NORTHERN AUSTRALIA IRRIGATION FUTURES: Providing new knowledge, tools and processes to support debate and decision making regarding irrigation in northern Australia

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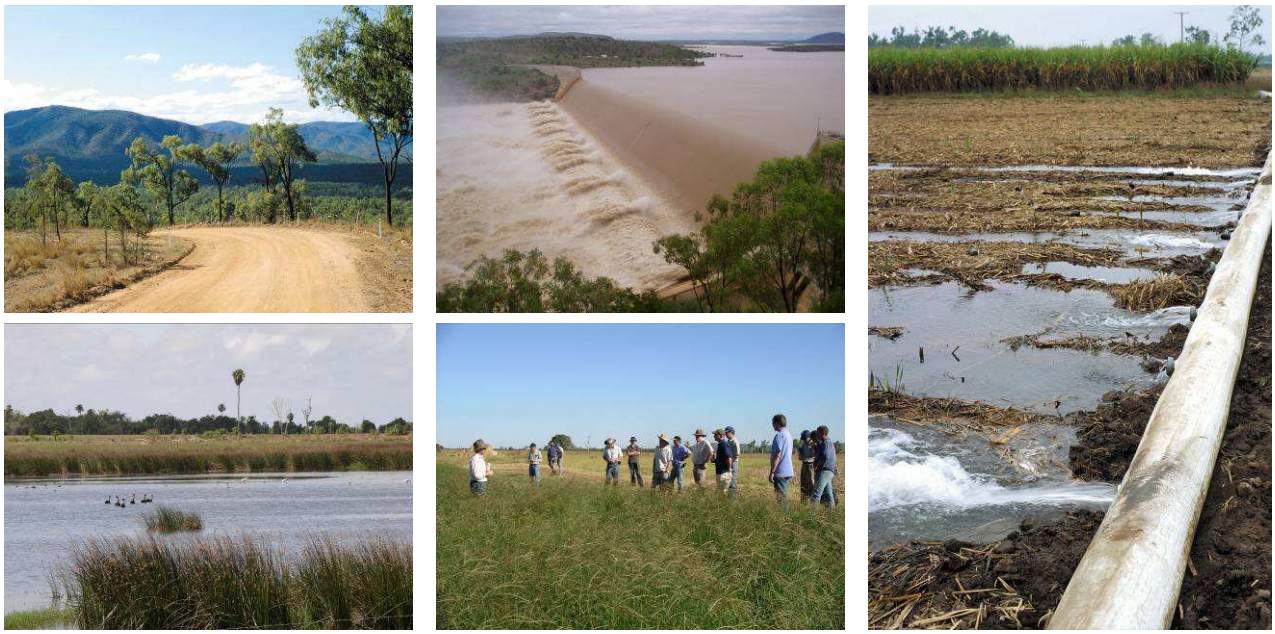

NPSI Project CDS23
Milestone 5 Report – May 2006

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[1] The Project Partners are: CSIRO, Land and Water Australia, National Program for Sustainable Irrigation, CRC for Irrigation Futures, and the Governments of Australia, Queensland, Northern Territory and Western Australia.

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Andrew Kelly – Ord Irrigation Cooperative
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NORTHERN AUSTRALIA IRRIGATION FUTURES

Providing new knowledge, tools and processes to support debate and decision making regarding irrigation in northern Australia

1.0 SUMMARY

Northern Australia holds an iconic status for many Australians. The interplay between the landscapes, rivers and strongly monsoonal weather patterns has resulted in unique and diverse ecological systems that will need special care to retain their integrity. At the same time, with some 70 per cent of Australia's available fresh water discharging from tropical rivers, there are pressures from various quarters to extract some of the water, including for irrigated agriculture. There is, however, widespread recognition that there is an opportunity to learn from previous decisions, including in southern Australia and internationally, where many irrigation systems are now degraded or degrading. No one wants to see that repeated in northern Australia.

Deciding on whether to irrigate in northern Australia, and if so what irrigation should look like, where it should be located, and how it should be managed, requires improved understanding of river and catchment attributes and the risks associated with irrigation. Various studies are underway to improve that understanding and ensure decisions are made with the best information available about the long term implications for tropical catchments.

The NAIF project has been established as a collaborative arrangement between the Australian, QLD, NT and WA governments to provide new knowledge, tools and processes, including an overarching sustainability framework, to support debate and improved decision making on these complex issues in northern Australia. It is expected that the project will also provide new information and tools with which to consider the sustainability of new and existing irrigation in southern Australia.

The project will draw on past experience of irrigation and develop new knowledge of groundwater systems and irrigation mosaics to build understanding of risks associated with irrigation and of the key landscape attributes critical to sustainable irrigation in northern Australia.

The NAIF project comprises of two key phases. Project initiation in 2003 was funded through Land and Water Australia's (LWA) National Program for Sustainable Irrigation (NPSI). Funding was subsequently provided through the CRC for Irrigation Futures (CRC IF) for PhD students to undertake research consistent with the NAIF objectives. In 2005 the QLD, NT, WA and Australian Governments agreed to fund a new position of Sustainability Specialist to provide additional resources to the research. While the initial research under the LWA/NPSI program concludes in mid 2007, further follow-on work is anticipated as the funding agreement for the Sustainability Specialist position extends to October 2008.

The NAIF project is continuing to make solid progress with much of the critical strategic planning and operational processes now in place. Implementation of the Stage 2 Work Plan is generally progressing on track, with some minor changes to deliverables and timeframes required as a result of further refinement of the project. This is to be expected in a research project of this complexity and scale.

The NAIF project is already proving to be a catalyst for further research and other activity related to decisions about irrigation in northern Australia. The development of linkages with other research and the development of a sense of partnership with key stakeholders has been a highlight of recent progress, reflected in an increasing number of requests for NAIF involvement and assistance being received.

While the focus over the past six months has been on developing partnerships and putting in place the necessary project management, project team thinking on the sustainability framework is making good progress. Now that the planning and operational processes are largely in place, the reduced project administration load over the next six months should provide for a significant increase in activity in this area.

