

Gwydir Valley Irrigators Association Inc.

458 Frome St, PO Box 1451, Moree NSW 2400

Submission to the Department of Primary Industries – Water and the Natural Resources Commission

On

Review of Water Sharing Plan for the Lower Gwydir Groundwater Source

By Gwydir Valley Irrigators Association Inc

August 2015

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1 Purpose of this submission

This document has been developed by the Gwydir Valley Irrigators Association (GVIA) on behalf of its members as a formal submission for consideration by NSW Government as part of its review of NSW Water Sharing Plans. Comments within this submission are outlined for the Natural Resources Commission and the Department of Primary Industries – Water, in preparation for the formulation of advice to the NSW Government.

This document represents the concerns and views of GVIA's members. However, each member reserves the right to express their own opinion and is entitled to make their own submission.

2 About the Association

2.1 *Where we are and what we do*

The Gwydir Valley Irrigators Association (GVIA) represents in excess of 250 water entitlement holders in the Gwydir Valley, centred around the town of Moree in North-West New South Wales. Our mission is to build a secure future for its members, the environment and the Gwydir Valley community through irrigated agriculture.

The region is highly dependent on agriculture and in particular irrigated agriculture for economic activity contributing over 40% of Gross Regional Product, employing 20-30% of the population and accounting for almost 90% of exports from the Moree Plains Shire in particular (Cotton Catchment Communities CRC Communities and People Series 2009).

The 2011 Agricultural Census estimates that the total value of agricultural commodities for the Moree Plains region was \$911,951,079 up from \$527,744,851 in the 2005-06 census. This is an estimated 7.83% of NSW's total agricultural production from a 1,040,021Ha principally used for agricultural crops.

GVIA members hold entitlements within the Gwydir regulated and un-regulated surface water areas, in addition to groundwater resources. All of which are managed through water sharing plans, which have been progressively developed since early 2000. Total river water availability for irrigation is 26% of the long term average flows. There is around 575,000ML available to irrigators from regulated entitlement (high security, general security and supplementary water). There is also nearly 30,000ML available from groundwater aquifers. In addition, unregulated water is used for irrigation purposes with the use well below the volumetric licences.

The Gwydir is characterised as having low water reliability with the majority of water held as general security water with a reliability of 36%. Supplementary water entitlement is somewhat more reliable with 55% but accounts for less than a quarter of the total volume.

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Groundwater reliability is considered 100% although recent usage statistics indicate the three-year rolling average is above the targeted extraction limit and access maybe reduced.

Environmental water has been held in the Gwydir prior to the first water Sharing Plan and is primarily used to contribute waterbird and fish breeding events and to maintain the condition and extent of the internationally recognised Gwydir Wetlands. Entitlements owned for environmental purposes totals more than 150,000ML, made up of high security (375ML), general security (106,000ML), supplementary water (19,500ML) and an environmental contingency allowance (45,000ML).

The main broad acre irrigated crop is cotton with irrigated wheat, barley and Lucerne also occurring depending on commodity prices the total broad acre irrigated area is approximately 80,000 ha (although recent results indicate this to be around 110,000 ha) but is rarely cropped in one year. In 2010-11 census data indicated the total production value of irrigated cotton was \$623M (see table 1) and is estimated to be worth three times that to the local community using the Cotton Catchment Communities Research Corporation economic multiplier for cotton regions¹.

Currently there are also pecans, walnuts, oranges and olives being grown within the region covering approximately 1,500 hectares, generating an estimate \$31M (see table 1) with considerable benefits to the local community as a high intensity, permanent crop. There is however, significant and potential for expansion into horticulture and improve high security water utilisation on permanent cropping.

The Gwydir Valley Irrigators Association organisation is voluntary, funded by a cents/megalitre levy on regulated, unregulated and groundwater irrigation entitlement. In 2014/15 the levy was paid on in excess of 93% of the eligible entitlement (excludes entitlement held by the State and Federal Government).

The Association is managed by a committee of 11 irrigators and employs a full-time executive officer and a part-time administrative assistant, as well as hosting a Regional Facilitator funded through Local Land Services and the Cotton Research and Development Corporation.

Much of the activity the association revolves around negotiating with government at a Federal, State and Local level to ensure the rights of irrigators are maintained and respected. While the core activities of the Association are funded entirely through a voluntary levy, the Association does from time to time, undertakes special projects, which can be funded by government.

¹ Social and Economic Analysis of the Moree Community, 2009. Cotton Catchment Communities CRC

The GVIA and its members are members of both the National Irrigators Council and the NSW Irrigators Council.

