

## POL-C-104 Environmental Planning

### 1. POLICY PURPOSE AND APPLICATION

- 1.1 The purpose of this Policy is to clearly articulate and set out the City's expectations for the management of the natural environment especially relating to urban growth areas.
- 1.2 This Policy sets out the policy requirements measures and processes for planning, developing and managing the natural environment aspects of urban development areas through Structure Planning (and associated Management Plans) and Associated Town Planning Scheme Amendments.
- 1.3 The Policy must be read in conjunction with the Urban Growth Policy that sets out the City's urban growth objectives and priorities to be achieved through Structure Plans, Town Planning Scheme and Metropolitan Region Scheme amendments.
- 1.4 This policy must be used in conjunction with other relevant City of Swan strategies and policies; including the City of Swan Environmental Policy, Biodiversity Strategy and Place Plans.
- 1.5 The Policy is intended to compliment and be used in conjunction with the relevant State Government Legislation, Policies and guidelines that apply to the Natural Environment.



### 2. OBJECTIVES AND REQUIREMENTS

This section sets out the City's expectations and minimum requirements for investigation and management of natural environment assets that must be addressed in Structure Plans, Management Plans or Programs, Detailed Area Plans and any subsequent proposals for subdivision.

#### 2.1 Environmental Planning

##### 2.1.1 Objectives

- a) Conservation of environmental assets and management of negative impacts on the environment will be achieved through robust monitoring, analysis and preparation of comprehensive whole-of-site environmental plans to ensure that environmental issues are identified and proper corrective action taken in a timely manner.
- b) Environmental planning will consider off-site and cumulative impacts where necessary.
- c) Assessment of potential environmental and human impacts must be carried out as early as possible in the development process to ensure that these constraints are incorporated into the design and management of urban areas.
- d) Developers must be aware that there are some areas where the long term impacts on the environment or human health may preclude development.

## 2.1.2 Requirements

2.1.2.1 Early consultation with City and relevant authorities responsible for management of the natural environment is essential to ensure that:

- a) Adequate assessment of environmental constraints is carried out prior to any amendment of the City's Town Planning Scheme.
- b) Structure Plans and Management Plans are prepared to provide an adequate assessment of environmental constraints and opportunities and contain a comprehensive framework for their management.

2.1.2.2 Where developments have the potential for significant environmental impacts both within the site and on other areas, or where impacts of several developments may be cumulative, a Statement of Potential Environmental Impacts must be prepared that provides an overview of:

- a) Environmental investigations to-date; and
- b) Environmental constraints and opportunities
- c) The City will request that the Environmental Protection Authority carry out a formal assessment where the potential for significant environmental impacts or cumulative impacts is likely to result from development.

2.1.2.3 A comprehensive Environmental Management Plan will be prepared in conjunction with any Structure Plan and Local Water Management Strategy. These plans should be developed in consultation with the City of Swan and the relevant State Government agencies and address the following:

### 2.1.2.3.1 Assessment

- a) Identified and potential environmental constraints, issues and opportunities including the extent of the constraint;
- b) The results of baseline monitoring programs that have been undertaken to allow an assessment of the potential impacts of the development;
- c) A detailed risk assessment of any potential environmental issues and the management strategies that are proposed to address these issues;
- d) A description of any pre-development bushland or wetlands; including their flora and fauna, biodiversity and ecological values;
- e) The extent of the potential impacts and their likely effect on the area of native vegetation;
- f) An assessment of the potential for disturbance or dewatering of Acid Sulfate Soils and the likelihood and impact of the discharge of leachate from these soils;
- g) Risk management analysis for areas all potential environmental impacts identified for the development area;
- h) A risk management analysis and management program for potential risks to the public from biting insects, and pathogens;
- i) A risk management analysis and management program for potential risks to public and private property and human health from fires in wetlands or areas of bushland;

