

Changing land use in the GMID 2006 – 2010



Prepared for Northern Victoria Irrigation Renewal Project and
Department of Primary Industries

By
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incorporating
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July 2010

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Executive Summary

Drought and changes in water and planning policy have seen unprecedented land use change in the GMID (Goulburn Murray Irrigation District) in the past decade.

LG Valuations (part of the HMC Property Group) have been undertaking local government valuations across the GMID for decades. At the end of the 2008 valuation cycle it became apparent that the rate of change meant that standard municipal assessment processes were not capturing the rate and extent of change.

LG Valuations gained the support of NVIRP (Northern Victoria Irrigation Renewal Program), DPI (Department of Primary Industries) and a number of local councils to proceed with an extensive land assessment process to ascertain with 95 per cent accuracy current land usage in the GMID.

While a high degree of change was anticipated, the results can only be described as startling. The most significant finding was the movement of properties out of irrigated dairy production due to extended drought conditions and a low water allocation environment that has prevailed since the 2002/2003 irrigation season (when allocations first dipped below 100%), and the extent to which that land is longer actively farmed.

In fact, in the area long considered the food bowl of the Victoria, the most common land use for the 2009/2010 irrigation season was 'in transition'. The inspection program identified that idle rural land comprised over 45% of the nearly 800,000 hectares of rural land across the study area.

Typically the idle land was part of ex-dairy and fodder production properties that have been 'dried off' and fallen into poor state. Weed infestation and general degradation were prevalent on these properties. Not only had these holdings been retired from irrigation, they had been retired from active agriculture.

The farms were often located within old soldier settlement districts and while they featured older style irrigation lay-outs they also often occupied better than average soils in areas that were once highly sought after.

Typically the underlying land values were priced above productive value. Some of the farms were in the hands of lifestyle buyers not interested in re-developing the farms or returning them to productivity.

New Farm Zone regulations, prohibiting subdivision of land less than 100 hectares (including in most circumstances restricting excising houses off balance rural land), had resulted in unwanted surplus land being tied to rural house sites in demand from lifestyle buyers.

In total 9,500 of the 11,500 properties in the GMID were physically inspected throughout the 2009-2010 irrigation season. Irrigation allocations were poor at the commencement of the season but good summer rains resulted in better than expected final allocations on most systems. It was evident that optimism among landholders increased significantly as the season progressed and this coincided with extensive works undertaken by NVIRP as part of the Foodbowl Modernisation Project.

As a result a large number of properties (many of them idle when first assessed) have subsequently been returned to active agriculture. We are also aware of a number of properties that were identified as ex-dairy properties during the inspection program that have since either commenced production or are in the process of returning to production.

Taking into account seasonally effected fluctuations and land use changes that have occurred since the date of inspection, we are confident that land use and other data is at a consistently high level across the GMID. The program has been successful in achieving the intended goal of bringing the current land use data set up to the required level of +95% accuracy for the 09/10 irrigation season.

The opportunity now exists for considerable value adding and leveraging off the new data set. It also provides an opportunity to continue to improve the base data at a reduced cost with wide ranging benefits for policy development and implementation.

There are many current benefits that will be available from an ongoing program and many more that will become obvious over time. The magnitude of change that is occurring across Victoria's most productive region. This will be even more so when the benefits of the irrigation modernisation program will flow through to the broader productive industries.

It is essential that the data set be maintained over time and added to where possible. This will assist with the broad range of planning and policy decisions that continue to impact on the region as the most essential ingredient, water, becomes more scarce due to climate change, policy review and other competing interests.

Issues involving idle land, the implementation of the Farming Zone, reductions in the number of large volume rural water users (notably dairy properties), modernisation impacts and opportunities and an uncertain although optimistic future of irrigation will need to be explored using real property data.

HMC Property Group is pleased to submit the first stage of this process and remain excited about future potential development and use of this crucial information.

This project has delivered not only a comprehensive and accurate dataset but the significant trends revealed and quantified through analysis of the data raise real questions for the future, including:

- is some form of market intervention needed to fully leverage the benefits of irrigation modernisation?
- are current planning provisions flexible enough to allow the necessary reconfiguration of rural holdings?
- is the largest rural water use group in northern Victoria - dairy, resilient enough to fully take advantage of improved industry conditions, and modernisation?
- if not, how can currently idle land be otherwise brought back into a reasonable level of alternative agricultural production?

Project Background

LG Valuations Services (the Local Government arm of HMC Property Group) conducts bi-annual revaluations of over 11,500 irrigation properties within the GMID in the municipal areas of Greater Shepparton, Moira, Campaspe, Loddon and Gannawarra. Over time our firm has gathered significant property related data that we have exchanged for detailed spatial data with the Department of Primary Industries for mutual benefit. Shared information includes land use and GIS data, as well as water usage, land cover, soil type and many other useful data elements.

As we know, there has been considerable upheaval across the GMID over the last decade due to a wide range of factors, including the introduction of water trading, unbundling water from land, prolonged drought, and fluctuation in commodity prices.

As a result of this accelerated period of change, the reliability of some of the important property and land use data for irrigation properties had fallen to around 60% accuracy. After completion of the 2008 Revaluation, concerns about the level of confidence in the land use and other data was raised by LG Valuations.

During the course of discussions an expanded re-inspection program coinciding with the 2010 revaluation was proposed. Support was sought from potential end users of the data set including NVIRP, DPI and other related Government organisations.

The Project Team

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Marcus Hann – LG Valuations Services (HMC Property Group) – Project Manager

Oliver Boyd - LG Valuations Services (HMC Property Group) - Delivered Field Inspection Program

David McKenzie – HMC Valuers Opteon (HMC Property Group) – Analysis, commentary and interpretation of data

Commencing in late October 2009 and finishing in early April 2010, LG Valuation deployed three experienced field staff with a specially designed database comprising all relevant fields required for verification and GIS mapping data.

Data Gathered on the 2009-10 Re-inspection Program

The primary data that has been either captured or verified is as follows:

- dominant land use (dairying, horticulture, fodder production, lifestyle etc).
- condition and use of on-farm infrastructure.
- improvement descriptions.
- general pasture description and irrigation methods.
- configuration and description of dairies that are in use.
- area of orchards and varieties.

As well, more than 60 further data elements, as historically required for municipal valuation purposes, were also recorded.

Funding

The Councils which contracted LG Valuations to provide their municipal valuations funded the field inspection requirement of 30% of all rural properties as part of the 2010 revaluation. (All five municipal areas have a dryland component, however approximately 25% of all irrigation areas were inspected and funded by Council revaluation contracts). The additional inspections as part of the joint project funded a further 50+/- days of inspection plus further days of preparation, analysis, quality assurance and final reporting procedures.

