

# **Waste disposal, Nowergup**

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**H A & K M Athorn**

**Report and recommendations of the  
Environmental Protection Authority**

**Environmental Protection Authority  
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**Landfill, non-organic (dry) waste disposal site,  
Reserve 25252, Wanneroo Road, Nowergup**

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# Summary and recommendations

This proposal to fill an old limestone quarry with dry inert fill is within an area affected by the Environmental Protection Authority's System Six Recommendation M6. As the site is surrounded on three sides by Neerabup National Park, the potential impacts of the proposal on the values of the park need to be considered. The proponents have made several commitments which should ensure site operations do not significantly affect the values of the National Park.

The proponent has made a commitment to preparing and carrying out a plan for site rehabilitation in liaison with and to and to the satisfaction of the City of Wanneroo and the Department Conservation and Land Management.

The potential for groundwater pollution is an issue of concern because the site is located about 800 m upstream of an area designated by the Water Authority as a Priority 3 Public Water Supply Area. The Environmental Protection Authority is aware of at least three 'dry inert' fill sites in the metropolitan area where materials dumped at the site have caused or have had the potential to cause pollution. The proponents intend to carefully inspect incoming loads for unacceptable materials and have made a commitment that a multiport groundwater monitoring bore be installed to the satisfaction of Geological Survey.

## Recommendation 1

The Environmental Protection Authority has concluded that the proposal by H A and K A Athorn to fill the limestone quarry on Reserve 25252 with dry inert fill is environmentally acceptable, and recommends that it could proceed subject to the proponent's commitments and the recommendations in this report.

## Recommendation 2

The Environmental Protection Authority recommends that only dry inert fill, timber, metals used in building construction (ie steel, galvanised iron and aluminium) and concrete blocks be permitted to be dumped at Quarry Reserve 25252, to the satisfaction of the Environmental Protection Authority on advice of the City of Wanneroo. The Environmental Protection Authority further recommends that the valuable components of the wastes received, in particular the metals, be considered for recycling.

## Recommendation 3

The Environmental Protection Authority recommends that an Environmental Monitoring and Management Programme (EMMP) be prepared by the proponent to the satisfaction of the Environmental Protection Authority prior to the commencement of dumping.

The EMMP should include;

- a description of the proposed strategy for clean-up of a selection of possible pollution events; and
- water quality standards, a breach of which may bring about implementation of the proposed strategy for clean-up. The water quality standards should be developed in consultation with the Water Authority of WA and be to the satisfaction of the Environmental Protection Authority.

## Recommendation 4

The Environmental Protection Authority recommends that the on-going management of dumping and the implementation of the EMMP should be to the satisfaction of the City of Wanneroo. In this regard the City of Wanneroo should give consideration to whether the proponent should be required to provide some financial bond or guarantee to cover the cost of any cleanup.

## **Recommendation 5**

The Environmental Protection Authority recommends that in addition to the proponent's commitments, the following should take place;

- **six monthly groundwater monitoring and reporting of drinking water parameters as determined by the Water Authority of Western Australia during operation of the site and for a period of five years after site closure, with a review to determine the need for further monitoring, to the satisfaction of the Environmental Protection Authority;**
- **the proponent should organise clean-up of any materials presently at the site which do not conform with Recommendation 2 above, and provide a status report on the cleanliness of the site prior to the commencement of filling, in consultation with the City of Wanneroo and to the satisfaction of the Environmental Protection Authority; and**
- **sewage wastes from on-site facilities should be disposed of off-site or at a location where there is a minimum separation of 2 m between the base of the leach drain and bedrock or limestone.**

The Authority's experience is that it is common for details of a proposal to alter through the detailed design and construction phase. In many cases alterations are not environmentally significant or have a positive effect on the environmental performance of the project. The Authority believes that such non-substantial changes, and especially those which improve environmental performance and protection, should be provided for.

The Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

# 1. Introduction

The proponents propose to raise money for the Vietnam Veterans Association by operating an dry inert fill site in Quarry Reserve 25252, which is vested in the City of Wanneroo. They intend to fill the quarry to a level consistent with the surrounding landscape so that the site can be integrated with Neerabup National Park, which surrounds the Quarry Reserve on three sides.