Table 1: Agricultural Commodity Summary

Crop	Ha	Total Production	Yield		Total Value	Value per Hectare
Broadacre crops		t	t/Ha	\$/t		
	941,619	1,601,592				
Wheat	371,725	972,812	2.62	\$257.30	\$250,304,527.60	\$674.13
Barley	124,947	294,369	2.36	\$238.00	\$70,059,822.00	\$561.68
Sorghum	80,705	310,929	3.85	\$150.00	\$46,639,350.00	\$577.50
Hay	4,508	13,903	3.1		\$1,777,680.00	\$394.34
Oilseeds and Pulses		t	t/Ha			
	207,683					
Chickpeas	149,802	116803	0.78	\$207.40	\$24,224,942.20	\$161.77
Faba Beans	12685	20062	1.58			
Mung Beans	9033	7610	0.84			
Sunflowers	6,212	6,614	1.06			
Cotton		Bales	Bales/Ha	\$/bale *		
Total Cotton	154,219	971,789	6.3	\$856.70	\$832,531,636	\$5,397
Irrigated Cotton	74,570	728,199	9.8	\$856.70	\$623,848,083	\$8,366
Dryland Cotton	79,649	243,590	3.1	\$800.00	\$194,872,000	\$2,480
Cultivated Turf						
Turf	19				\$613,399	\$32,284
Fruit and Nuts		Kg	Kg/tree	\$/t		
Oranges	21,402	107,898	20	\$330 **	\$55,465	
Olives	80,301	1,115,005	21		\$2,076,529	
		t	t/tree	\$/kg		
Pecans	77,070	1,759	2	\$16,510	\$29,041,090	\$58,493
Walnuts	2,592			\$2,700		

Source: Census 2010-11².

² Sources: agdata cubes, local producer information;71210D0005-201011 Agricultural Commodities, Australia, 2010-11

Local industry input has been included with regard some of the pricing.

* Cotton: 2010-11 Australian base price 377.4c/kg = \$856.70/bale an all-time record high price. The current 2014-2015 Australian base pricing is in the range of 150 – 200c/kg approximately \$400 - \$450/bale.

** Oranges: The current value of juicing Oranges is \$330/tonne.

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2.2 Association Contacts

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3 Introduction

The Gwydir Valley Irrigators Association (GVIA) welcomes the opportunity by the NSW Government to provide comment on the Water Sharing Plan (WSP) for the Lower Gwydir Groundwater Source.

The GVIA and its members are committed to ensuring the future sustainability of our groundwater resource, our livelihoods, the longevity of the industry and our communities depend on this. However we do believe there remain far too many unresolved concerns with the plan and the groundwater model used to inform decision making that we cannot ignore the opportunity to improve our knowledge and improve our planning for the future. We believe there is enough evidence to warrant a remake of this water sharing plan prior to transitioning to a water resource plan.

The GVIA is disappointed by the lack of information available to stakeholders, particularly on the groundwater model and its accuracy, to allow them to us to genuinely participate in this review at this point in time. Whilst engagement on the review has improved (in comparison to our experience in surface water planning), the process remains flawed by the lack of preparation by the Department. Although we do acknowledge a commitment by Department of Primary Industries (DPI) - Water to facilitate a future meeting with groundwater modellers and hydrogeologists from within the Department, the fact that this could not be facilitated prior to this submission date has significantly impeded our ability to provide recommendations.

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With this in mind, the GVIA have considered this submission (in part), as an initial discussion paper addressing some of the key questions from the Natural Resources Commission and the DPI Water. With the anticipation of further information to be made available, the GVIA reserves the right to suggest additional rule changes through the provision of additional submissions directly to Government if necessary.

We have also provided recommendations for further work by the NSW Government, to assist stakeholders to make an assessment of the effectiveness and appropriateness of the plan to meet its objectives. We have also made suggestions on how to improve engagement with stakeholders as part of this review and the development of water resource plans in the future.

In providing a concise list of recommendations below, the GVIA is not offering agreement or support for the balance of the rules or conditions within the Water Sharing Plan but believes that the following 20 recommendations are a starting point for DPI Water to replace the Water Sharing Plan for the Lower Gwydir Groundwater Source. The GVIA believe some of these recommendations should be fast-tracked immediately prior to developing the water resource plan.

The GVIA acknowledges that the NSW Government is compelled to meet legislative requirements of the Murray Darling Basin Plan (MDBP) and that there are limitations to the scale of changes that can be made to NSW Water Sharing Plans. Nonetheless, we ask that the NSW Government honour the commitment to our industry and our communities to transparently review this Plan, test its earlier assumptions and make an objective analysis on its effectiveness despite the constraints of the MDBP.

The fact that we have not had a chance to fully implement and test this plan, prior to the implementation of a new reform agenda, has and will continue to be an issue for the GVIA and its members. We do believe there is scope to improve our knowledge and understanding of the Lower Gwydir Groundwater Source and that decisions are made using best available science. As a result, we believe that a thorough review of this plan without limitation is imperative.

The GVIA will continue to work with the NSW Government to ensure that they continue to provide irrigators with the appropriate level of protection and access to their water right.

Recommendations

1. The Water Sharing Plan for the Lower Gwydir Groundwater Source is remade prior to alignment with the Basin Plan.
2. Supplementary submissions will be accepted following the release of further information on the performance of the groundwater model and any upgrades or changes.