At the outset of the project it was proposed to inspect 5,500 properties. However as a result of improved efficiencies and additional resourcing commitments (funded by LG Valuations) we have completed the reinspection of approximately 9,500 out of 11,500 properties. The remaining 2,000 properties that were not inspected are primarily vacant outlying land that is some distance from the irrigation "backbone" and has mostly been out of irrigation for some time.

| Additional Inspection Program of Properties within GMID 2009/2010 | | | | | | |
|---|--|--|--------------------------------------|-----------------------------------|--|---------------|
| Municipal Area | Approx number of Irrigation Properties | Properties inspected for revaluation contracts (25%) | Proposed Additional Inspection (25%) | Total Additional Inspection (50%) | Actual completed inspections | Days in field |
| Greater Shepparton City Council | 2,900 | 725 | 725 | 1,450 | 2,454 | 32 |
| Moira Shire Council | 2,250 | 563 | 563 | 1,126 | 1,957 | 26 |
| Campaspe Shire Council | 3,500 | 875 | 875 | 1,750 | 3,051 | 40 |
| Loddon Shire Council | 1,000 | 250 | 250 | 500 | 852 | 11 |
| Gannawarra Shire Council | 1,400 | 350 | 350 | 700 | 1,237 | 16 |
| Total | 11,050 | 2,763 | 2,763 | 5,526 | 9,551 | 125 |
| | | | | | Averaged 76 Inspections per day | |

Level of Confidence in the New Data Set:

LG Valuations and Department of Primary Industries are subsequently satisfied that the reliability of the dataset has increased to the required level of 95%+ as at date of inspection over the 2009/2010 irrigation season.

As well as delivering a stronger platform for more accurate rating valuations, the re-inspection program has also provided an accurate snapshot of current land use which can be utilised to benchmark change across the GMID. This will be of particular use in areas proposed to benefit from irrigation modernisation programs over the next 5+ years.

We also believe it will be beneficial in years to come for auditing and reporting purposes, in terms of benchmarking movements in both land use and value in areas impacted by policy and market factors. Tracking movements in value within identifiable geographical districts, such as inside or outside the 4% trade out exemption zone, or property on the irrigation backbone relative to property off the backbone, could provide a real and measurable metric to assess the benefits of such programs over time.

It is important to note that it is not considered 'automatic' that property on the backbone will outperform property off the backbone, (in terms of value) simply due to the availability of irrigation water.

Indeed, we have observed over the past five years that fair to good quality dryland has strongly outperformed irrigation country in northern Victoria. There are therefore many factors influencing rural land value beyond 'ability to irrigate'.

Land Use Codes (LUCs)

The Land Use Codes adopted by LG Valuations have come from the Australian Valuation Property Classification Codes (AVPCC) used for municipal valuations. We have however made some amendments in consultation with DPI to add more meaningful description to the LUCs where we felt that the existing LUCs were too broad. The new land use codes are shown shaded green in the table below:

| 2009/2010 GMID Re-inspection Project | | | |
|--------------------------------------|-----|---|---|
| | LUC | Description - AVPCC | Additional Requirements |
| Rural/Primary Production etc | 551 | 1 Orchards, Groves and Plantations | Specify Other, In Use or Not in Use |
| | 525 | 1 Livestock Production - Dairy | Irrigation Type / Pasture Type |
| | 526 | 2 Ex Dairy – Idle Land/ Past Fodder Production / Mixed | Irrigation Type / Pasture Type |
| | 511 | 2 Fodder Production (Specialised cropping) | Irrigation Type / Pasture Type |
| | 512 | 3 Irrigated Cropping (Potential for future irrigation) | Irrigation Type / Pasture Type |
| | 510 | 4 General Cropping - (Dry/remote- future irrigation on opportunistic basis) | Dryland |
| | 530 | 4 Mixed Farming and Grazing | Last Resort/rarely used |
| | 524 | 4 Livestock Production - Beef Cattle | Irrigation Pasture – Type |
| | 550 | 1 Market Garden | |
| | 561 | 1 Vineyard | Table or Wine |
| | 572 | Native Hardwood | Type |
| | 570 | Softwood Plantation | Type |
| | 544 | Horse Stud / Training Facilities / Stables | Lifestyle or Professional |
| | 545 | Piggery | |
| | 543 | Poultry | |
| Rural Residential | | | |
| | 117 | Rural Residential / Rural Lifestyle | Well Presented Rural Lifestyle Property |
| | 151 | Miscellaneous Buildings on Rural Land | Poorly Presented/ Maintained |

The main addition was to recognise a new category known as Ex Dairy (526). At a very early stage of the re-inspection program it was recognised that there were a large number of properties that have gone out of dairy farming in the past five years that are now either idle land or engaged in some type of fodder production or lower value grazing/agistment enterprises.

The other was to appropriately identify and categorise irrigated (intensive and extensive) and dryland cropping uses that were previously bundled together as one LUC. As you will see above these are now broken into three separate LUCs (510, 511 and 512), shaded green in the above table.

Findings

The inspection program has identified a range of land use trends across the study area that are stark and compelling.

The most significant observation is the movement of properties out of irrigated production, particularly dairy, due to extended drought conditions and a low water allocation environment that has prevailed since the 2002/2003 irrigation season (when allocations first dipped below 100%). The history of surface water availability by irrigation district is shown on the table below (with sub 100% seasons shown in red):

| Historical Irrigation Allocation Data by System | | | | | | | | | | | |
|---|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|--|
| Season | Murray | | Broken | | Goulburn | | Campaspe | | Loddon | | |
| | % HR | % LR | % HR | % LR | % HR | % LR | % HR | % LR | % HR | % LR | |
| 2002/2003 | 100 | 29 | 100 | 0 | 57 | 0 | 100 | 0 | - | - | |
| 2003/2004 | 100 | 0 | 100 | 70 | 100 | 0 | 100 | 0 | 67 | 0 | |
| 2004/2005 | 100 | 0 | 100 | 70 | 100 | 0 | 39 | 0 | 100 | 0 | |
| 2005/2006 | 100 | 44 | 100 | 70 | 100 | 0 | 31 | 0 | 100 | 0 | |
| 2006/2007 | 95 | 0 | 77 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | |
| 2007/2008 | 43 | 0 | 71 | 0 | 57 | 0 | 18 | 0 | 5 | 0 | |
| 2008/2009 | 35 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | |
| 2009/2010 | 100 | 0 | 13 | 0 | 71 | 0 | 0 | 0 | 3 | 0 | |
| Average | 85% | 0 | 70% | 0 | 71% | 0 | 68% | 0 | 39% | 0 | |

Irrigation water across the study area is sourced primarily from the Goulburn and Murray systems as well as the Broken, Campaspe and Loddon systems. The total amount of unavailable irrigation water across the study area due to reduced allocations since the 2002/2003 irrigation season is approximately 25% or approximately 4,500 gigalitres.

The lowest allocation year in 2008/2009 was 75% down and it is considered that this is the year that saw the most significant shift away from intensive irrigation uses such as dairying in the Goulburn Murray Irrigation District.

Several years prior to 2008/2009 were particularly challenging for irrigators also (both dairy and horticulture), with rising input costs, soft commodity prices, and poor seasonal conditions

(including wind, heat waves, frost and hail), already strongly impacting on the resilience of irrigated farming communities, thus lowering their capability to withstand a further negative circumstance.

Unfortunately, closer tracking of land use change was not being undertaken regularly through this period, and closer analysis of the annual shifts is not possible. The Dairy Australia 'Situation and Outlook' survey for that period may provide indicative information to support this assessment.

