

PROPOSED AMENDMENT TO METROPOLITAN REGION SCHEME

REZONING FROM RURAL TO URBAN AND URBAN
DEFERRED, STIRLING CRESCENT HAZELMERE

SHIRE OF SWAN

Report and Recommendations
of the
Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia

Bulletin 312

November 1987

ISSN 1030-0120
ISBN 0 7309 1670 7

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Swan Shire Council has submitted an overall planning strategy for the Hazelmere area to the State Planning Commission (SPC) and has requested the Commission's consideration to amending the Metropolitan Region Scheme (MRS) to introduce Urban and Urban Deferred zoning and an Important Regional Road reserve into the area.

The SPC referred the proposed MRS amendment to the Environmental Protection Authority (EPA) requesting comments and/or recommendations on Council's submission. The EPA determined that the proposal should be assessed under Part IV of the Environmental Protection Act, 1986 and that the level of assessment would be Notice of Intent (NOI). The potential environmental impacts of the proposed amendment have been assessed from information provided in the NOI.

The Environmental Protection Authority has concluded that the environmental acceptability of the proposal is constrained by several environmental factors. In order for the proposal to be considered environmentally acceptable, these environmental factors would require managing. The Authority has recommended accordingly.

RECOMMENDATIONS 1

The Environmental Protection Authority has concluded that the suitability of the land east of the existing Hazelmere townsite for residential development is significantly constrained by the prevailing environmental conditions, in particular aircraft noise and aerial contaminants. An alternative land use designation for the area which would not result in an increase in human habitation would be environmentally preferable.

RECOMMENDATION 2

The Environmental Protection Authority recommends that a specific interpretation for Perth of the ANEF system be developed to provide a more accurate estimate of aircraft noise exposure.

RECOMMENDATION 3

The Environmental Protection Authority considers that the ANEF system, while providing an estimate of aircraft noise exposure, is not a good predictor of aircraft noise annoyance, and it should not be used as the determining factor in locating residential developments. This fact should be recognised by the decision making authorities when determining the suitability of the land east of the existing Hazelmere townsite for more intense human habitation.

Should the proposed Urban and Urban Deferred rezoning proceed:

RECOMMENDATION 4

The Environmental Protection Authority recommends that no residential development be permitted above the 25 ANEF contour.

RECOMMENDATION 5

The Environmental Protection Authority considers that, should residences be located in areas where there would be concern regarding noise (ie above the 20 ANEF contour), the Shire of Swan should consider noise insulation and air-conditioning by-laws to mitigate noise intrusion.

RECOMMENDATION 6

The Environmental Protection Authority considers that, if the level of aerial contaminants from the existing rendering works is such that it would be incompatible with residential development, then either the rendering works should be relocated, or the proposed residential development should not occur.

RECOMMENDATION 7

The Environmental Protection Authority recommends that drainage waters from the proposed urban areas be disposed of on-site. Further, prior to the proposed amendment proceeding, the Shire of Swan should be required to demonstrate that on-site disposal would be technically possible.

1. BACKGROUND

In 1986, the Swan Shire Council submitted a proposal to the State Planning Commission requesting the amendment of the Metropolitan Region Scheme (MRS) by rezoning approximately 103 hectares of land immediately east of the existing Hazelmere townsite and generally bounded by Bushmead Road and Stirling Crescent, from Rural to Urban.

The former Department of Conservation and Environment provided advice to the Commission on the proposal. The Department was opposed to the rezoning because the various constraints affecting the site (aircraft noise, noxious landfill areas, aerial contaminants, drainage,) were considered to produce environmental conditions fundamentally unfavourable for residential development.

In May 1987, the Commission resolved that it was not prepared to proceed with the amendment pending the presentation by Council of an acceptable overall planning and development strategy plan for the wider Hazelmere locality north of the Redcliffe-Bushmead Highway.

Swan Shire Council has submitted an overall planning strategy to the Commission and has requested the Commission's further consideration to amending the MRS.