This NPSI Milestone 5 Report was endorsed by the NAIF Steering Committee (SC) out of session.

2.0 PROJECT DETAILS

2.1 Project Reference Number: CDS23

2.2 Project Title: Northern Australia Irrigation Futures: Providing new knowledge, tools and processes to support debate and decision making regarding irrigation in northern Australia.

2.3 Contracted Research Organisation: CSIRO Land and Water

2.4 Principal Contact:
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2.5 Project Duration: 01/07/03 – 30/06/07

2.6 Milestone number: 5

2.7 Due date: 15 May 2006.
Note: Change of due date from 1/5/2006 to 15/5/2006 was approved on 2/5/2006.

2.8 Project Objectives (original):

The original project objectives were:

1. To delineate key landscape attributes (including soil & water resources, climate, vegetation, rivers, near shore marine environments, & where appropriate links to people, industries, markets) relevant to sustainable irrigation development across northern Australia

2. To use key landscape attributes to develop sustainability indicators and associated management criteria covering a range of scales (field, farm, district, irrigation scheme, catchment) for northern Australia

3. To develop an overall framework that, through their involvement, is embraced by policy makers, regulators, investors and managers, to ensure irrigation is developed and managed in a consistent and sustainable manner across northern Australia

4. To use a number of linked case studies to support and inform development and enable testing of the framework

5. Through provision of a robust framework, contribute tools and knowledge to support considered debate & long term strategic planning for northern Australia & Australia as a whole.

The SC approved several changes to the project objectives at its meeting on 14/2/06. The revised objectives are provided in full at Section 3.0 to this report.

3.0 ALTERATION TO ORIGINAL OBJECTIVES

The proposed project objectives (with those amended shown in italics), agreed by the NAIF SC on 14/2/06, are:

1. *To delineate key landscape attributes (including soil & water resources, climate, vegetation, rivers, near shore marine environments, & where appropriate links to people, industries, markets) relevant to ecologically sustainable irrigation across northern Australia*

2. To use key landscape attributes to develop sustainability indicators and associated management criteria covering a range of scales (field, farm, district, irrigation scheme, catchment) for northern Australia

3. *To develop an overall framework that, through their involvement, is embraced by policy makers, regulators, investors and managers, to help ensure any irrigation is managed in a consistent, ecologically sustainable manner in northern Australia*

4. *To use a number of linked case studies and stakeholder input to support and inform development and testing of the framework*

5. *Through provision of a robust framework, contribute tools and knowledge to support considered debate, decision making and long term strategic planning for northern Australia & Australia as a whole.*

4.0 MILESTONE DESCRIPTION AND ACHIEVEMENT

4.1 Generic Deliverables

Related Achievement Criteria: "*Generic deliverables achieved"*

Report format
All project reports and communications are available in electronic and hardcopy as specified by LWA.

Photographs
A disk containing photographs depicting project milestones in a digital format suitable for web and PowerPoint presentations will be forwarded to NPSI separate to this report. Discs containing photographs will be forwarded at each Milestone report.

Media
A list of media articles directly relating to the NAIF project is at Attachment 1. There have been no new media articles during this reporting period.

In accordance with the Stakeholder Engagement and Communication (SE&C) Strategy, NAIF media releases require approval of the Communications Management Team,

comprising of the SC Chairman Greg Claydon, Dr Keith Bristow and Jeff Camkin. Where the media release includes potentially sensitive material of a scientific or political nature, SC members will be given the opportunity to comment prior to release.

Knowledge assets
The NAIF project is delivering a range of new knowledge assets. NAIF reports released to date include either new knowledge or interpretations/new perspectives of existing knowledge in the northern Australia context. A table listing knowledge assets generated through the NAIF project is at attachment 2.

Comments on Special Conditions (as required)
Nil.

4.2 Implementation of work plan continues

Related Achievement Criteria: *"Work Plan deliverables achieved (as per Gantt chart): Report on tools to assist individuals & communities to identify control structures and influences relevant to their decisions on irrigation in northern Australia**; and (ii) Recommended approach for finalising and delivering the Sustainability Framework" **.*

The status of all NAIF Stage 2 Work Plan deliverables was provided to the SC as part of the April 2006 Project Status Report and is reproduced at Attachment 3. Of the 36 project activities/deliverables, 10 have been completed, a further 18 are on track of which 6 need revision, 2 are slightly delayed and need revision, 1 is delayed and needs revision, and 5 are delayed but do not need revision.

Recommendations for amendments to the Stage 2 Work Plan were considered by the SC on 12 April 2006. The following changes were endorsed by the SC on 12 April 2006:

- Activity 2.1: change due date to 15/05/06
- Activity 2.2: due date to be advised as input from government staff is received and the project team has a better idea of the effort required to complete the report
- Activity 3.1: change title to "Overview of the hydrology of northern Australia"
- Activity 3.2: change due date to 30/6/06
- Activity 5.1.6: change due date to 15/5/06
- Activity 5.2.1(i): change due date to 15/5/06 and amend title to "Summary of work to date on development of a sustainability framework"
- Activity 5.2.1(ii): change due date to 30/6/06

The SC did not endorse a proposal to combine 5.3.3, 5.4.3, 5.5.3 and 5.6.1 into a single report due to concerns about the potential for loss of detail. The project team will give further consideration to how best to deliver these reports with the resources available to the project.

The status of deliverables due within the Milestone 5 reporting period is provided in Table 1.

Table 1. Status of deliverables due within the current NPSI reporting period.

