



Water quality protection note 1

August 2021

Agriculture - extensive

Scope

This note applies to extensive agricultural activities in Western Australia, including:

- non-irrigated perennial pasture
- non-irrigated floriculture
- dry land cropping such as cereals (e.g. wheat, barley and oats), maize, legumes, oilseeds and fodder
- pastoral and rangeland leases
- stock grazing.

This note does not cover:

- intensive agriculture such as irrigated pasture, floriculture, nurseries, turf farms, orchards, viticulture and other fruit and nut plantations¹
- aquaculture²
- intensive animal keeping including dairies, feedlots, poultry farms and piggeries.³

Standard information to be read in conjunction with this note can be found in water quality protection note (WQPN) 3: [Using water quality protection notes](#).

Water quality contamination risks

Extensive agriculture can cause the following impacts on water resources:

- Pathogens from animal faeces can wash into surface water or infiltrate into groundwater. Pathogens pose a health risk to anyone who may consume or come into contact with that source of water. For more information about pathogens, see our brochure: [Risks from pathogenic micro-organisms in public drinking water source areas](#).
- Nutrients from fertilisers and animal waste can cause eutrophication of surface water bodies, which can kill aquatic life. Nutrients can also infiltrate into groundwater, making it unsafe to drink.
- Land clearing, over-grazing and animal access to surface water can cause erosion. The eroded soil can run off into surface water sources, clog infrastructure, smother aquatic life and act as a 'mask' to drinking water treatment processes, making the water unsafe to drink. This is called 'turbidity'.

¹ See WQPNs 32: [Nurseries and garden centres](#); 34: [Orchards near sensitive water resources](#); 17: [Floriculture activities near sensitive water resources](#); 121: [Plantations in PDWSAs](#) and 101: [Tropical agriculture](#).

² See WQPN 2: [Aquaculture](#).

³ See WQPN 80: [Stockyards and Environmental code of practice for poultry farms in Western Australia](#).

- Hydrocarbons, pesticides and other chemicals can contaminate surface water or groundwater through leaks, spills and spraying.

For general information about protecting water quality, see WQPN 8: [Further reading](#).

Recommendations

Location

The following recommendations describe areas to avoid or appropriate buffers to be maintained near sensitive water resources (see WQPN 4: [Sensitive water resources](#) for definitions).

Within public drinking water source areas

- Extensive agriculture is incompatible within priority 1 (P1) areas of public drinking water source areas (PDWSAs), except for stock grazing on pastoral leases which is compatible with conditions. Pastoral lease holders are expected to adopt the best management practices outlined in this note to address water quality contamination risks in P1 areas. (See conditions 6, 7, 19, 21 in WQPN 25: [Land use compatibility tables for PDWSAs](#).)
- Extensive agriculture is compatible with conditions in priority 2 (P2) areas, which means that it is an appropriate land use provided best management practices are undertaken to address water quality contamination risks. This note outlines those practices. (See conditions 6 and 11 for cropping; and conditions 6, 7, 11, 19, 21 for grazing in WQPN 25: [Land use compatibility tables for PDWSAs](#).)
- Extensive agriculture is acceptable within priority 3 (P3) areas.
- Pastoral grazing is an incompatible activity within wellhead protection zones (WHPZs) and reservoir protection zones (RPZs). Domestic animals should be prevented from entering these zones.⁴ By-laws⁵ may apply in these areas.
- Establish appropriate buffers between drinking water sources and grazing areas, crops and infrastructure such as waste pits, stockyards and chemical storage areas.⁶

For more information on PDWSAs, see Strategic policy: [Protecting PDWSAs in Western Australia](#) and WQPN 25: [Land use compatibility tables for PDWSAs](#).

Private water supplies

- Provide a buffer of at least 100 m between the outside boundary of the land use/activity and any bore or dam that supplies drinking water, or water for the irrigation of food crops.⁶
- Ensure water used for drinking water⁷ or stock watering⁸ is regularly sampled and meets the relevant water quality standards.

⁴ See Water Note (WN) 18: [Livestock management: fence location and grazing control](#).

⁵ Metropolitan Water Supply, Sewerage and Drainage By-laws 1981; Country Areas Water Supply By-laws 1957.

⁶ See WQPN 6: [Vegetation buffers to sensitive water resources](#).

⁷ See WQPN 41: [Private drinking water supplies](#).