The Commission has referred the proposed MRS amendment to the Authority requesting comments and/or recommendations on Council's submission.

In considering the State Planning Commission's referral, the Authority determined the potential for environmental impact was such that the proposal would require assessment under Part IV of the Environmental Protection Act, 1986, and that the level of assessment would be Notice of Intent. The level of information provided in the referral was determined to be adequate and was accepted as the Notice of Intent.

2. THE PROPOSAL

The area covered by the planning strategy is defined by the Roe Highway and Redcliffe-Bushmead Highway to the east and south respectively, the Helena River to the north and the railway line to the west (Figure 1). The planning strategy proposes to:

- . amend the Local Authority's Town Planning Scheme to make provision for the zoning of the proposed Urban, Special (Rural) Industry and Special Rural (to protect the Hazelmere Lakes and land abutting the Helena River) land; and
- . amend the MRS to introduce Urban and Urban deferred zoning and an Important Regional Road reserve into the area.

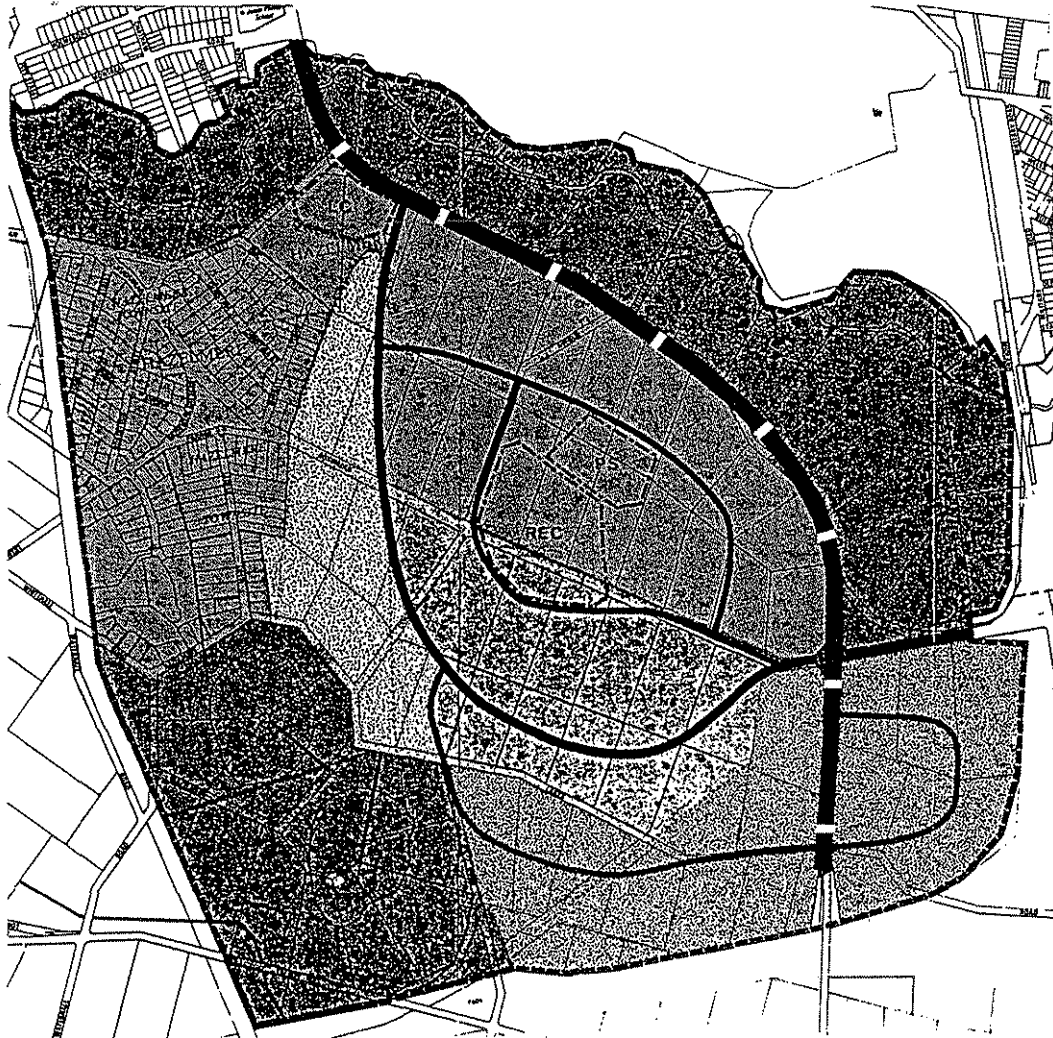
The land subject to the proposed Urban and Urban Deferred zoning is presently zoned Rural in both the MRS and the Shire of Swan's Town Planning Scheme No 9, and is generally being used for rural (predominantly stockholding paddocks) and equestrian/special rural purposes.