### 2.1.2.3.2 Management

- a) Where impacts are predicted, a detailed risk assessment and management strategy is required to minimise these impacts;
- b) Management programs are required for both during and after construction providing details of identified and agreed roles and responsibilities for

monitoring between the developer/City and State agencies, assessment of results, the limits and trigger points that will precipitate action, roles and responsibilities for taking of action, and agreed timeframes;

- c) A detailed monitoring program to determine the extent of any adverse effects, and assist in formulating strategies to mitigate adverse effects and ensure that ecological values are maintained;
- d) Clearly stated roles and responsibilities for assessment of results and dissemination of information;
- e) Remedial actions that are to be taken in the event that limits are reached, or where other adverse environmental effects become apparent, including agreed roles and responsibilities between the developer, City of Swan and State Government Agencies;
- f) A whole of life costing analysis for the preferred treatment method, Best Management Practice or management options (at some levels this will be a preliminary assessment – the methodology to be agreed and determined with Council).

#### 2.1.2.3.3 Planning Context

- a) Details of other plans to be prepared at during subsequent planning stages;
- b) Identify any planning implications or mechanisms;
- c) Identify partners and stakeholders; and
- d) Any other matters of significance as determined by the City or relevant authorities.

2.1.2.4 The City will require additional management plans to be prepared at the Structure Plan and subsequent stages of development to adequately manage the environmental and development impacts and desired outcomes in accordance with the objective of this Policy. These will include:

- a) Local Water Management Strategies, Acid Sulfate Soils Reports and Cultural Heritage Management Plans to assist in the assessment of Structure Plans
- b) Water Management Plans, Acid Sulfate Soils Management Strategies and/or Plans, Fire Management Plans, Construction Management Plans, Wetland Management Plans, Contaminated Soils Remediation Plans and Noise Management Plans to assist in the assessment of Development Plans.

2.1.2.5 Baseline monitoring is essential for informed decision making. The level of baseline monitoring will be dependent on the location of the development and its potential environmental impact. For developments that have a high potential for environmental impacts to occur (eg where high groundwater levels exist in the area), a robust monitoring program that is carried out for several years is required to properly inform decision making. These programs will typically be required for:

- a) Hydrology for the development and catchment areas, including surface water quality and flows and groundwater levels (including seasonal fluctuations), groundwater quality, and flows;
- b) Biodiversity (including baseline surveys for native and non-native flora and fauna);
- c) Geotechnical surveys, including soil types, underlying strata (including the presence of clay layers), acid sulfate soils and other potential site contamination issues.

2.1.2.6 Potential offsite environmental impacts must be addressed including predicted and potential impacts on areas of native vegetation from human activity and alterations in surface or groundwater regimes or quality. The robustness of predictions must be demonstrated through adequate baseline monitoring and assessment by suitable qualified professionals. Ongoing monitoring and management of potential offsite impacts is to be addressed in an Environmental Management Plan for the Structure Plan area.

## **2.2 Biodiversity<sup>1</sup>**

### 2.2.1 Objectives

- a) Areas of high biodiversity value such as Conservation Category Wetlands, BushForever sites, riparian vegetation, locally significant areas of vegetation and other areas of high conservation value, will be retained in their natural condition and appropriate buffers used to maintain their integrity. Development or changes in land use should not create adverse impacts either directly or indirectly, on these areas.
- b) Expert ecological survey and assessment of natural systems is one of the key foundations of biodiversity planning. Structure Plans, Development Plans and Environmental Management Plans will be underpinned by an appropriate level of assessment to ensure that biodiversity values are identified, maintained and that adverse impacts are avoided or where minimised where impact is unavoidable.