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3. DPI Water is to facilitate an information session regarding an assessment of model and aquifer behaviour.
4. Further engagement with informed stakeholders is made regarding the development of the new groundwater model for the region.
5. All models should be peer reviewed with these reviews made public.
6. Expand the scope of review to thoroughly and objectively test the assumptions and rules within this water sharing plan.
7. Establishment of a working group to assess how the plan has met its objectives and how the strategies and performance indicators have been employed and their effectiveness and identify knowledge gaps.
8. The engagement strategy should focus on preparing information for stakeholders to allow for local input into decision making.
9. New infrastructure approvals be allowed on a case by case basis to provide irrigators the flexibility in ensuring efficient water use.
10. The Vision, Objectives and Key Performance Indicators for this plan are reviewed in consultation with stakeholders. These are linked to key sections and clauses within the plan to allow for greater clarity around the reasoning behind rules and conditions.
11. The estimate for average annual recharge is updated and the water resource's extraction limit amended accordingly.
12. Removal of planned environmental water allocations from the water sharing plan and the extraction limit increased to 100% of estimated average annual recharge.
13. Basic Landholder Rights estimated is updated.
14. Share components for aquifer licences should be simplified and outlined as the volumetric amount of 28,858ML shares.
15. The extraction limit should be reviewed following amendments to planned environmental water and improved estimates of average annual recharge.
16. The assessment of performance on compliance of extraction is expanded to a five-year rolling average calculation to account for seasonality in this region.
17. Unlimited carryover is allowed to provide irrigators flexibility and to manage their own business risks.
18. The process for determining Available Water Determinations is more clearly defined within the plan to improve transparency and accountability.
19. The requirement to maintain a trade restricted area is reviewed.
20. The risk assessment for the groundwater source and the plan is updated and the plan rules amended accordingly.

4 General Comments

4.1 Transparency and Availability of Data

The GVIA has welcomed the review of the Water Sharing Plans Lower Gwydir Groundwater Water Source. We have however found it difficult to develop constructive submission due to a lack of information on key components of the plan. These being:

- An assessment of how the plan has achieved its objectives through implementation and monitoring of strategies and key performance indicators;
- Performance reporting on the current and proposed Groundwater Model for the region;
- Monitoring of groundwater quality;
- Environmental outcomes in particular, Groundwater Dependant Ecosystems; and
- Socio economic analysis of the impact of the plan.

The GVIA are aware there have been surveys of irrigator perception and behaviour³, the information from these surveys does not address the environmental or socio-economic key performance indicators of the plan. Previous auditing reports⁴⁵ by the Department were also considered inadequate in assessing the plans performance against many of the stated objectives but rather focused on legislative requirements that NSW are obligated to adhere to.

A major frustration with the conduct of this review has been the lack of information around the performance of the Lower Gwydir Groundwater model and its applicability to represent aquifer behaviour overtime. Stakeholders like ourselves, have been unable to make informed recommendations about the suitability of rules within the plan to meet desired outcomes, as we lack an understanding of the model performance through an analysis of modelled versus actual behaviour and an analysis of assumptions. The GVIA require this information to make an assessment of whether the plan strikes the balance between environmental, industry and community needs. We also believe it is crucial to ensure evidenced based decision making that uses the best available science.

Whilst we appreciate we can (and have done so) access real time and/or logged groundwater level data, this information forms only a component of the information required to make informed decisions.

³ NSW Office of Water, *Monitoring economic and social changes in NSW water sharing plan areas: A comparison of irrigators' survey 2006 and 2010 – covering plans commenced in 2004*. December 2011.

⁴ NSW Office of Water, Report to the Minister on audit of inland alluvial water sharing plans which commenced in 2006, May 2012

⁵ NSW Office of Water, Inland alluvial aquifer water sharing plan audit report cards - Prepared for the period between 1 October 2006 and 30 June 2010, April 2013

The need for more thorough understanding of the model is made more important considering the concerns with the established model and it being considered by some as having “deficiencies” and “not fit for purpose” for future scenario planning and with a low level of certainty⁶. Not to mention the developments in the hydrogeological understanding of the lower Gwydir groundwater aquifers as outlined by the Department⁷ and others⁸ since the Plan has been in place and irrigator usage as well as additional calibration data.

With this in mind, we believe that the review at this point is flawed and that supplementary submissions will be required following the provision of additional data about aquifer and model behaviour. We require this information to make informed recommendations around the appropriateness of the long-term extraction limit and many of the account management rules contained within the plan. The GVIA therefore recommend that additional submission options be made available following the proposed meeting with the DPI Water modelling team.

The GVIA would be interested in at least the following information:

- Summary of changes to conceptual model and updated calibration exercises.
- Analysis of modelled versus actual behaviour of the aquifer.
- Accuracy of the Estimation of Annual Average Recharge or any changes.
- Percentage change of groundwater levels of all bores since plan establishment and a comparison of flood years to low and high groundwater usage years.

The GVIA acknowledges that there are at least two overriding issues or factors that have overshadowed the intent of this review. Those being, the development of a new upgraded model and the implementation of the Murray Darling Basin Plan (see next section) that both have potentially resulted in a lack of transparency around the outputs and assessments of the initial model and its assumptions. These factors are not by any means appropriate reasons for not keeping stakeholders informed and up to date nor are they appropriate for not undertaking a thorough review as expected by water users and their communities.

The GVIA recommend that further engagement with informed stakeholders is made regarding the development of the new model for the region.

We also recommend that appropriate peer reviewing of the model is also undertaken and that any reporting is publicly available. We would welcome the opportunity to scrutinise the model as well.

