



WQPN 84, May 2009

Rehabilitation of disturbed land in public drinking water source areas

Purpose

Forested catchments that are in near pristine condition provide the highest quality water supply source for drinking and the environment. However, sometimes it is necessary to disturb and clear parts of a catchment for a construction or short-term land use.

Disturbance may also have been caused by an emergency situation such as a wildfire or have resulted from past land uses such as logging, mining, extractive industry or access tracks, that have occurred in much of Western Australia's forests. Once disturbed land is no longer required, it should be rehabilitated so that it returns to its natural state and does not pose a water quality risk to sensitive water resources (see [Appendix A](#)). Poorly rehabilitated land can pose as much of a water quality risk as land that has not been rehabilitated.

The water quality risks are from:

- turbidity due to erosion
- contamination of water from pesticides and nutrients used during the rehabilitation
- pathogen contamination as a result of leaving open areas and tracks that encourage human activity close to water resources, leading to body contact with water or the depositing of human and domestic animal excreta.

Rehabilitation can also reduce the quantity of water flowing in waterways to below pre-disturbance levels.

The Department of Water is responsible for managing and protecting the state's water resources. It is also a lead agency for water conservation and reuse. This note offers:

- views on minimising impacts from disturbed land on water resources
- guidance on acceptable practices employed to protect the quality of water resources
- a basis for developing a multi-agency code or guideline designed to balance the views of industry, government and the community, while sustaining a healthy environment.

The recommendations made in this note do not override any statutory obligation or government policy statement. Alternative practical environmental solutions suited to local conditions may be considered. This note shall not be used as the department's policy

position on a specific matter, unless confirmed in writing. The note may be amended at our discretion, as new data becomes available.

Regulatory agencies should not use this note's recommendations in lieu of site-specific conditions based on a project's environmental risks. Such conditions should consider the values of the surrounding environment, the safeguards in place and take a precautionary approach.

Where a conflict arises between our recommendations and any proposed activity that may affect a sensitive water resource, this note may be used to assist negotiations with stakeholders. The negotiated outcome should not result in a greater risk to water quality than if our recommended protection measures were used.

Scope

This note applies to rehabilitation of land in public drinking water source areas that has been significantly altered from its condition prior to European settlement. It includes land that has been disturbed by agriculture, forestry, mining and extractive industries, tree plantations, human habitation and infrastructure such as roads, railways, conveyors and powerlines.

A public drinking water source area (PDWSA) is the collective name given to any catchment area proclaimed for the management and protection of a water source used for community drinking water supplies. PDWSA include *underground water pollution control areas*, *water reserves* and *catchment areas* administered under the provisions of the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*. For details on these statutes and associated regulatory measures, see [Appendix B](#).

The note does not apply to disturbed land that provides for a continuing approved use, but may offer some useful guidance on potential risks to water resources and good practice.

Advice and recommendations

Planning

- 1 A rehabilitation plan should be developed at the beginning of any development project that involves the interim disturbance of land in a PDWSA. A key component of this plan will be identifying pre-disturbance characteristics including vegetation types and density, soil type and soil condition so the rehabilitation can replicate these conditions. The plan should also detail the objectives of the rehabilitation, including establishing completion criteria against which the success of the rehabilitation can be benchmarked. Development proposals within PDWSA should adhere to the department's water quality protection note *25 Land use compatibility in public drinking water source areas* (see [Reference 5b](#)).
- 2 Local stakeholders should be consulted during the development of the rehabilitation plan to discuss the plan, its objectives and to resolve any concerns that may arise. Key stakeholders besides the Department of Water may include the Department of

Environment and Conservation, the Western Australian Planning Commission, local government authorities, local catchment councils or natural resource management groups and other community groups.

- 3 Mining companies often carry out a significant amount of research into rehabilitation of mined areas. If there is or has been mining near to the area which is going to be disturbed, then proponents should contact the mining company to access any publicly available information about rehabilitation in the area ([Reference 1](#)). Many mining companies will have a public liaison officer who can be contacted to source this information. To find out if mining has or is occurring nearby, contact the local regional office of the Department of Mines and Petroleum.

