

# **FERTILISER ACTION PLAN**

## **Phasing-out the use of Highly Water Soluble Phosphorus Fertilisers in Environmentally Sensitive Areas of South West, Western Australia**

**A report to the Western Australian  
Minister for the Environment**

**Prepared by the *Joint Government and  
Fertiliser Industry Working Party***

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## **Fertiliser Action Plan**

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## Fertiliser Action Plan

### FOREWORD

The coastal waterways and wetlands in Western Australia are valued by our community for the social, environmental, recreational and many other amenities they provide. However, these values are significantly threatened by declining water quality.

The causes of river ill-health are complex but central to this is the excessively high level of nutrients transported each year to waterways causing algal blooms, mal-odours and fish deaths. There is an urgent need to significantly reduce the nutrient load particularly to estuaries in coastal areas.

Actions to address river ill-health are not new. There has been considerable government and community initiative to overcome environmental problems with estuaries. These have included algae harvesting, relocation of polluting industries, excavating the 'Dawesville Channel' and many catchment-based initiatives. However, monitoring shows that the level of nutrients continues to cause problems and new action that addresses the cause of the problem is required.

Phosphorus is identified as the primary nutrient for controlled use. Other nutrients also contribute to declining water quality but are more difficult to manage.

There are many sources of phosphorus located on the extensive sandy soils of coastal areas. The most extensive is fertilised pastures for beef and dairy cattle however the urban areas and number of hobby farms is rapidly expanding in the areas at risk. The more intensive land uses, including horticulture, viticulture and turf managements are limited in area although are potential of high risk where they occur.

The decision by the Western Australian Government to phase out the use of highly water soluble phosphate fertilisers highlights the need for significant change to occur. The Joint Government and Fertiliser Industry Working Party was formed by the Minister for the Environment to develop a 4-year *Fertiliser Action Plan* to implement the decision. The fertiliser industry, through its national organisation (Fertiliser Industry Federation of Australia), has demonstrated its strong commitment to being part of solving the problem – a response that provides a significant platform on which to build the engagement process.

The *Fertilizer Action Plan* provides clear direction to implement change in the way we use phosphate fertilisers on the coastal plain in Western Australia. It is an initiative of the State Government to take preventative action that will provide healthy coastal waterways for the generations to come.

Dr Wally Cox  
Chair,  
Joint Government and Industry Fertiliser Working Party

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### Executive Summary

The Western Australian Government has decided to phase out the use of highly water soluble phosphate fertilisers in environmentally sensitive areas of the coastal plain in the South West of Western Australia. This is an important preventative action that deals with a major cause of declining environmental health of our valued coastal waterways.

This initiative is not being taken in isolation. There are many initiatives taken by government and community groups to protect or improve our coastal waterways. Change in the use of fertilisers will be effective in reducing the nutrient load to waterways and will add significantly to the value of other actions being taken, including constructed wetlands, nutrient interception, groundwater treatment and a wide range of catchment management activities.

**The Fertiliser Action Plan** provides a blue-print for the actions required to phase out the use of highly water soluble phosphate fertilisers in coastal areas over a period of 4 years.

The change in fertiliser use is to apply to a defined area of the coastal plain extending south from the Moore River to the Scott River plain east of Augusta, with some excluded areas. The change will apply to all land uses within the defined area. The South Coast is not included for change at present although similar issues are well recognised.

Alternative low water soluble products will be made available. These will have the water solubility of phosphorus (P) reduced to 40% or less (the most commonly used P fertilisers currently have water solubility of 80% or more). All bagged P fertiliser will have a reduced amount of water soluble P (a maximum of 1% for lawns and turf, and 2.5% for general garden use). It is expected that when applied according to recommended practices, there will be little change in growth or productivity in most situations. Preparation of a Nutrient Management Plan will be promoted as best practice management for all relevant fertiliser user groups. There may be some 'exceptional situations' where nutrient management planning shows there is expected to be low environmental risk and significant loss in production.

The change to use of low water soluble phosphate (LWSP) fertilisers will occur through an **Implementation Framework**. This will be structured as a *State Environment Policy (SEP)* that enables voluntary and regulatory processes to be effectively engaged. A Management Council will coordinate activities of the 4 year phase-out period and report annually to the Minister for the Environment.

The **key activity areas** of the Implementation Framework are to:

- Replace current stocks of bagged P fertiliser with easily recognised 'River Friendly' products (which will have reduced P content),
- Demonstrate the use of LWSP fertilisers linked to improved fertiliser management practices particularly with beef producers and horticulturalists within the defined area,
- Arrange bulk supply of a range of conforming LWSP fertiliser products,

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- Engage and communicate with all fertiliser user groups to ensure full understanding of the reasons for change and to 'learn as we go' while change occurs during the 4 year phase-out period,
- Encouraged preparation of Nutrient Management Plans for larger landholdings,
- Require an accredited Nutrient Management Plan for commercial landholders seeking an approved 'exception' to the phase-out,
- Develop Partnership Arrangements for industry-based 'self-managed' nutrient management programs that are to meet targets of the *Fertiliser Action Plan*,
- Regulate non-compliance by both suppliers and users of fertiliser products following a reasonable period of time for voluntary change to occur within the 4 year phase out period, and
- Monitor, evaluate and report on the change management activities.

The processes of change in the use of P fertilisers are recognised as being complex. Some fertilisers, such as 'Superphosphate' have been used traditionally for many years. Actions of the *Fertiliser Action Plan* will be implemented through engagement with the provision of information and development of understanding. The responsibility for change will be shared between those who supply and those who use fertilisers with a lead provided by State Government agencies.

Implementation of actions will be progressive with processes to adapt to new information or experience gained during the 4 year phase-out period. However, the change in fertiliser use is essential in order to benefit the valued coastal waterways for future generations. Regulation will apply to the supply or use of non-conforming P fertilisers within the defined area as a part of these change processes.

Recognizing the need for change and also the needs of the many suppliers and fertiliser users involved, the State Government through its agencies will undertake a wide-ranging consultation process before implementation of the *Fertiliser Action Plan* commences early in the first year of the plan (2007/08).

The **expected outcomes** by the final year (2010/11) of the *Fertiliser Action Plan* are that there will be substantial change in the use and type of P fertilisers by all user groups with support through supplier organisations. It is expected that field demonstrations linked to improved nutrient management practices will encourage voluntary adoption of change processes by individual landholders or industry organisations. Regulatory processes will be applied to phosphate fertiliser suppliers and users for non-compliance.

We should not expect to see significant change in the condition of waterways within the 4 year period. Restoring the health of our coastal waterways is a long-term endeavor. This important initiative is to address the cause of nutrients in waterways so that there will be major social and environmental benefits into the future. It may take many years for these benefits to be fully appreciated. Without preventative action, the full impact of coastal waterway ill-health will be revealed in a much shorter period of time.

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### 1 Introduction

Many coastal waterways in the South West of Western Australia have signs of environmental stress from high nutrient loading, including algal blooms and seasonal fish deaths. This results in considerable loss of social amenity as well as decline in environmental and economic values

The input of water soluble phosphorus into rivers and wetlands in the South-West of Western Australia is one of the single greatest factors affecting the long-term environmental health and amenity of coastal waterways.

Reduction of nutrient inputs at source is an essential part of a suite of actions required to reduce the total environmental impact of excess nutrients in these ecosystems.

The *Fertiliser Action Plan* provides the reasons for the change in fertiliser use in some areas and a strategic approach for the change to occur over a 4-year period while limiting the impact to those involved.

#### 1 Background – the issue

The waterways and estuaries of the Swan-Canning, Peel-Harvey, Leschenault, Vasse-Wonnerup and Hardy Inlet are important to the increasing numbers of people who live by them. These valued assets are significantly threatened by declining water quality. Environmental decline of waterways of the south coast is also significant. The Wilson Inlet and wetlands in the Torbay catchment are two areas where the health of waterways is of considerable community concern.

Recognition of declining values in coastal waterways is well established. The response by successive government initiatives and community involvement has been to establish an understanding of the cause of environmental stress in waterways and to implement a range of strategic actions. The (draft) *Healthy Rivers Action Plan* for the Swan-Canning river system is the most recent initiative for improving water quality. The *Watershed Torbay* initiative is an example of a whole-of-catchment restoration project to improve water quality in south coastal waterways and wetlands. Most threatened coastal waterways now have a relatively high level of awareness and understanding about the effects of environmental decline on the values of our river systems.

Research has shown there to be many causes for water quality decline in coastal waterways but that increased nutrient load is most significant. Change in land use following European settlement of the coastal plain has resulted in a significant increase in nutrient export from catchment to waterways. Excess nutrients are derived from agriculture, urban development and other 'diffuse source' areas where enhanced plant growth and production is derived from application of artificial or organic fertilisers. Other sources of nutrients are from industries or intensive animal industries ('point' sources).

There has been considerable effort by government, industries and community to tackle waterway health issues, including reduced 'point' source nutrient emissions and improved management practices. However this is known to be insufficient to reverse the trends of water quality decline. It is widely recognised that further

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actions are necessary, particularly those that reduce the 'diffuse' sources of nutrients to coastal waterways.

The most significant nutrients causing environmental stress in waterways are phosphorus (P) and nitrogen (N). The primary focus of this initiative is on reduction of phosphorus. This is because the P nutrient loss pathways from the catchment source to the receiving water bodies are better understood and because effective change management options are available.

The importance of nitrogen to water quality is not diminished by this initial focus on P. Instead, it is expected that some management change actions for P reduction may also result in reductions in N in waterways. Further actions may be required.

### **2 Identifying excess nutrients - the cause**

Many of the soils of the State's South-west coastal areas are sandy and have low fertility without fertilisers being applied. Since clearing of native vegetation for agriculture and urban development, fertilisers high in phosphorus have been applied annually to maintain production. 'Superphosphate' (see section 2.1 for product definition) has been commonly used for pasture production as it is readily available for plant growth when applied as a source of both phosphorus and sulphur. However, it is highly soluble in water so a high proportion (up to 80%) of P can be lost to production with winter rain. There has been recent wider adoption of higher analysis blended fertiliser products. These also have high water solubility for phosphate.

Phosphorus is leached through the coarse sandy soils or is transported in surface water flow via drains to where it accumulates in rivers, wetlands and estuaries. This is a major cause of poor water quality that must be addressed for investment in other river management actions to be effective.