⁶ Hillier, JR, Timms, W, and Merrick, NP (2010). Peer Review of the Lower Gwydir Numerical Groundwater Model, Heritage Computing Report to the Murray Darling Basin Authority

⁷ Barrett, C (2009). Lower Gwydir Groundwater Source: Groundwater Management Area 004, Groundwater Status Report - 2008, NSW Department of Water and Energy

⁸ Carr, JR, and Kelly, BFJ (2010) Gwydir Catchment Groundwater Hydrographs

Please refer to the following section regarding our recommendations on the scope of the review in light of the Murray Darling Basin Plan.

4.2 Scope of Review

Whilst we acknowledge the legislative requirements of NSW to pursue accreditation of Water Resource Plans to the Murray Darling Basin Plan, we are disappointed that the NSW Government is limiting the scope of this review at the current point in time.

During water sharing plan development, the GVIA and indeed water users and their communities, were promised that the Government would continue to develop the knowledge based around this water source and that all rules and assumptions would be tested through a legislated review between five and definitely at 10-years of implementation. These reviews were promised with the full knowledge that there were technical limitations at the time of preparation and that new information would become available to improve decision making.

The reduced scope of this review fails to meet this commitment and indeed reinforces a loss of faith in the water reform, which has continued to see reductions in productive water and environmental creep erode irrigator capacity and long-term regional economic viability.

We therefore, request that the NSW Government expand the scope of this review to thoroughly and objectively test the assumptions that formed the foundation of this water sharing plan, with a view of improving best available science and potentially challenging the Sustainable Diversion Limit for the region.

4.3 Review Process

Whilst we have welcomed the review, we believe that for a thorough, objective review to occur the NSW Government needed to provide an initial assessment, prior to public submissions, on how the plans have performed against it's objectives⁹, whether the strategies¹⁰ were appropriate (or indeed if they were implemented) and how the plan measured against the performance indicators¹¹. This information must then be provided to all stakeholders, allowing for comment and recommendations moving forward. Without this stakeholders are subsequently required to make assumptions regarding the perceived effectiveness of the plan rather than an objective review of actual outcomes.

For example, a brief assessment by the GVIA highlighted that due to limited information, many of the performance indicators and objectives outlined within the plan have not been measured or reports are not publically available.

We recommend that a working group of informed stakeholders be established to work through this assessment and identify knowledge gaps, prior to stakeholders making

⁹ E.g. Section 11, Water Sharing Plan for the Lower Gwydir Groundwater Source (2006)

¹⁰ E.g. Section 12, Water Sharing Plan for the Lower Gwydir Groundwater Source (2006)

¹¹ E.g. Section 13, Water Sharing Plan for the Lower Gwydir Groundwater Source (2006)

additional submissions on the plan and the NSW Government consider amending their review process for future reviews to maximise input and engagement.

4.4 Engagement

The development of water sharing plans more than ten years ago was a demanding, tiresome task for both the NSW Government and stakeholders. The process was emotionally exhausting for those involved, so much that many do not wish to re-engage with process again.

Although there have been improvements in the transparency of the Water Sharing Plan development process, it remains unclear on how Stakeholder Advisory Panels (SAPs) will operate, whether these will provide stakeholders an appropriate level of engagement and participation in decision making or if they will even operate for groundwater planning.

The GVIA remains concerned that even with the development of SAPs there needs to be a greater emphasis on genuine, local community consultation utilising broad ranging strategies to improve awareness and participation of the plan development and implementation.

The GVIA recommends continual review and improvement on DPI Water's engagement strategy for reviewing and developing new WSP with a focus on preparing information to allow for local input.

4.5 Constraints

The combination of the implementation of the Plan and the embargo on new infrastructure (when it is not being replaced) has resulted in many barriers impeding the maturing of the trade market and efficient resource usage. Some irrigators have found that they are constrained in accessing their resource as their flow rate does not allow for efficient access and are therefore excluded from obtaining further licence, either permanently or temporarily.

Irrigators have strived to be more efficient with their water and the cotton industry alone, has improved its efficiency 40% in the last decade¹² and ¹³ and recent follow-up surveys have outlined that this efficiency is being maintained or improved¹⁴. Yet the restrictions on infrastructure are limiting their scope in ensuring all on-farm efficiencies are minimised. Not to mention that inefficient pumping and storing of groundwater is counterintuitive to ensuring the most valuable use of the highly valuable resource.

¹² Roth, G, Harris, G, Gillies, M, Montgomery, J and Wigginton, D (2013). Water use efficiency and productivity trends in Australian irrigated cotton: a review. *Crop and Pasture Science*, 2013, 64:1033 – 1048.

¹³ Various (2013). *The Australian Cotton Water Story: A decade of Research and Development in the Cotton Industry 2002-2012*.

¹⁴ Montgomery, J, Hughes, R, Bray, S, and Shepard, K (2014). Benchmarking Irrigation Water Use for the Australian Cotton Industry. *Irrigation Australia Conference Proceedings, 2014 Conference*.

Whilst the GVIA recognise the important role that the embargo on new works has had, we recognise that in some circumstances new infrastructure will actually have little to no impact on the aquifer resource but be a positive outcome for the individual. The GVIA therefore recommend that consideration on a case by case basis be allowed to provide irrigators the flexibility in addressing on-farm efficiencies.