Activity	Deliverable	Due	Comments
2.1	Guide to northern Australia institutional frameworks	31/12/05 revised to 15/5/06	Draft report provided with Milestone 4 Report. Draft requires further work before forwarding to NT/WA/QLD/Australian Government representatives for review. SC endorsed change to Work Plan with Activity 2.1 and 5.1.6 now being finalised in tandem by 15/5/06.
5.1.6 *	Tools to assist individuals and communities to identify control structures and influences	30/4/06 revised to 15/5/06	SC endorsed change to Work Plan with Activity 2.1 and 5.1.6 now being finalised in tandem by 15/5/06. Draft report at Attachment 4.
5.2.1(i)	Journal paper: A sustainability framework for designing and evaluating irrigation planning processes: an approach for northern Australian communities	31/3/06 revised to 30/6/06	Further project analysis identified the need for a report summarising work to date for the development of the SF. The draft report is currently under review within the project team. SC endorsed change to Work Plan and for paper to be available by 30/6/06.
5.2.1(ii) *	Paper to SC: recommended approach for finalising and delivering the sustainability framework	31/3/06 revised to 30/6/06	This report will build on 5.2.1(i). While the project team's thinking on development of the sustainability framework has progressed significantly through involvement in a wide range of NAIF related activities, further time and discussion is required to consolidate ideas and prepare this paper. SC endorsed change to Work Plan and for paper to be available by 30/6/06.
5.3.1(i)	Operational agreement between NAIF & NT re case study	31/3/06	The NT Case Study Work Plan has been agreed with the NT key contact and is currently with NRETA staff for final comments. The latest draft is at Attachment 5.
5.3.1(ii)	NT case study stakeholder engagement strategy	31/3/06	Incorporated into 5.3.1(i), above.
5.4.1(i)	Operational agreement between NAIF & WA re case study	31/3/06	New WA water governance arrangements have slowed progress. Preferred case study site (Ord) confirmed on 11/4/06. Preparation of case study currently with WA Dept. of Water officer for initial thoughts. Timetable to be revised.
5.4.1(ii)	WA case study stakeholder engagement strategy	31/3/06	Will be incorporated into 5.4.1(i), above.
5.5.1(i)	Operational agreement between NAIF & QLD re case study	31/3/06	QLD Case Study Work Plan agreed with QLD key contact and noted by SC on 12 April. Copy at Attachment 6.
5.5.1(ii)	QLD case study stakeholder engagement strategy	31/3/06	Incorporated into 5.5.1(i), above.

Institutional Frameworks
Activities 2.1 and 5.1.6 require further work to pick up recent changes to institutional water frameworks in northern Australia prior to SC review. A draft of deliverable 2.1 was provided with Milestone 4 Report and a draft of 5.1.6 is provided as attachment 4 to this report. It should be possible to forward both reports to SC members by 15 June 2006 for review.

Case Studies
The QLD (Lower Burdekin) Case Study Work Plan has been agreed with QLD and noted by the NAIF SC. The draft NT (Daly) Case Study Work Plan has been agreed with the NT key contact and final comments from staff at the NT Department of Natural Resources, Environment and the Arts are currently being sought. Resolution of the case study location and activities for WA was delayed due to the reorganisation of water governance in the state and a change in personnel at senior levels. WA was now identified the preferred case study site (Ord) and acceleration is anticipated.

Sustainability Framework
Further project analysis identified the need for a report summarising work to date for the development of the sustainability framework. A draft paper is currently under review within the project team. While the project team's thinking on development of the sustainability framework has progressed significantly through involvement in a wide range of NAIF related activities, further time and discussion is required to consolidate ideas and prepare recommendations on how to finalise development of the framework. Recommendations to the SC will be included in a report on the sustainability framework to be prepared by 30/6/06.

4.3 Implementation of Stakeholder Engagement and Communication Strategy continues

Related Achievement Criteria: *"Report against SE&C Strategy including: (i) evidence of NAIF taking a proactive approach to identify key audiences and issues and strategies to address them***; and (ii) and feedback from SRG.*****

The SE&C Strategy was forwarded to the SC on 10/3/06 after final revision and is now being implemented. The vast majority of actions required under the SE&C Strategy during this reporting period have been completed. Following are some of the highlights.

There have been over 60 individual contacts with members of the Stakeholder Reference Group (SRG), including 45 during the Milestone 5 reporting period. The NAIF Stage 2 Work Plan, SE&C Strategy and Monitoring and Evaluation (M&E) Plan were forwarded to all SRG members for comment on 13/3/06.

The first NAIFNEWS was circulated to the NAIF Stakeholder Network, which now stands at 244 individuals, on 28/3/06 with 3 responses.

62 workshops, seminars and meetings with more than 1,000 participants have been facilitated by or featured NAIF, including 22 totalling 345 participants during the Milestone 5 reporting period. Further details are provided at Attachment 7.

2 NAIF technical reports and 1 journal paper have been published to date. There have been 25 NAIF presentations, 2 radio interviews and 1 TV interview to date. Further details are provided at Attachment 7.

Of the 16 SE&C Strategy activities specifically required in the current reporting period 12 have been fully completed, a further 2 are awaiting feedback from NAIF key contacts and 2 are yet to commence. The status of all activities required under the SE&C Strategy during the current NPSI reporting period is provided in Table 2.

Table 2. Activities required under the SE&C Strategy during the Milestone 5 reporting period.