### 2.2.2 Requirements

- a) Development must be planned to meet the Natural Resource Targets set in the City of Swan Biodiversity Strategy or Policies.
- b) Clearing of regionally significant bushland, conservation and resource enhancement wetlands, or significant areas of fringing vegetation along creek-lines and watercourses is not supported.
- c) Linkages between areas of high biodiversity values should be maintained where possible to avoid natural areas becoming isolated.
- d) The City will request from the Western Australian Planning Commission that significant natural areas are zoned Metropolitan Region Scheme "Parks and Recreation" and managed by the appropriate State Government agency. The City may however accept ownership or management responsibility of regionally significant natural areas where it considers this to be in the strategic interests of the City.
- e) Where appropriate the City may enter into an agreement with the developer for the monitoring and maintenance of the designated natural areas.
- f) For areas that require the preparation of Environmental Management Plans and subsequent monitoring, the developer will undertake the following:

<sup>1</sup>Biodiversity is a term used to describe the variety of organisms that inhabit the earth and form complex linkages that underpin the ecological processes of the natural environment.

<b>Management Area</b>	<b>Responsibility</b>	<b>Comments</b>
Preparation of detailed and costed maintenance and operation plan wetlands, Bushforever sites, riparian vegetation and areas of native vegetation	Proponent for 5 years <sup>2</sup>	To be prepared to the satisfaction of the City of Swan.
Preparation of Wetland Management Plans for Conservation Category or Resource Enhancement Wetlands	Proponent for 5 years <sup>2</sup>	To be prepared to the satisfaction of the City of Swan.
Preparation of Bushforever sites plans including rehabilitation works, maintenance and monitoring.	Proponent for 5 years <sup>2</sup>	Managerial responsibility.
Riparian vegetation and other significant areas of native vegetation including rehabilitation programs and coordination of community involvement and/or education campaigns.	Proponent for 5 years <sup>2</sup>	Management and maintenance for these areas, including any rehabilitation works as detailed in the management plans
Monitoring of native flora and fauna monitoring	Proponent for 5 years <sup>2</sup>	
Monitoring non-native species of flora and fauna	Proponent for 5 years <sup>2</sup>	
Feral animal, weed and pest control programs	Proponent for 5 years <sup>2</sup>	To the requirements of the City of Swan, CALM and DOE
Wetland water level and quality monitoring	Proponent for 5 years <sup>2</sup>	Results to be supplied to CoS, DEP and Water Corp.
Preparation and implementation of Fire management plans	Proponent for 5 years <sup>2</sup>	To the satisfaction of the City of Swan and FESA
Implementation of any community education strategies as identified in individual Management Plans.	Proponent for 5 years <sup>2</sup>	

<sup>2</sup> All time frames are from sale of the last lot within the development area (subdivision, precinct or village).

## **2.3 Integrated Water Management**

### **2.3.1 Objectives**

- a) The City of Swan supports the integration of water management through water sensitive urban design, adoption of best management practices and the introduction of water conservation schemes; however water management strategies must recognise the limited resources of the City of Swan to maintain these assets.
- b) The principles of integrated water management outlined in the WAPC Liveable Neighbourhoods, the Department of Environment Stormwater Management Manual for Western Australia, and other relevant guidelines produced by the State and Commonwealth Governments should be applied where practical.

## 2.3.2 Requirements

2.3.2.1 A Local Water Management Strategy must be prepared for Structure Plans and will be adopted as a part of the Structure Plan under the Town Planning Scheme. The Local Water Management Strategy is to include:

- a) Water management objectives for the development area.
- b) Mapping clearly detailing the extent of the area covered by the Local Water Management Strategy. Where off-site impacts are predicted, the Local Water Management Strategy will be extended to include those areas beyond the area covered by the Structure Plan that will be impacted by the development.

## 2.3.2.2 Assessment

- a) Modelling of pre-development surface water flows and retention areas (including seasonally flooded and waterlogged areas)
- b) Modelling of pre-development groundwater levels and flows (including seasonal other temporal fluctuations to allow accurate modelling of AAGML for the development area)
- c) Water quality monitoring data for both surface water (including that stationary water bodies and stream flows) and groundwater.
- d) Prediction modelling for post-development surface water quality and flows
- e) Prediction modelling for groundwater levels, quality and flows.
- f) A discussion of any potential constraints to development (including high water tables, potential for flooding, AS soils, contaminated sites and groundwater dependent vegetation), potential for adverse impacts to either the natural environment or other land owners, and the proposed methodology to mitigate these impacts.