5 Department of Primary Industries - Water

5.1 Key Questions

The GVIA is of the understanding that Department of Primary Industries(DPI) Water's review will focus on whether plan rules are appropriate, practical to implement and if there are any ways to improve the plan outcomes. As such DPI Water will assess any issues raised by answering the following key questions:

Improve clarity, practicality and consistency

What changes can be made to:

- Improve clarity and understanding?
- Ensure the plan is practical and efficient to implement?
- Improve consistency with current policies and similar plans?

What changes, additional rules or strategies required to meet the Murray Darling Basin Requirements?

Risk

What changes, additional rules or strategies could be made to manage risks to; the groundwater source; its users; and groundwater dependent cultural values and ecosystems?

5.2 Comments on Clarity, Practicality and Consistency

5.2.1 Vision, Objectives, Strategies and Key Performance Indicators

The GVIA assumes that there will be major template changes to this plan to ensure its consistency with the new format for presenting water sharing plans and indeed what little knowledge planners have about the expectations for a Water Resource Plan.

With this in mind, the GVIA recommends that the Vision, Objectives, Strategies and Key Performance Indicators for this plan are reviewed in consultation with stakeholders to ensure that they are meaningful and measurable over time. We also recommend that these are linked to key sections and clauses within the plan to allow for greater clarity around the reasoning behind rules and conditions. We also recommend the development of a work plan for the NSW Government to ensure that there is ongoing monitoring of the plans performance into the future.

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5.2.2 Recharge Estimation

As previously outlined, the GVIA is aware that there are technical concerns with the current model and that there are planned upgrades to the groundwater model for the region. Following the completion of this new information, peer and stakeholder review/scrutiny, the GVIA recommend that the estimate for average annual recharge to the aquifer is updated and the plan and its extraction limits amended accordingly.

The GVIA notes that the NSW Government did not review this rate or undertake additional recharge studies during the term of the plan, despite this being a legislated option as outlined in the plan. As there is now additional new information, it appears a practical option to request this review formally now.

5.2.3 Environmental Water Provisions

The GVIA are not aware of any high priority Groundwater Dependant Ecosystems or Cultural Heritage Sites within the plan area¹⁵ or monitoring of the provision for these sites as part of plan compliance. We therefore do not consider it appropriate that a volumetric requirement be maintained as part of this plan, over and above the aquifers sustainable yield. Not to mention that an aquifers sustainable yield inherently implies that environmental components are met through balancing recharge and use and maintaining groundwater levels.

The GVIA recommends the removal of planned environmental water, in particular the provision of 15% of the estimated average annual recharge (currently estimated at 5,700ML). We anticipate that any changes to environmental water provisions will result in amendments to the extraction limit of this plan for example, if planned environmental provisions are to be removed, the extraction limit should be considered to be 100% of estimated average annual recharge.

The GVIA believes that this change should be prioritised and made immediately.

The GVIA does not recommend a change to the share components but rather a change in Available Water Determinations as a result of a change in the extraction limit being made.

5.2.4 Basic Landholder Rights

The GVIA anticipates that the NSW Government has improved estimation for Basic Landholder Rights and this figure should be amended accordingly.

5.2.5 Share Components

We recommend that the share components for aquifer licences should be simplified and outlined as the volumetric amount of 28,858ML shares. If additional detail is required on the

¹⁵ The GVIA is aware that there are GDE sites identified as part of the State of the Catchment report in 2010 but that these do not appear to be within the plan area.

process for determining share components as part of the initial plan, this should be provided as an appendix to the Plan.

The GVIA assumes all references to supplementary water access licences will be removed.

5.2.6 Extraction Limit

As outlined earlier, the GVIA recommend that the extraction limit be reviewed in light of changes to the estimate of annual average recharge and the recommended changes to planned environmental water provisions.

5.2.7 Account Management Rules

Since the establishment of the plan, there has been a significant improvement in the understanding of the behaviour of the aquifer and users⁷. It is clear from groundwater monitoring observations that there is a distinct relationship between surface water availability and groundwater use (See table 2) and that this has a corresponding effect on groundwater levels^{7,16 and 17}. This is most profound following a major flood event as in 2011/2012 when groundwater levels show a peak in recovery and groundwater usage is relatively low (see hydrographs for GW030390 and GW020159 for example¹⁷). As a result of natural fluctuations in surface water availability, extraction (use) has been well below allowable limits resulting in a 'credit' of 37,000ML of water that was available to users but not accessed throughout the past ten years.