A close look at the current (2010) facts now reveals significant structural change in the location and type of irrigated agriculture through the GMID. The key results of the survey can be broadly summarised as shown on the following table:

Land Use % Change

| Land Use | 2006 Area (Ha) / Properties (No.) | 2010 Area (Ha) / Properties (No.) | % Change Area (Ha) / Properties (No.) |
|--------------|-----------------------------------|-----------------------------------|---------------------------------------|
| Dairying | 235,584ha / 2,721 props | 123,571ha / 1,143 props | -47.5 ha / -57% props |
| Horticulture | 14,688ha / 592 props | 16,807ha / 625 props | 14% ha / -5% props |

Idle land/Land Out of Agricultural Production

The most common land use across the GMID as at the 2009/2010 irrigation season was found to be 'in transition', or idle. The inspection program identified that idle rural land comprises over 45% of the nearly 800,000 hectares of rural land across the study area.

It is important to understand our distinction between land that has simply gone out of dairying and into another active agricultural pursuit, as opposed to 'idle' or in 'transition'. Where the property has undergone a change of use but remains actively farmed, we have reallocated that land to another Land Use Descriptor. However, where the land was observed to be mostly 'unfarmed' or not being managed in a way that would indicate genuine farming activity, it was classed as 'idle'.

Observations relating to land 'in transition' obtained during the inspection process are as follows:

- typically, ex-dairy properties that have been 'dried off' and have fallen into a poor state.
- high level of weed infestation and degradation.
- older style irrigation lay-out.

- increased incidence of idle land in areas that comprise better soil types. These areas were previously high production ex-soldier settlement areas that were intensively farmed but are now too small to be viable and typically too valuable to be easily aggregated and consolidated into a potentially viable larger holding.
- increased presence of lifestyle buyers that are often not interested in surplus land associated with rural holdings, and often do not manage the surplus land well.
- land is often locked out of production as the cost of re-developing sites for modern irrigation practices is prohibitive, particularly in the context of current commodity prices and general irrigation sector profitability.
- underlying land values priced above productive value.
- farming Zone across most of the GMID prohibits subdivision of land less than 100 hectares including in most circumstances the excising of houses off balance rural land (or land surplus to the lifestyle needs of the non farmer purchaser). This results in unwanted surplus land being tied to the rural house sites in demand from lifestyle buyers. Alternatively, unwanted improvements are tied to productive rural land sought for primary production.

The extent of idle land in the GMID is shown summarised on the table below:

| GMID LAND AREA BY CLASSIFICATION AREA OF IDLE LAND as at early 2010 | | | | | |
|---|---|----------------|----------------|----------------|-------------|
| LCC | Description | Total Ha | Idle Ha | Irrigated Ha | Irrigated % |
| 117 and 151 | Rural Residential | 23,864 | 17,898 | 5,966 | 25% |
| 551, 550, 561, | Horticulture, Viticulture and Market Garden | 24,308 | 4,862 | 19,446 | 80% |
| 511 and 524 | Specialised Cropping and Livestock Production | 86,459 | | 86,459 | 100% |
| 526 | Dairy's Not In Use | 133,674 | 66,837 | 66,837 | 50% |
| 525 | Dairy's In Use | 123,571 | | 123,571 | 100% |
| 512 | Irrigated Cropping | 168,793 | 101,276 | 67,517 | 40% |
| 510 | Dry / opportunistic irrigation | 210,176 | 157,632 | 52,544 | 25% |
| 530 | Mixed Farming | 13,839 | 8,303 | 5,536 | 40% |
| 543, 544 and 545 | Piggery's, Poultry and Horse | 9,795 | | 9,795 | 50% |
| | Totals | 794,479 | 356,807 | 437,672 | |
| | | | 45% | 65% | |

This table shows the results of the observed use of the property, via physical inspection, and where possible, interview with the farmer, through our inspection period from October 2009 to April 2010.

The results of the onground survey were subsequently cross checked and substantially verified by satellite remote sensing technology to determine the extent of irrigation through the 2009/2010 season (via Department of Primary Industries).

Where a dairy farm was in ongoing production, for the purposes of our study, we have assumed that the entire property would be irrigated at some stage through the 2010-2011 season, although we acknowledge that this would not always be the case. Under these circumstances the area of unirrigated land would be greater (however the land would be more likely to be actively farmed). The same approach was taken with 'specialised cropping and livestock production'.

The key messages from this table include:

- 50% of properties formerly devoted to dairying in the GMID were found to be 'in transition' and were not being actively or intensively farmed in the 2009/10 season.
- 60% of irrigated fodder production/cropping blocks in the GMID were dried off and were not planned to be irrigated in the 2009/10 season.
- 45% of land available for irrigation within the GMID is now severely underutilised and generating very little in the way of agricultural production.

More specifically, our research shows that within the GMID:

- there has been a reduction of approximately 47% in land primarily devoted to dairying from 2006 to 2010, and a 57% reduction in the number of properties primarily devoted to dairying.
- there has been an increase of approximately 14% in land primarily devoted to horticulture (including orchards, market gardens and vineyards) from 2006 to 2010, and a 5% increase in the number of properties primarily devoted to horticulture.

Closer Analysis and Commentary

The tables below demonstrate the detail of the changes in land use. They detail the change in both land area (in hectares) and number of properties devoted to each of the major land classifications as described earlier.

Using 'Dairy' in the first table as an example, moving horizontally across the table from the 'Dairy' row, to the 'Dairy' column, the total area primarily devoted to dairying in 2006 within the study area is shown in the pink shaded box at the foot of the table (226,181 hectares).

The green shaded box in the 'Dairy' column shows that 108,183 hectares remain primarily devoted to dairying in early 2010. The other figures in the column show where the land previously in dairying has moved to; for example, 101,678 hectares to 'ex dairy', 8,208 hectares to 'cropping', 466 hectares to 'rural residential' and 818 hectares to 'horse studs'.

The second table below details the number of properties involved, on the same basis.

A number of limitations in relation to the data should be acknowledged. Primarily, in 2006, LG Valuations were not recognising 'ex dairy' as a Land Use descriptor in its own right. At this time, such properties were still included under a general 'dairy' classification. Therefore, properties which had been retired from dairying prior to 2006 may show up in the 2006 totals as still being in use.

Close definition of what constitutes a 'horse stud' as opposed to 'rural residential' and vice versa is also ultimately a judgement call. In order to qualify as a horse stud it was necessary for a property to display equine specific improvements such as stable complexes, training tracks and specialised horse fencing. This strict definition excluded many holdings where it was observed that the dominant stock were in fact horses. Many small former dairies fell into this category but have not yet become specialised holdings. These properties therefore fell into either 'ex dairy' or 'rural residential' land use categories.