## 2. Description of proposal

The proposal is to fill the old limestone quarry by allowing waste disposal operators, such as demolition contractors, to dump non-organic materials (ie dry inert fill) under the supervision of the proponent. Access would be from Wanneroo Road.

It is estimated that the site will be operational for between 2 and 5 years.

Vehicles will be inspected at the gate and unacceptable loads will be turned away. A sign will be erected stating materials that will not be accepted such as acids, lime, organic material and household refuse. In the event of unacceptable material being missed at the inspection point, these will be collected and put into a contractors bin for disposal.

Bricks, tiles, timber, aluminium, steel and paper will be recycled.

It is proposed to operate the site six days a week.

At the entrance to the tip there would be a lockable boom gate and at the pit a fence across any possible access areas. Temporary litter control fences are proposed to catch windblown litter.

Site security at the site is proposed to be arranged.

## 3. Consultation

The Environmental Protection Authority received comments on the proposal from the following groups and agencies;

Greenforce.

Quinns Rocks Environmental Research Group.

Conservation Council of Western Australia.

City of Wanneroo.

Department of Conservation and Land Management.

Water Authority of Western Australia.

## 4. Discussion of environmental issues

### 4.1 Definition of dry inert fill

The word dry is used to clearly indicate that no liquids, such as oils, acids, sewage or sludges (eg wet concrete) should be disposed of at a dry inert fill site.

The dictionary definition of inert indicates that material is 'without active properties' or 'chemically inactive'. In the context of a landfill operation this definition implies that there would be no chemical change to the material as a result of biological activity or interaction of the material with water. If the definition of inert is strictly applied the oxidation of steel materials to form rust classifies these materials as non-inert. The Authority has decided to adopt the dictionary definition of inert as stated above as the general definition of materials that may be dumped at a dry inert fill site and to create a list of non-inert materials that either degrade at rates which are not likely to cause groundwater pollution or degrade to chemical substances which are not of concern which may be dumped at dry inert fill sites.

The Authority considers that the following materials are inert; asphalt from former roads, bricks, fibreglass, plastic, road base materials, and soils such as sand, gravel and clay.

The following non-inert materials may be dumped at dry inert fill sites; timber, metals used in building construction (ie steel, galvanised iron, aluminium), and concrete blocks. The proponents intend to recycle most of the materials listed in this paragraph.

It should be noted that the following materials are not considered inert and should not be dumped at dry inert fill sites; garden refuse such as tree lopings, grass clippings etc, containers such as chemical containers, sawdust and paper and cardboard wastes.

The Authority understands that often loads delivered to the site are mixed, for example some loads of bricks and sand may contain small quantities of garden waste. The Authority considers that the site operator has a responsibility to remove these materials.

The Authority concurs with submissions that considered dumping should be supervised by the City of Wanneroo.

## **Recommendation 2**

**The Environmental Protection Authority recommends that only dry inert fill, timber, metals used in building construction (ie steel, galvanised iron and aluminium) and concrete blocks be permitted to be dumped at Quarry Reserve 25252, to the satisfaction of the Environmental Protection Authority on advice of the City of Wanneroo. The Environmental Protection Authority further recommends that the valuable components of the wastes received, in particular the metals, be considered for recycling.**

## **4.2 Groundwater pollution**

It is important to ensure all of the material which is dumped at an dry inert fill site is dry and inert.

The Authority is aware of at least three dry inert fill sites in the metropolitan area where materials dumped at the site have caused or have had the potential to cause pollution.

Whilst the site is not in an area designated by the Water Authority as a source area, a "Priority 3" public water supply source area is located within 800 m downstream of the site. The Water Authority has recently approached the Environmental Protection Authority with a view to developing the Quinns Groundwater Scheme. The closest public water supply bore is expected to be about 3 km downstream.

### **4.2.1 Potential for groundwater pollution**

With higher prices being charged at many domestic landfill sites there is increasing incentive for waste disposal operators to dump illegally or dispose of non-inert materials at sites suitable for dry inert fill only. Dry inert fill site operators need to be vigilant to ensure that materials which could cause pollution are not hidden in the loads which they accept. When such materials are detected, they need to be removed immediately from the site.