3. ENVIRONMENTAL ASSESSMENT

The Authority has assessed the proposal to amend the MRS to introduce Urban and Urban Deferred zoning and an Important Regional Road reserve in the

SHIRE OF SWAN

METROPOLITAN REGION SCHEME PROPOSED AMENDMENT - HAZELMERE














- | | |
|--|---|
|  EXISTING AND PROPOSED URBAN |  PROPOSED LOCAL CENTRE |
|  PROPOSED URBAN DEFERRED |  PROPOSED PRIMARY SCHOOL |
|  PROPOSED ENVIRONMENTAL AREA (SPECIAL) RURAL ZONE |  PROPOSED MAJOR OPEN SPACE |
|  PROPOSED SPECIAL (RURAL) INDUSTRY |  25 A.N.E.F FOOTPRINT |
|  PROPOSED IMPORTANT REGIONAL ROAD |  STUDY AREA BOUNDARY |
|  AREA REMAINING RURAL | |

Figure 1. Planning and development strategy for the Hazelmere area.

context of the overall strategy plan for the wider Hazelmere area. The Authority considers noise, aerial contaminants and drainage to be the major issues, and these are discussed in detail below.

The Authority considers that the suitability of the overall area for more intense human habitation is significantly constrained by the prevailing environmental conditions, in particular aircraft noise and aerial contaminant, and an alternative land use designation which would not result in an increase in the residential population of the Hazelmere area would be environmentally preferable.

RECOMMENDATION 1

The Environmental Protection Authority has concluded that the suitability of the land east of the existing Hazelmere townsite for residential development is significantly constrained by the prevailing environmental conditions, in particular aircraft noise and aerial contaminants. An alternative land use designation for the area which would not result in an increase in human habitation would be environmentally preferable.

3.1 NOISE

Aircraft noise has been recognised in the strategy report as a constraint on the development potential of the site. The projected 1990 Australian Noise Exposure Forecast (ANEF) contours for Perth Airport (including the parallel runway) have been adopted as a determinant of the extent of Urban and Urban Deferred zoning proposed (Figure 2). Based on the projected contours, and land use compatibility advice for areas near Australian airports, the strategy plan generally excludes urban development but allows Special Rural development between the 25 ANEF and 30 ANEF contours. Urban development is proposed between the 20 ANEF and 25 ANEF contours.

Indices used to estimate exposure to aircraft noise are usually based on a measure which tries to approximate a subjective response to the noise of individual aircraft and a method for taking into account the number and variety of aircraft operations. The ANEF system is used in Australia to measure noise exposure and to provide advice for land use planning around airports.

The ANEF contour drawing for an airport is an estimate of future noise exposure which will be experienced in the vicinity of the airport and takes into account aircraft type, weight and flight path, the distribution of noise energy, the forecast frequency of aircraft movements on various flight paths, and the average daily distribution of aircraft movements by day and night. A complication for Perth Airport is the possible construction of a parallel runway system (which could affect the impact of aircraft noise) at an unknown time. The ANEF contour drawing for Perth Airport is therefore a composite of the Australian Noise Exposure Concepts (ANECs) for the likely range of possible operational modes. The ANEF system provides advice on land-use planning around airports.