In relation to 'mixed farming' 'cropping', or 'grazing', again a judgement call was made by the field officer as to the dominant land use at the time of inspection.

| Previous Land Use 2005 - Area (hectares) | | | | | | | | | | | |
|--|---------------|----------------|----------------|----------------|----------------|----------------|--------------|-------------------|--------------|---------------|------------------|
| Current Land Use 2010 | Mixed Farming | Cropping | Grazing | Dairy | Orchard/Groves | Market Gardens | Vineyard | Rural Residential | Horse Studs | Pigs/Chickens | Grand Total 2010 |
| Mixed Farming (ex-Dairy) | 22,658 | 95 | 5,435 | 101,678 | | | | 764 | 32 | | 130,661 |
| Cropping | 400 | 309,305 | 48,541 | 8,208 | 144 | 842 | | 455 | 465 | 120 | 368,480 |
| Grazing | 538 | 1,647 | 84,562 | 6,607 | 88 | | | 59 | 180 | 45 | 93,727 |
| Dairy | 239 | | 2,096 | 108,183 | 59 | | | | | 87 | 110,665 |
| Orchard/Groves | 16 | 81 | 710 | 194 | 14,147 | 135 | 13 | 110 | | | 15,407 |
| Market Gardens | | | | 27 | | 1,588 | | 16 | | | 1,631 |
| Vineyard | | | | | | | 1,236 | | | | 1,236 |
| Rural Residential | 1,230 | 50 | 20 | 466 | 89 | | 12 | 28,707 | | | 30,575 |
| Horse Studs | | 34 | 66 | 818 | 11 | 27 | | 111 | 3,689 | | 4,757 |
| Pigs/Chickens | | | 1,225 | | | | | 69 | | 2,362 | 3,656 |
| Grand Total 2005 | 25,082 | 311,212 | 142,656 | 226,181 | 14,539 | 2,591 | 1,261 | 30,292 | 4,367 | 2,614 | 760,795 |

| Previous Land Use 2005 - Number Properties | | | | | | | | | | | |
|--|---------------|--------------|--------------|--------------|----------------|----------------|-----------|-------------------|-------------|---------------|------------------|
| Current Land Use 2010 | Mixed Farming | Cropping | Grazing | Dairy | Orchard/Groves | Market Gardens | Vineyard | Rural Residential | Horse Studs | Pigs/Chickens | Grand Total 2010 |
| Mixed Farming (ex-Dairy) | 255 | 2 | 78 | 1,371 | | | | 30 | 1 | | 1,737 |
| Cropping | 4 | 2,675 | 378 | 81 | 8 | 6 | | 27 | 4 | 3 | 3,186 |
| Grazing | 6 | 9 | 701 | 73 | 3 | | | 4 | 1 | 2 | 799 |
| Dairy | 1 | | 16 | 1,061 | 1 | | | | | 1 | 1,080 |
| Orchard/Groves | 1 | 2 | 13 | 4 | 524 | 2 | 1 | 9 | | | 556 |
| Market Gardens | | | | 1 | | 15 | | 1 | | | 17 |
| Vineyard | | | | | | | 28 | | | | 28 |
| Rural Residential | 23 | 2 | 1 | 9 | 6 | | 1 | 2,444 | | | 2,486 |
| Horse Studs | | 1 | 2 | 12 | 1 | 1 | | 9 | 54 | | 80 |
| Pigs/Chickens | | | 5 | | | | | 3 | | 39 | 47 |
| Grand Total 2005 | 290 | 2,691 | 1,194 | 2,612 | 543 | 24 | 30 | 2,527 | 60 | 45 | 10,016 |

| | | | |
|-------------------------|-------------------------|-------------------------|-----------------------------|
| 2010 Land Use Area (ha) | 2005 Land Use area (ha) | Unchanged Land Use (ha) | Changed Land Use (hectares) |
|-------------------------|-------------------------|-------------------------|-----------------------------|

Table prepared by Andy McAllister (DPI).

The data in this table was prepared from existing data sets held by DPI and LG Valuations for the 2006 benchmark, cross referenced with other data sets held by DPI to add specific relevance for the department. The totals exclude certain minor land uses that do not correspond with the broad categories above. There is therefore some minor variation between the totals expressed in other parts of this report.

The main driver of land use impact on the northern Victorian landscape is related to the dairy industry. The previous table shows that the total of current and ex dairy land represents more than 32% of the total land area and the Australian Bureau of Statistics Water and the *Murray Darling Basin – A Statistical Profile* shows that dairy farming consumes approximately 58% of available rural water in northern Victoria.

The other key driver of land use change through this period was ‘unbundling’, where the nexus between land and water was broken. Although water entitlements had previously been permanently tradeable, unbundling delivered an unprecedented level of flexibility in relation to the portability of water. It is unfortunate that benchmarking studies were not undertaken closer to 1 July 2007, to more closely observe the immediate impact of such a significant change to water policy on land use, but nonetheless, the long term results are now clear. It is obvious that unbundling would have had some

impact in facilitating the rapid land use change we have now quantified.

The impact of unbundling on land use has probably been ameliorated to some extent by the 4% trade out cap, which specifies some areas within the GMID where more than 4% of the total sum of entitlements can be permanently traded out of the system each year. These areas can be easily seen on Map 3 in the appendices of this report, shaded yellow. Within the green zone, no more than 4% of total system entitlement can be permanently traded out each year, and in future studies, we will be closely tracking the rate of change inside and outside the 4% exempt zones.

As the dominant land use change observed has been away from dairy, to relatively idle or significantly underutilised land, we have looked more closely at the results around dairy holdings and the following presents a snapshot of the changes to the dairying landscape over the past 5 years:

| Number of Properties Primarily Devoted to Dairying | | | |
|---|--------------|--------------|----------------|
| Municipality | 2006 | 2010 | % Shift |
| Greater Shepparton | 664 | 227 | -65.8% |
| Moira | 719 | 312 | -56.6% |
| Campaspe | 861 | 374 | -56.5% |
| Loddon | 113 | 45 | -60.0% |
| Gannawarra | 364 | 185 | -49.1% |
| Total Farm Numbers | 2,721 | 1,143 | -57.9% |

It is important to note that this information is based on ‘parcel identification’ rather than ‘enterprise identification’. Therefore, one dairy farm may have several separate parcels of land as part of the enterprise, and this will be counted as 2, 3, or 4 properties primarily devoted to dairying’ rather than one single dairy farm or enterprise.

Maps 1 and 2 in the appendices of this report reveal the extent of the movement away from dairying. Map 1 displays the location of holdings primarily devoted to dairying in 2006 and Map 2 displays the location of holdings primarily devoted to dairying in 2010. This visual representation of the shift is compelling.

These numbers suggest that northern Victoria has borne the great brunt of the structural change in the location of dairy farms in Victoria. Figures from Dairy Australia suggest that the number of registered dairy farms in Victoria in 2008/2009 (the most recent figures available) was 5,462, down only 7.3% since 2005/2006.

Clearly, the number of registered dairy farms in the south west and Gippsland have decreased at a slower rate over the same period. It is inevitable to conclude that drought and water security issues have driven this disproportionate change, when most other business inputs (cost of stock, supplementary feed, labour, milk revenues) are largely similar between the districts.

Broadly however, it is interesting to note that the number of registered dairy farms in Victoria has decreased by 52.4% since 1979/1980 and the number of registered dairy farms in Australia has decreased by 64% over the same time. Up until the year 2000 the drivers of this change were unlikely to be related to water security issues.