Action	**Timeframe**	**Comments**
SC meetings	At least quarterly	SC meetings held 14/2/06 and 19/4/06.
Review SC membership and any proposed changes to SC agreed	14/2/06	Discussed at SC meeting on 14/2/06 and amendments to SC TOR agreed with SC on 19/4/06.
Standard Q&As available for use by all SC members	14/2/06	Provided to all SC members as attachment to SE&C Strategy on 10/3/06
Summary of NAIF project as PowerPoint available for use by all SC members	31/3/06	Not yet completed
Project Status Reports and NPSI Milestone Reports to SC	1/4/06	Project Status Report provided to SC and discussed on 19/4/06. Draft Milestone 5 Report provided to SC on 5/5/06 for comment.
*****NAIF to Chair NT research collaboration tele-meetings (NAIF, TRIAP, CDU, NRETA)	Bi-monthly	Meetings chaired on 2/2/06, 7/4/06 & 4/5/06
Review SRG membership	28/2/06	Membership reviewed in December 2006. Gaps in environmental and local government representation identified.
Encourage unrepresented sectors to join SRG	Ongoing	Unrepresented sectors are being addressed through discussions with NAEA and through advertisement in NAIFNEWS respectively.
*****Meet with NAEA to address and resolve any misunderstandings about the NAIF project	30/4/06	Meeting held 20/4/06 facilitated by Dr John Williams. Discussions ongoing.
Finalise stakeholder engagement and communication strategy for QLD case study	31/3/06	Incorporated into QLD Case Study Work Plan agreed with QLD and noted by SC on 19/4/06.
Finalise stakeholder engagement and communication strategy for NT case study	31/3/06	Incorporated into NT Case Study Work Plan agreed with the NT key contact on 8/5/06. Currently with NRETA staff for final comments.
Finalise stakeholder engagement and communication strategy for WA case study	31/3/06	To be incorporated into WA Case Study Work Plan. New WA water governance arrangements have slowed progress. Preferred case study site (Ord) confirmed on 11/4/06 and noted by SC on 19/4/06. Preparation of case study currently with WA Dept. of Water officer for initial

		thoughts. Timetable to be revised.
Distribute NAIF project newsletter to stakeholder network	Quarterly	Issue #1 of NAIFNEWS forwarded to 244 individuals on the NAIF Stakeholder Network on 28/3/06.
FAQs provided to SC and project team	31/3/06	Provided to all SC members as attachment to SE&C Strategy on 10/3/06
Communication protocols and key messages approved by SC	31/3/06	Incorporated into SE&C Strategy forwarded to SC members on 10/3/06 and now operational
Media releases linked to key project milestones	Every 6 months	The most recent NAIF media release was issued on 17/10/05.

Evidence of NAIF taking a proactive approach to identify key audiences and issues and strategies to address them

The identification of key audiences and their issues, and the development of strategies to address them are critical to the desired NAIF outcomes. Highlights that demonstrate progress in this area include:

Policy makers are aware of NAIF

There is high level of awareness of the NAIF project within relevant WA, NT, QLD and Australian Government agencies. In each case, senior members of the key agencies are the Government representative on the SC.

There is a high level of awareness of the NAIF project within the National Water Commission (NWC). A meeting of the NWC and a sub-committee of the NAIF SC was initiated following the project team's involvement in the NWC workshop on the Water Smart Australia irrigation round in Canberra on 29-30 March 2006. The meeting was attended by 15 members of the NWC, including the Chairman/CEO Ken Mathews. The NAIF project was represented by QLD (Peter Gilbey), NT (Ian Smith), NPSI (Murray Chapman), Dr Keith Bristow and Jeff Camkin, SC Chairman (Greg Claydon) and WA (John Loney) were unable to attend but spoke with Ken Mathews by phone to reinforce their support for the project and the benefits of the building alliances in northern Australia.

There is some awareness at the political level (Malcolm Turnbull). Awareness of the NAIF project will continue to expand within Government, including at Ministerial level, as C&SE Strategy activities are progressively rolled out.

Other stakeholders are aware of NAIF

The Stakeholder Reference Group (SRG) is operational with increasing levels of engagement. There have been more than 60 individual contacts with members, including more than 45 during the Milestone 5 reporting period. While the SRG members bring important knowledge and skills, the group does not yet cover all key stakeholders. Additional strategies are being implemented to fill those areas not covered, including a meeting with the Northern Australia Environment Alliance and advertising for a local government representative on the SRG through NAIFNEWS. NAIF has facilitated or featured in over 60 meetings, workshops etc attended by over 1,000 people.

The North Queensland Local Government Association requested the Principal Investigator present on the NAIF project at a major forum of mayors and councillors on 5 May 2006.

Several local government authorities have initiated follow up actions with the NAIF team.

Increasing collaboration
There are a rapidly increasing number of requests for NAIF involvement and assistance in northern Australia. The NAIF project is already proving to be a catalyst for further research and other activity related to decisions about irrigation in northern Australia and several organisations have approached the NAIF team to discuss opportunities for NAIF involvement in achieving sustainable irrigation.

NT Research Collaboration Tele-Meetings
NAIF continues to chair monthly tele-meetings of the NT Department of Natural Resources, Environment and the Arts, Charles Darwin University, Environmental Research Institute of the Supervising Scientist and NAIF to assist collaboration between the researchers operating in the Northern Territory relevant to the NAIF project. This forum is assisting the transfer of knowledge, sharing information on upcoming activities and the integration of various programs. For example, NAIF and TRIAP researchers are aligning stakeholder activities in the Daly River catchment to minimise disruption to stakeholders and share outputs.

Northern Australia Environment Alliance
Previous correspondence from Dr Stuart Blanch (WWF) on behalf of the Northern Australia Environment Alliance (NAEA) outlined concerns with the NAIF project. After several written communications and telephone conversations many of the issues had been resolved. However, several important issues remained and a meeting of NAIF and NAEA representatives was convened to discuss these on 20/4/06. The meeting was facilitated by Dr John Williams. At the time of preparation of this Report the minutes of the meeting were not yet available. However, key messages and outcomes from the meeting were:

- An awareness that the parties had a lot in common in terms of experience and a strong desire to see the land, rivers, groundwater, wetlands and estuaries of northern Australia managed in a sustainable manner
- Changes to the NAIF project goal and objectives have reduced some of the original concerns
- NAEA members have very useful perspectives, knowledge and expertise to contribute to the development of the sustainability framework
- There is a need to strengthen the link between the sustainability framework and the statutory planning frameworks of the jurisdictions
- There is a need to capture information about why some irrigation developments did not proceed as well as about those that did
- Copies of documents provided to the SRG (Work Plan, SE&C Strategy, M&E Plan) would be provided to the NAEA participants
- Effective means for the views and knowledge of the conservation organisations to be made available to NAIF would be investigated further. Membership of the SRG would be considered further by the NAEA as one option
- NAEA participants were advised that NAIF was encouraging the 2006 RiverSymposium program coordinator to establish a feature session on northern Australia, including an opportunity for NAEA involvement.