Table 2: Analysis of Water usage

	Dam %*	Plan Limit	Total Limit + 5%	TOTAL Usage**	3-year average	5-year average	Difference 3 years	Difference 5 years	Overs/unders
2006/07	23	46,230	48,542	39,078	39,078	39,078	9,464	9,464	7,152
2007/08	14	46,230	48,542	50,139	44,608	44,608	3,933	3,933	3,243
2008/09	19	46,230	48,542	34,851	41,356	41,356	7,186	7,186	14,622
2009/10	11	44,238	46,450	41,345	42,112	41,353	4,338	5,097	17,515
2010/11	14	42,246	44,358	32,931	36,376	39,669	7,982	4,689	26,830
2011/12	51	40,254	42,267	23,488	32,588	36,551	9,679	5,716	43,596
2012/13	100	38,276	40,190	28,633	28,351	32,250	11,839	7,940	53,239
2013/14	74	36,284	38,098	45,685	32,602	34,416	5,496	3,682	43,839
2014/15	33	34,292	36,007	41,104	38,474	34,368	- 2,467	1,638	37,026

* Percentage capacity of Copeton Dam as of September

** Total usage including aquifer usage, supplementary water and local utility

¹⁶ NSW Office of Water, General Purpose Water Accounting Reports, 2010-11, 2011-12, 2012-13

¹⁷ NSW Office of Water, Lower Gwydir Groundwater Source Summary Report 2006-2015, May 2015

However the current compliance mechanism for assessing long term extractions utilises limited scope of a three-year rolling average, which doesn't reflect the cyclical nature of the water availability in the Gwydir Valley and historical behaviour. In response, the GVIA recommend that a five-year rolling average is used to assess compliance, which will allow for natural, seasonal variation whilst maintaining access within long term limits.

In addition, the GVIA also recommend that the carryover limit of 3ML per unit share is removed and that unlimited carryover provisions are allowed. The current limits to carryover do not allow for the most efficient use of this resource by forcing irrigators to abstract and store on the surface, rather than continue to store underground until required. Unlimited carryover will also allow irrigators to manage their own business risk, rather than the plan rules influencing business decisions.

Furthermore, as initial risks associated with aquifer integrity have not been realised, this additional constraint does not appear necessary given our improved understanding of the aquifer and its behaviour.

However, to limit sudden draw down or dewatering, which would decimate the industry, we do propose to maintain an annual use limit of 2ML per unit share.

The GVIA believes that these changes should be prioritised and made immediately.

5.2.8 Available Water Determinations

Whilst the plan provides for the legal requirements for the NSW Government to make annual Available Water Determinations (AWD), the decision making process remains unclear. The GVIA believe a range of factors should be considered when making changes to Available Water Determinations these include but are not limited to:

- Total available account water;
- Aquifer status;
- Usage reports, both past and forecasts; and
- Antecedent conditions, in particular surface water availability.

The GVIA recommend that a set of principles including the above mentioned points, be developed to guide the process for determining AWD and that this is either clearly defined within the plan or provided as a guiding note, to improve transparency and accountability. We also recommend that a local committee to include industry, community and relevant Department staff is established to provide recommendations on future AWD according to these principles to the appropriate Minister, acknowledging that the final decision rests with the Minister at the time.

5.2.9 Trade Restricted Zone

In 2008 a trade restricted zone was established between the towns of Moree and Ashley in response to concerns regarding the drawdown of groundwater levels in the region⁷ and in particular the concerns regarding town water supplies.

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However since enforcement there have been a number of localised changes that may warrant the removal of this restriction, most significantly the reduction in total water available for extraction with the removal of supplementary entitlements. As a result, the GVIA recommends that a review of the requirement for this zone is undertaken and consideration given to any new information.

5.3 Comments on Risk

The GVIA believes that the risk assessment for the Lower Gwydir Groundwater plan will be outdated and should be updated. In particular, many of the major risks that resulted in specific rules do not appear to have eventuated and require review.

We recommend that a joint workshop following the finalisation of the groundwater model and any new rules or rule changes, would be appropriate with all risks considered including to the groundwater source, users and other values.

This assessment should consider assessing the major assumptions made during the initial plan development in early 2000, as well as new assumptions as part of this upgraded version, assuming there has been an improvement in knowledge on aquifer behaviour, stability and structure. This is of particular interest where highly conservative rules were established as a precautionary approach but may not still be warranted. For example, a major concern during initial planning was that management rules were required to prevent aquifer compaction. The GVIA are not aware of any compaction issues to date and as many test bores continue to easily fluctuate in response to use and recharge behaviours, suggesting that aquifer integrity remains stable¹⁷. The GVIA as a result questions if this continues to be the major risk and that whether the subsequent rules are appropriate.

Furthermore, the GVIA are of the understanding that there have been technical changes to the conceptual understanding of the Lower Gwydir aquifer overtime⁷ and we now have an additional 10-years of data to utilise in calibration and analysis both of which may deem many initial risks associated with security and stability of the aquifer as outdated.

6 Natural Resources Commission

6.1 Key Questions

The mandate of the Natural Resources Commission (NRC) is to consider the suitability of the plan to meet objectives of the NSW Local Land Services Act (2013). As a result, the NRC prepared the following themes and key questions as a guide or terms of reference for the review.

Productive and resilient water-dependant industries

- To what extent does the water sharing plan contribute to productive and resilient water-dependent industries?

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- How can the productivity and resilience of water dependent industries be improved and made more cost effective?
 - How could the management of water access licences under the plans be improved?
 - Are there opportunities for local communities to manage or contribute to managing the sharing of groundwater more effectively in areas of restricted availability?

Secure long-term water supplies for urban and rural communities

- To what extent does the water sharing plan contribute to security of supply for rural and urban communities?
- How can security of supply for rural and urban communities be improved and made more cost effective?
 - Are there risks to availability of groundwater to towns and rural stock and domestic water users that could be better addressed?
 - Are there salinity risks associated with land or water management that could be better addressed?
 - Are cultural uses and values of water adequately addressed?

