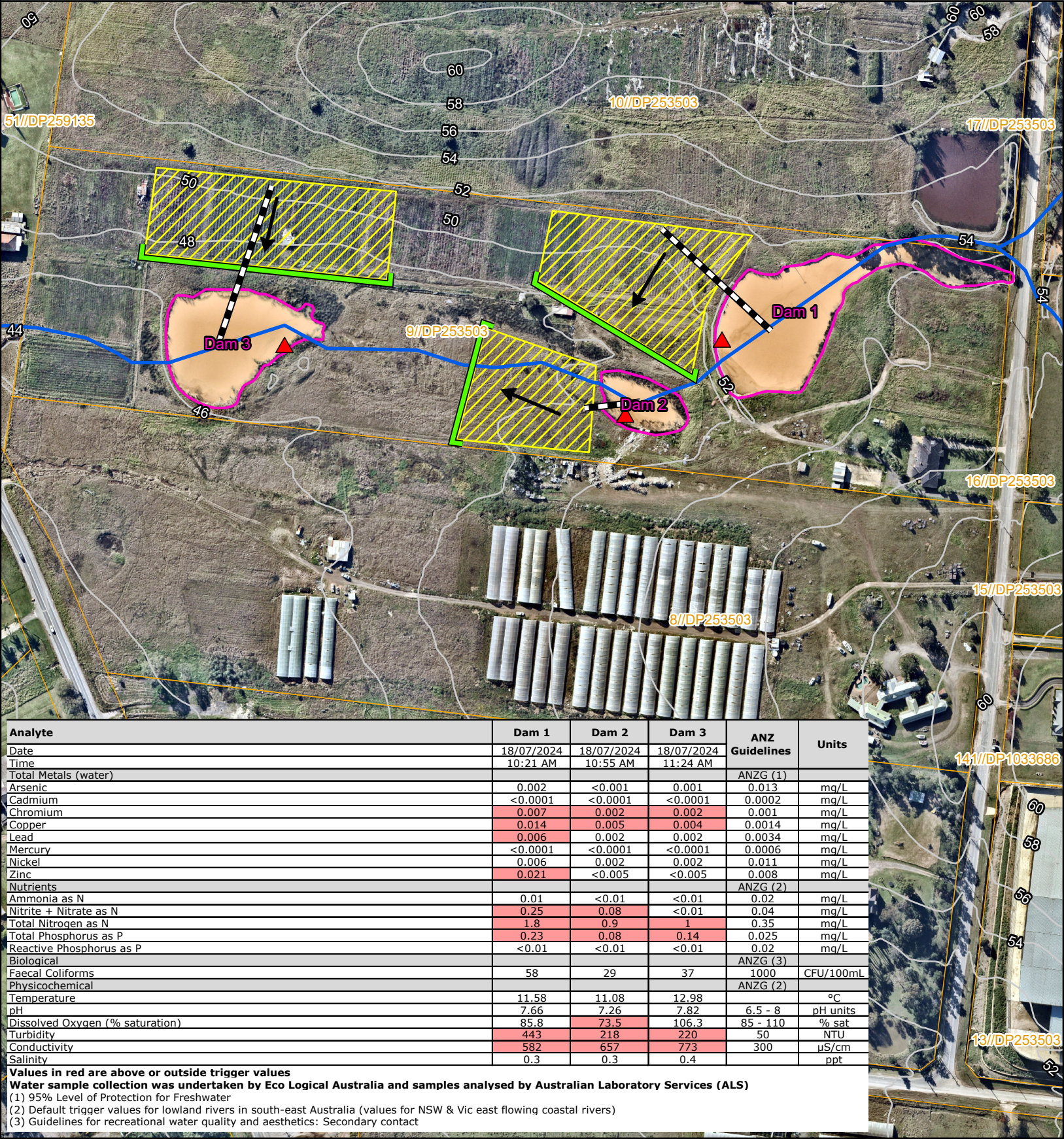


Dam Dewatering Plan: 253-267 Aldington Road, Kemps Creek (Lot 9 DP253503)

