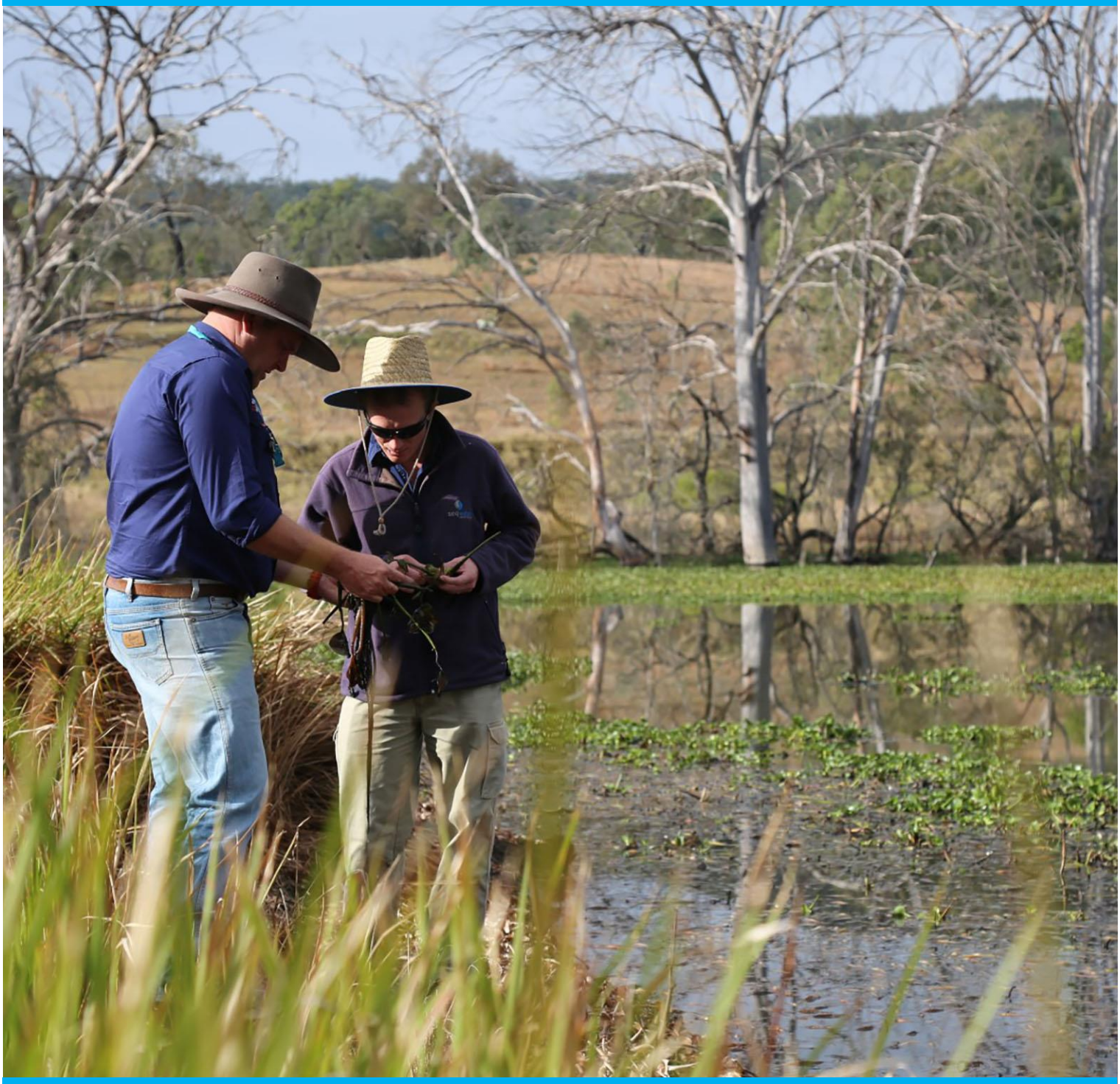
Leslie Harrison Dam Upgrade Project
Environmental Management Plan - Summary



June 2018

seqwater
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SOURCE STORE SUPPLY

Project background

Leslie Harrison Dam is an earth fill dam on Tingalpa Creek in the Redland City Council area and is one of the 12 drinking water supply dams in the SEQ Water Grid. It was constructed in 1967/8 by (then) Redland Shire Council as an un-gated dam. The dam was upgraded in 1984 to increase the drinking water storage capacity for the growing Redlands region. This upgrade included the installation of four vertical lift gates on the spillway.