At the end of the meeting it was clear that some of the issues had been resolved prior to the meeting, some additional issues were resolved during the meeting and some issues remain. Participants agreed to continue to seek to resolve the outstanding issues.

RiverSymposium 2006
NAIF instigated a meeting with the 2006 RiverSymposium program convenor which has resulted in an additional feature session on northern Australia at the Symposium. NAIF has been guiding the program convenor on possible presenters and the program is likely to include NAIF, Tropical Rivers Program, Charles Darwin University, NAEA and the University Of Brasilia, Brazil.

Dr Henrique Chaves is a specialist in water resource management and the use of sustainability indices at the catchment level. He is also the Brazilian coordinator of UNESCO's Hydrology, Environment, Life and Policy (HELP) program. NAIF has initiated Dr Chaves' involvement in RiverSymposium and will facilitate a series of activities in WA, NT, QLD and NSW linked to Dr Chaves' visit, in conjunction with the CRC IF and the UNESCO HELP program. The activities are now built into the NAIF case studies.

Australian National Committee on Irrigation and Drainage Conference 2006
The NAIF team continues to assist and influence the development of the 2006 ANCID conference in Darwin to establish complementarity with NAIF where appropriate. Activities are likely to include a joint SC/SRG meeting.

National Water Commission, National Water Initiative & Australian Government Water Fund
The NWC has issued a specific irrigation call under the $1.6bn Water Smart Australia (WSA) program. The NWC held a workshop in Canberra on 29-30 March to explain the guidelines for the program and to provide an opportunity for the approximately 180 participants to test and refine project ideas. NAIF was asked to provide input into the guidelines which now refer to the NAIF project and, in particular, the work on irrigation mosaics in northern Australia.

Break-out sessions were held in which participants tested their ideas with other participants and NWC staff, and looked for synergies between projects and for potential joint projects. In recognition of the role NAIF is playing in developing new knowledge, tools and processes in northern Australia, and in encouraging collaboration across northern Australia, NAIF was asked to facilitate discussions on project ideas by the northern Australia group of over 20 attendees. The group included stakeholders from across northern Australia, including from each of the NAIF case study areas, as well as the NWC and several government agencies.

Key messages form NWC workshop and break-out sessions of relevance to NAIF were:

- The NWC focus on a systems approach is also central to NAIF.
- The NWC is interested in investing in problem avoidance as well as recovery.
- The NWC expects industry to be strategic about how it approaches WSA.
- NAIF meets many of the key requirements of the NWC in relation to WSA program: systems approach, partnerships, groundwater, investment in problem avoidance, strategic approach, TBL focus, stakeholder engagement etc. However, funding will be focused on investment in infrastructure and improved WRM. Research is likely to be funded only where it underpins on ground activity.
- The NWC will give further consideration to options for progressing the sustainable use and measurement of groundwater.
- The northern Australia break-out group had 16 project ideas which roughly fell into the following categories:
    - Aboriginal economic development on freehold and native title lands

    - New infrastructure to optimise the use of existing infrastructure
    - Improved WRM through monitoring, measurement and on-farm efficiency
    - Holistic, systems approach to managing irrigation catchments including governance arrangements
    - Linking effluent/wastewater reuse to new industry development opportunities.
- Participants in the northern Australia group clearly want a strategic, systems approach to sustainable irrigation in the north and are looking for leadership to emerge to achieve this. This appears to be a major opportunity for NAIF, which was recognised by the participants.

Project proposals seeking funding under the WSA program are now being prepared and NAIF has been contacted by several parties seeking advice on their proposals and also with a view to possibly being part of some proposals.

The $200m Raising National Water Standards (RNWS) program will be directed at high priority activities in three strategic investment areas identified by the NWC:

- Implementing the National Water Initiative
- Improving integrated water management across Australia
- Improving knowledge and understanding of Australia's water resources.

Consideration needs to be given to how the alliance of northern jurisdictions, stakeholders and partners that is developing through NAIF can support implementation of the National Water Initiative in northern Australia, including through the WSA and RNWS programs. For this reason NAIF instigated a meeting of a sub-committee of the NAIF SC and NWC staff on 12/5/06 to begin discussions on this issue. This is addressed further under Section 9.0 to this report.

Lower Burdekin
The NAIF team has provided assistance in the Trent Road and Mona Park areas in the Burdekin through the provision of science support for the resolution of significant conflicts between irrigation and other land and water uses.

Feedback from the NAIF Stakeholder Reference Group
Following the request for Expressions of Interest all nine people who expressed an interest were appointed to the SRG. The SC also agreed that membership of the SRG should remain open with sectors not covered encouraged to join, subject to SC endorsement. While the EOI process was not successful in attracting membership from all key stakeholder groups, subsequent analysis of the SRG members' background and personal conversations with them indicate that they each have useful knowledge, background and skills to contribute to the project (Attachment 8).

The SE&C Strategy reflects the view of the project team and SC by highlighting the importance of the NAIF SRG as a key mechanism to engage with project stakeholders. Strategies to address membership of the SRG are included in the SE&C Strategy and action against these is reported in 4.3, above.

Given the dispersed nature of the SRG (3 from each of NT and WA, 2 from QLD and 1 from NSW) and the funding available to the project, the SRG will not meet as a group very often, particularly in person. Although there will be some group activities (including a proposed

joint SRG and SC meeting in Darwin in October 2005, coinciding with the ANCID conference), the main way SRG members will contribute to the project will be through direct interactions with the project team. Relevant issues and opportunities raised through the SRG will be brought to the attention of the SC by the Sustainability Specialist, who has responsibility for managing the SRG process. Accordingly, the SRG Terms of Reference were amended by the SC on 14/2/06 to remove the role of the SRG Chairman as a member of the SC.

The SRG is now operational and was reported in Issue #1 of the NAIFNEWS. There have now been more than 60 individual contacts with members, including more than 45 during the Milestone 5 reporting period. Members that have been most active in liaising with the NAIF project team are those developing project proposals for consideration under the Australian Government's Water Smart Australia program irrigation call.

