habitat	☐ Maintain stable water levels as far as practicable within the weir by capturing regulated releases from Burnett River Dam. This will sustain suitable macrophyte habitat (cover and density). This is contingent upon the Burnett River Dam being built.	☐ Lungfish recruitment confirmed ☐ Macrophyte habitat stable ☐ Utilisation of fishlock	☐ Annual survey of impounded areas.	☐ Revision of Storage Operation Management Plan (SOMP)	☐ Dam Operator
☐ Lungfish recruitment	☐ Potential of the storage to foster lungfish breeding and recruitment is to be maxiimised within the bounds of the SOMP ☐ Movement of lungfish to be monitored via tag and release using PIT tags	☐ Lungfish are found to occupy and lay eggs in the dam. ☐ Lungfish can successfully mover to other spawning locations	☐ Local and system-wide monitoring of lungfish. Monitoring during breeding season and mid-summer	☐ Investigate cause of failure. Include assessment of relative success in other storages ☐ Discuss with DPI	☐ Dam Operator

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
☐ Loss of *Elseya sp* turtle habitat	☐ Effort will be expended to make areas of the storage suitable for *Elseya sp* if practicable	☐ *Elseya sp* is found in areas of the storage suspected to be suitable	☐ Biannual monitoring of inflow areas and shallow edges	☐ Re-assess reality of performance criteria. If not achievable, investigate off-site trade offs in terms of habitat protection or sponsoring research programs	☐ Dam Operator
☐ Platypus mortalities due to unnatural water level fluctuations	☐ Maintain bank stability and stable water levels as far as practicable within the weir by capturing regulated releases from Burnett River Dam. This will sustain suitable macrophyte habitat (cover and density). This is contingent upon the Burnett River Dam being built. ☐ Maintain stream ecology downstream of impoundment	☐ Platypus populations remain stable	☐ Annual breeding surveys upstream and downstream, to be undertaken to obtain Platypus population data. ☐ To include population, habitat assessment and burrow density.	☐ Determine cause and, if related to water storage management, adjust where practicable	☐ Dam Operator
☐ Loss of macrophyte species due to unnatural fluctuations in flows and water levels	☐ Maintain bank stability and stable water levels as far as practicable within the weir by capturing regulated releases from Burnett River Dam. This will sustain suitable macrophyte habitat (cover and density). This is contingent upon the Burnett River Dam being built.	☐ Macrophyte populations maintained	☐ Monitoring program of impoundment and adjacent water ways. ☐ Macrophyte survey to be undertaken with lungfish surveys.	☐ Revision of Storage Operation Management Plan (SOMP)	☐ Dam Operator
☐ Destruction of aquatic habitat by introduced fish species ☐ Displacement of native fishes.	☐ Prevention of introduced species	☐ Absence of introduced fish species	☐ Monitoring to be undertaken with lungfish and macrophyte surveys	☐ Consult with leading fisheries scientists on successful introduced species management plans	☐ Dam Operator

Table 18-11 Terrestrial Flora and Fauna

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Walla Island - vegetation	☐ Ensure the health of vegetation on Walla Island	☐ Vegetation not detrimentally affected by fluctuating water levels	☐ Periodic inspection of fig trees for waterlogging ☐ Monitoring will occur monthly after the filling of the weir to the new supply level for 1 year, and 6 monthly there after	☐ Prepare management approach through consultation with flora experts	☐ Dam Operator
Remnant Vine Forest	☐ Prevent loss of remnant vine forest	☐ Vine forest bordering the weir to not decrease in extent, health or biodiversity	☐ Assess the health of vine forests annually	☐ Build bunds around areas ☐ Prepare management approach through consultation with flora experts	☐ Dam Operator
Walla Weir Right Bank Koala Habitat	☐ No net loss of Koala habitat on the right bank at Johnson's Rocks, near Walla Weir	☐ Maintain the integrity of the vegetation comprising the Koala Habitat	☐ Assess health of vegetation annually, and presence of exotic flora/fauna	☐ Assess tree planting program or relocation	☐ Dam Operator
Identification of suitable sites for revegetation	☐ Liaise with landholders on identification of suitable sites for revegetation	☐ Sites identified and agreed with landholders	☐ N/A	☐ N/A	☐ Dam Operator
Revegetation Araucarian vine forest community	☐ Negotiate with DNRM on a revegetation program for Araucarian vie forest community	☐ Revegetation program devised and agreed with DNRM	☐ Quarterly review of program implementation	☐ Revise program to meet revegetation goals	☐ Proponent and Dam Operator
Impact of inundation on endangered regional ecosystems	☐ Liaise with DNRM on impacts of weir on endangered regional ecosystems ☐ Devise a revegetation program for endangered regional ecosystems affected by the weir	☐ DNRM liaison occurred ☐ Revegetation program devised and implemented, in accordance with DNRM negotiations	☐ N/A ☐ Quarterly review and monitoring of revegetation program	☐ N/A ☐ Revise revegetation program	☐ Dam Operator ☐ Dam Operator
Inundation of Bertya species	☐ Relocate Bertya to beyond the FSL of the raised weir	☐ Bertya relocated and successfully re-established	☐ Monthly monitoring of plants	☐ Ensure propagation material is available to replace lost plants	☐ Dam Operator