Topsoil (overburden)

- 4 Where the period of land disturbance is for less than 10 years, removed topsoil should be stockpiled for use in the rehabilitation. This topsoil can provide a source of local seed species and may be a cheaper alternative than sourcing imported soil to use during the rehabilitation. If imported soil is being used, please refer to the department's water quality protection note 16 *Soil fill to raise the level of land in public drinking water source areas*.
- 5 Windbreaks, covers or other suitable controls such as sealants or cover crops should be used to prevent stockpiled top soil from being blown away.
- 6 Where topsoil with viable seed stock has been lost, it should be replaced with soil that is equivalent to the pre-disturbance condition, i.e. it has the same mix of soil, seed stock, organic matter, trace elements and soil fauna. Replacement topsoil should be obtained from a source that is certified free of weed species.
- 7 All stored topsoil, including stockpiled or imported soil should be monitored for the presence of weed species. If weeds are present, management measures should be taken to control the weeds. The use of herbicides to control weeds should be in accordance with the Department of Health's Public Sector Circular 88 *Use of herbicides in catchment areas* ([Reference 4](#)) and the Department of Water's guidance on pesticide use ([Reference 5](#)).
- 8 Soil should be checked for evidence of contamination, buried materials, salinity and acid sulfate soil-related problems likely to impede plant regrowth. Contaminated soil that cannot be remediated should be disposed of at a facility approved for the type of contamination. A soil analysis should also be carried out to determine pH, nutrients and trace elements of the soil, as well as the presence of any plant diseases. Specific field tests for field pH (pH_f) or field pH peroxide (pH_{fox}) will provide a quick assessment of the likelihood of acid sulfate soils. If these tests indicate that acid sulfate soils may result from soil disturbance, more explicit and accurate tests should be carried out, such as chromium reducible sulfur or titratable acidity.
- 9 Any topsoil that may be contaminated with plant diseases (such as dieback) should be stored separately from uninfected soil. Wet, moist conditions can aid in the spread of disease so topsoil should be stored on high ground and in dry areas. Drainage should

be directed around infected topsoil stockpiles to prevent runoff transporting infected soil to non-infected areas. Stockpiles should be signposted to indicate whether they are infected or not ([Reference 6](#)).

- 10 If the disturbance of land involved significant changes to the natural landforms then landscaping may be required before topsoil is returned. Topsoil return and landscaping should ensure that a minimum two metre vertical buffer exists between the soil surface and the maximum wet season water table. The landscaping should ensure that surface water flows are managed to prevent runoff contaminating other areas, including the transport of soil, pesticides and fertilisers used in the rehabilitation to undisturbed areas.

Vegetation type

- 11 Rehabilitation should be with native endemic species of vegetation with equivalent diversity and density to the natural condition, as determined in the rehabilitation planning stage.
- 12 Seeds/rootstock to be used in the rehabilitation should be collected locally. The seeds may need to be either cultured to seedling stage prior to planting or seeds planted into topsoil at a time suited to natural seasonal propagation. Proponents may need to engage a specialist to determine whether special care of seeds or seedlings is required to ensure success of the rehabilitation.
- 13 When the rehabilitation is in areas infested with dieback disease, the use of vegetation types that are highly susceptible to forest disease infestation may aid the spread of the disease and should be avoided. Any plant stock or seeds should be sourced from nurseries that are certified dieback free and have good hygiene practices. Direct seeding should be considered as this has a lower risk of introducing dieback ([Reference 6](#)).
- 14 If the soil has become degraded, soil restoration may be required before vegetation is planted. Proponents may need to plant cereal crops, or use green waste or biosolids to provide soil carbon or legumes to restore lost nitrogen prior to restoration with native vegetation. Industrial by-products may also be used to improve soil fertility. These should be used in accordance with the water quality protection note 50 *Soil amendment using industrial by-products to improve land fertility* ([Reference 5b](#)).
- 15 Newly planted vegetation needs to be protected from wind, runoff, grazing animals or any other factor that may cause the uprooting or destruction of the revegetation. This use of stakes, tree guards, wind breaks and drainage controls are recommended to protect the revegetation until it is established.

Riparian vegetation

For guidance on rehabilitation of riparian vegetation, see the Department of Water's *River restoration manual* ([Reference 5c](#)) and water quality protection note 6 *Vegetation buffers to sensitive water resources* ([Reference 5b](#))