Healthy and resilient water dependant ecosystems.

- To what extent does the water sharing plan contribute to the health and resilience of the groundwater source and associated water dependent ecosystems?
- How can the health and resilience of the groundwater source and associated water dependent ecosystems be improved?
 - How could confidence in the extent, nature and water needs of groundwater dependent ecosystems be improved
 - Are there concerns about groundwater pressure, levels and water quality?
 - Are there alternative means for meeting water needs of groundwater dependent ecosystems to that included in the water sharing plans (e.g. through targeted watering using water access licences)?

6.2 Comments on Productive and Resilient Water-dependant Industries

The GVIA and its members are committed to ensuring the future sustainability of our groundwater resource, our livelihoods, the longevity of the industry and our communities depend on this. Whilst we represent the interests of irrigation entitlement holders in the region, we do indirectly represent the communities in which the industry operates and our members live. With this in mind, we believe that consideration must be given to not only the irrigation industries (and the resource) performance since the plans inception but also that of the broader community within the Moree Plains Shire, who are also affected by water reform but often without knowledge, compensation or support. We have therefore, provided a snap

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shot of changes to the social and economic condition of the region, rather than only focussing on the irrigation industry.

We have also provided general commentary on the social and economic outcomes of water reform not only the implementation of the groundwater water sharing plan. Whilst we acknowledge this submission is regarding the groundwater plan, due to the nature of irrigation systems in the region most irrigators maintain a combination of licences and therefore it is difficult to determine impacts from groundwater versus surface water reform.

By clearly defining water access arrangements and resource management rules, Water Sharing Plans provide a framework in which water users can then manage their own individual business risk. However when a plan enforces significant and sudden changes to historical access arrangements and conditions, the certainty provided by the plan must be measured against the immediate and long term impacts to the industry and the community. The implementation of this plan, whilst providing a level of certainty to the industry, has come at a cost; directly to individuals and to the broader community.

Agriculture employs between 20-30% of the population in the Moree Plains Shire Council region and as a result, the region is extremely sensitive to changes in water availability. Between the 2005/06 and 2010/11 census periods, there was an 11% loss in employment coupled with a direct loss in population during the period. There were other more subtle changes with an aggregation of farming size¹⁸ and water entitlement¹⁹. Indicating that during the Water Sharing Plan's implementation period, many were required to consolidate and to buy more land and water to survive. Many borrowed heavily and hence, farm debt is also said to have increased.

The reductions in water access through the removal of groundwater supplementary licences undermined the industries long term sustainability by the overcapitalisation of irrigation assets with developed area underutilised. Overcapitalisation could also explain the increase in farm debt too. Whilst there was gradual decrease overtime, the overall reduction to the current extraction limit, has resulted in a heavier reliance on surface water, which is

¹⁸ Median farm size in the Border Rivers/Gwydir/Namoi region increased from 526 Ha to 970 Ha between 2006 and 2010. NSW Office of Water, *Monitoring economic and social changes in NSW water sharing plan areas: A comparison of irrigators' survey 2006 and 2010 – covering plans commenced in 2004*. December 2011

¹⁹ Median water entitlement owned in the Border Rivers/Gwydir/Namoi region increased from 199 ML to 549 ML between 2006 and 2010. NSW Office of Water, *Monitoring economic and social changes in NSW water sharing plan areas: A comparison of irrigators' survey 2006 and 2010 – covering plans commenced in 2004*. December 2011

significantly less reliable, has greater risk for the individual and appears to have removed groundwater only cotton irrigators from within the region²⁰.

The compensation provided at the time was inadequate at offsetting the overall impact and undervalued the groundwater resource in particular, resulting in financial complications for some. Not to mention that compensation was only available for the entitlement holder and there was little to no structural adjustment provided to the broader community, who had built their businesses around irrigated agricultural production.

An assessment of area of cotton production over time highlights the impact that less water has on a region like Moree. Figure 1 below, shows that it is now evident that both our maximum and our base level, minimum area of production have been reduced as a direct result of water reform. This is also resulting in more volatile production with less recovery time between base level production years. This relationship suggests that the region now has a much smaller opportunity of recovery between known cyclical periods of water availability and directly impacts the local economies ability to recover post a drought.