## 2.3.2.3 Management

- a) Outline of the drainage and water management methodology to be used.
- b) Details of major structural devices (including surface drainage lines, fill areas, sub-surface drainage, major control devices, water bodies and wetlands and discharge points).
- c) Details of anticipated water extraction rates and allocation within the Structure Plan area (including details of any current licences that are to be allocated for the reticulation of POS).
- d) Details of pre-development and the proposed post-developing monitoring programs for ground and surface water quality to assess impacts of development onsite and on surrounding catchments. This will include a description of previous monitoring programs and details of current monitoring programs.
- e) Details of responsibilities for ongoing data collection, review of data, and dissemination of results (including the duration of any post-development monitoring programs).
- f) Targets and limits for ground and surface water quality, flows and levels, and corrective or remedial action to be taken if targets or limits are exceeded (including agreed responsibilities for action and time periods in which it will be taken).
- g) Details of contingency strategies, responsibilities and estimated costs.
- h) Whole of life-cycle costings for water management infrastructure and non-structural control measures (including general management and maintenance

costs, major maintenance events, anticipated life expectancy and replacement costs).

- i) Details of the environmental education strategies that will be undertaken to support water management objectives (can also be contained within Community and Economic Development Plan).
- j) Details of water allocations to be supplied for the reticulation of public open space and public facilities.

2.3.2.4 More detailed Water Management Plans will be required subsequent to the Structure Plan. These may include a Water Management Plan at Development Plan and/or a Water Management Program at Subdivision Stage (depending on the size of the development area and complexity of the environmental and water management issues identified). These will typically include:

- a) The results of detailed environmental and hydrological studies
- b) Precise predictions and post-development modelling
- c) Details of location and design of drainage infrastructure.
- d) Descriptions and cost-benefit analysis (including whole of life costing) for any structural or non-structural controls
- e) Details of monitoring program to evaluate ground and surface water quality, flows and levels, including the location and design of any current and proposed monitoring stations.
- f) Precise and measurable targets and limits for ground and surface water quality, flows and levels that are to be maintained for the development area. This will be accompanied by a clear description of the roles and responsibilities agreed upon by each agency and the agencies commitment for action to be taken.

2.3.2.5 The City supports installation of water conservation and re-use schemes especially in relation to watering community/public facilities (especially Primary Schools), open spaces and households (and associated implications for design of open space/drainage system) such as:

- a) Greywater and stormwater reuse systems
- b) Low water use gardens
- c) Rainwater tanks, household water savings devices, low water gardens, and the introduction of education programs to assist residents in minimising household usage of potable water.
- d) Installation of Third Pipe technology to all lots where there is an undue cost implication for the City. It is essential that developers enter into a dialogue with the City to ensure that these assets are designed to minimise long term maintenance costs, while providing an effective form of treatment.

2.3.2.6 Where practical, developments should incorporate best practice water recycling within major commercial centres.

2.3.2.7 Water management plans should be based on at least 2 years monitoring of surface and ground water quantity and quality to establish water patterns prior to development occurring. Where this has not occurred, the developer must be able to demonstrate there is sufficient data available to predict post development conditions and anticipate potential impacts.

2.3.2.8 Where the developer proposes water management measures that are not fully supported by the Department of Environment, Department of Water and/or Water Corporation, responsibility for any remedial works or programs that may

be required if the measure does not function as predicted, or meet standards required by the City will be detailed in an agreement between the developer and the City.