With regard to the ANEF system, the following points should be noted:

- . In the original NEF system adopted by Australia, the US criterion was adhered to. However, as a result of a report by the National Acoustic Laboratories published in 1982, the Department of Aviation revised the NEF system to reflect the Australian findings. The system was renamed the ANEF system, and was adopted in 1985.



Figure 2. Perth Airport - 1990 ANEF.

- . The 'night time' period was changed in the new ANEF system from between 2200 hours and 0700 hours to between 1900 hours and 0700 hours. The weighting for 'night' flights (between 2200 and 0700 hours) was reduced from 17 to 2 day time flights, and a weighting was introduced so that an aircraft flight between the 'evening' hours (1900 to 2200 hours) is equivalent to 4 day time flights. These modifications disadvantage Perth Airport because it is not a curfewed airport with many flights arriving between 2300 hours and 0300 hours, and had the effect of reducing the area affected by the ANEF contours by about 5-10 units.
- . Other changes to the new system were inclusion of the 20 ANEF contour, tabulation of aircraft movement and runway usages, and revision of the land use advice.
- . The ANEF is a measure of the noise exposure arriving at a given point, independent of whether it comes from a few loud aircraft or many quieter aircraft.
- . Noise from aircraft which are at the airport itself is not included in the ANEF calculations, ie ground running, engine testing and taxiing are excluded.
- . The ANEF increases as the logarithm of the number of operations increases, ie a 10 fold increase in total aircraft movements would increase ANEF contours by 10 units whilst a doubling of movements would increase the ANEF contours by about 3 units.
- . Because ANEF calculations are based on the operations of an average day, extreme variations in procedures are not represented, and in particular, aircraft are assumed to take off and land on fixed flight paths. This affects the 20 ANEF contour most significantly, which is in fact a band up to 1 kilometre wide.
- . The ANEF contours are drawn as a line, but are in reality bands with an error of +/- 5 units.
- . Perth differs from other Australian cities surveyed in the National Acoustics Laboratories 1982 study in the emphasis on outdoor living and recreation, particularly during the evening.

In summary, although the NEF system was revised, it is considered that the new system (ANEF) has similar limitations, and in fact may be more deficient for Perth as a result of the revised night time weighting. A specific interpretation for Perth of the ANEF system should be developed to provide a more accurate estimate of aircraft noise exposure.

RECOMMENDATION 2

The Environmental Protection Authority recommends that a specific interpretation for Perth of the ANEF system be developed to provide a more accurate estimate of aircraft noise exposure.

As a result of the weaknesses in the calculations (discussed above), the ANEF system is considered to be a poor indicator of aircraft noise annoyance. Further, the ANEF system correlates poorly with measured noise levels under flight paths and would not be a good indicator of the number of people adversely affected by aircraft noise.

Consequently, the ANEF system has a role in determining the relative qualitative impact of different airport planning options, but its limitations when estimating the absolute noise impact of aircraft on development proposals must be recognised. Until the ANEF system is improved as a predictor of aircraft noise annoyance, its use in land use planning is limited. Further, even if the ANEF system provided an accurate measure of annoyance, it would still be a value judgement as to what level of ANEF is acceptable.

RECOMMENDATION 3

The Environmental Protection Authority considers that the ANEF system, while providing an estimate of aircraft noise exposure, is not a good predictor of aircraft noise annoyance, and it should not be used as the determining factor in locating residential developments. This fact should be recognised by the decision making authorities when determining the suitability of the land east of the existing Hazelmere townsite for more intense human habitation.

The land use compatibility advice associated with the ANEF contours indicates that residential development above the 25 ANEF contour would be unacceptable (Figure 3). If the decision making authorities determine that an increase in the residential population in the Hazelmere area is appropriate and decide to proceed with the proposed rezoning, the Authority considers that no residential development should be permitted above the 25 ANEF contour, including residences associated with Special Rural development.