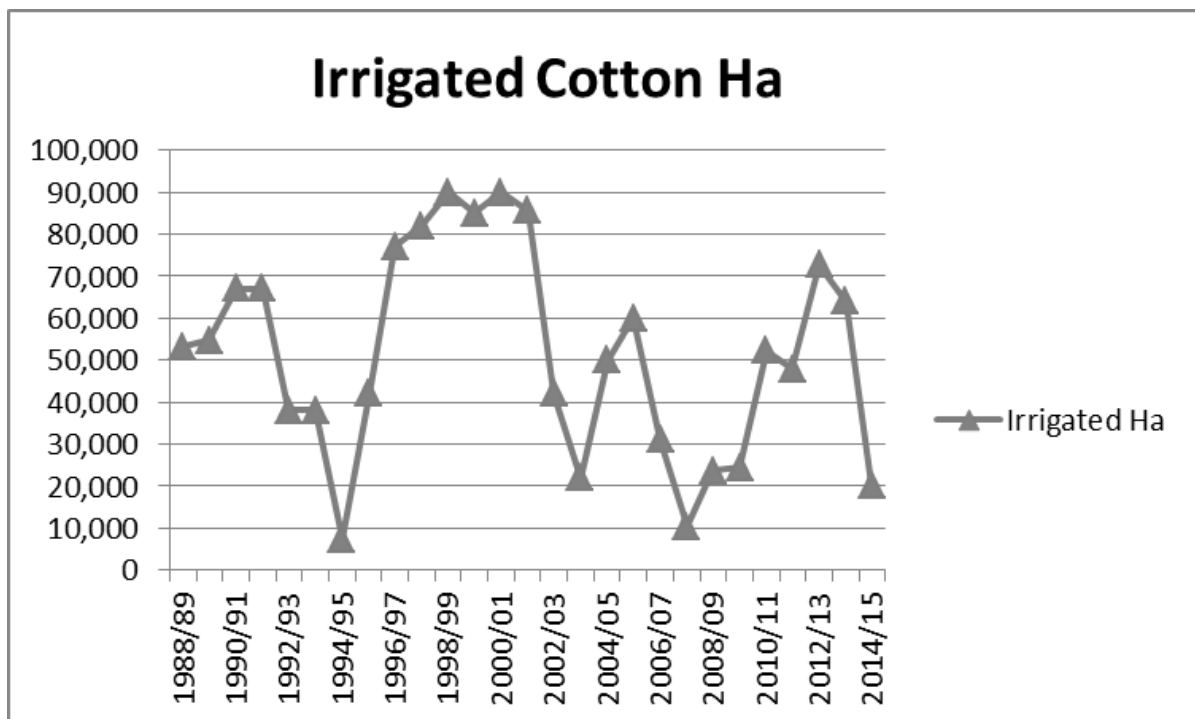


Figure 1: Yearly Analysis of Irrigated Cotton Hectares

The gradual reduction in groundwater availability in the last decade of this time series will have a particular impact on the regions 'base level' of production that is evident in years

²⁰ This outcome was predicted by Michael Young & Associates as part of the initial Social and Economic Assessment of Recommendations for the Gwydir Groundwater Water Sharing Plan in 2002.

were surface water availability is low. For example, historically there could be up to 10,000Ha of cotton grown on groundwater (as in 2007/08) but plantings forecasted for this season are anticipated to be half that area.

But it's important to note that for the majority of the implementation period, the region was in drought with low water availability and therefore, it can be difficult to infer if the changes were drought influenced or policy but most likely a combination of the two.

6.3 Comments of Healthy and Resilient Water Dependant Ecosystems

Due to a lack of monitoring by the NSW Government it is difficult to ascertain how the plan has contributed to healthy and resilient water dependent ecosystems as there is a lack of monitoring information at the appropriate scale. However, there is good quality water level information which if used as a surrogate for overall ecosystem health, indicates that the aquifer remains in a healthy, sustainable state.

The GVIA believes there is compelling evidence provided in groundwater level data to indicate that since the plans implementation, water levels are being maintained at current levels albeit with seasonal variations of drawdown and recovery evident in most monitoring cross sections⁷. This coupled with no evidence of aquifer dewatering, aquifer compaction or water quality concerns, appears to suggest that the plan has stabilised the resource. This is despite access being above the targeted extraction limit with the allowances for supplementary water.

With this in mind, the anticipation of improved knowledge regarding recharge and water use, and the increasing need to balance social, environmental and economic outcomes, the GVIA believes that there is scope to consider increasing groundwater access without long-term detriment to the aquifer. The fact that groundwater levels are not in major decline during the period of supplementary water access reinforces the potential for revisiting access arrangements as part of any plan remake.

7 Conclusion

The GVIA welcomes the opportunity to participate in the review of the Water Sharing Plan for the Lower Gwydir Groundwater Source. Whilst we have been disappointed at the lack of information available to inform this review, we acknowledge the commitment by DPI Water to ensure that there is future discussions and that this is an ongoing process as part of the development of water resource plans.

The GVIA believe we have provided enough evidence within this submission to warrant a remake of this water sharing plan prior to transitioning to a water resource plan. We have as a result provided 19 Recommendations to the NSW Government on areas that requirement amended or further work. A number of these should be actioned as a priority and they include:

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Recommendation 2: DPI Water is to facilitate an information session regarding an assessment of model and aquifer behaviour.

Recommendation 3: Further engagement with informed stakeholders is made regarding the development of the new groundwater model for the region.

Recommendation 11: Removal of planned environmental water allocations from the water sharing plan and the extraction limit increased to 100% of estimated average annual recharge.

Recommendation 15: The assessment of performance on compliance of extraction is expanded to a five-year rolling average calculation to account for seasonality in this region.

Recommendation 16: Unlimited carryover is allowed to provide irrigators flexibility and to manage their own business risks.

The GVIA are committed to working with the NSW Government on developing a new water sharing plan and believe there is great opportunity to provide more balance and therefore, economic stimulus to our region as a result of a closer inspection of this plan.

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