There are substantial research findings for catchments of the Peel-Harvey estuary. These show that at least a 50% reduction in the annual phosphorus load to the estuary is needed. While many sources of phosphorus are identified, by far the most extensive is from land used for agriculture. Annual phosphorus loss from pastures for beef and dairy cattle is estimated to be 64% of the total load to the estuary.

Urbanisation is an increasing cause of phosphorus loss particularly in catchments of the Swan-Canning estuary (e.g. in the Southern River and Ellen Brook catchments), however agricultural land use remains extensive in these high risk areas. Water soluble phosphorus fertilisers applied for rural and urban land uses are causing environmental impacts. The smaller, intensively managed areas for horticulture, viticulture or turf production where a high rate of fertiliser is applied are of further concern.

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### 3 Changing fertiliser use – the decision

In September 2006 the Western Australian Minister for the Environment announced a four-year timeframe for the phase-out of highly soluble phosphate fertilisers from environmentally sensitive areas in the State's South-West.

A Joint Government and Fertiliser Industry Working Party (FWP) was established to prepare a *draft Fertiliser Action Plan* for the phase out of harmful fertiliser use. This joint initiative indicates the importance to both government and the fertiliser industry in resolving the harmful effects of fertiliser use.

When endorsed by the Minister for the Environment, the *draft Fertiliser Action Plan* will become the focus of consultation with key stakeholder organisations. The consultation process includes a Symposium which is expected to be held during April or May, 2007.

The decision to phase out the use of highly water soluble phosphorus fertilisers in some areas of Western Australia is not taken in isolation. It is complementary to the many strategic actions being undertaken by government, industries and communities within catchments of coastal waterways. The importance of reversing the trend of declining water quality by reducing the source of excess nutrients is well recognised.

### 4 The outcomes - identifying the benefits

Undertaking the actions required to phase out the use of harmful fertilisers alone will not completely remove the causes of algal blooms and fish deaths in waterways. Other actions will be required. However, it is expected that this one set of actions will achieve approximately 50% of the required P load reduction in estuaries. Importantly, this level of reduction is required for some other actions to take effect.

The expected benefits to coastal waterways from change in fertiliser use combined with other management actions is that future generations continue to enjoy these key social assets. More people are moving to live by coastal waterways and many others recreate there during long, hot summers. Coastal waterways are an important part of the Western Australian landscape and lifestyle. Fishing in waterways provides a living for some and is a hobby for many who live on the coastal plain. Water-based sports and recreational boating are a part of many family lives. Tourism in the South West of the state is focussed around coastal waterways. The waterways also provide the fabric of support for nature conservation linking land to the sea. The value of these coastal waterways is difficult to quantify and may never be fully appreciated unless lost.

There will be some costs and inconvenience involved with a change in fertiliser use however the costs for preventative action by reducing the source of nutrients to coastal waterways is substantially lower than re-active action within waterways. The combination of constructed wetlands, nutrient interception and groundwater treatment required to achieve the same P reductions is in the order of tens of millions of dollars. A change to lower water soluble fertiliser use will greatly lessen the need for the more expensive technologies to be applied.

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The cost of rehabilitating aquatic ecosystems on the verge of collapse from high nutrient loading is almost impossible to estimate.

Costs associated with phasing out high water soluble phosphorus fertiliser are very much lower than almost all other preventative phosphorus reduction strategies especially when applied over the whole south west. It is the single most cost effective management action that can be taken to reduce phosphorus losses to waterways on the coastal plain.

### 2 Scope of the Action Plan

Actions to phase out harmful fertiliser use apply only to those phosphorus fertilisers with high water soluble P content and only to environmentally sensitive areas in the South West of Western Australia.

The terms and definitions used to describe fertiliser products are provided towards the end of this document.

#### 1 Defining the product criteria

The intention of the strategy is to replace the use of **highly water soluble phosphorus** (HWSP) fertilisers with **low water soluble phosphorus** (LWSP) fertilisers. This is a change to P fertilisers with water solubility of less than 40%.

The most commonly used HWSP fertiliser is 'super phosphate' however there is a range of other products that are used. Table 2.1 lists the HWSP fertilisers and their product analyses. This shows the water solubility of most P fertilisers that are currently available to be well above 40%.

**Table 2.1** Typical analysis of a range of **highly water soluble P** fertilisers

<b>Product</b>	<b>Total P (%)</b>	<b>Water Solubility (%)</b>
Single Super ('Super phosphate')	8.8	77
Double Super	17.1	80
Triple Super	20.7	78
MAP	21.9	83
DAP	20.0	89
'Turf Special'	1.8	83
'Potato E'	7.0	83

There has been previous use of LWSP fertilisers in the South West. For example, 'coastal super' (Mk I and Mk II) have been commercially available although the voluntary uptake of these products was not sufficient for manufacture and supply to be continued. It should be noted that both of these products had very low water solubility (6% and 27% respectively). Table 2.2 shows the analyses for a range of LWSP fertilisers.

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**Table 2.2** Typical analysis of a range of **low water soluble P** fertilisers

<b>Product</b>	<b>Total P (%)</b>	<b>Water Solubility (%)</b>
Lime Reverted Super	7.0	39
CSBP 'coastal super' (Mk I)	7.2	6
CSBP 'coastal super' (Mk II)	9.0	27
Agmin	4.5	17
'Red mud' coated Superphosphate	7.1	39
Reactive Phosphate Rock	10 to 18	0

While the change in fertiliser use is to products that are lower than 40% water soluble P, there would be significant additional environmental benefits if the level were further reduced to 25% water solubility.

## 2 Identifying the areas

The phase-out of harmful fertiliser applies to areas where there is high risk to coastal waterways. The '*Environmentally Sensitive Fertiliser Use Zone*' where the change is to apply is described broadly as follows:

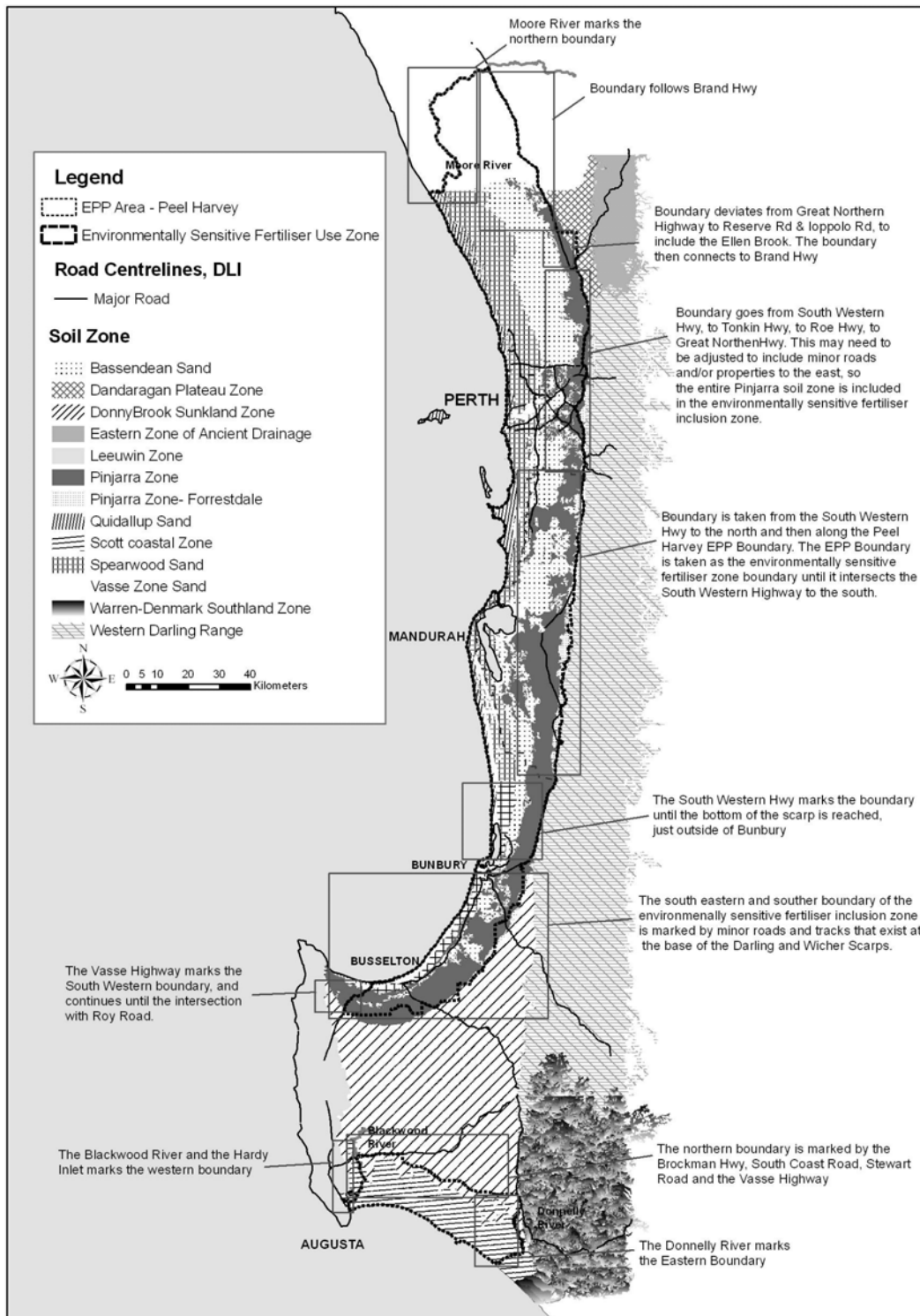
- Coastal boundary to the west,
- Moore River boundary to the north (including the Gingin Brook catchment),
- Great Northern Highway and South West Highway to the east (with boundary adjustment to that of the *Peel-Harvey Environmental Protection Policy*),
- Includes the catchments for Swan-Canning, Peel-Harvey, Leschenault, Vasse-Wonnerup estuarine systems,
- Includes Scott River plains,
- Excludes Blackwood and Warren catchments.

Map 2.1 provides detail of the boundary location.

The boundary does not currently include the South Coast region.

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**Map 2.1 Proposed boundary of the 'Environmentally Sensitive Fertiliser Use Zone'**



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### 3 Timeframe for implementation

The phase-out of harmful fertiliser use is to occur over a 4-year period (2007/8-2010/11). This allows time for production of suitable LWSP fertiliser products and for their use with other nutrient management practices to be adequately demonstrated.