Erosion control

- 16 Before planting vegetation, the topsoil should be cross ripped along the contour to break up any compacted soil and create furrows to improve water infiltration and reduce erosion caused by surface water runoff. The distance between ripping lines will depend on soil types but should ensure that the compacted soil is continuously fractured.
- 17 Rehabilitation should be carried out on up-slope areas first to slow the flow rate and quantity of rainfall-induced runoff from higher areas to reduce down-slope erosion. Once rehabilitation in up-slope areas has been established it will also provide protection for down-slope areas from runoff flowing onto the rehabilitation from outside the disturbed area.
- 18 Embankments, quarry pits and erosion gullies should be restored to the natural landform so that runoff mimics naturally occurring conditions. This should be done as part of the landscaping carried out before topsoil is returned (see recommendation 10 above).
- 19 Restoration activities should be timed to match seasonal rainfall. Any surface disturbance that is required as part of the rehabilitation, for example cross-ripping, should be carried out during drier months to allow soils to stabilise before any runoff occurs. Sumps, drains and other engineered drainage controls used in the rehabilitation should be designed to contain runoff from large rainfall events. Temporary drainage controls may be required if severe storm events or flooding are predicted to occur.
- 20 Paper mache, jute geotextiles, native vegetation brush cover or mulch or other suitable substances that do not pose a weed or water quality contamination risk should be used to stabilise topsoil. Substances that contain chemicals that could leach and contaminate sensitive water resources should not be used for topsoil stabilisation. Mulch should be obtained from a source that is free of forest diseases.
- 21 Roads and tracks that are not required for ongoing management of rehabilitated areas or services access should be closed and included in the rehabilitation program. Roads and tracks that are not rehabilitated may become a preferential flow path for runoff, leading to increased erosion and require drainage control systems ([Reference 5b](#)).

Pesticides

- 22 Pesticide use should comply with the Department of Water's Statewide policy No.2 *Pesticide use in public drinking water source areas* ([Reference 5a](#)).
- 23 Herbicide use to control weeds should be in accordance with the Department of Health's Public Sector Circular 88 *Use of herbicides in catchment areas* ([Reference 4](#)). Weed control should be undertaken before vegetation is planted and subsequently carried out as necessary to prevent spread of exotic flora.

- 24 Appropriate biological pest controls or non-chemical control (e.g. hand weeding) should be considered to reduce quantities of pesticides used near sensitive water resources. Contact the Department of Agriculture and Food's Pest and Disease Information Service on 1800 084 881 or <info@agric.wa.gov.au> for information on suitable biological controls.
- 25 Pesticides should be used according to manufacturer's instructions. Spot application, rather than broadcast application, should be used to reduce the potential for off-site transport of pesticides through spray drift or runoff.

Fertiliser application

- 26 Native vegetation should not need fertiliser application. However, fertiliser use may be necessary to foster growth in seeded or newly planted vegetation. Fertiliser should be used according to manufacturer's instructions, with the use of slow release fertiliser encouraged to reduce the risk of excess nutrients leaching into groundwater or surface water. The use of animal manures should be avoided as they may host the seeds of weed species. If fertiliser is being applied, a nutrient management plan should be prepared in accordance with water quality protection note 33 *Nutrient and irrigation management plans* ([Reference 5b](#)).
- 27 Fertiliser should not be applied when storm events are expected that will create runoff and carry the nutrients to water bodies.

Water yield maintenance

- 28 If rehabilitation results in vegetation density greater than the natural conditions then the amount of runoff within a catchment may be significantly reduced, leading to lower stream flow levels. If rehabilitation density is observed to be greater than pre-disturbance levels then thinning or burning may be required. Appropriate densities should be agreed upon in consultation with the Department of Environment and Conservation and the Department of Water.

Fire management

- 29 Rehabilitation must be protected from wildfires until it is established and able to naturally withstand fires. Susceptibility to wildfires may vary according to the vegetation age for tree species. Wildfire control measures for the rehabilitation (such as fuel reduction) should be prepared and implemented in accordance with the *Bush Fires Act 1954*.
- 30 Fire management of rehabilitated areas should be incorporated into the fire management plans of surrounding areas, including prescribed burning. Proponents should consult with the Department of Environment and Conservation, surrounding landowners and the local emergency management authority when developing a fire management plan for the rehabilitation area.

Dieback

31 The following management measures may be required to prevent the spread of forest diseases into rehabilitated areas that are disease free or out of rehabilitated areas that are infected with forest diseases:

- a Surface water containment measures to prevent the transport of forest diseases in runoff.
- b Wash-down facilities for vehicles, equipment and footwear. Wastewater from wash-down facilities should be treated and disposed of at an approved location.
- c Signage indicating areas that are infected with forest diseases.