⁸ See Chapter 4.3 of the [Australian and New Zealand guidelines for fresh and marine water quality](#).

Waterways and wetlands

- Avoid cropping and grazing on land that is subject to seasonal inundation or waterlogging.
- Maintain adequate buffers between agricultural activities and wetlands, waterways and their foreshore areas.⁹
- Avoid draining naturally waterlogged environments such as wetlands.
- Ensure drainage systems installed on dryland agricultural properties do not cause detrimental effects to existing vegetation, waterways, wetlands or neighbouring properties.¹⁰

For any land- or water-based developments or activities near the Swan, Canning, Helena or Southern rivers, contact the Swan River Trust (www.swanrivertrust.wa.gov.au) for special requirements.

To find out the locations of wetlands, and any separation distances or special measures that may be required, contact the Department of Biodiversity, Conservation and Attractions www.dbca.wa.gov.au.

Development and expansion approvals

- Please refer to WQPN 14: [Statutory approvals](#) for a list of approvals that you may need to obtain before starting your development or activity, and which agency is responsible for them.
- Before clearing native vegetation, you need to contact the department to find out if you require an *Environmental Protection Act 1986* permit or *Country Area Water Supply Act 1947* licence.¹¹
- If your development or activity is located in a proclaimed *Rights in Water and Irrigation Act 1914* area, you will need to apply for a licence to abstract groundwater or surface water, and a permit to alter the beds and banks of watercourses (i.e. dams).¹²
- If you are intending to drain or pump water from under the land surface and then discharge that water onto other land, into other water or into a watercourse, you are required to notify the Commissioner of Soil and Land Conservation ([Department of Primary Industries and Regional Development](#)) at least 90 days before discharging water.¹³

Farm planning

- Prepare a comprehensive farm environmental plan, including:
 - mapping of the farm and neighbouring areas
 - information on sensitive environments, on- and off-site

⁹ See Operational policy 4.3: [Identifying and establishing waterways foreshore areas](#) and WQPN 6: [Vegetation buffers to sensitive water resources](#).

¹⁰ See [Policy framework for inland drainage](#).

¹¹ See [Clearing Permits](#).

¹² See [Do I need a license or permit?](#)

¹³ See [Land drainage and the Soil and Land Conservation Act, Western Australia](#).

- areas of current or potential land degradation such as salt-affected, eroded and waterlogged areas
- analysis of soil characteristics, hydrogeology, rainfall and climate
- best industry management practices
- appropriate locations for grain, chemical, fertiliser and fuel storage, and access roads
- potential on- and off-site environmental impacts
- effective strategies to prevent or manage environmental impacts.

For more advice, contact the [Department of Primary Industries and Regional Development](#).

Operation and management

Soil and land management

- Undertake appropriate soil and land management strategies¹⁴ including:
 - erosion control measures, such as revegetating erosion-prone areas, engineering contours or grading, retaining stubble, creating wind breaks, ensuring ideal crop orientation and avoiding rocky and steep slopes or other erosion-prone areas
 - management of grazing pressure, by ensuring stocking rates are appropriate for the capability of the land, seasonal rainfall and the condition of vegetation and soil¹⁵
 - minimising degradation of soil structure including compaction
 - salinity prevention and management, such as retaining and replanting native trees and shrubs
 - acidity monitoring and controls
 - prevention of heavy metal accumulation, such as using low cadmium fertilisers, maintaining or improving soil organic matter and applying agricultural lime.

Water bores

- Ensure all bores on the property are properly constructed and maintained to prevent ingress of any contaminated surface waters. This includes permanently sealing test holes and unwanted or failed bores.¹⁶
- Equip artesian bores to control the natural pressure flow of groundwater and prevent water running to waste.

Stock near sensitive water resources

- Within PDWSAs, conditions apply to the stocking density of animals (animals per hectare) based on nitrogen loading calculations and the carrying capacity of the land.

¹⁴ See [Soilguide: A handbook for understanding and managing agricultural soils](#) and www.dpird.wa.gov.au for guidance on the following soil management strategies.

¹⁵ Including grazing pressure from domestic, native and feral animals. For stocking rate guidance see www.dpird.wa.gov.au and [Stocking rate guidelines for rural small holdings](#).

¹⁶ See [Minimum construction requirements for water bores in Australia](#).