### 4 Who is involved

The change in fertiliser use is to apply to all within the '*Environmentally Sensitive Fertiliser Use Zone*'. Users are broadly categorized as follows:

- **Rural** (commercial farm enterprises),
- **Horticulture/viticulture**,
- **Rural lifestyle** (including hobby-farms),
- **Commercial, municipal and recreational turf**,
- **Urban domestic** (further categorised as 'lawn' and 'general gardens')

There are two separate geographic areas. The 'Swan Coastal Plain' has a total of 18,553 landholdings (greater than 1 ha) of which 856 are 100 ha or larger. There are approximately 17,700 smaller holdings which would include mostly 'rural lifestyle' and some 'horticulture/viticulture' fertiliser users.

The 'Scott River Plain' area has a total of 82 landholdings of which 46 are 100 ha or greater.

There are very substantial areas of 'urban domestic' fertiliser use including the metropolitan areas of Perth, Mandurah, Bunbury, Busselton, Augusta and many smaller towns.

The user categories provide a guide to the alternative fertiliser products that are required and to the range of actions needed to ensure that the change applies equitably within the identified zone.

### 3 Setting Targets for Change

The requirement to change fertiliser use within a specified geographic area requires a strategic approach to ensure that the actions are effective, equitable and cause as little disruption as possible.

#### 1 Strategic context

The aim of the *Fertiliser Action Plan* is:

*To phase out the use of high water soluble phosphorus fertilisers in environmentally sensitive areas of the coastal plain in Western Australia within 4 years (i.e. by June, 2011).*

The objectives set to achieve the aim of the *Fertiliser Action Plan* are:

1. Define the geographic location to which the phase-out of high water soluble fertiliser use is to apply,
2. Identify the range of low water soluble phosphorus fertilisers that are suitable to replace current high water soluble phosphate fertiliser use (based on environmental performance criteria/benchmarks for water solubility),
3. Identify opportunities for product identification ('branding') as being of acceptable environmental standards,
4. Identify the requirement for accreditation for acceptable products and associated services;
5. Evaluation of policy instruments, including regulatory measures, required to implement the fertiliser phase-out strategy,
6. Identify complementary fertiliser management measures to assist the fertiliser phase-out strategy,
7. Raise awareness and gain acceptance for the fertiliser phase-out strategy among industry, community and fertiliser users;
8. Assessment of the economic and other impacts on fertiliser producers and users by the fertiliser phase-out strategy,
9. Set targets for the fertiliser phase-out strategy, and
10. Assess efficiency and effectiveness of implementation shown through monitoring, evaluation and reporting.

It is well recognised that the 4-year period for change in fertiliser use is small in relation to the time before full environmental benefits from the actions are achieved. For this reason, targets for change are based on implementing the actions rather than measuring the environmental outcomes.

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### 2 A framework for implementation

Application of a framework for implementation of actions of the *Fertiliser Action Plan* is considered essential to complement the voluntary change processes and to support Partnership Agreements with regulatory mechanisms. It is also required to ensure adoption of nutrient management planning and implementation processes for 'exceptional situations'.

The benefit of an implementation framework with regulatory options is in ensuring the necessary practice change occurs within the time allocated. It will also ensure that the change occurs in an equitable and consistent way across fertiliser user groups and across the relevant retail industry. With the expectation of regulation, practice change is more likely to occur voluntarily. Most users will make the change with the knowledge that other users will also be required to do so, and be penalised if they don't.

Regulatory processes are to apply to both suppliers and users of HWSP fertilisers. Detailed arrangements of the regulatory framework are to be developed during initial stages of the 4-year phase-out period.

The implementation framework will be based on a *State Environmental Policy* (SEP) developed under the *Environmental Protection Act (1986)*, Section 17 (3) (d). This provides a 'Whole-of-Government' non-statutory framework to which regulations may be added from a range of legislative options. Regulations will apply for non-compliance by both suppliers and users of phosphorus fertilisers within the 'environmentally sensitive fertiliser use zone'.

Adoption of a SEP also enables effective linkage to regional planning initiatives, including those for Water Quality Improvement Plans (WQIP's).

The SEP will contain:

- The objectives, targets, actions and geographical area of the *Fertiliser Action Plan*,
- Controls through existing regulatory mechanisms on:
  - \* sales of HWSP fertilisers,
  - \* use of HWSP fertilisers,
- Provision for HWSP fertiliser use in 'exceptional situations',
- A management framework (including a Management Council responsible for coordinating the implementation of the *Fertiliser Action Plan*)
- Monitoring and reporting requirements
- Performance auditing and review of:
  - actions of the *Fertiliser Action Plan*
  - environmental outcomes, and
- Review of the SEP and effectiveness of the *Fertiliser Action Plan* before completion of the phase-out period.

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A SEP is intended to foster a cooperative approach and can be applied to a specific geographic area. The functions of a SEP are to be coordinated through a Management Council. The Council is to be formed under the *EP Act (1986)* with membership of senior State Government agency, industry and community representatives. An important requirement is to report to the Minister for the Environment annually.

### 3 Benchmark targets for change in environmentally sensitive areas

The 4-year period for change in fertiliser use is to allow processes to be developed in a way that facilitates a high level of understanding and willingness to make the changes that are required. The change processes are staged to ensure that this occurs. Benchmark Targets shown in Table 3.1 provide a 'blue-print' for the change processes.

**Table 3.1 Benchmark Targets for change in fertiliser use**

<b>Benchmark Targets</b>	
<b>YEAR ONE (2007/08)</b>	<ol style="list-style-type: none"><li>1. All user categories within the specified zone consulted, informed and engaged,</li><li>2. Suitable products made available for demonstration purposes,</li><li>3. Demonstration project established,</li><li>4. Behaviour change surveys completed in priority areas,</li><li>5. Communications and promotion campaign arranged,</li><li>6. Endorsed labelling adopted and recognised,</li><li>7. Regulatory framework developed and implemented,</li></ol>
<b>YEAR TWO (2008/09)</b>	<ol style="list-style-type: none"><li>8. Information available and models developed for nutrient management planning,</li><li>9. Accreditation for products and processes established,</li><li>10. Extension (behaviour change) programs developed and being implemented for relevant user categories within identified priority areas,</li><li>11. Formal partnership agreements developed with key organisations,</li><li>12. Monitoring program for natural resource condition improvement developed,</li></ol>

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13. Suitable LWSP fertiliser products commercially available (for rural and rural lifestyle users),
14. Annual reporting on implementation of actions and the environmental condition of waterways,

### **YEAR THREE (2009/10)**

15. Monitoring and reporting shows at least 20% adoption of practice change to LWSP fertiliser use for relevant user categories,
16. Nutrient management plans are being implemented by more than 20% of commercial rural, horticulture/viticulture and turf management fertiliser user groups,
17. Suitable LWSP fertiliser products commercially available (for horticulture and viticulture users),

### **YEAR FOUR (2010/11)**

18. Monitoring and reporting shows at least 50% adoption of practice change to LWSP fertiliser use for all user categories,
19. Nutrient management plans are being implemented by more than 50% of commercial rural, horticulture, viticulture and turf management fertiliser user groups,
20. Regulations are applied for non-compliance by fertiliser suppliers and users.

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More specific 'Action Targets' are set for each of the Change Strategies (Sections 4 and 5). These provide the basis for monitoring, evaluation and reporting.

The change processes of the *Fertiliser Action Plan* are developed with recognition that some may need to be further adapted during the 4-year period. The principles of 'adaptive management' are adopted to allow for continuous improvement in the way that the actions are implemented.

### 4 Strategies for Action

To achieve the Benchmark Targets within the 4-year period of the *Fertiliser Action Plan*, a set of change strategies have been developed based on guiding principles that are considered to be fundamental to the required change processes.

The guiding principles have been developed by the FWP specifically for the fertiliser use change.

The change strategies have been developed through evaluation of a comprehensive list of policy options and endorsed by the FWP.

#### 1 Guiding principles of practice change

Guiding principles for change are required to phase out the use of HWSP fertilisers because it directs processes that are to be applied to a range of different fertiliser users over a period of time. The change is not able to be applied instantly nor simultaneously because of the need to develop and gain acceptance for the use of alternative fertiliser products and associated nutrient management practices.

The FWP recognize that some individuals may be disadvantaged, for example where the available alternative products significantly reduce the production potential and where the environmental risk can be satisfactorily managed. On this basis, it is recognised that there may need to be limited 'exceptions' to the total phase-out of HWSP fertilisers.

The principles that provide the foundation to a strategic approach to fertiliser use change are:

1. Engagement through providing information and understanding,
2. Equity in application of change to all user groups,
3. Supplier responsibility through product replacement and labeling,
4. User responsibility in the use of HWSP fertilisers,
5. Change processes are under-pinned by regulation,
6. Progressive implementation based on priorities and targets for behavior change methods,
7. Recognition of 'exceptions' through accredited processes, and
8. Processes of 'adaptive management' are applied.

The guiding principles are intended to be continuous and apply across all change strategies.

## **Fertiliser Action Plan**

### **2 Exceptions to the HWSP fertiliser phase-out**

The seventh guiding principle (section 4.1) recognises there may be exceptions to the total phase-out of HWSP fertilisers.

The *Fertiliser Action Plan* provides for exceptional situations on an individual basis. Claims for continued use of HWSP fertilisers will be assessed on the basis of there being:

1. A 'Nutrient Management Plan' that contains:
  - a. Review of fertiliser application and management practice,
  - b. An assessment of P loss risk (based on soils information),
  - c. An annual account of HWSP fertiliser use,
  - d. A target for reduction of annual P loss,
  - e. Additional benefits that may occur for other fertiliser elements (e.g. N, K, S and others),
  - f. Complementary fertiliser management actions, and
  - g. Methods for monitoring annual P application and loss.
2. Evidence of low environmental risk (e.g. soil mapping/soil testing to show phosphorus retention capacity of soils), and
3. No alternative LWSP fertiliser available as an acceptable replacement,

Assessment of exceptional situations will be undertaken by accredited personnel. The criteria for assessment are to be developed.

Processes for auditing and review of conditions imposed for accepted exceptions situation claims are to be developed.

Arrangements for 'exceptional situation' claims are included within the change strategies.

### **3 Non-bulk fertilisers**

Where low quantities of P fertiliser are being used, there will be significant reduction in the proportion of high water soluble P in non-bulk (including all bagged phosphorus fertilisers) products recognizing the benefits to be gained by using a lower amount. This will apply to urban fertiliser users where some HWSP is required to maintain lawns and gardens but not at the current levels of use. The change will be applied across the entire fertiliser supply chain in WA so that only products with the agreed maximum P level will be available at home garden suppliers.