Proponents should contact their Department of Environment and Conservation regional office for information on what forest diseases may be present in their operational area, and for advice and recommendations on suitable measures to manage the spread of forest diseases. Go to <www.dec.wa.gov.au> select *contact us* or telephone 6467 5000 to find the location of the nearest regional office.

Access control

32 Access to rehabilitated areas should be controlled to prevent accidental or deliberate damage to newly established vegetated areas. Vandal resistant signage should be erected explaining that the area is subject to restoration and who is responsible for managing the area.

33 Land undergoing rehabilitation in public drinking water source areas, especially where it is sparsely vegetated, can attract unauthorised recreational activities (refer to the Department of Water's statewide policy no.13 *Policy and guidelines for recreation in public drinking water source areas on crown land*). If evidence is found that unauthorised recreation is occurring, then fencing, gates, a surveillance program or other suitable management measures should be introduced.

34 Fencing or similar barriers should be erected to prevent animals from grazing on rehabilitated vegetation, particularly on seedlings.

35 Roads and tracks used for access should be designed and managed in accordance with the department's water quality protection notes 44 *Roads near sensitive water resources* and 81 *Tracks and trails near sensitive water resources* ([Reference 5b](#)).

Management and monitoring of rehabilitation

36 Responsibilities for ongoing management and monitoring should be clearly defined after consultation with interested stakeholders including the Department of Water, the Water Corporation, the Department of Environment and Conservation and the relevant local government authority. A written agreement or management plan signed off by stakeholders is recommended to ensure all parties are aware of their responsibilities.

37 A monitoring program should be carried out that includes assessing the success of the rehabilitation against the completion criteria established during the rehabilitation

planning stage. The program should include inspection for damaged or degraded rehabilitation. Any non-thriving rehabilitation should be repaired and areas where rehabilitation has been unsuccessful should undergo further rehabilitation.

- 38 The rehabilitation plan should include how ongoing management of the restored land will be carried out. It should include plans to control waste dumping, weed infestation, damage by intruders and wildfire risk.

Handover of land

- 39 Procedures should be defined if the restored land is going to be handed over to government or another landowner. A written agreement should be put in place that details future land uses and care and maintenance responsibilities once the land is handed over. The rehabilitated land will be subject to Western Australian vegetation clearing and thinning controls under the *Environmental Protection Act 1986*.

More information

We welcome your views on this note. All feedback is retained on our file no. **WT4721**.

To comment on this note or for more information, please contact our water source protection branch as shown below, citing the note topic and version.

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This note will be updated periodically as new information is received or activity standards change. Updated versions are placed online at <www.water.wa.gov.au> select *waterways health > water quality > water quality protection notes*.

References and further reading

- 1 Alcoa World Alumina Australia – Mine rehabilitation process see <www.alcoa.com/australia> select *environment > environmental management > mine rehabilitation*.
- 2 Australian Government - Department of Environment, Water, Heritage and the Arts National water quality management strategy papers available online at <www.environment.gov.au> select *water > water quality > national water quality management strategy > national guidelines*
 - a *Australian and New Zealand guidelines for fresh and marine water quality 4 2000*
 - b *Australian drinking water guidelines 6 2004*

- c *Australian guidelines for water quality monitoring and reporting* 7 2000
 - d *Implementation guidelines* 3 1998
 - e *Policies and principles* 2 1994
 - f *Rural land uses and water quality - a community resource* 9 2000.
- 3 Department of Environment and Conservation (WA)
- a Acid sulfate soil management policies and guidelines see <www.dec.wa.gov.au> select *management and protection* > *land* > *acid sulfate soils*.
 - *Treatment and management of soils and water in acid sulfate landscapes* Draft 2009
 - b Dieback management – policies, guidelines and maps see <www.dec.wa.gov.au>, select *Land* > *Managing dieback*
 - c Forest management publications are available online at <www.dec.wa.gov.au> select *management and protection* > *forests* > *forest management planning*
 - *W.A. Forest management plan 2004*
 - *Soil and water management guidelines 2007*
 - d Native vegetation protection - legal framework and guidance publications online at <www.dec.wa.gov.au> select *Management and protection* > *Plants* > *Native vegetation*
 - e Protection of threatened flora - licensing and guidance publications online at <www.dec.wa.gov.au> select *Management and protection* > *Plants*
 - *Environmental weed strategy for Western Australia 1999*.
- 4 Department of Health (WA) Public Service Circular 88: *Use of herbicides in water catchment areas*, Perth, publication available from <http://www.public.health.wa.gov.au/cproot/1418/2/PSC88_Use_of_Herbicides_in_Water_Catchment_Areas.pdf>
- 5 Department of Water (WA)
- a Water protection policies available online at <www.water.wa.gov.au> select *publication* > *find a publication* > *series browse* > *statewide policy*
 - *Pesticide use in public drinking water source areas* 2000
 - *Policy and guidelines for recreation within public drinking water source areas on crown land* 2003
 - b Water quality protection notes available online at <www.water.wa.gov.au> select *publication* > *find a publication* > *series browse* > *water quality protection notes*
 - *WQPN 6 Vegetation buffers to sensitive water resources*
 - *WQPN 16 Soil fill to raise the level of land in public drinking water source areas*
 - *WQPN 25 Land use compatibility in public drinking water source areas*
 - *WQPN 32 Nurseries and garden centres*