Table 18-12 Hazard and Risk

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Sudden Bag deflation leading to release of water wall downstream	☐ Design according to category of installation determined by Failure Impact assessment according to ANCOLD standards. ☐ Use of fail safe devices ☐ Install 2 bags to reduce probability	☐ Bag failures do not result in a significant release of water downstream	☐ Remote monitoring by maintenance crew ☐ Review maintenance schedules monthly ☐ Log reasons for failures and review when failure occurs	☐ Review maintenance practices and schedules. ☐ Review security measures.	☐ Dam Operator

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
	of complete weir failure ☐ Regular maintenance ☐ Increase in compressor power consumption ☐ Backup power generator ☐ Backup compressor ☐ Develop Emergency Action Plan				
Delayed Bag deflation causing up stream flooding	☐ Design according to ANCOLD guidelines. ☐ Backup power generator and compressor ☐ Regular maintenance	☐ Limited impacts from upstream flooding	☐ Log upstream flood levels during flood periods, hourly ☐ Remote monitoring by maintenance crew ☐ Review maintenance schedules monthly ☐ Log reasons for failures and review when failure occurs	☐ Review maintenance practices and schedules.	☐ Dam Operator
Flooding different lands/habitats	☐ Ensure potential flooding zone does not affect significant habitats or residents.	☐ Residents not unduly affected and minimal loss of significant habitat	☐ Survey vulnerable populations before and after inundation. ☐ Monitor flood levels monthly.	☐ Lower weir level	☐ Dam Operator
Drowning in Weir Injury/Loss of life	☐ Provide adequate signage to warn public of any dangers ☐ Restrict primary contact	☐ No incremental increase in the frequency of drownings along the river	☐ Full investigation of any death.	☐ Review security measures and signage.	☐ Dam Operator
Changes to current downstream river ecology	☐ Ensure fish lock is adequate ☐ Mimic environmental flows with release patterns ☐ Maintain downstream riffle areas ☐ Log water release flows and schedules	☐ No incremental change in indicator species over and above natural variation	☐ Survey for macro-invertebrates and other relevant indicator species' population 6 monthly ☐ Review water release flows and schedules after survey	☐ Change flow patterns/schedules Consult with fisheries scientists	☐ Dam Operator
Increase in Inundation area Displacement of species,	☐ Maintain upstream and downstream riffle areas ☐ Determine status of vulnerable species ☐ Determine if possible to relocate vulnerable species	☐ No incremental change in population over and above natural variation	☐ Monitor numbers of vulnerable species 6 monthly over 5 years	☐ Review upstream and downstream habitat quality	☐ Dam Operator

Table 18-13 Social and Economic

Impact	Management Principles	Performance Criteria	Monitoring Requirements	Corrective Action	Responsibility
Exacerbation of the current population changes in the Study Area	☐ Wide Bay 2020 Human Services Network to coordinate responses to population growth as a result of the cumulative effects of the Burnett River Dam and the raising of Walla Weir.	☐ All residents have continuing access to the services they require	☐ Human Services Network to Monitor though existing human service networks	☐ In consultation with Human service network, Families Department and Local Governments	☐ Government
Loss of landholdings including good agricultural land affecting business viability and severing properties	☐ The proponent will use the *"Guidelines for Acquisition of Land for Infrastructure Projects by Persons other than the State"* in order to acquire the necessary land holdings	☐ Acquisition guidelines followed and appropriate consultation and referral processes put in place	☐ Department of Families involved in consultation process	☐ In consultation with Human service network, Families Department and Local Governments	☐ Proponent and Government