If on-site fuel storages are properly designed the threat from spillages should be minimal.

Newman (1977) rates the suitability of limestone and other fissured rock as the worst geological formation for siting of domestic landfill. Limestone has the ability to attenuate acids, heavy metals and nutrients, however, this ability is rapidly used up. Figure 1 shows the groundwater contours around the site. The steepness of the groundwater contours indicates that the limestone under the site has a high porosity.

The natural ground level at the site is about 40 m and the quarry is estimated to be about 10 m deep at the deepest point. Therefore, the distance between the base of the quarry and the highest known groundwater level is approximately 18 metres, however, the nature of the limestone underneath the site is not known and the possibility exists of channels through the limestone that would allow pollutants to reach the groundwater with little or no attenuation. If the waste dumped at the site contains organic or acidic materials, preferential channels may be created.

Because of the likelihood of preferential channels, the Authority would not recommend that toilet wastes are disposed of via a conventional septic tank/leach drain system. A chemical toilet or similar approved by the Health Department should be used.

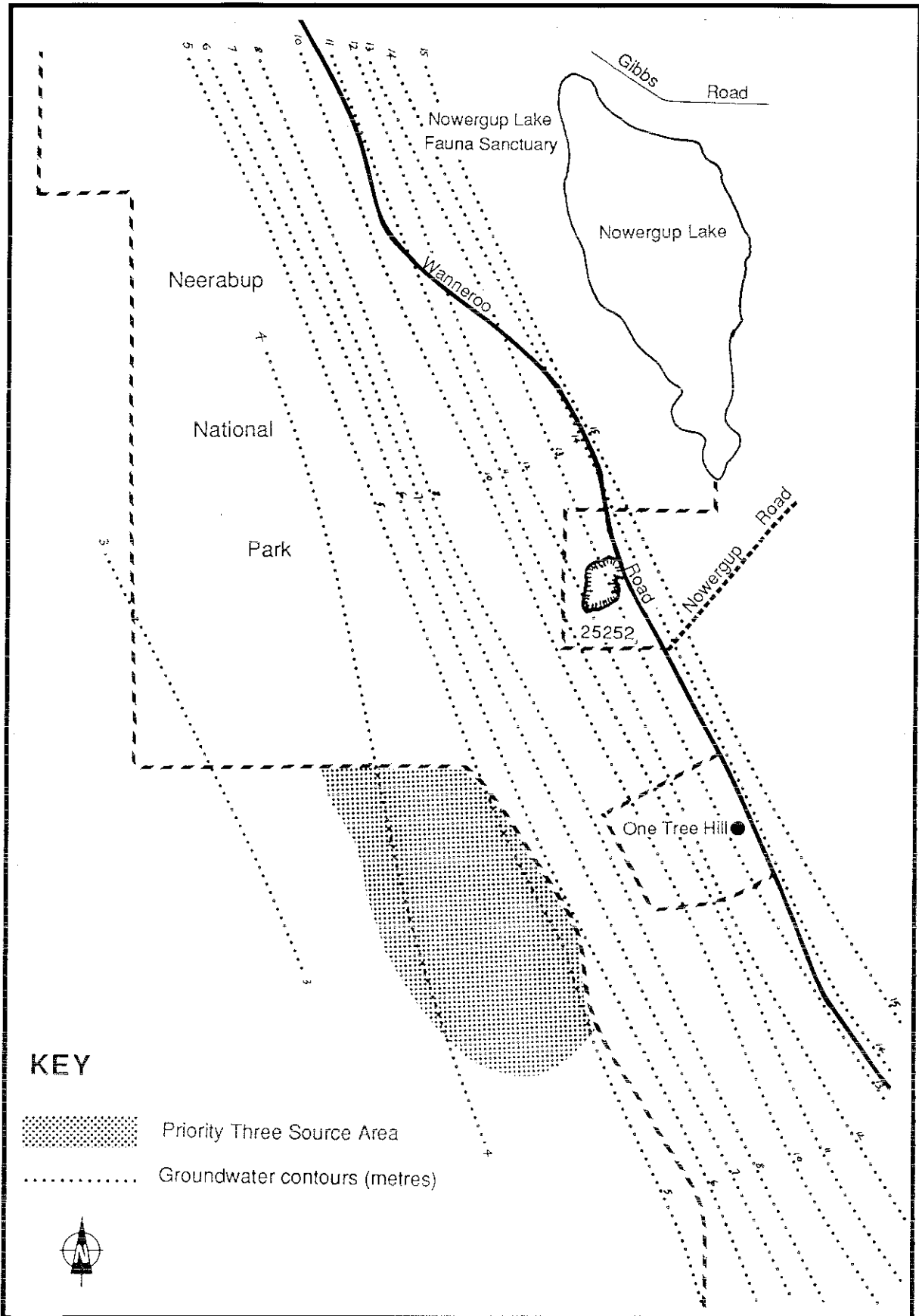


Figure 1: Location map for Quarry Reserve 25252 showing highest known groundwater contours



## **4.2.2 Monitoring groundwater quality**

Monitoring groundwater quality provides the best known mechanism of detecting whether non-inert materials which are causing pollution have been dumped. Such monitoring would need to occur six monthly for about 10 years after closure of the site.

Given that groundwater downstream is to be used for drinking, potable water quality standards should be used as a guide to determine if pollution is occurring.

## **4.2.3 Planning and paying for clean-up if pollution occurs**

Where landfill activities result in groundwater pollution, the Authority believes that the "polluter pays" principle should apply. Were this proposal to proceed, in order to ensure that government does not have to bear the cost of clean-up operations, the City of Wanneroo should consider whether the proponent should provide a financial guarantee equal to the estimated cost of a clean-up operation

In Victoria, a bank guarantee system is used for privately owned or operated refuse sites. This may also be appropriate in Western Australia.

Two possibilities which may need to be used together exist for clean-up: removal of the fill or pumping out polluted water, treating it and returning it to the aquifer.

Nevertheless, it is the Authority's view that pollution should be prevented at source, rather than looking to clean it up afterwards.