A clear set of consistent messages have not yet emerged from the discussions with SRG members who are still building their understanding of the project. Nevertheless, some of the messages emerging from one or more of the members in response to the NAIF Work Plan include:

- All members have been positive about the NAIF project and its intent, and enthusiastic about their involvement
- NAIF is having an impact in improving collaboration and focus on northern Australia.
- Maximising beneficial links should be a key component of NAIF
- It would be useful to have a process to enable public submissions to the project
- How irrigation mosaics will affect ecological systems and wildlife at the landscape scale is a key issue. What kind of monitoring will be put in place to measure the dynamics of the effect of these irrigation projects on migratory species?
- Ecological/agricultural spatial/temporal mapping and ground-truthing of the impacts of these irrigation schemes on wildlife and changes in ecological structures should be a component of monitoring programs.
- Environmental conservation groups need to be members of the SRG
- Clearly past developments are now proving to be unsustainable. The focus should be on how we can change existing developments to perhaps turn them towards sustainability rather than how we can develop new areas and see whether we get it right next time. The focus should be on whether to develop rather than how we can compromise remaining relatively pristine areas.
- Cannot see where there is work to develop an understanding of the ecological needs of native florae and fauna or how changing the natural hydrology will affect those communities.

The NAIF project team is currently considering these and other messages from the feedback from SRG members and will develop recommendations for SC consideration.

4.4 At least one Steering Committee meeting held

Related Achievement Criteria: *"SC meeting held with Work Plan confirmed or modified, if required. SC endorses Milestone 5 Report.*

SC meetings continue to be held on an as needs basis to address agreed priorities. The full list of SC meetings since project inception is at Attachment 9. All SC meetings are minuted and these have been provided to NPSI.

The SC met on two occasions during the Milestone 5 reporting period. The SC met in person on 14/2/06 at the CSIRO Davies Laboratory in Townsville followed by a stakeholder event and field trip. The key outcomes of the meeting were endorsement of the Milestone 4 Report, fine tuning of the project goal and refinement of the project objectives.

Following is an excerpt from Issue #1 of the NAIFNEWS.

> *"The SC meeting was followed by a Stakeholder Event at which a good crowd of 40 heard challenging presentations from the Great Barrier Reef Marine Park Authority, the Environmental Protection Agency and a local canegrower. A lively discussion ensured that a wide range of views were put from presenters and the audience.*
>
> *The following day provided the SC and project team an opportunity to visit the lower Burdekin. This provided a chance to hear about irrigation and water management first hand from a range of stakeholders, including representatives from the North and South Burdekin Water Boards, Sunwater, BSES, the Department of Natural Resources Mines and Water, Mulgowie Farming Operations and CSIRO.*
>
> *According to Greg Claydon, Chairman of the NAIF SC, the site visit was invaluable. A key focus of the NAIF project is to capture lessons from existing irrigation areas and to develop a clear understanding of what those lessons mean for the future of irrigation in northern Australia. As an existing developed irrigation area, the lower Burdekin is a fertile ground for learning from the past and the present. We greatly appreciate the assistance of everyone we met in helping us understand the area, its challenges and its opportunities".*

The SC met by tele-conference on 19/4/06. The key outcomes of the meeting were support for several modifications to the Stage 2 Work Plan, agreement to establish a sub-committee to meet with the NWC and approval of amendments to the SC TOR.

The draft Milestone 5 Report was forwarded to the SC on 5/5/06 for endorsement.

The next SC meeting will be a tele-link during July 2006 and the next face-to-face meeting will be in Darwin during October to coincide with the 2006 Australian Committee on Irrigation and Drainage (ANCID) Conference.

4.5 Milestone report submitted

Related Achievement Criteria: *"Milestone report approved by Land & Water Australia."*

This Milestone 5 Report was submitted to the NPSI Coordinator on 15/5/06.

5.0 VARIATIONS REQUIRED TO FUTURE MILESTONES

No variations to future milestones are proposed. The revised Deliverables and Achievement Criteria provide for minor modifications to the Work Plan required from time to time. In accordance with the M&E Plan, changes to the project approved by the SC will be reflected in updates to the Work Plan.

6.0 FINANCIAL ISSUES

Commitments for cash contributions to the NAIF project from the QLD, NT, WA and Australian Governments increased significantly in accordance with their agreement to fund the establishment and operation of a new position of Sustainability Specialist for the period 17/10/05 to 16/10/08. These contributions are $65,000 p.a. from QLD and WA, $50,000 p.a. from NT and $20,000 p.a. from the Department of Agriculture, Fisheries and Forestry (DAFF), all excluding GST.

The Deed of Grant between CSIRO and the Department of Agriculture, Fisheries and Forestry has been signed and invoiced for the first of three annual payments. The payment is currently being processed.

A single Funding Agreement between CSIRO, the State of Queensland (represented by the Department of Natural Resources, Mines and Water), the State of Western Australia (represented by the Department of the Premier and Cabinet) and the Northern Territory (represented by the Department of Natural Resources, Environment and the Arts) has been prepared. The contract and the invoices for the first annual payments are currently being processed.

7.0 HUMAN RESOURCE ISSUES

NAIF has not yet been able to attract a full complement of sufficiently qualified PhD students to the team due to the high level of competition for students from Universities and other research organisations. The ability of PhD students appointed now to contribute directly to the CDS23 project before completion at the end of July 2007 is probably limited. However, PhD students are expected to be able to make a significant contribution to NAIF activities beyond the CDS23 project. Attracting PhD students to carry out post CDS23 work will require greater certainty about future resourcing for PhD students than currently exists.

Additional effort is underway, in consultation with the CRC IF, to advertise for and secure additional students. This will aim to attract students in the areas of hydrogeology and surface groundwater interactions in tropical groundwater systems, geochemistry of tropical groundwater systems, and decision-making in irrigation developments.