- 2.3.2.9 Environmental water flows will be maintained at pre-development levels, with no significant increase or decrease.
- 2.3.2.10 Nutrient levels should not be increased as a result of urban development, and ideally should decrease after development.
- 2.3.2.11 Where possible, stormwater treatment should be at source, and not end of pipe.
- 2.3.2.12 Drainage systems should utilize natural drainage channels where possible.
- 2.3.2.13 The City is not responsible for supporting water management systems on private property, and will not undertake management of these systems, except in exceptional circumstances.
- 2.3.2.14 The effectiveness of the proposed treatment methods must be evaluated for each geological and catchment area.
- 2.3.2.15 The City supports the use of non-structural treatment methods as outlined in the Department of Environment Stormwater Management Manual for Western Australia to reduce the discharge of nutrients from residential areas where it can be demonstrated that these measures are cost effective and sustainable. The use of non-structural methods does not remove any requirement for structural water treatment measures to be undertaken. Where non-structural measures are proposed, the Water Management Plan should:
  - a) Details of the non-structural treatment program proposed
  - b) Clear identification of roles and responsibilities
  - c) Commitment from the landowner to funding and managing the non-structural treatment program for a minimum of 5 years
  - d) Targets and processes for measuring, monitoring and reviewing them where necessary
  - e) Triggers and contingencies
  - f) Involvement and partnership with local catchment groups.
- 2.3.2.16 The installation and marketing of wet stormwater detention basins as artificial lakes and ponds will not be supported unless the proponent can demonstrate long term cost effectiveness and sustainability of these structures. The installation of ponds or basins that allow the formation of algal blooms and discharge either indirectly or directly into the Swan River is not supported.
- 2.3.2.17 Areas that provide the dual functions of water management and public open space (POS) are generally supported where other functional POS sites exist that cater for community need and the amount, function and amenity of the POS is not compromised and the water management facility does not impose an unreasonable maintenance burden on the City. The principle use of the land and the usefulness of the land for recreational purposes will guide the City's decision on POS credited.
- 2.3.2.18 Public access should be restricted in natural areas that are preserved for their high conservation value such as BushForever sites and Conservation Category wetlands, where this is considered necessary to maintain environmental values.
- 2.3.2.19 The use of hard buffers (eg roads) are preferred for housing adjacent to wetlands and the City does not support private lots backing onto wetland areas.

- 2.3.2.20 Where lowering of groundwater levels or disturbance of waterlogged land is proposed, the developer will undertake detailed and extensive assessment for the presence of Acid Sulfate Soils and Potential Acid Sulfate Soils.
- 2.3.2.21 Water management strategies and mechanisms must address potential contamination issues for ground and surface water.
- 2.3.2.22 Whole of life costings for any water management systems, treatment measures, structures and facilities must be carried out at an early stage in the development and an agreement reached with the City over the type and placement of these assets. This is required to enable a cost- benefit analysis to be carried out to assist in determining optimal systems that take into account cost effectiveness and long term financial implications.
- 2.3.2.23 Proponents and/or landowners are responsible for securing adequate water allocations, from agreed sources and levels, for the reticulation of public open space, grounds associated with public facilities, and recreational grounds within the development area.
- 2.3.2.24 The City may require conditions for development that are outlined in any management plans or strategies to be contained within a separate legal agreement with the proponent and/or landowner.
- 2.3.2.25 The City requires the following management responsibilities and timeframes to be undertaken by the proponent and/or landowners:

<b>Management Area</b>	<b>Responsibility</b>	<b>Comments</b>
Preparation of detailed and costed stormwater maintenance and operation plan	Proponent for 5 years <sup>2</sup>	To be prepared to the satisfaction of the City of Swan
Groundwater level and quality monitoring	Proponent for 5 years <sup>2</sup>	Results to be supplied to CoS, DEP and Water Corp.
Structural control compliance (installation, operation and maintenance) of detention storage	Proponent for 5 years <sup>2</sup>	Agreements may be entered into with Water Corporation
Detention storage outlet gauging station (including water quality) installation, operation and maintenance	Proponent for 5 years <sup>2</sup>	To the satisfaction of Water Corporation
Non structural source control: - development of agreed source control programme - education campaigns - balanced planting regime - review of operating and maintenance practices	Proponent for 5 years <sup>2</sup>	
Non structural source control : - street sweeping	Proponent for 5 years <sup>2</sup>	Frequency as per CoS requirements
Structural source control compliance (installation, operation and maintenance) - Stormwater Pollutant Traps (SPTs) - Swales	Proponent for 5 years <sup>2</sup>	Council for maintenance
Detention storage inflow quantity and quality monitoring	Proponent for 5 years <sup>2</sup>	
Detention storage – quantity	Proponent for 5 years <sup>2</sup>	Proponent to monitor and ensure that sufficient

Management Area	Responsibility	Comments
		capacity is available. To the satisfaction of the CoS and Water Corporation
Detention storage - quality	Proponent for 5 years <sup>2</sup>	Proponent to carry out monitoring and maintenance to ensure agreed quality is maintained for 10 years
Preparation of Annual Monitoring Reports	Proponent for 5 years <sup>2</sup>	Copies supplied to the CoS, DEP and Water Corporation
Assessments for performance of catchment management and source control measures (Items 1, 4 and 7) from Annual Monitoring Reports (Item 8).	Proponent for 5 years <sup>2</sup>	Proponent in conjunction with City of Swan, Department of Environment and Water Corporation
Advise new purchasers: o of the modelling behaviour of any water bodies within the development area, their intended purpose (as agreed with Council), predicted water levels and water quality (including risk and predicted frequency of algal blooms) o that the performance of water quality is dependent in large part on the behaviour of residents	Proponent for 5 years <sup>2</sup>	

<sup>2</sup> All time frames are from sale of the last lot within the development area (subdivision, precinct or village).

## 2.4 Acid Sulfate (AS) Soils

### 2.4.1 Objectives

- a) A thorough assessment for Acid Sulfate soils and associated environmental constraints at an earlier stage in the development process to allow the development to be designed around the constraints and use the natural features rather than use the "end of pipe" approach that is currently prevalent.
- b) The basic premise for managing Acid Sulfate Soils within the City of Swan is that these soils should not be disturbed or allowed to oxidise as a result of dewatering or drainage. This may be achieved through careful design of urban areas.
- c) Developers will minimise the risk to human health and the receiving environment by ensuring that development areas are designed in such a way as to minimise the potential for disturbance or drying of Acid Sulfate Soils.

### 2.4.2 Requirements

- 2.4.2.1 Initial identification and assessment of Acid Sulfate Soils will be undertaken prior to any Scheme Amendment being considered and/or during the Structure Planning stage of a development. Where there is evidence of a significant risk of disturbing acid sulfate soils, an Acid Sulfate Soils Report will be prepared that addresses the issue of acid sulfate soils and includes an Acid Sulfate Soils Site Investigation that:
  - a) Verifies the existence, general location and extent of acid sulfate soils, or alternatively the absence of acid sulfate soils, based on:

- i) Landscape characteristics;
  - ii) Soil characteristics;
  - iii) Surface and sub-surface water characteristics; and
  - iv) At least Steps 1, 2, 3 and 4 of the Department of Environment's Acid Sulfate Soil Site Investigation process; and
- b) Demonstrates the capacity of the land to sustain the proposed land uses having regarded to:
- i) The extent and severity of acid sulfate soils;
  - ii) Potential impacts on surface and groundwater quality and quantity;
  - iii) Potential impacts on ecosystems and biodiversity;
  - iv) Potential impacts on existing land uses in the vicinity;
  - v) Any likely engineering constraints and impacts on infrastructure; and
  - vi) Cumulative impacts.