## **Recommendation 3**

**The Environmental Protection Authority recommends that an Environmental Monitoring and Management Programme (EMMP) be prepared by the proponent to the satisfaction of the Environmental Protection Authority prior to the commencement of dumping.**

**The EMMP should include;**

- a description of the proposed strategy for clean-up of a selection of possible pollution events; and**
- water quality standards, a breach of which may bring about implementation of the proposed strategy for clean-up. The water quality standards should be developed in consultation with the Water Authority of WA and be to the satisfaction of the Environmental Protection Authority.**

## **Recommendation 4**

**The Environmental Protection Authority recommends that the on-going management of dumping and the implementation of the EMMP should be to the satisfaction of the City of Wanneroo. In this regard the City of Wanneroo should give consideration to whether the proponent should be required to provide some financial bond or guarantee to cover the cost of any cleanup.**

## **4.3 Proximity to Neerabup National Park**

The quarry reserve is surrounded on three sides by Neerabup National Park.

### **4.3.1 Potential impacts on flora and fauna**

The following potential impacts have been identified:

- Windblown litter may affect plants and animals in the National Park (eg by smothering plants or fauna getting caught in containers etc).
- Excessive levels of dust may affect some plants.

- Weed seeds may also be brought onto the site; weeds growing on site could permit weed seeds to be blown into the National Park.
- If a fire was to start in the quarry reserve it could spread into the National Park, affecting plants and animals;
- Large items of rubble in combination with food scraps in the material may increase numbers of animals such as rats and mice, which could move off-site.

The proponent's commitments adequately address these issues.

### **4.3.2 Illegal dumping**

When the site is closed in the evenings or when the site is closed because it is full, waste disposal operators with loads to dispose of may dump them illegally in the surrounding bushland. The proponents intend to organise some security at the site after hours.

The site currently has several loads of rubbish dumped in it and the proponents are concerned that some pollution may have occurred already as a result. The proponents are keen to organise soil testing to detect whether pollution has already occurred.

## **4.4 Compatibility with System Six recommendations**

The System Six report made the following recommendations in respect of the Quarry reserve:

- that the Authority's general recommendations on planning and management of regional parks be applied to this area;
- that the purpose of the Reserve 25252 be amended to Parkland and Water; and
- the area be reserved for Parks and Recreation under the Metropolitan Region Scheme.