Victoria remains the dominant force in Australian dairying, with nearly 69% of registered dairy farms in Australia and approximately just over 64% of total milk production.

On this basis alone the investment in milk processing and dairy infrastructure which has been developed over the years to support this historical level of production in Northern Victoria must continue to be a significant driver of continued dairy activity. Proximity to existing processing facilities (Murray Goulburn, Bega/TMI, Fonterra, United Dairy Power, Parmalat etc) should continue to influence decision making for new entrants to the industry in northern Victoria.

It is noted that milk production in northern Victoria, whilst significantly reduced from historical high levels, has not fallen in proportion to the drop in both farms and area primarily devoted to dairying, as follows (source; Dairy Australia):

Reduction in properties primarily devoted to dairying; 2006-10:

57%

Reduction in land devoted to dairying; 2006-10:

47%

Reduction in total milk production; 2006-10:

32%

This confirms that, despite nearly a decade of extremely trying and fatiguing industry conditions in Northern Victoria, farmers who have remained in the industry have continued to find new efficiencies and to produce more milk from less land, with less water.

The resilience and innovation of the industry over this period has been crucial to helping processors maintain a base level of milk throughput and thus maintain their investments in processing capacity in the region. Maintenance of this processing capacity is considered to be as crucial to the future of dairying in Northern Victoria as any other factor.

Taking all this into account, (and crucially, with a positive change in water availability or security settings), there must be strong potential for significant areas of currently idle former dairy land, to come back into dairy production, subject to favourable commodity prices.

The Dairy Australia "Dairy 2010 Situation and Outlook" report published in May 2010 noted National conditions as follows:

- in 2009, the industry was facing a crisis with the global economic downturn cutting milk prices and continued dry conditions placing many farm businesses at risk.
- in 2010, the industry's position has changed significantly for the better – spot international dairy commodity prices have increased 80% in US dollar terms since their February 2009 low, taking prices generally back to April 2008 levels.
- the negative cash flow conditions of 2009 will still weigh heavily on farm businesses – with debt estimated to have increased by an average of 20% over the two years to 2009-10.
- the international dairy market has become increasingly volatile over the past three years and this volatility is likely to continue, due to several factors including; structural changes in the global market with emerging suppliers and lower structural surpluses of stocks in the Northern Hemisphere, and continued uncertainty over the prospect of a double dip global economic downturn.
- increases in official interest rates coupled with increasing short and long term debt loads will maintain pressure on many farmers in southern regions. The conditions of the past 12 months have increased the polarisation of farm businesses dependent on their region and exposure to the international market. For example, farmers in south east Queensland and northern New South Wales reported average debt levels of \$999 per cow, less than half the debt reported in northern Victoria (\$2,077 per cow).

It is considered that there are a number of key issues which will reduce the ability of the dairy industry in northern Victoria to rebound from its current low point.

It is clear that the greatest opportunities for the future of dairying in northern Victoria lie in the areas which are already most closely settled, particularly in many areas broken up into relatively small farms under soldier settlement schemes. These have been identified as among the areas with the best quality soil types, proximity to processing facilities and likely proximity to the modernised irrigation backbone.

Within these areas, currently inflexible subdivision regulations are a significant constraint on dairy industry participants being able to amalgamate viable tracts of irrigation country, reconfigure layouts, sell unwanted dwellings and commence viable commercial dairying on an appropriate scale.

Current Planning Provisions in the municipal districts of Campaspe, Shepparton, Moira, Loddon and Gannawarra Councils require a minimum lot size of 100 hectares in irrigation supply districts and 250 hectares in dryland districts to both subdivide land and to erect a dwelling without the need for a Planning Permit.

Breaking the nexus between subdivision of farm land and the entitlement to erect a new dwelling is considered crucial to helping market forces find a way to amalgamate and

consolidate small holdings of otherwise prime irrigation land, into sustainable and viable dairy enterprises of the future.

Otherwise we are likely to see a repeat of the expansion patterns for dairy farms in northern Victoria through the 1990's when dairy conversion (from irrigated cropping and grazing holdings) was still a significant factor in the market.

At that time, the difficulties of establishing modern dairy practices on a large scale over the top of small existing dairy farms (with problems including duplication of infrastructure and the cost involved in holding unwanted extra dwellings, etc.), meant new dairy farms were typically established on the fringes of existing dairy districts, at the end of irrigation supply systems, and on 'B' or 'C' grade soils. The presence of these large scale dairy conversion projects can be partly identified through Map 3 in the appendices of this report, which shows Dairy Configuration (rotary, swingover or herringbone) overlaid on the 4% trade out exemption areas, and the irrigation backbone. Many of the rotary dairies are located on these fringe holdings.

Map 4, in the appendices of this report, reveals the location of dairy properties that ceased milking between 2006 and 2010. It can be seen that many of the larger holdings currently retired from dairying are located on the fringes of established irrigation districts.

The ability of the dairy industry to rebound is not only tied to physical and land factors. The resilience and financial capacity of the people involved in dairying in northern Victoria is also key to helping the GMID back to fuller levels of production. Unfortunately, there are a number of key indicators which suggest that the resilience of dairy farmers must be approaching its limit:

- ABARE reports that only 16% of dairy farmers in Northern Victoria and the Riverina expect to produce more milk than 2008/2009 levels in three years time. This is the lowest level of any dairy district in Australia, with the exception of South Australia (9%).
- ABARE reports that 29% of dairy farmers in Northern Victoria and the Riverina report that they are 'unlikely to be in dairying in three years time'.
- ABARE reports that the Average Farm Cash Income for Dairy in Northern Victoria and the Riverina is expected to be -\$27,300 for 2009/2010 and profit to be -\$109,800, the lowest of all geographical groups in the survey.
- ABARE reports that average dairy farm debt in Northern Victoria and the Riverina is expected to be \$538,000 for 2009/2010.

The authors note that the 'Dairy Australia 2010 Situation and Outlook' report presents significantly different numbers in relation to optimism and intentions of dairy farmers in Northern Victoria, and simply note that it is very difficult to understand why each report has such contradictory conclusions.

It should be noted that the ABARE report *Financial Performance of Australian Dairy Farms 2007-08 to 2009-10* was published in June 2010, before stronger winter rains and improvements in likely opening allocations were announced. This more positive news is likely to moderate some of the projections above.

The last figure average farm debt statistics can be considered in the context of the most recent round of valuations undertaken by LG Valuations for the 2010 return of municipal rating valuations.

It should be noted that water assets are not rateable in Victoria and the assessed values therefore relate only to land and buildings, as follows:

| | Average Capital Improved Value Working Dairy Farms | Average Equity Position |
|----------------------|---|--------------------------------|
| Shepparton | \$574,691 | \$36,691 |
| Moira | \$571,658 | \$33,658 |
| Campaspe | \$607,072 | \$69,072 |
| Gannawarra | \$494,875 | \$43,125 |
| Loddon | \$460,666 | \$77,334 |
| Total Average | \$567,043 | \$29,043 |

While recognising that dairy farms typically hold further assets in the form of water, stock and plant and machinery, these figures show that maintenance of water values will be crucial to ongoing solvency when equity levels in relation to land and buildings is so low.