Ownership of the dam was transferred to Seqwater in 2008. In 2012/3 an independent review found safety improvements were required at Leslie Harrison Dam to meet the current Queensland Dam Safety Guidelines. The spillway gates were removed and the water level lowered in 2014/5 to reduce water pressure and loads on the dam wall to improve safety.

The Leslie Harrison Dam Upgrade will start construction in mid 2018 and will take up to 12 months to complete, subject to weather. The design for the upgrade includes:

- widening and strengthening of the dam wall
- anchoring the spillway
- improving resilience to extreme weather events and earthquakes
- modifying the water intake tower to improve flood immunity

As part of planning for construction, Seqwater commissioned a number of surveys and investigations of the site area. These included flora and fauna, geological, surface and groundwater, and drainage. We also reviewed legislative and regulatory requirements at Commonwealth, Queensland and local government levels.

Seqwater respects the traditional owners of the land, catchments and waterways on which we operate, and seek to continue their tradition of stewardship. Representatives of both the Quandamooka and Turrbal people have inspected the works area and will continue to be engaged throughout the project.

Environmental concerns identified in planning for construction include vegetation clearing, potential impacts on native wildlife or their habitat, erosion and sediment impacting Tingalpa Creek, noise, dust or vibration impacts to neighbouring properties, and the potential for an on-site accident causing environmental harm.

Seqwater made a commitment to keep the community informed of planning and construction work, and to publish summaries of both the Traffic Management Plan and Environmental Management Plan for the works. Fulton Hogan, who have been contracted to undertake the dam upgrade works, have now completed these plans.

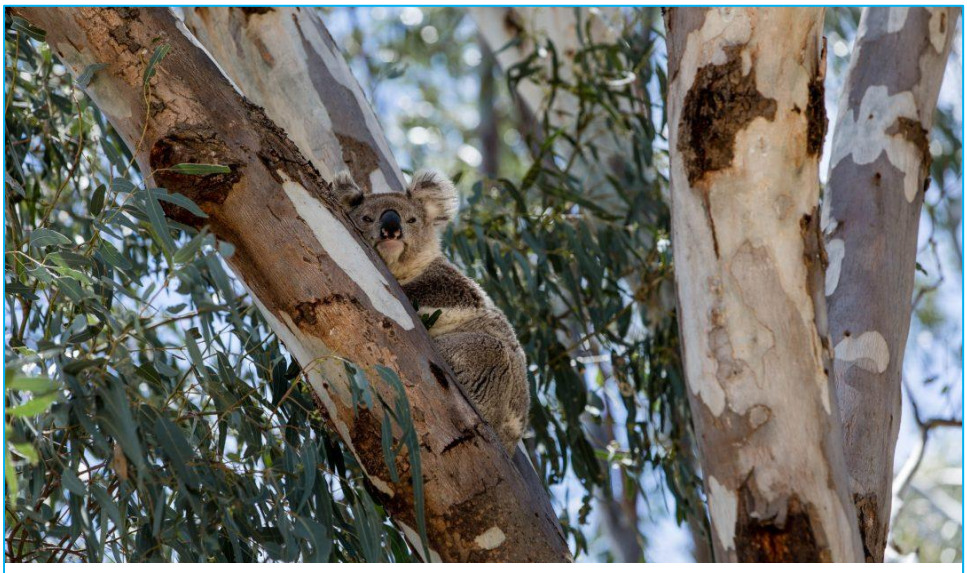
This document provides a summary of Environmental Management Plans for the Leslie Harrison Dam Upgrade construction project.

Environmental management

The contractor, Fulton Hogan, have developed an Environmental Management Plan and several sub plans targeting specific environmental aspects to support delivery of the Leslie Harrison Dam Upgrade. These plans will ensure the project meets legislative requirements, meets any permit and approval requirements, meets Seqwater's environmental management requirements and is consistent with Australian and international best practice standards.

