Project overview

The Midlands Groundwater and Land Assessment project was established in 2015 to investigate the potential for irrigated agriculture expansion in the Midlands region.

The $4.7 million project was coordinated by the Department of Primary Industries and Regional Development's (DPIRD) Water for Food program in collaboration with the Department of Water and Environmental Regulation (DWER).

The project aimed to provide information on water availability and land suitability for irrigated horticultural activity. The objective was to identify precincts of 2,000 to 3,000 hectares suitable for intensive horticulture in the coastal mid-west of Western Australia.

Covering roughly 17,000 km², the land assessment area is located 120 km north of Perth, stretching along the coast from Dongara to Lancelin, and inland to Mingenew and Moora.

The focus areas

The selection criterion for the chosen focus areas was determined by a community reference group. Requirements included groundwater; soil and landscape types; and planning and infrastructure. From this criteria, two focus areas were identified; Irwin in the north and Dinner Hill in the south.

The Dinner Hill focus area is located to the north-west of Moora, and north of Dandaragan. Along its western border lies the Dandaragan Scarp. The Dandaragan plateau, on which the focus area sits, is crossed from south to north by the Minyulo Brook, and contains a number of springs and soaks.
Water investigation

DWER completed a new, three-dimensional conceptual model of the Dinner Hill aquifers (See Figure 2). This and other analyses showed that more groundwater can be taken from the Leederville-Parmelia aquifer. For a sustainable resource, the best areas to abstract more groundwater from the Leederville–Parmelia aquifer are the northern parts and the western parts of Dinner Hill. (See Figure 3).

Investigations also show water abstraction in the south-east corner of the focus area closest to Moora, has resulted in a reduction in groundwater levels since 2000. (See Figure 3).

The work highlights that DWER need to manage local-scale abstraction carefully to avoid causing adverse impacts on water quality, water supply and dependent ecosystems.

The Dinner Hill groundwater allocation statement defines the area’s water availability and the rules to access it. This is located on the DWER website.

Currently, decisions about the allocation and licensing of groundwater take in the focus area are made in line with the Jurien groundwater allocation plan (DWER 2010a) and the Arrowsmith groundwater allocation plan (DWER 2010).

Sound planning and management practices are essential. Irrigation water quality is dependent on the amount and type of dissolved salts present in the water. Problems caused by the use of low quality irrigation water can greatly vary in type as well as severity depending on soil type, climate, crop and irrigation techniques.

Whilst suitable irrigation quality water and soil types are present in the Dinner Hill focus area, the limiting factor for expansion of horticulture is the volume of water available and its location.

Figure 1 Midlands Groundwater and Land Assessment project study area
The DPIRD Land capability assessment for expanding irrigated agriculture in the Dinner Hill focus area, Midlands, Western Australia report outlines the capability of the soil and land for irrigated horticulture and identifies Land Management Units for the area.

Two-thirds of the soils within the focus area are deep sands and were usually yellow or red in colour. Ironstone gravelly soils were also common. The majority of the soils within the focus area were shown to have moderate to high capability for both annual and perennial irrigated horticulture. Due to the sandy nature of these soils, wind erosion is a widespread constraint, with ongoing management by growers required to mitigate the problem. Sloping land is an additional constraint in some areas.

The availability of suitable volumes and quality water, therefore, is the greatest limiting factor for the expansion of irrigated agriculture within the Dinner Hill focus area.

**Infrastructure investigation**

DPIRD conducted a high-level infrastructure investigation focusing on power and energy, transport, telecommunications, labour, processing and packaging facilities, and weather stations.

The findings are in the *Midlands Regional and localised infrastructure assessment* report.
Groundwater-dependent environments

The *Groundwater-dependent environmental values of the Dinner Hill and Irwin focus areas* report, describes sites at which connectivity to groundwater supports social, cultural and economic values and benefits, such as:

- Stock water supply
- Shelter and food
- Irrigation water from river baseflow
- Indigenous cultural values
- Heritage values
- Recreational or tourism use
- Ecological and biodiversity values
- Commercial use

The report and associated mapping was used to establish a water allocation limit review relevant to the focus area. It may also be used by proponents with proposals to take groundwater, through identifying and avoiding drawdown at high value groundwater-dependent sites.

Within the focus area, shallow groundwater is found primarily along valleys through which watercourses flow. Within some watercourses, surface water derived from shallow groundwater discharge (baseflow) is taken for commercial purposes, notably for stock water supply and to supplement commercial irrigation.

Potential groundwater-dependent ecosystems within the focus area are associated with five main areas:

- The Minyulo, Yatheroo and Caren-Caren Brooks and their tributaries
- Watercourses, where they cross the Dandaragan Scarp at the western extent of the Dandaragan Plateau, including the headwaters of the Hill River
- The Yallalie impact structure (a meteorite impact structure at the head of the Minyulo Brook)
- Wetlands at the base of Gingin scarp, at the eastern extent of the Swan Coastal Plain
- Lake Dalaroo and nearby wetlands west of Moora town site
Crops and climate

Whilst broadacre agriculture dominates the Dinner Hill focus area, there is also an established horticulture industry. Popular horticultural crops include potatoes for fresh and seed markets, citrus and olives. Mangoes and stonefruits are also produced on a smaller scale.

Table 1 shows the suitability of potential irrigated crops according to soil type, along with other management considerations for the focus area.

The climate of the Midlands region and its potential for commercial horticultural crops is outlined in the *Crop and climate suitability for the Midlands area of Western Australia* report.

The largest constraint for extensive horticultural development within the focus area is the availability of a suitable quantity of irrigation water.

### Table 1  Summary of crop suitability with management considerations for main land management units (LMUs)

<table>
<thead>
<tr>
<th>LMUs suited for irrigation</th>
<th>Potential irrigated crops for the Dinner Hill focus area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annual shallow-rooted vegetables</td>
</tr>
<tr>
<td>Poor pale sands</td>
<td>⚫ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Poor coloured sands</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Fair coloured sands</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Fair pale sands</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Good coloured sands</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Shallow soils</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Good gravels</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Good heavy soils</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Good sandy duplexes</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
<tr>
<td>Good loams</td>
<td>☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘</td>
</tr>
</tbody>
</table>

- ☘ Crop is highly suited
- ☘ Crop is suited
- ☘ Crop is marginally suited
- ☘ Crop is not suited

- ☘ Crop may be frost sensitive; careful selection of suitable varieties needed for inland frost prone locations
- ☘ Chilling of crop is required; crop more suited to inland locations
- ☘ High wind erosion risk; extensive protection for soils and crops is necessary to avoid degradation
- ☘ Moderate wind erosion risk; general protection for soils and crops
- ☘ Optimum quality water needed to prevent irrigation salinity and soil degradation
Find out more

Please visit the Department of Primary Industries and Regional Development website for more information on the Midlands Groundwater and Land Investigations including the reports referenced in this brochure.


Contact DPIRD, or email [enquiries@dpird.wa.gov.au](mailto:enquiries@dpird.wa.gov.au)

- Locked Bag 4, Bentley Delivery Centre
- WA 6983
- 1300 374 731 (1300 DPIRD1)

Please visit the Department of Water and Environmental Regulation website for more information on water allocations.


Contact the Department of Water and Environmental Regulation Mid-West Office for up-to-date water availability statistics, or to discuss opportunities for obtaining water by trading or from alternative sources

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