8.0 COMMUNICATION ACHIEVEMENTS

A range of communication activities have taken place in accordance with the SE&C Strategy and these are reported in Section 4.3 to this Report. Key communication achievements during to date include:

- There have been over 60 individual contacts with members of the SRG, including 45 during the Milestone 5 reporting period.
- The first NAIFNEWS was circulated to the NAIF Stakeholder Network, which now stands at 244 individuals.
- 62 workshops, seminars and meetings with more than 1,000 participants have been facilitated by or featured NAIF, including 22 totalling 345 participants during the Milestone 5 reporting period.
- 2 NAIF technical reports and 1 journal paper have been published to date. There have been 25 NAIF presentations, 2 radio interviews and 1 TV interview to date.
- Of the 16 SE&C Strategy activities specifically required in the current reporting period 12 have been fully completed, a further 2 are awaiting feedback from NAIF key contacts and 2 are yet to commence.

A list of all NAIF publications and significant workshops and meetings facilitated by or involving NAIF are at Attachment 7. A list of all NAIF publications is available at http://www.clw.csiro.au/naif/publications.html.

Reports on the following subjects are currently in preparation. The report titles and the number of reports may change as the project progresses.

- A guide to northern Australia's institutional water frameworks
- A hotlink directory to northern Australia's institutional water frameworks
- An overview of irrigation across northern Australia
- Comparisons and lessons from the Daly, Ord and Burdekin irrigation systems
- An overview of the hydrology of northern Australia
- Review of the current understanding of irrigation mosaics
- Research findings, modelling results and applications for irrigation mosaics in northern Australia.

9.0 OTHER COMMENTS

The NAIF project comprises of two key phases. Project initiation in 2003 was funded through the NPSI. Funding was subsequently provided through the CRC IF for PhD students to undertake research consistent with the NAIF objectives. In 2005 the QLD, NT, WA and Australian Governments agreed to fund a new position of Sustainability Specialist to provide additional resources to the research. While the initial research under the LWA/NPSI program concludes in mid 2007, further follow-on work is anticipated as the funding agreement for the Sustainability Specialist position extends to October 2008.

Commitment to funding the position to October 2008, well beyond the completion of NPSI Project CDS23, is clear recognition of the expectation that there will be ongoing work under the NAIF umbrella. Furthermore, the SC has consistently recognised that the success of the

NAIF project will, to a considerable extent, be judged by what further activity it creates beyond the completion of the initial NPSI project.

The NAIF project is already proving to be a catalyst for further research and other activity related to decisions about irrigation in northern Australia. Several organisations have approached the NAIF team to discuss opportunities for NAIF involvement in achieving sustainable irrigation in northern Australia. Furthermore, the ability of the NAIF project to achieve collaboration across northern Australia is being recognised, as demonstrated by a request from the NWC to facilitate a northern Australia group at the recent workshop on the call for irrigation projects under the Water Smart Australia program. The rapidly increasing challenge for NAIF is to service these requests, which will inevitably lead to post CDS23 activity and therefore meet the expectations of the SC and government funders, while successfully completing the CDS23 deliverables.

In short, the opportunities being generated through the NAIF project are likely to rapidly outstrip the current capacity to meet the dual objectives of delivering the CDS23 project AND generate ongoing activity beyond 31 July 2007. It is, however, not possible to await completion of CDS23 without effort now on the partnerships that will ensure that the benefits of the developing alliances extend beyond 31 July 2007.

This matter was discussed with the NAIF SC on 19/4/06. The SC endorsed the project team's recommendation to establish a sub-committee to meet with the NWC. The purpose of the meeting was to help inform the NWC and its staff about the NAIF project and about the developing alliance between the northern jurisdictions, the Australian Government and other project partners and stakeholders.

The key questions were:

How can that developing alliance be utilized to support the NWC in its roles of driving the national water reform agenda, advising the Prime Minister and State/Territory Governments on water issues, and managing the implementation of the NWI, including the WSA and RNWS programs? and

How can that alliance be utilized to support the northern jurisdictions, individually and collectively, in their implementation of the NWI?

The meeting identified that there are a number of points of intersection of NAIF and the NWC with respect to water management. These include: improving Australian/State/Territory cooperation; improving State/State Cooperation; helping to ensure that water decisions are based on data, evidence, research and good planning; and not just being consistent with but advancing the National Water Initiative.

Representations made by WA and QLD Governments, together with attendance and comments made by NT and QLD government representatives at the meeting indicate strong recognition that the NAIF project is working well and has the capacity to make a major contribution.

It was agreed that further consideration would be given to the linkages between the NAIF project and the NWC with a view to holding a second meeting in late June to progress the opportunities.

10.0 LIST OF ATTACHMENTS

The following are provided as attachments to this report:

NUMBER	DESCRIPTION
Attachment 1	Media articles relating to NAIF
Attachment 2	Knowledge assets
Attachment 3	Status of Stage 2 Work Plan deliverables
Attachment 4	Draft hotlink directory to northern Australia's water and irrigation management"
Attachment 5	Draft NT Case Study Work Plan
Attachment 6	QLD Case Study Work Plan
Attachment 7	List of all publications, presentations, workshops, seminars & meetings facilitated by or featuring NAIF
Attachment 8	Analysis of membership of the NAIF SRG
Attachment 9	NAIF Steering Committee meeting dates
Attachment 10	Presentation to NWC on 12 May 2006