2.4.2.2 Notwithstanding the City's additional requirements, an Acid Sulfate Soil Management Strategy is to be prepared at the Development Plan stage for any development areas where there is the potential for Acid Sulfate Soils or Potential Acid Sulfate Soils to be disturbed or discharge of contaminated waters from these areas to occur. Preparation of Acid Sulfate Soils Management Strategies will be based on a sampling and assessment program that will be undertaken in accordance with the latest guidance that is available from the Department of Environment and WA Planning Commission. It is expected that this program will comply with the Department of Environment's guidelines for assessment and management of Acid Sulfate Soils and preparation of Acid Sulfate Soils Management Plans. In particular the Management Plan should include:

- a) Results from a detailed on site assessment of all areas of the site that may contain Acid Sulfate Soils, where disturbance may occur in areas where water tables are close to the surface or are seasonally or permanently waterlogged, or where there is the possibility that groundwater levels may be altered as a result of the development. Developers will comply with the Department of Environment guidelines for the assessment of Acid Sulfate Soils and will treat these areas as "high risk" areas.
- b) Details of the monitoring program undertaken, including sampling rates and methodology, and details of testing and analysis process used
- c) Detailed mapping of the development area that show the areas included in the sampling and assessment programs and clearly indicate where areas of Acid Sulfate Soils that have been identified.
- d) A detailed description of the way in which the development will be designed to avoid the disturbance or drying of these soils
- e) A detailed risk analysis that includes modelling of post-development groundwater levels and predicted impacts from any unintentional disturbance including an analysis of the potential to generate acidic discharge
- f) Details of post development monitoring programs that will be undertaken to ensure that discharge from Acid Sulfate Soils is not occurring. This will include frequency of monitoring and location of monitoring sites
- g) A program for analysis and dissemination of data, including responsibilities and time lines

- h) A detailed response program that includes remedial actions that will be undertaken, designated roles and responsibilities that for actions, and time frames within which actions will be taken
- 2.4.2.3 The City will request the WAPC imposes a condition requiring the preparation of an Acid Sulfate Soils Management Plan as a condition of approval at the Subdivision Stage. Notwithstanding the requirements of the WAPC, the City will request a detailed Acid Sulfate Soils Management Plan prior to forwarding any applications for subdivision to the WAPC for approval. These management plans will be expected to include:
- a) More detailed sampling of areas where the presence of actual acid sulfate soils or potential acid sulfate soils has been detected; particularly those areas where soil disturbing activities may occur, or for areas where sub-surface drainage systems are proposed
  - b) Detailed management plans for avoiding disturbance of these soils during and post construction phase
  - c) Detailed management plans for instances where is expected that acid sulfate soils will be disturbed by either excavation, dewatering works or by groundwater extraction
  - d) Location of sites that will be used to monitor ground and surface water to ensure that any acidification of these waters is detected
  - e) Details of the monitoring program to be undertaken
  - f) Expected outcomes and trigger points which will precipitate remedial action
  - g) A program for analysis and dissemination of data, including responsibilities and time lines
  - h) A detailed response program that includes remedial actions that will be undertaken, designated roles and responsibilities that for actions, and time frames within which actions will be taken
- 2.4.2.4 The preferred approach is to avoid acid sulfate soils disturbance in any known risk areas.
- 2.4.2.5 The City does not support sub-surface drainage systems, the excavation of detention basins, ponds or swales in areas where acid sulfate soils are present, or where the installation of this infrastructure may cause the exposure of acid sulfate soils to the atmosphere.
- 2.4.2.6 Where sub-surface drainage systems are used, they must be laid at or above the Average Annual Maximum Groundwater Level (AAMGL) unless it can be clearly demonstrated to the satisfaction of the City, the Department of Environment and the Department of Water that there will be no resultant drying or exposure of acid sulfate soils. Sufficient fill must be imported to provide adequate separation between the land surface and groundwater.
- 2.4.2.7 Where exposure of acid sulfate soils is unavoidable, appropriate treatment measures are to be installed to ensure that contamination of ground or surface water does not occur.
- 2.4.2.8 In the event that acid sulfate soils are to be disturbed during the development process, the developers will demonstrate that:
- a) Every reasonable step has been taken to minimise and avoid the disturbance of ASS or PASS and adverse environmental impacts;
  - b) There are no unacceptable risks to the natural or built environment or human health as a result of ASS or PASS disturbance; and