## **Fertiliser Action Plan**

The maximum HWSP content of non-bulk fertilisers for urban use will be changed to:

Lawn fertilisers – maximum of 1% total P

General garden fertilisers – maximum of 2.5% total P

The restrictions on use of HWSP fertilisers and conditions for 'exceptional' use (Section 4.2) will apply to commercial users of bagged fertiliser products.

## **4 Practice Change Strategies**

The strategies for change are developed in relation to the Benchmark Targets. They incorporate policy options that range from voluntary engagement progressively through to a regulatory approach. The strategies are inter-related and are to be implemented sequentially. By the end of the 4-year period, all actions making up the strategies will have been implemented and, where relevant, be continuing.

The Change Strategies are described briefly below. The actions required for each strategy are listed in Section 5.

### **Strategy A Information and Awareness**

Clear science-based information is required to link the required fertiliser use change with improving the water quality of coastal waterways. This information is to engage all user categories on a 'journey of understanding' recognising that the pathways for change are not yet completely clear but that reduction in the source of phosphate nutrients to waterways is essential.

Information is to contain consistent messages that address all user categories. While it is recognised that greatest benefit will be gained through change by rural users, it is important to ensure that all users are making the changes that are necessary.

The information is to encourage voluntary uptake of the change that is required. This is to occur through development of 'best practice' information for each user category, linking to Behaviour Change processes (Strategy E) and through partnership arrangements with industry or user organisations (Strategy G).

The information will also ensure that there is clear understanding that the change is being undertaken within a regulatory framework.

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### **Strategy B Product Development and Demonstration**

The decision for fertiliser use change is not intended to stop fertiliser being used but requires that there be change to the use of an alternative LWSP fertiliser. For this to occur there needs to be fertiliser product replacement with suitable alternatives and that users adopt 'best practice' management in use of these LWSP fertilisers.

Arrangements will be made within the fertiliser industry to ensure that suitable LWSP fertilisers are available through existing manufacturing and supply processes. The alternative products are to be clearly recognised (Strategy F).

Demonstration sites are to be established for the key user categories to trial the available LWSP products and to gain experience in their use. These sites will become the focus for information and awareness (Strategy A) and for extension through behaviour change processes (Strategy E).

### **Strategy C Decision Support and Skills Training**

Adoption of practice change for use of LWSP fertilisers will require technical support. For some user categories, this may simply be by ensuring the information on labels and product documentation is clear and relevant. Others may require technical assistance to develop 'industry best practice' guidelines. However, there will be other situations, particularly for rural, horticulture and viticulture user categories, where technical support may be required on an individual basis.

The higher level of support is expected to be delivered through nutrient management planning processes (Strategy H). This will require consistent use of decision support tools and information by all service providers (private and public sectors). The availability of suitable production function models calibrated for differing user categories is considered essential.

Skills training and accreditation for all personnel involved in providing technical advice will be required. The fertiliser industry training initiative (*Fertcare*) provides a significant opportunity for this to occur.

### **Strategy D Risk Assessment and Setting Priorities**

While it is expected that the phase-out of HWSP fertiliser use will apply comprehensively within the *Environmentally Sensitive Fertiliser Use Zone* within the 4-year period, this may not occur uniformly due to limitations on resources to fully implement the change. Recognising this, it is important to ensure that efforts for change are concentrated on the areas that will provide greatest benefit for water quality improvement in coastal waterways.

A risk-based approach will be adopted for progressive implementation of fertiliser

## **Fertiliser Action Plan**

use practice change. Risk assessment will be applied to geographic areas within the *Environmentally Sensitive Fertiliser Use Zone* based on local government boundaries or with use of Postcodes.

The criteria for risk assessment will include soil and landscape information and the relative distance to threatened coastal waterways and wetlands.

An 'implementation schedule' will be prepared setting priorities for implementation within the 4-year phase-out period.

### **Strategy E Behaviour Change through Targeted Engagement**

The term 'Behaviour Change' is adopted to represent a strategic approach to extension and communication for change in fertiliser use. It is designed to ensure that limited resources available for the change that is required leads to maximum benefit. The intention is for the resulting practice change to be perpetual and not dependent upon ongoing extension effort. Effective behaviour change processes are considered essential to the successful adoption of LWSP fertiliser use.

Behaviour Change is a flexible concept with processes that can be adapted to the different fertiliser user categories. It is based on targeted engagement through developed understanding of the 'barriers to adoption' (e.g. past experience, costs, inconvenience) and of the 'potential benefits' though change (e.g. reduced fertiliser costs, environmental improvement). Surveys of targeted groups based on social science principles are undertaken to provide information about the specific requirements for change.

A Behaviour Change program will build on existing initiatives (e.g. *Fertcare* for rural users, *Great Gardens* for urban users) and be implemented according to priorities for implementation (Strategy D).

### **Strategy F Product Branding and Accreditation**

The alternative LWSP fertiliser products will be clearly labelled and easily recognised. Positive branding will focus on the benefits of using the LWSP fertilisers as 'river friendly' products. HWSP fertilisers will not be negatively branded. There will be adequate opportunity within the 4 year phase-out period for retailers to clear stocks of HWSP fertiliser products before regulations apply.

In addition to clear product recognition, retailers will have supporting documents and shelf display information.

The range of LWSP fertiliser products suitable for use will be accredited through the *Fertiliser Industry Federation of Australia (FIFA)*. Accreditation will be based on accepted criteria (section 2.1). Supply of fertiliser products without accreditation within the *Environmentally Sensitive Fertiliser Use Zone* will not be permitted (other than for 'exceptional situations').

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### **Strategy G Partnership Agreements**

Partnership Agreements provide substantial opportunity to formalise the processes of practice change for phasing out the use of harmful fertilisers in environmentally sensitive areas. Agreements can be developed and ratified between a range of agencies, groups and organisations, including state government, fertiliser industries, supplier organisations, grower groups and regional natural resource management (NRM) organisations (e.g. SCC, SWCC).

The benefits of formal agreements come through developing a consistent approach for change that is applied with continuity over the time required. Agreements also ensure equity of consideration for all user groups. Organisations seeking to self-manage the change may form an Agreement to do so. Producers, suppliers and users of fertilisers are able to gain formal recognition of their stewardship responsibilities for the environment through documented agreements.

Partnership Agreements will be a component of the Regulatory Framework. This is particularly important as the requirement for change is being applied to a specific geographic area, not all areas of the South West of Western Australia. Formalised agreements clarify the intentions of organisations to contribute to the primary purpose of change to improve the condition of coastal waterways for benefit to the current and future generations.

### **Strategy H Nutrient Management Planning**

Adoption of nutrient management planning will be encouraged for all commercial rural fertiliser users within the 'environmentally sensitive fertiliser use zone'. These will compliment the use of LWSP fertiliser products.

The processes for preparing Nutrient management plans (NMP's) are to be developed in ways that are adapted for the relevant user groups. Methods adopted for NMP's to improve environmental water quality in New Zealand and other countries will be reviewed.

Preparation of a NMP will be a mandatory requirement for any claim to there being an 'exceptional situation' for continued use of HWSP fertilisers.

Some high risk locations will require a Nutrient and Irrigation Management Plan (NIMP) as a statutory condition linked to a water allocation license or other regulatory process. In many situations, this will be combined with an existing statutory condition. It is expected that planning for the integrated use of allocated water and HWSP fertilisers in these situations will provide both economic and environmental benefits.

Nutrient management planning processes are to be included within the Implementation Framework, including processes for auditing and periodic review.

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### **Strategy I Economic and other Impact Assessment**

The economic and other impacts that may arise from the change to use of LWSP fertilisers within the specified zone are assessed (Section 7). Some initial additional costs may apply to production and supply of a new range of LWSP fertiliser products although it is expected that these costs will diminish with time as demand for the alternative products increases.

Some initial inconvenience to suppliers may be expected as new products and labelling information is arranged however this is expected to be minimal. There may be further limited supplier inconvenience through the requirement to check accreditation documents for HWSP fertiliser users in 'exceptional situations' for their purchases.

Suppliers of bagged and small package fertiliser products that are accredited and appropriately labelled will not be required to differentiate between users in restricted and non-restricted areas.

Suppliers of bulk HWSP fertiliser and bagged fertilise that is accredited and appropriately labelled will be required to account for the delivery destination.

Additional costs may apply to those required to prepare nutrient management plans, including soil testing, for exceptional situations. These costs are generally considered to be normal costs of developing 'best practice' fertiliser use and that economic benefits may well accrue as a result.

# 5 Implementation Plan

## 1 Arrangement for coordinated implementation

A set of actions have been developed for the change strategies. While implementation is expected to occur through partner organisations, there is a requirement for a coordinating organisation to ensure continuity and consistency of the proposed actions.

There is a key requirement to form a 'Management Council' to provide leadership, direction and coordination for implementation of the *Fertiliser Action Plan* over a 4-year period. The functions of this body would further include:

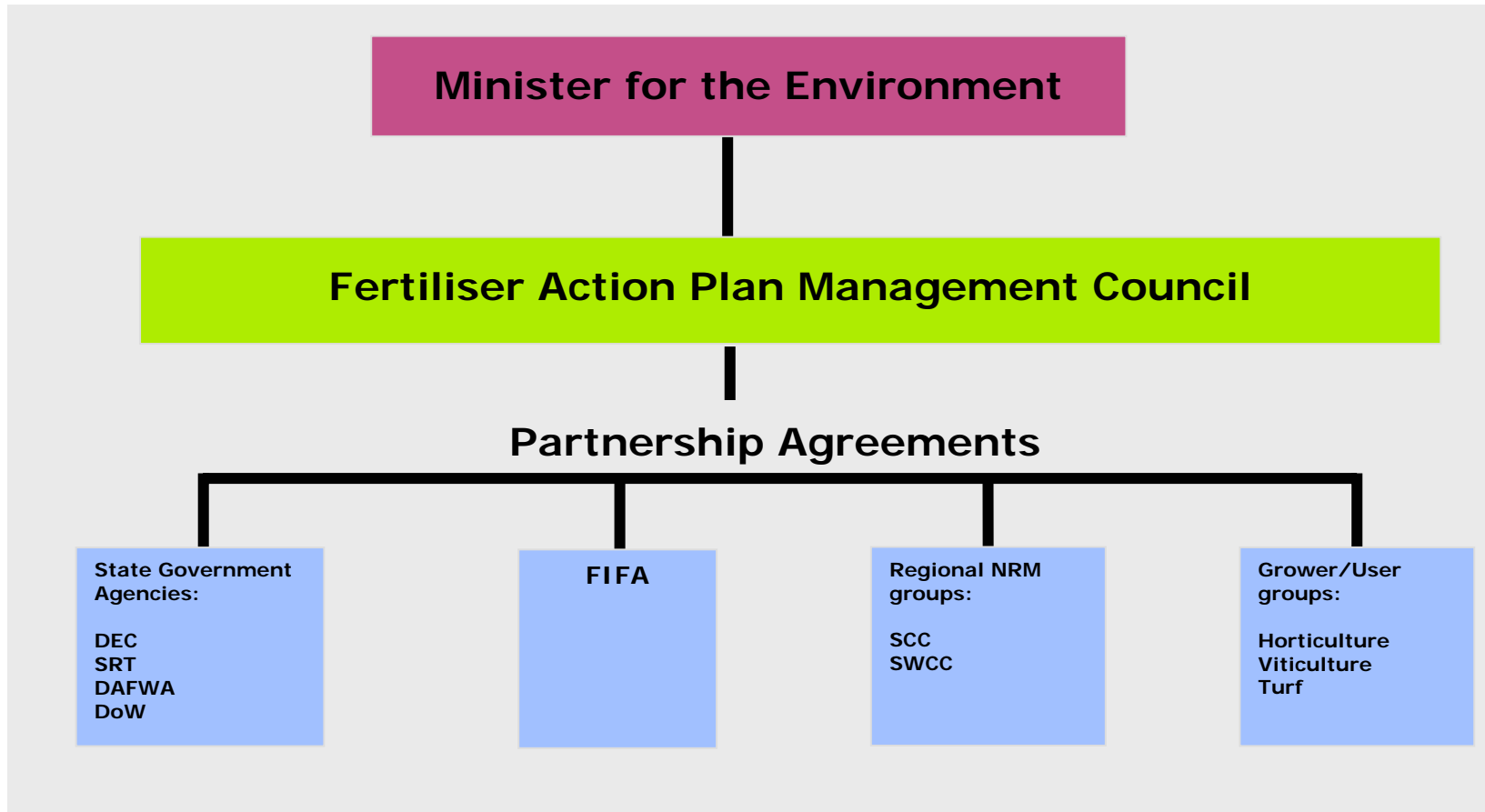
- Coordination of the implementation program
- Forming Partnership Agreements,
- Administering the regulatory framework,
- Financial accountability,
- Annual reporting to the Minister for the Environment,
- Evaluation of the *Fertiliser Action Plan* (prior to completion of the 4-year period).

Figure 5.1 shows the proposed structure for implementation by a Management Council through Partnership Agreements with key partner organisations.

The Management Council will manage the implementation program at a strategic level with advice from specialised 'Advisory Groups'. Many of the actions of the plan will be undertaken through Partnership Agreements.

## Fertiliser Action Plan

Figure 5.1 Arrangements for coordinated implementation through Partnership Agreements



## Fertiliser Action Plan

### 2 Actions to implement the strategies

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
<b>REGULATORY FRAMEWORK</b>				
RF1 Development of State Environmental Policy (SEP) framework for coordinated approach to implementation and linkage to regulatory options.	a) Draft SEP for fertiliser use change developed, December 2007.	<ul style="list-style-type: none"> <li>• SEP for Cockburn Sound (and existing model framework),</li> <li>• Existing and proposed legislation,</li> <li>• Links through the Office of Solicitor General (Legal Services Unit).</li> </ul>	<ul style="list-style-type: none"> <li>• Additional capacity to develop the SEP framework and liaise with representatives in a range of government agencies.</li> </ul>	DEC.
RF2 Implementation of SEP as a coordinating and regulatory framework for fertiliser use change.	a) Final SEP framework implemented for on-going application, July, 2008.	<ul style="list-style-type: none"> <li>• Draft SEP (as above).</li> </ul>	<ul style="list-style-type: none"> <li>• Additional capacity for administration and compliance.</li> </ul>	FAP Management Council, State Government agencies.
<b>STRATEGY A Information and Awareness</b>				
A1 Summary documentation of background information to support fertiliser practice change processes.	a) Public documentation prepared and distributed, September 2007	<ul style="list-style-type: none"> <li>• Existing 'Background Document' (DEC)</li> <li>• Link to FAP 'communications plan'</li> </ul>	<ul style="list-style-type: none"> <li>• Document preparation, publishing, printing and distribution.</li> </ul>	State government agencies, FIFA
A2 Information packages to be prepared suitable for relevant fertiliser user category.	a) Information sets prepared and distributed, September 2007.	<ul style="list-style-type: none"> <li>• Link to FAP 'communications plan'</li> <li>• Agency and regional NRM group</li> </ul>	<ul style="list-style-type: none"> <li>• Consultation and specific information package development.</li> </ul>	State government agencies, FIFA

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
		communications plans • <i>Fertcare</i>		
<b>STRATEGY B Product Development and Demonstration</b>				
B1 Develop a range of LWSP fertiliser products suitable for effective product replacement for relevant user category.	a) A suitable range of LWSP fertiliser products are developed and available for demonstration purposes, September 2007.	<ul style="list-style-type: none"> <li>Capacity for manufacture exists in WA. Some existing products will require little alteration.</li> </ul>	<ul style="list-style-type: none"> <li>Capacity for further research and development if suitable options are not currently available</li> </ul>	Fertiliser companies, FIFA, Management Council.
B2 Prepare a 'Demonstration Plan' for LWSP fertilisers relevant to commercial rural user groups across a range of geographic locations.	a) 'Demonstration Plan' complete, July 2007. b) Demonstration Program planned and being implemented, May 2008.	<ul style="list-style-type: none"> <li>Existing fertiliser trial and demonstration programs</li> <li><i>Fertcare</i></li> </ul>	<ul style="list-style-type: none"> <li>Significant resources for implementation of 'demonstration plan (see plan for resources required).</li> </ul>	DAFWA, fertiliser companies, FIFA.
B3 Product replacement by fertiliser suppliers adopted within the 'environmentally sensitive fertiliser use zone'.	a) Negotiations with manufactures and retailers of fertilisers complete, December, 2007. b) Supply of non-conforming bagged fertiliser products ceased, December, 2007,	<ul style="list-style-type: none"> <li>Industry trial production of LWSP fertilisers.</li> </ul>	<ul style="list-style-type: none"> <li>Industry capacity to manufacture, supply and distribute LWSP bulk fertiliser or reduced HWSP bagged fertiliser.</li> <li>Transitional period for retailers to clear existing HWSP stocks.</li> </ul>	Fertiliser companies, FIFA, suppliers.

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
	<p>c) Sales of non-conforming bagged fertiliser products ceased December, 2008.</p> <p>d) Bulk LWSP fertilisers produced in quantity to meet projected demand, July 2008.</p>			
<b>STRATEGY C Decision Support and Skills Training</b>				
C1 Develop (draft) 'best practice' guidelines in consultation with relevant fertiliser user groups.	a) (draft) Guidelines prepared and accepted by user group organisations, December 2007.	<ul style="list-style-type: none"> <li>• Existing industry 'best practice' guidelines (e.g. turf management, dairy industry),</li> <li>• Regional NRM group initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity for effective consultation with fertiliser user category groups.</li> </ul>	State government agencies, grower/user organisations, regional NRM groups, fertiliser companies, FIFA.
C2 Review existing fertiliser use production models and decision support systems for relevance to LWSP fertiliser use for relevant user groups.	a) Documented review completed and endorsed by Management Council, September 2007.	<ul style="list-style-type: none"> <li>• Existing fertiliser use models (e.g. Phosul-K)</li> <li>• <i>Better Fertiliser Decisions</i> program</li> <li>• Fertiliser company Decision Support System</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity for external review of production models and decision support systems.</li> </ul>	DAFWA, Management Council, FIFA.
C3 Develop appropriate	a) Decision Support	<ul style="list-style-type: none"> <li>• Based on review (Action</li> </ul>	<ul style="list-style-type: none"> <li>• Based on review</li> </ul>	DAFWA, FIFA.

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
Decision Support Systems based on acceptable production function models for relevant fertiliser user groups.	System(s) developed for LWSP fertiliser use relevant to each user category, July 2008.	C2)	(Action C2)	
C4 Review and adjust training processes to meet the requirements of fertiliser use change.	a) Documented review ('needs analyses') of training requirements, July 2007. b) Revised training program developed, July 2008	<ul style="list-style-type: none"> <li>• <i>Fertcare</i></li> <li>• Existing government behaviour change/ extension initiatives.</li> </ul>	<ul style="list-style-type: none"> <li>• Additional capacity for training in the use of LWSP fertiliser use,</li> <li>• Engagement of supplier organisations and advisory services.</li> </ul>	FIFA, State government agencies.
<b>STRATEGY D Risk Assessment and Setting Priorities</b>				
D1 Undertake a fertiliser use risk assessment for each local government authority within the <i>Environmentally Sensitive Fertiliser Use Zone</i> .	a) Risk assessment complete, July 2007.	<ul style="list-style-type: none"> <li>• Existing soils and land capability mapping</li> </ul>	<ul style="list-style-type: none"> <li>• GIS and supervision capacity to undertake assessment.</li> </ul>	State government agencies.
D2 Prioritise implementation for each fertiliser use category within LGA's based on postcode boundaries.	a) Priorities for implementation established and documented, August 2007.	<ul style="list-style-type: none"> <li>• Existing programs (e.g. government agencies, regional NRM groups, <i>CCI</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity to facilitate acceptable implementation priority outcomes based on risk assessment.</li> </ul>	State government agencies, grower/user organisations, regional NRM groups, FIFA.

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
<b>STRATEGY E Behaviour Change through Targeted Engagement</b>				
E1 Prepare a 'Behaviour Change' program for adoption of LWSP fertilisers in consultation with relevant user categories.	a) Fertiliser use Behaviour Change program complete, September, 2007.	<ul style="list-style-type: none"> <li>• Regional NRM group initiatives,</li> <li>• State government programs (e.g. Small Landholder Information Service, including <i>Heavenly Hectares</i>)</li> <li>• <i>Fertcare</i></li> <li>• <i>Great Gardens</i></li> </ul>	<ul style="list-style-type: none"> <li>• Additional capacity to consult with user categories and specific skills to develop 'behaviour Change' program.</li> </ul>	State government agencies, grower/user organisations, regional NRM groups, FIFA.
E2 Undertake 'behaviour change' surveys in priority areas.	a) Four highest priority 'behaviour change' surveys complete, December 2007, b) Eight highest priority 'behaviour change' surveys complete (including a) above), July 2008.	<ul style="list-style-type: none"> <li>• Peel-Harvey survey (URS, 2005),</li> <li>• <i>CCI</i> survey proposed for Ellen Brook (Swan Canning river system).</li> </ul>	<ul style="list-style-type: none"> <li>• Resources to undertake 8 targeted social surveys.</li> </ul>	State government agencies, regional NRM groups.
<b>STRATEGY F Product Branding and Accreditation</b>				
F1 Endorsed labelling design and associated manufacturer and supplier information prepared for	a) Labelling and information sets prepared and endorsed, December	<ul style="list-style-type: none"> <li>• Existing fertiliser use information</li> </ul>	<ul style="list-style-type: none"> <li>• Resources for design and endorsement of appropriate labelling</li> </ul>	FIFA, fertiliser industries.