- WQPN 33 *Nutrient and irrigation management plans*
 - WQPN 36 *Protection of public drinking water source areas - an overview*
 - WQPN 44 *Roads near sensitive water resources*
 - WQPN 50 *Soil amendment using industrial by-products to improve land fertility*
 - WQPN 81 *Tracks and trails near sensitive water resources*
- c River restoration manuals available online at <www.water.wa.gov.au>, select > *publications* > *find a publication* > *series browse* > *river restoration manual*
- d *Stormwater management manual for Western Australia*
available online at <www.water.wa.gov.au> select *publications* > *find a publication* > *series browse* > *stormwater management manual*.
- 6 Dieback Working Group publications see <www.dwg.org.au> *Management of Phytophthora dieback in extractive industries*.
- 7 Environmental Protection Authority (WA) publications see <www.epa.wa.gov.au> select *Guidance statements*

Guidance 33 - Environmental guidance for planning and development.
- 8 Forest Products Commission (WA) publications see <www.fpc.wa.gov.au> *Contractors' timber harvesting manual - south west forests FPC 2007*.
9. Government of Western Australia
- a *State water quality management strategy 2001*, available online at <www.water.wa.gov.au> select *water quality* > *publications* > *other publications*
- b *Securing our water future - a state water strategy for Western Australia 2003*, available online at <www.water.wa.gov.au> select *planning the water future*.
- 10 Western Australian Planning Commission online publications see <www.wapc.wa.gov.au>
- a State planning policies (SPP)
- *SPP 2 Environment and natural resources policy 2003*
 - *SPP 2.7 Public drinking water source policy 2003*
 - *SPP 2.9 Water resources policy 2004*
 - *SPP 4.1 State industrial buffer policy 1997*
 - *Planning bulletin 64/2009 Acid sulfate soils*
- b Guideline for the determination of wetland buffer requirements (draft 2006).

Appendices

Appendix A - Sensitive water resources

Clean water resources used for drinking, sustaining aquatic and terrestrial ecology, industry, and aesthetic values, along with breathable air, rank as the most fundamental and important needs for viable communities. Water resources should remain within specific quality limits to retain their values and therefore require stringent and conservative protection measures. Guidance on water quality parameters that are necessary to maintain water values are published in the Australian Government's *National water quality management strategy guidelines*, available online at <www.environment.gov.au> select *water > water quality > national water quality management strategy*.

The Department of Water strives to improve community awareness of catchment protection measures, for both surface water and groundwater, as part of a multi-barrier protection approach to water resource quality.

Human activity and many land uses pose a risk to water quality if contaminants are washed or leached into sensitive water resources in discernible quantities. These waters include estuaries, waterways, wetlands and unconfined groundwater accessed by water supply wells.

Sensitive water resources support one or more of the environmental values described below:

- 1 Public drinking water sources (i.e. *water reserves, catchment areas or underground water pollution control areas*) proclaimed or assigned under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*, the *Country Areas Water Supply Act 1947* or the *Health Act 1911*.
- 2 Private sources, used for the following water supplies:
 - a human or stock (animal) drinking water
 - b commercial or industrial water (requiring specific qualities that support activities such as aquaculture, cooling, food or mineral processing or crop irrigation)
 - c urban irrigation (that could affect people's health or wellbeing).
- 3 Recognised ecological functions in groundwater aquifers such as soil or cave fauna.
- 4 Social values in natural waterways including aesthetic appeal, boating, fishing, tourism and swimming.
- 5 Ecological functions of waterways including:
 - a those of high conservation significance described in the Environmental Protection Authority's guidance statement 33 *Environmental guidance for planning and development* (section B5.2.2), available online at <www.epa.wa.gov.au> select *EIA > guidance statements*

- b waterways managed by the Department of Water under the *Waterways Conservation Act 1976*, including the Avon River, Peel-Harvey Inlet, Leschenault Inlet, Wilson Inlet and Albany waterways
- c waterways managed by the Swan River Trust under the *Swan and Canning Rivers Management Act 2006*.