RECOMMENDATION 4

The Environmental Protection Authority recommends that no residential development be permitted above the 25 ANEF contour.

Also, the land use compatibility advice associated with the ANEF contours indicates that residential development between the 20 ANEF and 25 ANEF contours could be regarded as conditionally acceptable. This advice contains a number of qualifications, two of which are relevant to the proposed MRS amendment. These are:

"The actual location of the 20 ANEF contour is difficult to define accurately, mainly because of variations in aircraft flight paths" and

"Within the 20 ANEF to 25 ANEF, some people may find that the land is not compatible with residential use. Land use authorities may consider that the incorporation of noise control features in the construction of residences is appropriate."

RECOMMENDATION 5

The Environmental Protection Authority considers that, should residences be located in areas where there would be concern regarding noise (ie above the 20 ANEF contour), the Shire of Swan should consider noise insulation and air-conditioning by-laws to mitigate noise intrusion.

In summary, the presumption upon which the strategy plan is premised (ie the 25 ANEF contour firmly defines the area wherein aircraft noise would be sufficiently intrusive to preclude residential development) is regarded as an over simplification of the ANEF system. A more appropriate conclusion

**LAND USE COMPATIBILITY ADVICE FOR
AREAS IN THE VICINITY OF AUSTRALIAN AIRPORTS**

Building type	ANEF zone		
	Acceptable	Conditional	Unacceptable
Houses, home units, flats	Less than 20 ANEF (Note 1)	20 to 25 ANEF (Note 2)	Greater than 25 ANEF
Hotels, motels, hostels	Less than 25 ANEF	25 to 30 ANEF (Note 3)	Greater than 30 ANEF
Schools, universities	Less than 20 ANEF (Note 1)	20 to 25 ANEF (Note 3)	Greater than 25 ANEF
Hospitals, nursing homes	Less than 20 ANEF (Note 1)	20 to 25 ANEF (Note 3)	Greater than 25 ANEF
Public buildings	Less than 20 ANEF (Note 1)	20 to 30 ANEF (Note 3)	Greater than 30 ANEF
Commercial buildings	Less than 25 ANEF	25 to 35 ANEF (Note 3 & 4)	Greater than 35 ANEF (Note 4)
Light industrial buildings	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Heavy industrial buildings	Acceptable in all ANEF zones		

Notes:

1. The actual location of the 20 ANEF contour is difficult to define accurately, mainly because of variations in aircraft flight paths.
2. Within 20 ANEF to 25 ANEF, some people may find that the land is not compatible with residential use. Land use authorities may consider that the incorporation of noise control features in the construction of residences is appropriate (see also Appendix A).
3. An analysis of building noise reduction requirements by an acoustic consultant should be made and any necessary noise control features included in the design of the building.
4. If the 35 ANEF contour is not at present included in ANEF drawings produced by the Department of Aviation, this contour should be determined by interpolation.
5. This table is included in the Standards Association of Australia AS 2021-1985.

Figure 3. Land Use compatibility advice for areas in the vicinity of Australian airports.

would be that the ANEF contours indicate that the proposed urban and urban Deferred land would experience exposure to appreciable aircraft noise and that as a result, some people would find the site incompatible with residential use. While the insulation of residences against aircraft noise would ameliorate the problems, such noise would still impinge upon outdoor activities.

Further, it needs to be recognised that, even with prior knowledge of the adverse influence, people locating in such areas do not necessarily accept that influence and there is consequent pressure for action.

In regard to other noise sources, the site is within an area surrounded by major noise sources railway lines to the north and west, an industrial area to the north, the Bushmead Rifle Range to the east, and existing and proposed regional roads to the north, east and south. The combination of noise from these sources and overflying aircraft does represent a high noise environment and a constraint upon the suitability of the area for more intense human habitation.

3.2 AERIAL CONTAMINANTS

Two animal product rendering plants are located approximately one kilometre south of the proposed residential land. Because they convert waste matter into useful products, these plants could be regarded as beneficial (both environmentally and functionally).