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
<p>use, endorsed and being adopted.</p> <p>Note: Bagged P fertiliser not accredited and labelled will be subject to the same controls as bulk P fertiliser use.</p>	<p>2007),</p> <p>b) All bagged P fertiliser accredited for use being supplied with endorsed labelling, July 2007.</p>		<p>and information.</p>	
<p>F2 Distribution of endorsed labelling information to supplier organisations.</p>	<p>a) Distribution to suppliers within the 'environmentally sensitive fertiliser use zone' complete, July 2008.</p>	<ul style="list-style-type: none"> <li>Existing industry supply and communication networks.</li> </ul>	<ul style="list-style-type: none"> <li>Limited resources for additional distribution and supplier communication.</li> </ul>	<p>FIFA, fertiliser industries.</p>
<p>F3 Product accreditation processes for all bagged LWSP, accepted HWSP fertilisers and bulk LWSP fertilisers completed and applied.</p>	<p>a) Product accreditation processes developed, December 2007.</p> <p>b) All P fertilisers suitable for use in the <i>Environmentally Sensitive Fertiliser Use Zone</i> accredited, July 2008.</p>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>New processes for product accreditation.</li> </ul>	<p>FIFA, fertiliser industries.</p>
<p><b>STRATEGY G Partnership Agreements</b></p>				
<p>G1 Prepare a <i>proforma</i> for development of Partnership Agreements in consultation with potential partner organisations for the</p>	<p>a) Partnership Agreement <i>proforma</i> acceptable to potential partner organisations</p>	<ul style="list-style-type: none"> <li>Existing partner agreements,</li> <li>Principles developed in the WARR Bill</li> </ul>	<ul style="list-style-type: none"> <li>Capacity to develop <i>proforma</i> in consultation with partner</li> </ul>	<p>FAP Management Council, State Government agencies, FIFA,</p>

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
coordinating authority for the <i>Fertiliser Action Plan</i> .	prepared, September, 2007)		organisations.	fertiliser industry, regional NRM groups, grower/user organisations.
G2 Develop Partnership Agreements with relevant partner organisations.	<p>a) Partnership Agreements completed for 7 partner organisations (FIFA, DEC, DAF, DoW, SCC and SWCC), December 2008.</p> <p>b) Partnership Agreements completed for relevant user organisations, July 2008.</p>	<ul style="list-style-type: none"> <li>Roles and responsibilities identified in the <i>Fertiliser Action Plan</i>,</li> </ul>	<ul style="list-style-type: none"> <li>Additional capacity to negotiate and finalise Partnership Agreements.</li> </ul>	FAP Management Council, State Government agencies, FIFA, regional NRM groups, grower/user organisations.
<b>STRATEGY H Nutrient Management Planning</b>				
H1 Development of criteria and processes for assessment of 'exceptional situation' claims.	a) Documentation of 'exceptional situation' assessment criteria and processes completed and endorsed, December 2007.	<ul style="list-style-type: none"> <li>Risk assessment (Strategy D)</li> </ul>	<ul style="list-style-type: none"> <li>Additional capacity for consultation and development of documentation.</li> </ul>	FAP Management Council, State Government agencies, FIFA, grower/user organisations.

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
H2 Develop methods for nutrient management planning for each relevant fertiliser user category.	a) Documented processes for preparation of accredited nutrient management plans, July 2008.	<ul style="list-style-type: none"> <li>• Nutrient planning developed by DAF, <i>CCI</i></li> <li>• Methods used in NZ, USA</li> </ul>	<ul style="list-style-type: none"> <li>• Significant additional capacity to develop trial and demonstrate NMP's.</li> </ul>	State Government agencies, FIFA, grower/user organisations.
H3 Develop additional processes for existing Nutrient and Irrigation Management Plans.	a) Documented processes for preparation of statutory nutrient management plans, July 2008.	<ul style="list-style-type: none"> <li>• DoW arrangements for NIMP's.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited additional capacity to support existing DOW processes.</li> </ul>	DoW, other State Government agencies, FIFA, grower/user organisations.
H4 Implementation of nutrient management planning processes.	<p>a) NMP's and NIMPs completed for all 'exceptional situation' claims in high priority areas, July 2009.</p> <p>b) NMPs and NIMPs completed for all 'exceptional situation' claims in medium priority areas, December 2009,</p> <p>c) NMPs and NIMPs completed for all 'exceptional circumstance' claims in all areas, December, 2010</p>	<ul style="list-style-type: none"> <li>• <i>Fertcare</i></li> <li>• Linked to existing DoW program for NIMP's.</li> </ul>	<ul style="list-style-type: none"> <li>• Substantial additional resources to assist with implementation of NMP's, especially for the horticulture user category.</li> </ul>	FAP Management Council, State Government agencies, FIFA.

## Fertiliser Action Plan

Actions to implement the strategy	Action Targets	Existing policies and programs	Additional capacity required	Responsibility
	d) NMPs adopted by 20% of commercial rural, horticulture/viticulture and turf management fertiliser users by June, 2010 e) 50% as for d) by June, 2011.			
<b>STRATEGY I Economic and Other Impact Assessment</b>				
I1 Completion of economic and other impact assessment with cost estimates to industry and government for implementing the fertiliser use change.	a) Documented assessment of economic and other impact assessment, September, 2007.	<ul style="list-style-type: none"> <li>• Existing DAF processed (for FAP),</li> <li>• Industry cost estimates.</li> </ul>	<ul style="list-style-type: none"> <li>• Estimation of costs for proposed FAP actions.</li> </ul>	FAP Management Council, State Government agencies, FIFA, grower/user organisations.

### 6 Learning through Demonstration

Change in the use of phosphate fertilisers in coastal areas of WA will affect user groups in different ways. The effect on those who use land extensively, especially beef and dairy farmers, is less certain because there are many variable factors, including intensity of land use, fertiliser history, soil characteristics, landform, hydrology and proximity to waterways or wetlands at risk. It is difficult to predict the effect a change to using LWSP fertiliser will have on individual farms.

The production potential of a range of LWSP fertiliser products has been evaluated through a series of trials in the south-west of WA over the past 20-30 years. The production response of each conforming LWSP fertiliser product now needs to be demonstrated under differing farm conditions and with adoption of 'best practice' fertiliser management.

A program of demonstration sites is to be developed within the restricted fertiliser use zone over the 4 year phase-out period. These will be linked to previous fertiliser trials and undertaken at a meaningful farm scale. Some further trials may also be required.

The primary focus for demonstration is on pastures for beef production. The change in fertiliser practice is also required for dairy production, however there is an existing range of demonstration sites for 'best practice' fertiliser management that can include adoption of LWSP fertiliser use.

It is also important for adoption of LWSP fertiliser use for horticulture and viticulture industries to be demonstrated as a part of 'best practice' nutrient management. There are many differing horticultural crops and fertiliser management practices so detailed planning for these demonstrations will be required. Planning for these demonstrations will be undertaken through partnership arrangements with the representative industry organisations. This is particularly important as horticultural industries relocate to areas with poorer quality soils.

It is well recognised that adoption of LWSP fertilisers will require clear understanding and careful management to ensure the effectiveness of change. There will be new experience gained as landholders adopt these changed fertiliser practices over time. The intent of the demonstration program is to combine the experience gained by farmers with science-based information from trials and to extend this knowledge within the restricted use zone during the 4 year period.

#### 1 Objectives and scope of the LWSP Fertiliser Demonstration Program

The *aim* of the Demonstration Program is to improve industry and scientific understanding of using LWSP fertilisers for pasture production in the restricted fertiliser use zone. It will integrate the skills, experience and resources of government and industry within a unified program.

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The *objectives* of the program are to:

1. Provide scientifically defensible data that demonstrates the efficacy of using LWSP fertilisers in a variety of situations,
2. To provide commercial beef or dairy producers and horticulturalists with information on how to best manage LWSP fertiliser use to meet the P requirements of their pastures and crops,
3. To demonstrate the potential for the use of LWSP fertilisers combined with application of lime or other elements to provide an improve production response,
4. To promote more effective and efficient fertiliser management by graziers and horticulturalists on the coastal plain,
5. To add knowledge about the specific criteria used to assess applications for 'exceptional use' of HWSP fertilisers within the restricted use zone, and
6. Support the development and evaluation of alternative LWSP products.

The Demonstration Program will be fully developed and initiated during the first year of the phase-out period (2007/08). The initial steps to implement the demonstration program will include:

- Evaluation of conforming LWSP fertiliser products that are currently available,
- Selection of demonstration sites,
- Establishment of preliminary field demonstrations,
- Arrange supplies of recommended conforming LWSP fertilisers for full field demonstration, and
- Build the operational capacity required for the 4 year program.

The Demonstration Program will be focussed on beef producers and horticulturalists within the '*environmentally sensitive fertiliser use zone*'. The field demonstrations will be representative of a range of soil types, including those that are expected to be responsive to LWSP fertiliser applications and those that may not.

Field demonstrations will be of two types:

- a) 'A' sites - these will be the key demonstration sites on farms with application of LWSP fertilisers replicated at differing application rates,
- b) 'B' sites – these will be a larger number of sites within the zone to provide comparisons. LWSP fertiliser use combined with other fertiliser management practices (for example, application of soil ameliorants or other elements).

The 'A' sites will be formally established as well-recognised long-term demonstrations. The 'B' sites will be smaller demonstrations in farm paddocks (e.g. pasture strip trials) to address a wide range of local variable conditions that

## Fertiliser Action Plan

may be of interest to individual farmers. The 'A' sites will be coordinated through a Task Force committee while the 'B' sites may be managed independently.