Version 2: 6 February 2025



Site	Location	Estimated maximum depth when full	Surface area when full	Volume (when full) (0.4 x Depth x Surface Area / 1000)	Catchment size	Slope of irrigation area	Water quality analytes that did not meet guidelines (see table to left for full results)
Dam 1	-33.852662, 150.794101	3.5 m	7290 m ²	10.21 ML	67 ha	1:27	Chromium, Copper, Lead, Zinc, Nitrite + Nitrate, Total Nitrogen, Total Phosphorus, Turbidity, Conductivity
Dam 2	-33.853066, 150.793181	2.0 m	1657 m ²	1.33 ML	69 ha	1:89	Chromium, Copper, Nitrite + Nitrate, Total Nitrogen, Total Phosphorus, Dissolved Oxygen, Turbidity, Conductivity
Dam 3	-33.852643, 150.790335	2.0 m	5068 m ²	4.05 ML	78 ha	1:14	Chromium, Copper, Total Nitrogen, Total Phosphorus, Turbidity, Conductivity

Water quality
Water testing and a brief field survey occurred on 18 July 2024, using a calibrated water quality meter and samples analysed at ALS Laboratories Smithfield. Water quality analytes that did not meet the adopted ANZ guidelines are summarised above, including minor exceedance of some heavy metals and minor exceedance of nutrients. Faecal Coliform count met the guidelines, therefore, the water is suitable for secondary human contact during dewatering. Sediment from the base of dam after dewatering is to be reviewed by the geotechnical consultant prior to onsite re-use. The contractor's unexpected finds protocol is to be used to ensure suitability for re-use or classification for waste disposal.

Dewatering method
The works could be completed at any time of the year, provided that daytime temperature does not exceed 36°C during the final stages (to prevent stress to fauna and ecologists). Water should be pumped and slowly irrigated across the adjacent grassland prior to the removal of any vegetation. The intake pipe should be caged or shielded to minimise injury to aquatic fauna. Pumped water should be released at the highest ground and allowed to infiltrate the soil with minimal overland flow, using *AS/NZS 1547:2012 Onsite domestic wastewater management* as a guide to calculate flow rate. The contractor would be required to make this calculation, considering soil permeability (including saturation from recent rain), pump size, hose length, slope and area. The flow rate and position of hoses would need monitoring and adjusting if soils become saturated in the irrigation area. As a guide, but not necessarily suited here, other dewatering in the Sydney-Illawarra start at a maximum of 36 mm/hr and adjust as suited to prevent runoff into the local watercourses. A large irrigation area would reduce soil saturation and minimise concentrated application of contaminants into the soil. Silt fences are recommended to filter sediments from inadvertent overland flow during pumping. Hay bales are suited to deflect and slow water across a broader irrigation area, rather than filter sediments. The bottom sludge material and any remaining turbid water should be excavated and dried onsite. All turbid water and sediment must be prevented from entering other waterbodies. Breaching the wall is not recommended as water collects clays and fines from the wall structure, resulting in turbid flows offsite.

Timeline of fauna relocation to be coordinated with Dam Decommissioning Work Method Procedure (or similar) and Project Aquatic Ecologist				
Day 1	Day 2 - 5 (or longer)	Day 6	Day 7 - 8	Ongoing
Install erosion controls, such as a silt fence downslope of the irrigation area, and prepare flat pump pad near the deepest end. The pump intake head is best positioned in an excavated sump pit to allow water to naturally drain toward the intake pipe without choking it with sediment. Test discharge to ensure no erosion/sedimentation occurs. Avoid disturbing vegetation (grass) where water will travel. Notify Project Aquatic Ecologist to explain type of equipment in place and likely dewatering timeframe.	Pump water and irrigate overland at a rate allowing infiltration to the soil. Check sediment controls if irrigation saturates soil causing surface runoff. Adjust pumping rate to slow runoff. Update Project Aquatic Ecologist and send photos of water level to coordinate timing of fauna relocation.	During final 0.3 m of dewatering allow Project Aquatic Ecologist to rescue fauna in one day. Contractor must be able to pump all remaining water that day. Ecologist will instruct excavator operator to dig a solid surface around pump pit and carve steps for safe access up the bank. A suitable pump, excavator and communication with site staff is essential. Water will become turbid as it lowers and when ecologists trample sediment. This water should be discharged overland and away from drainage lines. To allow rapid fauna rescue, the pump inlet needs to be large enough to suck sediment (e.g. 4 - 6 inch). Earthworks machinery can push sediment across the dam to assist final fish capture (adjusted to suit conditions and ecologist's instructions). Grade escape ramp for fauna hidden in bottom sediment overnight. Project Aquatic Ecologist to advise on ramp design (slope and location).	Leave escape ramp for fauna trapped overnight (minimum two nights).	Remove sediment and wall and commence construction.