In this context any market distorting government interventions in the water market will have to extremely finely crafted. The loss of water entitlement without appropriate compensation would clearly be devastating for many dairy farmers who have 'lasted the distance' so far.

It is also clear that any mechanism that would secure environmental water from irrigators (other than from a willing seller), would severely impact on the ability of dairy farm businesses in northern Victoria to produce enough milk and therefore to earn enough income to recover a sound equity position and ensure a future in dairying.

The other key area of agricultural activity across the study district is horticulture. The results of the survey reveal that there has been an increase in both properties primarily devoted to horticulture (5%), as well as total area planted (14%).

The market for horticultural properties in the Goulburn Valley is considered to be weak and values have been under downward price pressure for more than 5 years. Many factors have impacted on this class of property including:

- Cash flow problems for most growers following consecutive poor crops due to hail and frost in the mid 2000's.
- Reduced water availability due to long term drought has led to several years of less than 100% allocation against entitlement, requiring growers to purchase high priced temporary allocations in peak growing periods, leading to both reduced equity positions and cash flow problems.
- Downward price pressure for fruit, both canning and fresh varieties, due to international factors, new supply from overseas trading partners, strong Australian dollar and loss of some key overseas markets due to biosecurity issues.
- The likelihood of competition from New Zealand apples and pears previously banned for biosecurity reasons.

- Consecutive years of reduced fruit intake by SPC Ardmona, the dominant purchasers of canning fruit varieties in Northern Victoria. This has compounded with the recent announcement that the pear intake would be reduced by a further 25% - 30% for the 2010-2011 season. There are very few options to sell canning fruit if SPC-Ardmona withdraws from the market.
- General lack of buyers for such complex, high risk agribusiness holdings. Acquiring the skills needed to manage a mixed orchard cannot be easily done, usually requiring years of experience to understand the different management regimes that apply to each variety of tree (watering, pruning, spraying, picking, fertilising, pest management and then marketing). For this reason there are practically no new entrants to the horticultural industry. The age profile of existing industry participants is quite old and there is a noted strong reluctance among second and third generation growers to stay on the farm, leading to well recognised succession planning problems.

Having regard for all these factors, we consider that the land use numbers as presented are disguising the reality that, despite the obvious reluctance of growers to walk away from their investment in perennality through established plantings, there has been a strong trend to invest less in orchard inputs and to manage the plantings to a lesser extent, through reduced spraying, watering, and pruning regimes within each horticultural enterprise.

In other words, growers are effectively retiring some areas within their orchards and more actively selecting blocks of different varieties and planting styles within their orchards to apply their increasingly limited resources to.

The fact that we are yet to see large tracts of plantings removed from established orchards may be obscuring the truth of the facts 'on the ground'.

At the time of preparation of this report several significant horticultural holdings in the Goulburn Valley were in the hands of receivers. We anticipate that, in the absence of a strong turnaround in commodity prices, international terms of trade or water security, significant movement in land devoted to horticulture may well be the next driver of land use change trends in northern Victoria.

Increased Optimism

Our inspection program was conducted over a five month period during an irrigation season that started with very low allocations as in previous years and the general confidence and sentiment observed during discussions with land owners was equally low. As the season continued there was an increased incidence of improved rainfalls across the region. Many irrigators have embraced new improved carry-over regulations that have provided enhanced surety for the 2010/2011 irrigation season and it was obvious that there was a considerable shift in optimism towards the future, from irrigators who were despondent some months earlier.

At the time of completing this report, the August announcement from Goulburn Murray Water indicated an opening allocation of 23% of high reliability entitlement on the Murray supply system (and a likely allocation of 100% by 15 December 2010, with continuation of average inflows), and 26% on the Goulburn supply system (and a likely allocation of 100% by 15 February 2011, with a continuation of average inflows).

There has been a significant amount of new landforming and efficiency works carried out (much of it with assistance from NVIRP) and there are a large number of properties that have taken advantage of a return to near average winter rainfalls, and have been sown down for what is likely to be one of the biggest cereal hay and crop seasons on record across the GMID.

We are also aware of a number of properties that were identified as ex-dairy properties during the inspection program that have since either commenced production or are in the process of returning to production.

We note that the national dairy herd has declined over the last five years and a large proportion of the decline will be due to the destocking of the GMID. National Herd reporting statistics show a reduction in the national dairy herd of approximately 16.5% over the same period. Dairy Australia report that a further 7% of total heifers in the Murray Dairy region were sold to provide cashflow for businesses. Taking this into account we consider that availability of quality stock and genetics will possibly be a significant short to medium term barrier to a dairy industry rebound in the GMID. Tracking the longevity of the return of these enterprises to dairying is likely to be very revealing over the coming few years.



Where to from here?

Now that the level of confidence in the land use and other data is at a consistently high level across such a wide area, the opportunity exists for considerable value adding and leveraging off the new data set.

It also provides an opportunity to continue to improve the base data at a reduced cost with wide ranging benefits for policy development and implementation.

The recent Productivity Commission (Market Mechanisms for Recovering Water in the Murray-Darling Basin) Research Report noted the lack of accurate base data, over which a number of macro studies have produced broad conclusions about the economic impact of water buy backs, modernisation and infrastructure investment programs. In some instances these broad conclusions may not help the credibility or local acceptance of modernisation and infrastructure rationalisation 'on the ground'.

This lack of reliable field data has now been resolved across a large area of the GMID and the level of accuracy should be maintained and built on. There is also a huge amount of additional spatial data held by various organisations that should be pulled together to benefit all parties.

Topics that can now be explored with confidence include:

- Capacity of irrigation land currently idle/out of production to return to production under various scenarios, including irrigation allocation settings.
- Implications of the Farm Zone on rural land use, the potential for unlocking areas restrained from production due to high underlying land values, identifying areas prime for future rural development.
- Quantification of benefit of Modernisation Programs post completion and resulting impact on water and land markets.

Case Studies on areas of strategic importance

A useful next step would involve tracking and recording the movements, motivations and future intentions of property vendors and purchasers within a discrete study area, for example, the Campaspe Supply District. This could add significant data and detail in relation to the impacts of the significant changes underway in the GMID and across northern Victoria.

Future steps could also include:

- Spatially tracking 'analysed property sales data' to establish whether 'value is retreating to the backbone' or whether property owners with a different business model and profile to the original owners are 'restoring value on the fringe'.
- Tracking movements in value between different irrigation supply districts to inform debate about the impact of allocation levels on value over time.
- Tracking movements in value for properties above a groundwater supply compared to properties without access to such a resource.
- Tracking the value of building permits issued within various zones (modernised vs existing channels) over time, identifying the effect on confidence of improvements to irrigation infrastructure.

- More in depth study into and spatial tracking of, changes in horticultural plantings over time (tree numbers, varieties, etc).
- Undertake regular update projects to establish clear trends via data with previously unavailable levels of accuracy.