The scope of the LWSP Fertiliser Demonstration Program will be developed to meet the following requirements:

1. Demonstration sites will target low P-sorbing soils (the 'gutless sands') but include a mixture of P responsive and non-responsive sites,
2. All type 'A' sites will be of grazed pastures while type 'B' sites may be either grazed or ungrazed pastures,
3. Farmers should not have to travel more than 30 km to visit a type 'A' demonstration site.

The LWSP Fertiliser Demonstration Program will be a central part of a planned 'behaviour change' program. It will be linked with other government agency and fertiliser industry extension initiatives (e.g. *Fertcare*, *Greener Pastures* and the *Coastal Catchments Initiative*).

The locations for the Class 'A' demonstrations are suggested to be:

- Ellen Brook catchment
- Serpentine
- Coolup
- West Harvey
- Capel
- Scott coastal plain

The final location of sites will be open for consultation processes. The added benefits of linking these key sites with a range of Class 'B' sites will be considered.

## 2 Capacity required for the Demonstration Program

The LWSP Fertiliser Demonstration Program will be lead by a joint industry and government agency Task Force. The program Task Force membership will be represented by experienced producers and science-based professionals from government agencies and the fertiliser industry. It will be lead by a respected rural community person. The program Task Force will report to the Fertiliser State Environment Policy (SEP) Management Council.

The program Task Force will receive administrative support through government agencies. This will include administering the employment of a full-time agricultural professional with experience in planning and design of an experimental program, knowledge of beef and dairy pasture management systems and high level rural communication skills.

There is further requirement for 2 full-time technicians to support the program as well as support facilities and costs for transport and operations.

The employment contracts would be for an initial 4 year period.

Additional funding will be required for the operational capacity required to undertake the Demonstration Program.

### 7 Economic and other Impact Assessment

The proposed change to use of LWSP fertilisers in the defined geographic area of WA has potential for economic or other impacts on manufacturers, suppliers and the fertiliser user groups. These may be beneficial or detrimental. The potential impacts are identified as being:

1. Additional costs to fertiliser manufacturers associated with production and distribution of LWSP fertiliser during the 4-year period of implementation and following full implementation of the phase-out strategy,
2. Higher fertiliser costs or lower production responses to applied fertiliser. ,
3. The net public and private benefits of achieving a targeted reduction in phosphorus fertiliser use by rural and urban landholders within the 'environmentally sensitive fertiliser use zone', and
4. Other potential impacts from the change in fertiliser use.

#### **Range of potential impacts**

##### *Manufacturers and suppliers*

The manufacturers in WA have the capacity to produce a restricted range of LWSP fertiliser products using existing facilities. The requirement to produce a broader range of low-volume products may require new investment.

The initial costs of re-labelling bagged fertilisers, providing new 'shelf' information for suppliers are not expected to be large although do need to be considered.

There will be minor costs and some initial inconvenience to suppliers through compliance requirements to ensure only bulk LWSP fertiliser is being delivered into the 'environmentally sensitive fertiliser use zone' unless there is an approved 'exceptional situation' certificate.

##### *Rural users*

Many farmers apply superphosphate at rates that are above those required for high pasture productivity on their particular soils. Some soil types have become unresponsive to P such that proportion of soluble P applied is lost to waterways with no benefit to plant growth.

Rural users will benefit where lower rates of LWSP fertiliser (relative to superphosphate) are required (and applied) to achieve similar levels of pasture production on leaching, sandy soils with low capacity for P retention. The costs of transport and application need not be greater under those circumstances. However those rural users who have a demonstrated need

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for high rates of P application (based on low soil P status and high PRI) may be financially disadvantaged if LWSP is more expensive than superphosphate.

These benefits derived from improved fertiliser practice would be reduced if to costs for LWSP fertiliser increase to be substantially more than for superphosphate or if improved decision making leading to lower P application rates is not widely adopted.

There will be costs for adopting change in farm nutrient practices including those for soil testing, nutrient planning, and possibly for application under different fertiliser regimes. The range of these services has been estimated at between \$300 to \$500 for soil testing and \$500 to \$1500 for broader nutrient planning consultancy. Development of comprehensive nutrient and irrigation management plans could cost several thousand dollars per farm.

There are production risks from poor fertiliser management that need to be managed. Landholders who reduce the rate of fertiliser application to unresponsive soils without monitoring P status may encounter production losses as soil P is depleted. This could lead to productivity losses.

### Individual enterprise responses

The implications for a range of individual farm case studies have been assessed (Table 6.1). These case studies assume that:

- Farm size is 400Ha,
- Dryland pasture potential on most parts of the coastal plain is up to 7t DM/ha,
- Average pasture use on dairy farms (dryland and irrigated) is about 5t DM/ha (compared to 2-3t DM/ha on beef farms).

It is noted that almost all farms will differ in some ways and that these case studies provide a limited representation of the situations that may occur. The type and distribution of soils on farms is a major determinant of the impact a change in fertiliser use will have.

In Table 6.2, the first four case studies indicate improvements in net profit based on reduced fertiliser application due to better fertiliser management. The impact of LSWP adoption in these scenarios will depend upon the extent to which better decision making enables a reduction in fertiliser application, and the cost of LWSP relative to superphosphate. Farmers who already apply optimal rates of P as HWSP will be disadvantaged if LWSP is more expensive per unit of P.

Case Study 5 illustrates the risk of ceasing fertiliser P application (in response to better information on soil test P requirements for plant production) without monitoring changes in soil P status over time. It highlights the risk that information about soil P levels for plant requirements

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may be misinterpreted by some users. It also demonstrated the importance of providing appropriate decision making support for LWSP users.

Case Study 6 shows the cost that could be incurred under circumstances where plant growth responds to water soluble but not citrate soluble P, with the result that LWSP must be applied at twice the rate of HWSP to maintain production.

**Table 6.2 Case studies for adoption of LWSP fertilisers.**

	Dairy		Beef			
Case Study	1	2	3	4	5	6
Soil type			Good Sand	Poor sand	Good sand/doesn't apply P	Good sand/ run down
Soil PRI	High	High	Moderate	Low	Moderate	Low
Soil P status (mg/L)	Good (50)	Good (80)	Good (30)	Poor (10)	Poor (10)	Poor (10)
Current HWSP use (kg/Ha)	250	250	150	100	100	50
LWSP use (kg/Ha)	125	125	125	50	0	100
Pasture utilisation (T/Ha)	6	12	5	2	2	2
Stocking rate near potential	yes	yes	yes	no	yes	no
Cost increase (LWSP 10% >HWSP)	\$1,100	\$1,100	\$1,100	\$440	N/A	\$880
Production loss					-\$20,000	
Fertiliser savings	\$11,000	\$11,000	\$2,200	\$4,400	\$8,800	-\$4,400
Net profit /Loss p.a.	<b>\$9,900</b>	<b>\$9,900</b>	<b>\$1,100</b>	<b>\$3,960</b>	<b>-\$11,200</b>	<b>-\$5,280</b>

### Comparative costs and benefits

The relative profit or loss that could occur is particularly sensitive to the additional cost of LWSP fertiliser compared with the current fertiliser costs, and to the costs savings due to current fertiliser management inefficiency.

The benefits from practice change are largely dependent landholders having both the skills and the confidence to make better fertiliser decisions based

## **Fertiliser Action Plan**

on soil test information and advice. Benefits will be reduced if fertiliser users are not supported to use better decision making tools to encourage reductions in P application rates.

## **8 Engaging and Communicating**

The initial phase of engagement in change practices is to raise awareness of the change that is required. The '*Engagement and Communications Plan*' identifies the key stakeholders involved and provides detailed actions for communication and consultation for the period March-July, 2007.

### **1 A strategic approach**

Adoption of a strategic approach to communication of information and engagement of the wide range of stakeholders requires an initial understanding of the current stakeholder situation. The most challenging engagement will be with those who are expected to change their fertiliser use practice, either in their roles of manufacture or supplier of products, or as users of fertilisers within the defined area. For some, the change may impact upon their business and/or business reputation.

During the 'awareness phase' (identified as March to June 2007), the ethos for change needs to be focused on concepts of 'good citizenship' and 'environmental responsibility'.

General awareness through media releases is required during the initial awareness phase after the alternative LWSP products are available through retailers.

There is a need for coordinated communication and information to ensure consistency of messages in awareness-raising initiatives.

### **2 Practice change statements**

Defining the content, style and tone of the messages is critical to ensure consistency of messages and style.

The recommended description of the fertiliser use change that is required is:

***Improving coastal waterway health by phasing out water soluble Phosphorus fertilisers on the Coastal Plain.***

Anticipation of the concerns of all user groups is required. Government agencies involved in change process will be required to provide information, extension services and some administrative support for practice change and delivery.

Many stakeholders are expected to understand and accept the change. Some will adopt a "wait and see" position observing how others respond to the change. A few may consider that the phase-out is "too slow" or "too little, too late".

Response statements are required to address these concerns.

### 9 Monitoring, Evaluation and Reporting

The expected outcome from change in the use of HWSP fertilisers is significant improvement in the water quality of coastal waterways. The full benefit from this change is predicted to be approximately 50% of the total water quality improvement that is required. However, it is well recognised that the environmental response to the proposed practice change will occur through time and that very little change can be expected within the first 4 years.

It is also understood that changing fertiliser practice is just one of many actions required to improve the condition of waterways. For example, replacement of septic systems with sewers in urban areas is a major initiative for water quality improvement.

Because of the long response time and inter-related processes by undertaking a range of actions, it is not relevant to measure environmental outcomes in relation to fertiliser use change.

Monitoring, evaluation and reporting for the *Fertiliser Action Plan* is focused on programmed activities rather than environmental outcomes.

#### 1 Monitoring and Evaluation framework

The monitoring and evaluation framework for the *Fertiliser Action Plan* is based on the effectiveness of the actions to deliver practice change outcomes. This is based on achievement of *Benchmark Targets* and *Action Targets* set in relation to the Aim and Objectives of the plan.

Recognising the complex processes of 'behavior change' for the phase-out of harmful fertiliser use, there is an on-going requirement to monitor *attitude to the change*. This will provide indication of the social response to the required practice change.

##### *Benchmark Targets*

A set of Benchmark Targets for the fertiliser use practice change program are shown in Table 3.1 (section 3.2). These provide broad guidelines for measured achievement over the 4-year period. It is expected that the Benchmark Targets will be reviewed at the completion of the 4-year 'phase-out' period.