Approvals and permits
This dam removal is part of a Development Approval. This plan should be included in the approval documents and/or referenced in the conditions of consent that a trained ecologist or licensed wildlife handler is present to relocate fauna. This will only be performed by a person with a s.37 licence under the *Fisheries Management Act 1994* (for fish), which approves handling methods and gear used. Care for animals during relocation, or dispatching sick, injured or feral fish species is to follow procedures expected by the NSW Secretary's Animal Care & Ethic Committee. If there is no development approval or condition of consent specifying an ecologist or licensed wildlife handler be present, then a Biodiversity Conservation Licence (Part 2 - Permit to Harm) under the *Biodiversity Conservation Act 2016* is required to relocate turtles, frogs and wetland birds. If the dam is licensed with Water NSW, the landowner can remove it from the register: <https://waterregister.watnsw.com.au/water-register-frame>.

Biodiversity
During a brief field survey, the following fauna species were observed: *Crinia signifera* (Common Eastern Froglet), *Fulica atra* (Eurasian Coot) and *Limnodynastes peronii* (Striped Marsh Frog). Based on dewatering activities nearby, the following native aquatic fauna could inhabit the site: *Anguilla australis* (shortfin eel), *Anguilla reinhardtii* (longfin eel), *Chelodina longicollis* (eastern long-necked turtle) and *Philypnodon grandiceps* (flathead gudgeon). Pest species may also occur, including *Carassius auratus* (wild goldfish), *Cyprinus carpio* (European carp) and *Gambusia holbrooki* (eastern gambusia). Dominant native macrophytes and sedges included: *Bolboschoenus fluviatilis* (Marsh Club-rush), *Juncus* sp. (Juncus), *Ludwigia peploides* (Water Primrose) and *Typha orientalis* (Broadleaf Cumbungi). One significant aquatic weed was observed: *Juncus acutus* (Sharp Rush), which is best removed mechanically and dried on site at least 50 m from a waterway.