Construction of a Comprehensive GIS

Geographic Information Systems are a common tool in modern planning and policy development processes. The use of GIS requires a high level of confidence in any data set that is represented to provide accurate and meaningful outputs. One of the main outcomes of this process should be the development of a comprehensive GIS so that the data can be easily accessed and interpreted on a spatial basis across the GMID. Information that the GIS can now accurately provide includes:

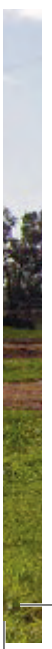
- Land use
- Land cover
- Irrigation information - method, timing, volume, layout, pasture, re-use etc
- Soil types and drainage
- Level of infrastructure - dairies, dwellings, other improvements
- Underlying land values
- Local market analysis and trends
- Aerial photos and satellite imagery
- Renewal infrastructure and backbone

Future Use of GIS

GIS should be a vital tool for planning purposes for the modernisation process and for tracking investment, upgrades and connections for future cost/benefit analysis.

It can provide detailed information to NVIRPs Modernisation Coordinators and easy access to all relevant property information including:

- Prevalence of different land uses in an area of interest.
- Assist with prioritising high value use areas.
- Underlying land values/market influences and trends.
- Level of structural development/investment.
- Underlying (not in use) production capacity.



Conclusion

The re-inspection program has been successful in achieving the intended goal of bringing the current land use data set up to the required level of +95% accuracy.

There are many current benefits that will be available from maintenance of an accurate land use dataset from the GMID, and many more that will become obvious over time given the magnitude of change that is occurring across Victoria's most productive region and as the benefits of the modernisation program flow through to the broader productive industries.

It is essential that the data set be maintained over time and added to where possible. This will assist with the broad range of planning and policy decisions that continue to impact on the region as the most essential ingredient, water, becomes more scarce due to climate change and other competing interests.

Having identified the large extent of 'latent capacity' for increased agricultural production in the GMID through quantifying the extent of land not currently actively farmed, the key questions for policy makers are clearly:

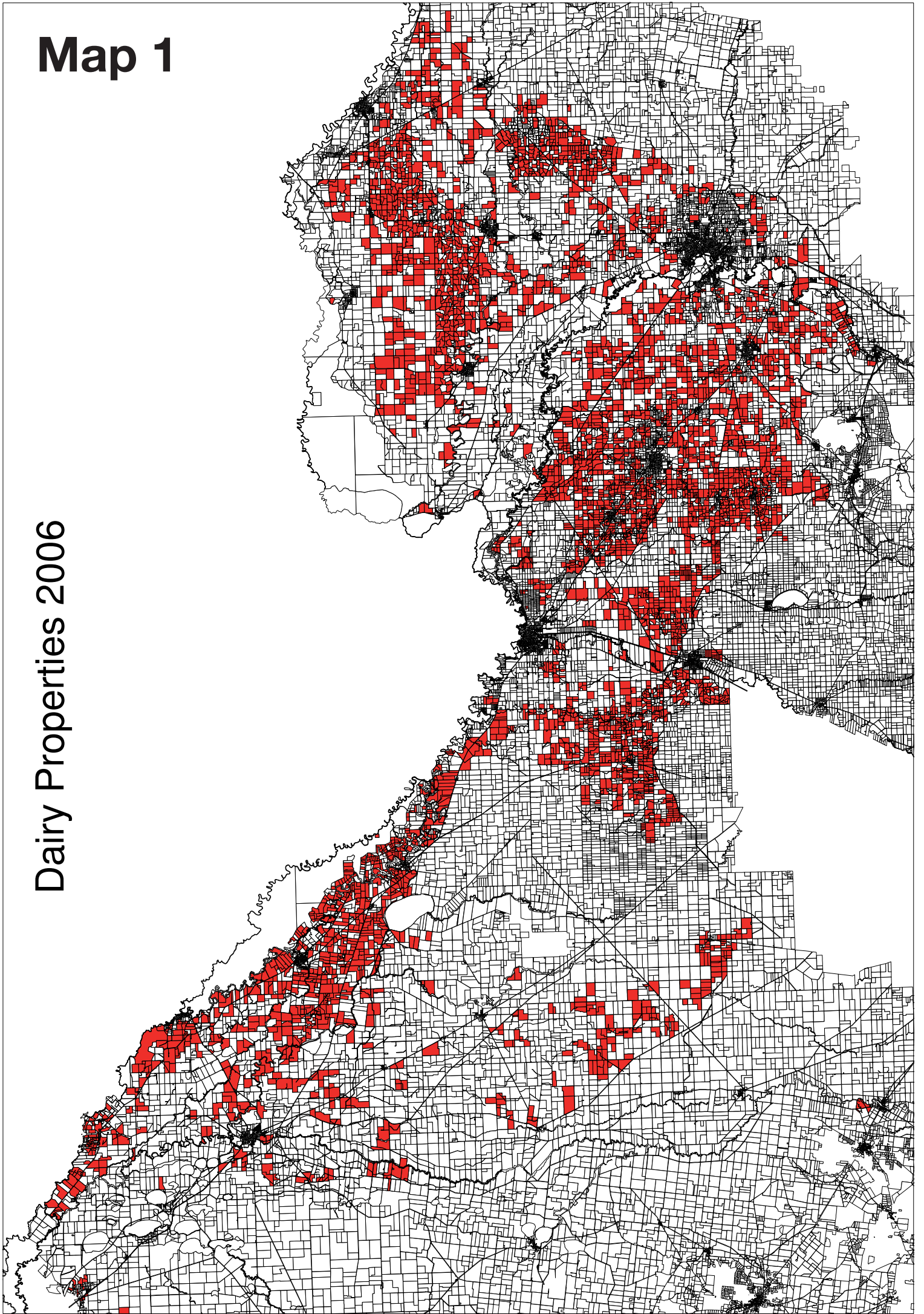
- How and when will the idle land be returned to active farming?
- Will current policy settings assist or constrain a dynamic market response?
- Will the cost of operating a modernised irrigation network be affordable for irrigators?
- What is the capacity and readiness of irrigators, particularly dairy farmers, to take advantage of a modernised irrigation system?

Issues involving land in transition, the implementation of the farm zone, reductions in the number of dairy properties, modernisation impacts and opportunities and an uncertain although optimistic future for irrigation will need to be explored using real property data. HMC Property Group is pleased to have been involved in the delivery of this landmark survey as the first stage of this process and looks forward to undertaking regular reviews for benchmarking, and staying alert to trends before they become 'fixed' in the future.