The Environmental Management Plan includes:

- Appointment of a suitably qualified and experienced Site Environmental Representative to identify and manage environmental concerns on the project site
- A risk assessment identifying potential environmental impacts and control measures to prevent or minimise impacts
- Several aspect specific sub plans which include control measures, monitoring and inspection programs
- A site induction program for all workers on site which includes details of the general environmental duty, conditions of approvals and permits, requirements of the Environmental Management Plan, identification of environmentally sensitive areas and other specific issues, management of environmental incidents, and fuel and waste control measures
- Environmental Awareness Training for key site personnel
- Toolbox meetings for all site personnel at least fortnightly to reiterate environmental requirements
- Regular site inspections and audits of records and registers by senior Fulton Hogan environmental managers or an independent third party
- Plans for identifying, managing and reporting environmental incidents or emergencies on site, including after hours procedures
- Plans for managing, rectifying and responding to environmental issues, concerns or complaints reported by community members or other external parties



Koalas are known in the local area and are specifically considered in the Environmental Management Plan.

Aspect specific sub plans

Fauna (native wildlife)

The fauna management plan identifies risks to native wildlife and measures to reduce impacts. The project area includes habitat for significant species including koalas, tusked frogs and the short beaked echidna. A Species Management Plan has been lodged with the Department of Environment and Science (DES) outlining how these species will be protected. This plan includes monthly monitoring of known threatened species habitat areas.

Before clearing of any vegetation, a survey will be undertaken by a qualified person to identify any animal breeding places. A fauna spotter/catcher will be engaged to relocate animals before clearing, and will monitor clearing activity to protect animals during the clearing process. They will also inspect the area after clearing.

Construction works will be planned with consideration of animal movements. Excavation pits will be covered at night or will provide a means of escape (such as a log) to prevent animals becoming trapped. Any native animals found injured on the site will be taken to a local animal hospital or veterinarian.

The site induction for all personnel will include a section on fauna protection and the environmental duty of care. Emergency contact cards carried by all personnel will include a local animal hospital and the RSPCA Animal Ambulance.

Vegetation

The vegetation management plan aims to protect native vegetation on site and avoid disturbance of significant or legally protected species wherever possible. Investigations were undertaken as part of the planning process to identify sensitive areas and permit requirements.

Before clearing of any vegetation, the area to be cleared will be surveyed, marked out and inspected to identify any significant species. Fauna spotters/catchers will be engaged to find, trap and relocate native animals prior to clearing.

Areas of vegetation to be protected will be marked out with flag tape and ‘no go zone’ signage. No plant, equipment or stockpiles will be allowed under the canopies of retained trees. If any of these trees are accidently damaged, a suitably qualified arborist will be engaged to advise on treatment. If the damage cannot be treated, the tree will be replaced with another of the same species. Protected areas will be regularly inspected for damage.

The area under the tree canopy is kept clear to protect its root system from damage.

The site induction for all personnel will include a section on vegetation management and the environmental duty of care. Pre-start meetings before any clearing activity will identify the area to be cleared, protected ‘no go zones’ and any other environmental sensitivities.

Air quality and dust

The air quality plan identifies potential sources of air quality impacts and how they will be controlled by the project. Activities which may impact air quality include clearing vegetation, earthworks, stockpiling of dusty materials, vehicle movements along access tracks, and heavy machinery engines. Adverse weather, particularly strong winds, could increase the movement of dust.

Control measures on site include a complete ban on burning materials, avoiding dust generating activities during high winds, stabilisation or covering of disturbed areas, watering of exposed areas and tracks to supress dust, and covered loads on trucks using public roads. Dust deposition gauges will be established between the work area and nearby residences to monitor dust impacts. The plan also includes a process to respond to complaints from the community.

Spraying a fine mist of water over exposed soil is a common method used to suppress dust.

Noise and vibration

The noise and vibration control plans identify potential impacts and control measures, particularly for nearby residential areas. Likely sources of noise and vibration include vehicles and machinery, earthworks or earthmoving, rock breaking and the possibility of emergency or night works.

The plans aim to reduce impacts on nearby residents by silencing equipment where possible, locating noisy equipment away from residential areas, using methods or machinery that reduce vibration impacts, building enclosures or screens to contain noise, and staging noisy works to minimise impacts. Noise monitoring equipment and a vibration logger will be placed between the work area and nearby residences to monitor noise and vibration impacts, and spot checks will be undertaken to check the noise level emitted by machinery. The plans also include a process to respond to noise and vibration complaints from residents.