- Exclude livestock from natural water bodies and ecologically important areas via stock-proof fencing and install stock crossing points over waterways.¹⁷
- Avoid congregation of stock near dams, waterways, wetlands or bores by:
 - piping or pumping water from a waterway, wetland, dam or bore to a trough, rather than allowing stock direct access to the water source¹⁸
 - locating troughs away from sensitive areas such as WHPZs, RPZs and land prone to waterlogging or erosion.
- Dead stock near watering points, bores, waterways or wetlands need to be promptly removed. Carcass burial should not occur within 100 metres of any bore, waterway or wetland, where the water table is less than two metres from the surface, in areas subject to waterlogging or within any WHPZ or RPZ.

Roads and tracks

- Use existing roads and tracks wherever possible to minimise vegetation damage, erosion and changes to surface hydrology and drainage.
- Construct roads and tracks in accordance with WQPN 44: [Roads near sensitive water resources](#) and WQPN 81: [Tracks and trails near sensitive water resources](#).

Stockyards

- Stockyards should be located and managed in accordance with WQPN 80: [Stockyards](#).

Vehicles

- Wash down of vehicles and any mechanical equipment should be undertaken as outlined in WQPN 68: [Mechanical equipment wash down](#).
- Any vehicle or machinery servicing and repairs should be in accordance with WQPNs 28: [Mechanical servicing and workshops](#) and 29: [Mobile mechanical servicing and cleaning](#).

Pesticide use

- Apply pesticides in accordance with best management practices¹⁹ and label directions.
- Minimise chemical spray drift and runoff by applying chemicals under suitable weather conditions (i.e. sufficiently dry and not windy).
- Re-fuelling areas for vehicles and aircraft should be bunded and located away from water resources and sensitive environments to prevent any accidental spillage contaminating the soil or seeping into groundwater. All runoff from servicing areas should be directed towards a fully contained collection sump for recovery and appropriate disposal.

¹⁷ See WNs 18: [Livestock management: fence location and grazing control](#); 19: [Flood proofing fencing for waterways](#); 6: [Livestock management: construction of livestock crossings](#).

¹⁸ See WN 7: [Livestock management: watering points and pumps](#).

¹⁹ See [Code of Practice for the use of agricultural and veterinary chemicals in Western Australia](#); brochure: [Liquid chemicals on agricultural land](#); the Department of Health's [Guides on pesticide use for industry and local government](#); [Circular PSC88: Use of herbicides in water catchment areas](#).

- Sheep and cattle drenching or jetting should not be undertaken within 100 metres of surface waters. If traditional plunge dipping pools are used for parasite control, dipping should not occur within 200 metres of water resources and must be fully contained to prevent any chemicals reaching water resources.

Fertiliser use

- Apply fertilisers in accordance with best management practices,^{20, 21} including:
 - applying the minimum quantity of nutrients necessary to sustain crop growth
 - limiting nutrient leaching by applying fertilisers at times of plant uptake and avoiding periods of heavy rainfall
 - using stabilised manures and slow-release fertilisers where practical
 - matching phosphorus and nitrate applications to soil type and drainage conditions
 - stockpiling fertilisers and animal manures on sealed surfaces away from water resources and sensitive environments.²²

Toxic and hazardous substances

- Storage, use and disposal of chemicals, fuels, pesticides and fertilisers should be in accordance with WQPN 65: *Toxic and hazardous substances* and 56: *Tanks for fuel and chemical storage near sensitive water resources*.

Accidents and emergency response

- Spills should be immediately cleaned up, with the solids disposed of appropriately in sealed containers for disposal offsite, and the residue should drain to a sealed collection sump, not into the environment.
- Any chemical spill or contaminated water that escapes containment should immediately be reported to the department's Pollution Watch Hotline, phone 1300 784 782. If the spill is within a PDWSA, advise the Water Corporation immediately, phone 13 13 75.
- Prepare a contingency plan to address emergency situations such as accidents, fires, chemical spills and vandalism that could impact on water resources. See WQPN 10: *Contaminant spills – emergency response plan* for more information.

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²⁰ For information on the use of biosolids and soil amendments see *Western Australian guidelines for biosolids management* and WQPN 50: *Soil amendment using industrial by-products*.

²¹ See brochures: *Fertiliser application on pasture or turf near sensitive water resources*; *Liquid chemicals on agricultural land*.

²² For general advice see *Guidelines for Management of Farmland adjacent to the Busselton Wetlands*.

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