Engineered drains or constructed water features are excluded, because functional and operational factors may outweigh their water quality values.

- 6 Conservation values in wetlands (assigned or recognised, excluding those highly disturbed unless actively managed to restore specified environmental values), including:
- a Ramsar wetlands, described online at <www.ramsar.org>.
 - b High conservation significance wetlands as described in the Environmental Protection Authority's guidance statement 33 *Environmental guidance for planning and development* (section B4.2.2), available online at <www.epa.wa.gov.au> select *Environmental impact assessment > guidance statements*.
 - c Wetlands defined by the Australian government in *A directory of important wetlands in Australia*, available online at <www.environment.gov.au> select *water > water for the environment > wetlands > wetlands publications, resources and links > books, reports directories*.
 - d Conservation valued and resource enhancement category wetlands identified in the *Geomorphic wetlands of the Swan coastal plain* dataset; all wetlands identified in the *South coast significant wetlands* dataset, and high value wetlands identified in the *Geomorphic wetlands Augusta to Walpole* dataset. The Augusta to Walpole wetland dataset awaits a detailed evaluation process. The Department of Environment and Conservation (DEC) is the custodian of wetland datasets and is responsible for maintaining and updating the information. The datasets can be viewed online at <www.dec.wa.gov.au> search *maps wetlands* or select *management and protection > wetlands > wetlands data*. Guidance on viewing the wetlands is provided on the same website at *water > wetlands > data* or by phoning DEC's nature conservation division for assistance on 08 9334 0333.

Many aquifers, waterways and wetlands in this state still need a detailed scientific evaluation and their value remains to be classified. Unless proven otherwise, any natural waters that are largely undisturbed by human activity, should be considered to have sensitive values.

Community support for water values, the setting of practical management objectives, providing sustainable protection strategies and effective implementation are vital to protecting or restoring water resources for current needs and those of future generations.

Appendix B - Statutory requirements and approvals relevant to this note include

What is regulated?	Statute	Regulatory body/agency
Subdivision of land Land zoning and development approval	<i>Planning and Development Act 2006</i>	WA Planning Commission < www.wapc.wa.gov.au > Department for Planning and Infrastructure < www.dpi.wa.gov.au > Local government (council)
Impact on the values and ecology of land or natural waters	<i>Environmental Protection Act, 1986, Part IV Environmental Impact assessment</i>	Minister for the Environment advised by the Environmental Protection Authority
Management and protection of indigenous fauna and flora and lands vested in the conservation estate	<i>Conservation and Land Management Act 1984</i> <i>Wildlife Conservation Act 1950</i>	Conservation Commission < www.conservation.wa.gov.au > Department of Environment and Conservation
Licensing of prescribed premises that pollute	<i>Environmental Protection Act 1986, Part V Environmental Regulation</i>	Department of Environment and Conservation < www.dec.wa.gov.au >
Vegetation clearing controls	Environmental Protection (Clearing of Native Vegetation) Regulations 2004	
Clearing in controlled country catchments	<i>Country Areas Water Supply Act 1947, Section 12AA</i>	Department of Water – regional office < www.water.wa.gov.au >
Buffers in proclaimed public drinking water source areas	<i>Metropolitan Water Supply, Sewerage & Drainage Act, 1909</i> <i>Country Areas Water Supply Act 1947</i>	
Environmental impact on managed waterways.	<i>Waterways Conservation Act 1976</i>	
Environmental impact on the Swan–Canning Estuary	<i>Swan and Canning Rivers Management Act 2006</i>	Swan River Trust < www.swanrivertrust.wa.gov.au >
Development applications - website select <i>heritage and culture > sites and surveys</i>	<i>Aboriginal Heritage Act 1972</i>	Department of Indigenous Affairs (WA) < www.dia.wa.gov.au >
Petroleum, minerals and basic raw materials extraction	<i>Mining Act 1978</i> <i>State agreement acts</i>	Department of Mines and Petroleum < www.dmp.wa.gov.au >
Emergency response planning	<i>Fire and Emergency Services Authority of WA Act 1998</i>	Fire and Emergency Services Authority < www.fesa.wa.gov.au >