- c) The developer has prepared an Acid Sulfate Management Plan in accordance with the Department of Environment guidelines for the Preparation of Acid Sulfate Soil Management Plan and other guidelines in the DoE Acid Sulfate Soils Guideline Series. The management plan should be prepared in consultation with, and to the satisfaction of the City of Swan and the Department of Environment (the Acid Sulfate Soils Management Plan may be included as part of an Environmental Management Plan for the development).

## **2.5 Contaminated Sites**

### **2.5.1 Objectives**

- a) A thorough assessment for contaminated sites and associated environmental constraints at an earlier stage in the development process to allow these issues to be addressed during the planning process and ensure that the potential for adverse impacts is minimised.
- b) Developers will minimise the risk to human health and the environment by ensuring that development areas are designed in such a way as to minimise the potential for adverse impacts from contaminated sites.

### **2.5.2 Requirements**

- a) Initial identification and assessment of contaminated sites will be undertaken during the Structure Planning stage of a development and the potential for contamination of ground or surface water to occur will be detailed, including the scientific basis on which this assessment is based. Details of this assessment and any proposed management strategies to allow the development to proceed will be included within the Statement of Potential Environmental Impacts.
- b) A Contaminated Sites Report will accompany any Structure Plan for areas where there is evidence that contaminated sites may be present, or where sites registered contaminated sites exist. The report is to contain a risk assessment of the site and proposed management strategy for any contaminated or potentially contaminated sites within the structure plan area.
- c) A Contaminated Sites Management Plan may be required by the City at Subdivision stage detailing;
  - i) The investigation process undertaken
  - ii) A detailed risk assessment for each site
  - iii) The proposed management program for each site
  - iv) Details of the monitoring programs that will be undertaken to ensure that there are no ongoing environmental or human health issues resulting from contaminants contained on the site, or emanating from the site
- d) Preparation of any management plans or program of works are to comply with the relevant State Government policies, regulations and guidelines

## **2.6 Fire Management**

### **2.6.1 Objective**

The design and management of new urban areas must minimise bushfire hazards and allow for safe and efficient movement of fire management vehicles and emergency evacuation.

## 2.6.2 Requirements

- 2.6.2.1 A Fire Management Plan or Program must be prepared in consultation with the City and Fire and Emergency Services Authority (FESA) and must include:
- a) An assessment of key fire management issues, including a detailed risk assessment of bushfire potential within the development area or in adjoining areas;
  - b) Fire management strategies and mechanisms to be contained in the Structure Plan or through later planning stages that adequately addresses the fire management issues and risk assessment outcomes; and
- 2.6.2.2 All Fire Management Plans or Programs must comply with the relevant State Government policies, regulations and guidelines
- 2.6.2.3 The City require the provision of a least two (2) suitable emergency exits to be constructed at the first stage of development area to facilitate safe access in the event of an emergency or bushfire. These must be clearly identified on the Structure Plan.

## Document Control

Document Approvals:			
Version #	Council Adoption		
1.	Ordinary Meeting of Council 24/5/2006 - adopted policy.		
2.	Ordinary Meeting of Council 10/9/2014 - adopted policy.		
3.	Ordinary Meeting of Council 14/3/2018 - adopted policy.		
Document Responsibilities			
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Document Management:			
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Compliance Requirements:			
<b>Legislation:</b>			
<b>Industry:</b>			
<b>Organisational:</b>			
<b>Strategic Community Plan:</b>			