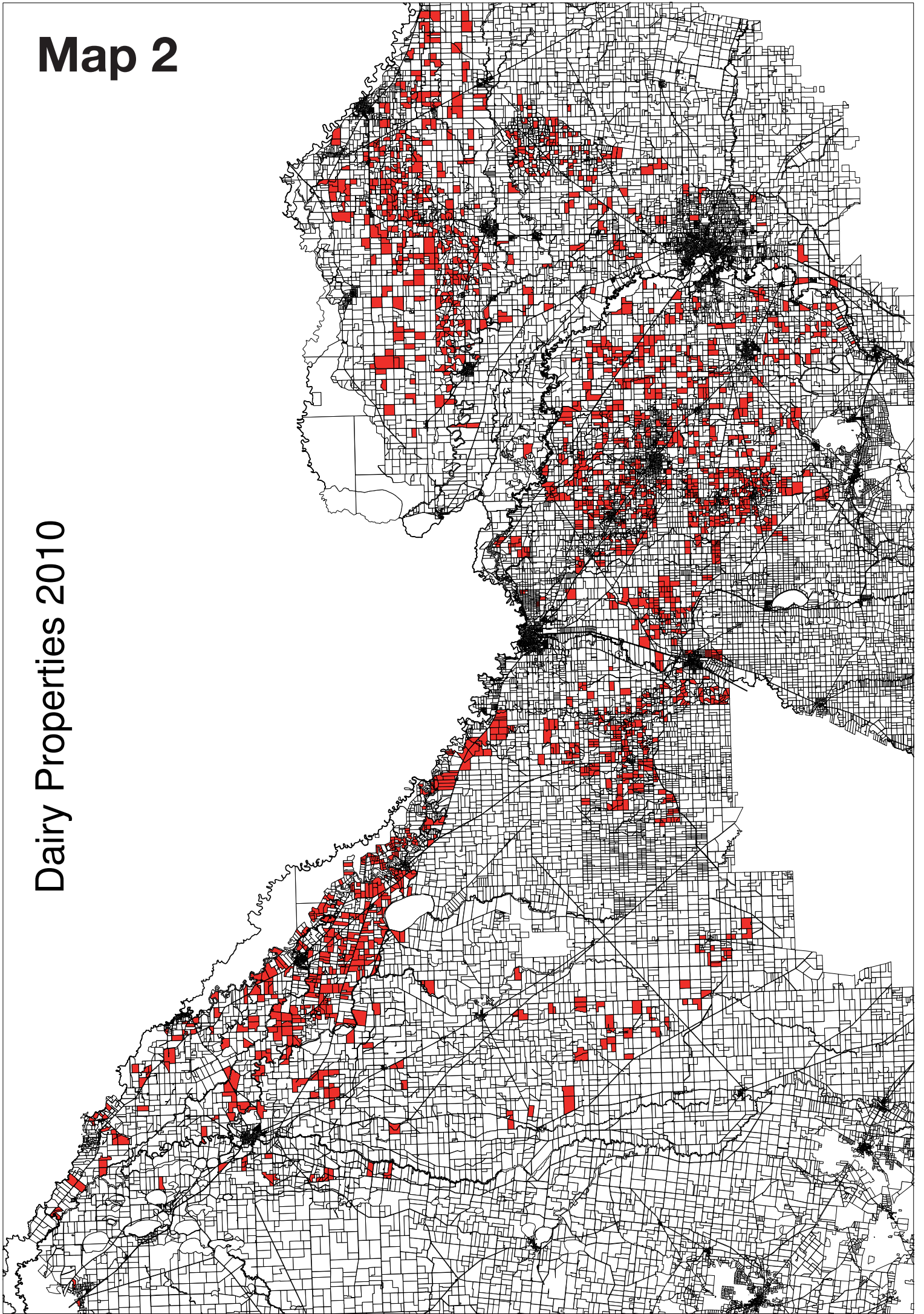
Map 1

Dairy Properties 2006



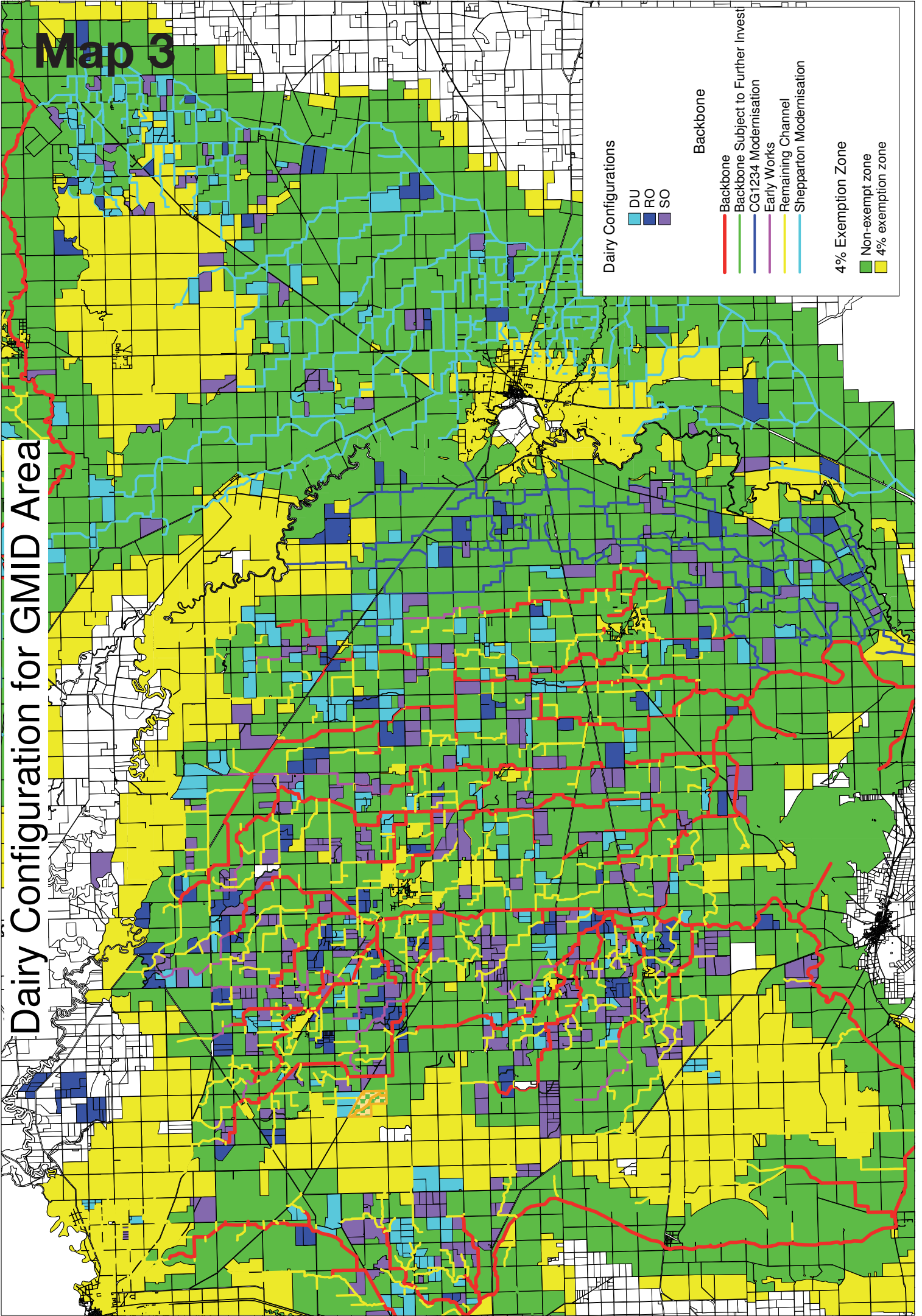
Map 2

Dairy Properties 2010



Map 3

Dairy Configuration for GMID Area



Map 4

Ex Dairy 2010