Although the operations have recently been improved in liaison with the Environmental Protection Authority, some malodours do occur and will continue to occur. There will always be a background odour and there are occasions (such as during maintenance of waste water disposal systems) when pronounced malodours can occur.

The current rural-industrial character of land use in the surrounding areas has limited the potential for complaints resulting from odour problems as a consequence of the rendering plants. It is likely, however, that the proposed residential area would experience both the background and pronounced odours from the plants under stable atmospheric conditions. If the proposed residential development proceeds, the risk of land use conflict would obviously increase while the rendering plants continue to operate.

RECOMMENDATION 6

The Environmental Protection Authority considers that, if the level of aerial contaminants from the existing rendering works is such that it would be incompatible with residential development, then either the rendering works should be relocated, or the proposed residential development should not occur.

The nearby stock feed lot could also produce problem odours and dust.

3.3 DRAINAGE

The subject land is flat and parts are poorly drained and retain standing water during winter. The general area is characterised by a high water table. As is acknowledged in the NOI, comprehensive drainage of the site would be necessary to enable residential development to proceed. However, it is proposed that the drainage waters be discharged into the Helena River

which is affected by System 6 Recommendation M33. Because of the pollution load it could carry, in particular nutrients, the Authority considers that drainage waters from the proposed urban areas should be contained on-site rather than discharged to the external environment. This is particularly so in this instance as the past use of the site for stock holding and waste disposal activities could increase the likelihood of contaminated drainage.

Also, drainage waters should not be discharged to the Hazelmere Lakes which are affected by System 6 Recommendation M45. The lakes already experience nutrient related stress with algal blooms and associated malodours occurring.

Drainage from the proposed urban areas into either the Helena River or the Hazelmere Lakes would contribute additional nutrients to those waterbodies and would not be regarded as environmentally acceptable unless clearly demonstrated to be so by the proponent. However, physical conditions throughout the site could militate against the on-site disposal of drainage.

RECOMMENDATION 7

The Environmental Protection Authority recommends that drainage waters from the proposed urban areas be disposed of on-site. Further, prior to the proposed amendment proceeding, the Shire of Swan should be required to demonstrate that on-site disposal would be technically possible.

The overall strategy plan of which the proposed MRS amendment is a part, also proposes that the Helena River Valley and the Hazelmere Lakes be subject to an Environmental Area (Special Rural) zoning under the local authority scheme, but no details have been provided. Although not directly related to the proposed MRS amendment, the Authority advises that it would support the proposed rezoning provided appropriate land use controls and management provisions were included in the zoning to protect water quality, fringing vegetation and the rural landscape, and also provide for public access to the river foreshore. Further, the rezoning should accommodate the existing land use and not permit any intensification of land use or allow an increase in residences. Also, there may be a problem with non-conforming land uses such as sheep holding yards. These are obviously issues which must be fully investigated if the rezonings are to proceed.

4. CONCLUSION

Upon assessment of the proposed MRS amendment requested by the Swan Shire Council, the EPA considers that the suitability of the overall area for more intense human habitation is constrained by prevailing environmental conditions, in particular aircraft noise and aerial contaminants. An alternative land use designation which would not result in an increase in human habitation would be environmentally preferable. The Authority is aware that, in terms of land use strategies for the overall area, a rural/industrial type designation is being contemplated. Such a land use designation would better reflect the prevailing environmental conditions.

In regard to the ANEF system, the EPA considers that there are several weaknesses in the calculations, particularly in regard to the night time weightings, and a specific interpretation for Perth should be developed which would provide a more accurate measure of aircraft noise exposure. Further, the ANEF system is a poor indicator of aircraft noise annoyance, and it correlates poorly with measured noise levels under flight paths. Consequently, the EPA considers that the use of the existing ANEF system in land use planning is limited.

If it is determined by the decision making authorities that more intense human habitation for the Hazelmere area is appropriate, then the EPA considers that the proposed MRS amendment should proceed subject to this Report and Recommendations 4-7.