- Aquatic fauna handling procedure**
- NOTICE:** The **Aquatic Ecologist** with a s.37 licence is to notify DPI Fisheries of the activity 48 hours prior to fish relocation using the online report permit activity tool: <https://www.dpi.nsw.gov.au/fishing/compliance/report-permit-activity>. Fisheries require permits to be carried by the licensed ecologist, who should also display a sign clearly showing licence number (if working in public areas, especially when releasing fauna to local creek).
 - PLANNING:** The dewatering schedule should allow time for fish rescue, especially during the final 0.3 m water depth or as advised by Aquatic Ecologist. Fauna should be captured in one day, so pumps need to be of an adequate size and placed in an area free from mud and debris (e.g. inside excavator bucket or screened sump pit). If wetland birds are observed nesting, or young birds (chicks) are using the dam, advise the Aquatic Ecologist immediately for advice. Depending on species and age, birds may be able to relocate themselves. Chicks will need temporary refuge during dewatering, or works may need to be postponed.
 - CAPTURE:** Fish are to be collected by hand nets during the final day of dewatering. This is most effective when the water is <0.3 m deep. Dissolved Oxygen concentration will drop rapidly as water volume decreases, especially in warm water or if lots of fish are present. Larger bodied fish should be targeted first. Wetland birds will scavenge for small fish in the shallows (e.g. Gambusia). Most small fauna will likely remain uncaptured in the dam until the water becomes very shallow (especially eels and turtles). Eels are best captured by large hand nets in water <0.3 m deep, although they burrow into mud. When the water is extremely low, turtles and fish may head towards the intake pump (placed in deepest part). This area should be monitored to intercept fauna (stand in water next to intake on hard surface). Turtles will burrow into mud and may require observation and rescue the following morning but can also move themselves to suitable nearby habitat if an escape ramp is graded. Frogs can be collected by hand using a freezer/snap-lock bag if observed or heard around the fringe. Hygiene protocols are to be followed (see below) and each frog stored in a separate bag. For safety, at least two people are required when wading and handling heavy tubs of water/fish up banks (excavator should dig access steps/ramp).
 - RELOCATE:** Native fish healthy enough for relocation are to be contained and transported in an aerated tub/tank to an appropriate waterbody. DPI Fisheries advise that the host location should be large enough to accommodate additional fish, especially predatory eels. The relocation site for fish is to be in the same catchment downstream (generally large pools near road crossings or open space) or artificial waterbodies no further than 10 km from the dam. Recommended relocation sites include the Luddenham Road or Elizabeth Drive crossings over Wianamatta-South Creek. Additional release sites may be needed. Do not overstock tubs or leave in direct sun for extended periods. Aeration can be provided by battery aquarium pumps or manual turbulence if only stored for a short period. Turtles can be transported in a shaded tub with a wet hessian bag placed inside for moisture and support during transport and released at the fish site. Frogs can be transported in an inflated freezer/snap-lock bag containing leaves moistened with bottled water or dam water (one frog per bag) and released at the nearest shaded riparian corridor near water. Tadpoles can be transported in small buckets with dam water and released at the fish or frog site.
 - HYGIENE PROTOCOLS (BIOSECURITY):** Do not transfer biological material across catchments, or into Marine Estates, Aquatic Reserves and National Parks. Works are to be carried out in accordance with NSW DPI Hygiene guidelines: *Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi myrtle rust, amphibian chytrid fungus and invasive plants* (2020). At a minimum, basic hygiene measures must be implemented, including checking vehicles, personal clothing, footwear and equipment for soil, plant material/propagules and other debris before entering and before leaving a site, removing such debris or seeds with a hard brush and (if required) clean water, washing hands with soap and water if dirty, and where practical, ensuring hands, clothing, footwear and equipment are dry before proceeding. To prevent the spread of chytrid fungus to amphibians, select clothing, footwear, tools and equipment that are easy to clean and pack separate sets of equipment for each site if visiting multiple sites. Remove all soil, water and organic material using a hard brush and clean water, and spray or soak potentially contaminated materials with disinfectant and leave for 30 seconds, then rinse with clean water and allow to dry. When handling amphibians, use a new bag or a new set of disposable non-powdered gloves to capture and hold each individual separately. Wear well-rinsed (with water) vinyl gloves when handling tadpoles. If gloves are not available, spray hands with 70% alcohol between handling each animal and allow hands to fully dry. Keep individuals in separate containers where practical.
 - RELEASE:** Water from the receiving waterbody should be mixed slowly over 5 - 10 minutes with the tank water to allow fish to acclimatise to the new water quality. Eels are less susceptible to changes in water quality. Care should be taken when releasing fauna not to also transfer weeds or invasive species (e.g. Carp eggs and Gambusia). Transfer animals via hand nets, rather than tipping the tub with water in the host waterbody. Eels can be released on land a few metres from the edge and pointed towards the water. Frogs are to be released in dense shade alongside water in the nearest protected riparian corridor.
 - PESTS:** Exotic fish (e.g. Carp, Gambusia) are to be intercepted, euthanised and disposed of in accordance with methods endorsed by the NSW Secretary's Animal Care & Ethic Committee. Exotic *Trachemys scripta elegans* (red-eared slider turtle) are to be contained humanely and DPI immediately notified (Biosecurity Line - 1800 680 244). They will collect the live turtle from the ecologist.
 - POST-DEWATERING:** An escape ramp should be graded to allow trapped fauna to escape overnight. The Project Aquatic Ecologist will advise on ramp design (slope and location) on the day. Sediment should be left up to two nights to allow hidden fauna to emerge, unless the ecologist confirms there are no fauna remaining (site specific assessment). Earthworks staff should notify the Project Aquatic Ecologist if stranded fish or turtles are observed post-dewatering.
 - REPORTING:** The Project Aquatic Ecologist should prepare a summary report suitable for submission to Council within 7 days of completing the aquatic fauna relocation works. The report would detail that the works have been completed according to this aquatic fauna handling procedure, and would include information relating to the location of the dam, the licences held by the staff involved in the works, the number and type of native species relocated, location of release point/s for native fauna and the number and type of exotic species dispatched. Photographic evidence of various steps in the procedure should be included.