The 'level of adoption' (in Benchmark Targets) is to be measured by:

1. **Product replacement** (indicated by survey of product available for suppliers),
2. **Use of LWSP fertilisers within the restricted use area** (indicated by fertiliser sales and delivery documentation), and
3. **Accreditation and compliance of NMP's and NIMP's** (indicated by random audits for NMP's and statutory compliance audits for NIMP's).

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Measurement of indicators for Benchmark Targets will be a requirement within Partnership Agreements. These targets will form the basis for annual reporting on the effectiveness of the plan and of the 4-year review.

### *Action Targets*

Targets have been set for each action required to implement the ten Change Strategies (section 5.2). Each target is specific, measurable and time-bound. Monitoring of activities in relation to the Action Targets will be a requirement within Partnership Agreements.

Action Targets will be reported annually. Monitoring and evaluation of Action Targets will provide the basis for continuous improvement through the Adaptive Management cycle (section 7.2).

### *Attitude Surveys*

Initial surveys will be undertaken for 'Behavior Change through Targeted Engagement' (Strategy E). These will provide baseline information for repeat social surveys to monitor change in attitude to adoption of fertiliser practices for all user categories. The information will enable analysis to determine adjustments to the program that may be required.

## **2 Adaptive Management**

Adaptive management is intended to enable continuous improvement of the implementation program through the 4-year period. This is essential to effective practice change because:

- Many 'external factors' alter during the period of implementation (e.g. economics, politics),
- Knowledge, skills and experience are gained during the period of implementation, and
- Monitoring may show that targets are being substantially under-achieved, or substantially over-achieved and adjustment may be required.

Adaptive management is based on the broad processes of PLAN-ACT-REVIEW with monitoring and evaluation to guide the response. Figure 7.1 shows the Adaptive Management cycle for the *Fertiliser Action Plan* and indicates linkage to program targets.

Partnership Agreements will adopt the principles and practices of Adaptive Management.

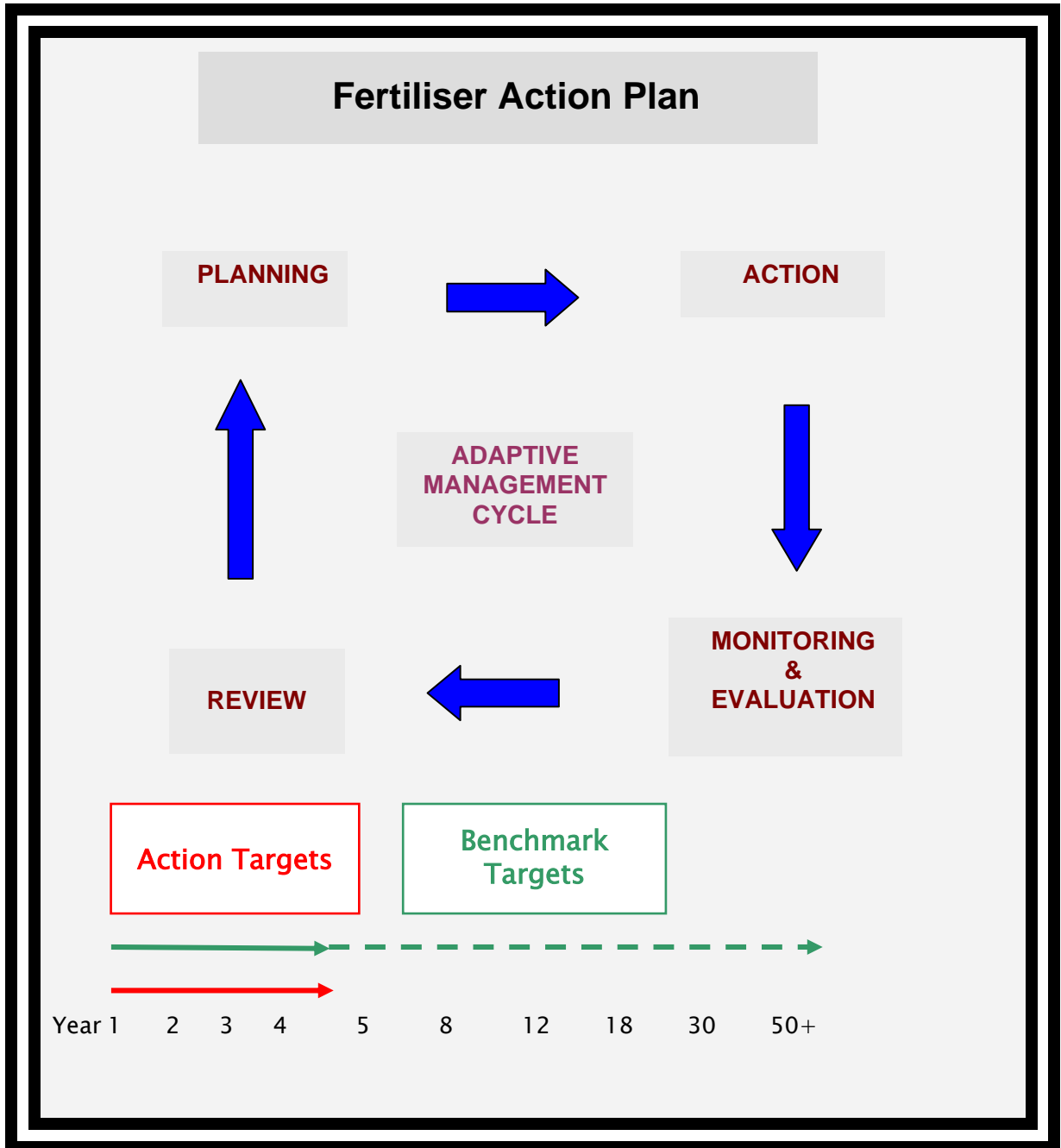


Figure 9.1 Monitoring and evaluation in the Adaptive Management cycle.

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### 3 Reporting procedures

The progress and effectiveness of implementing the actions of the **Fertiliser Action Plan** will be reported annually in three formats:

1. **Reporting to Parliament** – this will be delivered through the Minister for the Environment and will include an audited account of investment in relation to targeted outcomes ('Benchmark Targets'), and
2. **Reporting to Partners** - Partnership Agreement will include criteria for monitoring and evaluation that will be measured by partner organisations. Program reports will be prepared annually for partner organisations to review outcomes according to the agreements and make recommendations for change as may be required,
3. **Reporting to Community** – an annual report to community will be prepared based on measured achievements in relation to the Action Targets of the implementation program.

Within the final 6 months of the 4-year 'phase-out' period, a comprehensive review will be undertaken.

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### 10 Recommendations

The *Fertiliser Action Plan* has been prepared to implement the decision to phase out the use of highly water soluble phosphate fertilisers in environmentally sensitive areas of the coastal plain in Western Australia.

It is recommended that:

1. A *State Environment Policy* be developed to provide a regulatory framework with commitment from the relevant State Agencies, for implementation of the *Fertiliser Action Plan with appropriate regulatory mechanisms to be enacted*,
2. A Management Council be formed under the *State Environment Policy* to lead and account for implementation of the plan over the 4-year period and beyond. This Management Council is to report annually to the Minister for the Environment .
3. Partnership Agreements be negotiated between the Management Council and key organisations to implement the identified actions of the Plan,
4. Implementation of the Plan be based on achievement of Benchmark Targets through the actions of 'Change Strategies' identified in the *Fertiliser Action Plan*,
5. Additional resources be provided as recommended by the *Joint Industry and Government Fertiliser Working Party*,
6. The '*Engagement and Communication Plan*' is implemented,
7. Annual reports on the program are prepared for partner organisations and for community, and
8. The *Fertiliser Action Plan* be reviewed within the final 6 months of the 4-year phase-out period.

## Fertiliser Action Plan

### List of Supporting Documentation

1. Background Paper
2. Evaluation of Policy Options
3. Economic and Other Impact Assessment
4. Engagement and Communication Plan
5. Demonstration Program

### Acronyms

E&C Plan	Engagement and Communication Plan
DAFWA	Department of Agriculture and Food, Western Australia
DAP	Di-ammoniated phosphate (fertiliser)
DEC	Department of Environment and Conservation
DoW	Department of Water, Western Australia
FAP	Fertiliser Action Plan
FIFA	Fertiliser Industry Federation of Australia
FWP	Joint industry and government Fertiliser Working Party
HWSP	High Water Soluble Phosphate (fertiliser)
LWSP	Low Water Soluble Phosphate (fertiliser)
MAP	Mono-ammoniated phosphate (fertiliser)
NIMP	Nutrient and Irrigation Management Plan
NMP	Nutrient Management Plan
NRM	Natural resource management
P	Phosphorus
SCC	Swan Catchment Council
SEP	State Environmental Policy
SRT	Swan River Trust
SWCC	South West Catchments Council
WQIP	Water Quality Improvement Plan

## Fertiliser Action Plan

### Terms and Definitions

Terms used to describe fertilisers and their use:

<b>Total Phosphate</b>	the total % of P that is contained in a composite fertiliser in any form.
<b>Water solubility</b>	the % of P that is soluble in water
<b>Water soluble P</b>	the % of total P that is water soluble
<b>Citrate soluble P</b>	the % of P that is soluble in citric acid

#### EXAMPLE:

##### Superphosphate

Total P = 9.1%  
Water solubility = 82.4%  
Water soluble P = 7.5% (i.e. 82.4% of 9.1%)  
Citrate soluble P = 1.1%

#### Definitions

The West Australian Fertilisers Act 1977 and Regulations (1978 and 2001) define a **phosphorus fertiliser** as one containing more than 2% P.

**High water soluble phosphorus** (HWSP) fertilisers are defined (for the *Fertiliser Action Plan*) as being products containing greater than 2% total phosphorus and greater than 40% of the total phosphorus as water soluble phosphorus.

**Low water soluble phosphorus** (LWSP) fertilisers are defined (for the *Fertiliser Action Plan*) as being products containing greater than 2% total phosphorus and less than 40% of the total phosphorus as water soluble phosphorus. Other specifications of LWSP fertilisers are to maximize growth or production efficiency.

NOTE: greater environmental benefit will be achieved by reducing water solubility to a lower level. Selection of the 40% water solubility level is to provide acceptable levels for both environmental benefits and plant growth.

**Slow release phosphorus** (SRP) fertilisers are defined (for the *Fertiliser Action Plan*) as being products containing greater than 2% total phosphorus and are treated to delay plant available phosphorus.

Analytical methods for determining water soluble phosphorus, ammonium citrate soluble phosphorus and total phosphorus are those described by (International) Association of Official Analytical Chemists (AOAC).