Erosion and sediment control

The erosion and sediment control plan describes how stormwater and other run off will be diverted, captured, detained and treated to protect water quality in Tingalpa Creek and the lake. Area specific plans will be developed whenever an existing surface is removed, or an area is considered at high risk of erosion. Plans will also be put in place wherever there are stored materials, such as fuel, which could cause environmental harm.

Area erosion and sediment control plans include control measures to be used, plans to divert water for containment and treatment, monitoring and inspection requirements, and personnel training requirements.

Water quality

The water resources and quality plan identifies risks to water quality from the construction project and control measures to protect waterways. It is closely aligned to the erosion and sediment control plan and the fuel and chemical management plan.

Control measures on site include monitoring and sampling of water quality upstream and downstream of the works area, particularly after significant rainfall. Chemical storage and machinery refuelling will not be undertaken within 50m of waterways. Water captured in sediment control detention basins will be reused for dust suppression and other suitable purposes. The site induction will include a component on water resources and water quality.

Weeds and pests (including Red Imported Fire Ants)

The weed and pest plan identifies measures to prevent the spread of declared weed and pest species by the construction works. It is closely linked to the fauna and vegetation sub-plans. The construction site is located within Fire Ant zone 2, which requires measures to prevent the disturbance and distribution of fire ants.

Weed species identified on site will be treated as per local council guidelines, which may include manual removal or chemical spray. Disturbed areas will be revegetated as soon as practical to prevent weed outbreaks. All plant and machinery will be washed down before arriving on site to prevent the introduction of weed species.

Control measures in place to prevent the movement of fire ants include inspections of all materials and equipment before work, continual monitoring and inspection of the site, the use of material suppliers that can demonstrate compliance with biosecurity requirements. The site induction will include recognition and responses to fire ants.

Heritage (Indigenous and non-Indigenous)

The heritage management plan identifies measures to address the risk of cultural heritage finds during construction work. Searches of cultural heritage registers have found no known areas of cultural heritage significance. Representatives of the traditional owners of the land, the Quandamooka and Turrbal peoples, have identified areas of high risk for Aboriginal heritage finds.

The plan identifies actions to be taken if any item that may hold Indigenous or non-Indigenous heritage value is found on site. Representatives of the traditional owners will monitor clearing activities in identified high risk areas. All personnel working on site will be briefed on their cultural heritage duty of care.

Cultural heritage artefacts can be found on any construction site. This bridge project in NSW found brick drains built in 1814.

Contaminated land and Acid Sulphate Soils

The contaminated land and Acid Sulphate Soils (ASS) plans identify the risk of encountering contaminated soils on the project site, and appropriate management strategies. Surveys and investigations undertaken during planning for construction have not identified any areas of soil contamination. Dewatering of groundwater may result in the disturbance of ASS on site.

The plan includes a procedure for identifying potentially contaminated soil, containment, testing and treatment of contaminated soil, and monitoring and reporting for contamination. Potential Acid Sulphate Soils (PASS) will be identified and managed according to best practice. Aglime will be kept on site ready for use if necessary.

The site induction for all personnel will include information on identifying and managing contaminated soils and ASS.

Waste management

The waste management plan describes how waste materials are handled on site to reduce environmental impacts. It includes measures to avoid creating waste, reduce the amount of waste created and recycle waste where possible.

The plan identifies requirements for bunding fuels and chemical storage areas, designated wash down areas for trucks, and appropriate waste storage areas on site. It includes plans to recycle waste concrete, metal, paper, cleared vegetation (as mulch), oils and other recyclable materials. Non-recyclable or hazardous waste will be transported to a land fill facility. No waste will be burned or buried on site or discharged into Tingalpa Creek.

Chemicals and fuels

The chemical and fuel management plan describes how high risk materials will be stored, used and managed on site to prevent contamination and environmental harm. It also includes emergency response plans in the event of a spill.

Control measures used on site include avoiding the use of high risk materials where a safer alternative is available, secure storage in a sheltered area well away from watercourses, and spill response kits located at storage areas and any area materials are being used. Bunded areas will be constructed for storage of chemicals and fuels. Volumes stored on site will be kept to a minimum.

Site induction for all personnel will include spill prevention and spill response procedures. Pre start meetings for high risk activities will include a review of site requirements and spill response plans. All plant and machinery will be inspected before use each day, and work areas will be regularly inspected and monitored.

Site restoration

On completion of works, Fulton Hogan will remove all bunding, storage areas, screening, temporary fencing and other materials from the site. No waste materials will be left on site.