The Authority considers that Reserve 25252 should be managed consistent with the surrounding Neerabup National Park.

### **4.4.1 Site rehabilitation**

When the landfill is completed the site will need to be rehabilitated to be compatible with the purpose of the reserve (ie Parkland and Water) and the adjacent Neerabup National Park. Finished contour levels should ensure that landform is consistent with the surroundings. Proposals to rehabilitate and revegetate the site should be developed in conjunction with the Department of Conservation and Land Management and the City of Wanneroo to ensure that the proposed measures are compatible. Revegetation should ensure that weed species are not introduced into the National Park.

## **4.5 Other potential impacts**

### **4.5.1 Noise**

There are three residences located about 600 m from the quarry. Noise levels would need to comply with the Noise Abatement (Neighbourhood Annoyance) Regulations (1979).

### **4.5.2 Dust**

Dust levels should be controlled to meet the criteria specified in the Environmental Protection Authority's "Dust Control Guidelines" which were issued in September 1990.

### **4.5.2 Sewage wastes from on-site facilities**

Sewage wastes from on-site facilities should be disposed of off-site or at a location where there is a minimum separation of 2 m between the base of the leach drain and bedrock or limestone.

## 4.6 The do-nothing option

Currently the site is an unsightly hole with some rubbish and evidence of illegal dumping. Whilst it is possible to rehabilitate this area without filling the hole, the Department of Conservation and Land Management have indicated that it would be preferable to have the hole filled and landscaped, provided it was done in a manner that did not have other adverse environmental impacts. While clean fill would have less risk, however, it would be expensive.

### Recommendation 5

The Environmental Protection Authority recommends that in addition to the proponent's commitments, the following should take place;

- six monthly groundwater monitoring and reporting of drinking water parameters as determined by the Water Authority of Western Australia during operation of the site and for a period of five years after site closure, with a review to determine the need for further monitoring, to the satisfaction of the Environmental Protection Authority;
- the proponent should organise clean-up of any materials presently at the site which do not conform with Recommendation 2 above, and provide a status report on the cleanliness of the site prior to the commencement of filling, in consultation with the City of Wanneroo and to the satisfaction of the Environmental Protection Authority; and
- sewage wastes from on-site facilities should be disposed of off-site or at a location where there is a minimum separation of 2 m between the base of the leach drain and bedrock or limestone.

## Reference

Newman, P (1977) *Municipal landfill sites - geochemistry and site management* in The Institution of Engineers, Australia and Australian Institute of Health Surveyors WA Divisions Conference; Waste Management.

# **Appendix**

## **Proponents commitments**



(The commitments have been numbered by the Environmental Protection Authority for ease of reference)

We, HA & K M Athorn hereby make the following commitments:

## **1.0 Groundwater**

- 1.1 We undertake to install a multiport monitoring bore prior to commencement of filling to the satisfaction of Geological Survey and at a location agreed by Geological Survey downstream of the landfill site.

## **2.0 Site operations**

- 2.1 We undertake to erect a fence across access routes into the quarry before permitting any dumping of fill to the satisfaction of the City of Wanneroo and the Department Conservation and Land Management.
- 2.2 We undertake to remove windblown litter from around the site on a weekly basis to the satisfaction of the City of Wanneroo and the Department Conservation and Land Management.
- 2.3 We undertake to remove weed growth in the landfill area when requested to the satisfaction to the satisfaction of the City of Wanneroo and the Department Conservation and Land Management.
- 2.4 We undertake to control dust levels on the site to meet the criteria specified in the Dust Control Guidelines to the satisfaction of the City of Wanneroo.
- 2.5 We undertake to implement vermin control measures within the quarry area as considered necessary to the satisfaction of the City of Wanneroo and the Department Conservation and Land Management.
- 2.6 We undertake to operate the site in a manner that ensures that the Noise Abatement (Neighbourhood Annoyance) Regulations 1979 are not breached to the satisfaction of the City of Wanneroo.

## **3.0 Site rehabilitation**

- 3.1 We undertake to prepare and carry out a plan in liaison with and to the satisfaction of the City of Wanneroo and the Department Conservation and Land Management in regards to site rehabilitation.