ATTACHMENT 1

LIST OF MEDIA ITEMS RELATING TO THE NAIF PROJECT *

DATE	SOURCE	HEADLINE
2005		
29 October	Canberra Times	CSIRO 'bled to death'; 780 jobs under review.
2004		
2003		
19 November	ABC News	Daly should be considered for irrigation, Minister says. 179 words.
19 November	Herald & Weekly Times	Time our northern potential flowed. 786 words.
24 October	ABC News	Group slams govt funding for Kimberley river study. 152 words.
23 October	West Australian	New Fitzroy water project. 468 words.
23 October	ABC News	Research project gets mixed support. 225 words.
22 October	ABC News	Group supports plan for Burdekin irrigation. 189 words.
22 October	Ayr Advocate	Burdekin's bounty Study offers 'tremendous opportunity' Plan to 'bring industry to the water'. 403 words.
21 October	Geelong Advertiser	Move north for water: Truss. 146 words.
21 October	ABC News	Concerns raised over northern irrigation plan. 204 words.
21 October	ABC News	Environmentalists dismiss northern irrigation plans. 203 words.
21 October	Adelaide Advertiser	Farming looks north. 96 words.
21 October	Townsville Bulletin	Tor strikes a cord. 1,382 words.
21 October	Townsville Bulletin	Push to water North Study will expand on Burdekin's potential. 391 words.
21 October	The Australian	Tropical irrigation warning. 317 words.
21 October	Sunday Territorian	Water plan for north. 339 words.
21 October	Sydney Morning Herald	Irrigation Study To Look North. 568 words.
21 October	AAP General News	Irrigators may be encouraged to move to Australia's north. 473 words.
20 October	The Australian	Tropical solution for farm irrigation. 371 words.
20 October	The West Australian	Fitzroy water irrigation plan. 463 words.
20 October	ABC News	Study to consider Fitzroy River farming water. 136 words.
20 October	ABC News	Study to look at boost to irrigation farming from rivers. 181 words.
20 October	The Courier-Mail	Scheme to untap northern riches. 460 words.

***** List is currently incomplete.

ATTACHMENT 2

KNOWLEDGE ASSETS

Following are a collection of knowledge assets from the NAIF project. They fall into two key categories: knowledge assets as outputs of the project and knowledge assets that form inputs to considerations within the project.

KNOWLEDGE ASSET & COMMENTS	SOURCE
Adapting water and irrigation planning and management: opportunities for frontier communities in northern Australia	Kellett, Bart M; Beilin, Ruth; Bristow, Keith L; Camkin, Jeff; Moore, Graham (Draft - 2006)
Making decision processes more fair and transparent is important. Getting processes 'right' reduces the risks of litigation for government, developers and water service providers and facilitates harmonious communities that are more able to shape and adapt to change as well as being more productive Sustainability reporting is the next step after Triple Bottom Line reporting. It requires a systems approach, where issues rather than predetermined indicators are a priority. It is a process where the concerns of 'outside' people and institutions are genuinely used to shape the future of the reporting institution Incorporating visioning processes into regional planning can help communities plan and prepare for change. Visioning can help develop plans that set out possible responses to scenarios and it can built trust, cohesive social networks, and knowledge integration For water and irrigation planning, modelling should be viewed as a process of mutual learning between scientists and expert stakeholders. This can ensure that the meaning of any information developed is negotiated and therefore trusted Ecological risk assessments need to be flexible and open to negotiation in their application. This includes during preparation and execution. There are opportunities for broadening ERA outputs, by better recording stakeholders' qualitative knowledge and recording this alongside risk models	Kellett, Bart M; Camkin, Jeff K; Bristow, Keith L. NAIF Sustainability Framework: A summary of work to date (2006 Draft Report)
The report covers the development of the sustainability framework, improving groundwater systems and	Bristow, K. L., Camkin, J., Kellett,

development of conceptual understanding of the differences between extensive irrigation schemes and irrigation mosaics.	B. M. and Petheram, C. (2006). Northern Australia Irrigation Futures: Providing new knowledge, tools, and processes to support debate and decision making regarding irrigation in northern Australia. NPSI Milestone Report CDS23. 52 pp.
This bulletin describes 3 complementary approaches of communicating complex land management ideas that have been developed by NPSI investigations: Narrative methods, Ecological Risk Assessment (ERA) and Sustainability Indicators. The research bulletins are aimed at a broad, technically-literate audience. This bulletin is the first time that the three approaches have been summarised and compared.	Wang, Q. J., Kellett, B. M., Dore, D. and Chapman, E. (2005). Community participation in sustainable irrigation research. Research Bulletin 2. 4 pp. http://www.lwa.gov.au/downloads/publications_pdf/PF050993.pdf
All legislative acts and current policies and initiatives relating to water for Western Australia, Northern Territory, Queensland and the Commonwealth are documented. There is a brief comment on the effects or significance of each item for the irrigation industry.	Hegarty, P., Kellett, B. M. and Bristow, K. L. (2005). A Guide to Northern Australia's Institutional Water Frameworks. NPSI Draft Report CDS23. 71 pp.
A summary of current knowledge of sustainability indicators, and particularly sustainability indicator frameworks which is being used to shape up the structure for the Northern Australian Irrigation Futures (NAIF) Sustainability Framework.	Kellett, B. M., Bristow, K. L. and Charlesworth, P. (2005). Indicator Frameworks for assessing Irrigation Sustainability. Technical Report 05/01. 52 pp. http://www.clw.csiro.au/publications/technical2005/tr01-05.pdf
There are a number of points of intersection of NAIF and the NWC with respect to water management. These include: improving Australian/State/Territory cooperation; improving State/State Cooperation; helping to ensure that water decisions are based on data, evidence, research and good planning; and not just being consistent with but advancing the National Water Initiative.	Notes from NWC/NAIF meeting, Canberra, May 2006.

Strong alliances (government/government; government/stakeholder; stakeholder/stakeholder; and science/stakeholders) are being forged through the NAIF project. Key questions are how those developing alliances can be utilised to support the NWC and the States/Territory (individually and collectively) in their respective roles in implementing the NWI in northern Australia. The NAIF project will make a significant contribution to seven of the ten science and information needs to facilitate delivery of the ten NWI objectives. The NAIF Steering Committee is likely to provide a useful touchstone for the NWC in relation to project proposals under WSA and RNWS programs, and further development of the NWI in northern Australia. Representations made by WA and QLD Governments, together with attendance and comments made by NT and QLD government representatives at the meeting indicate strong recognition that the NAIF project is working well and has the capacity to make a major contribution.	
Some stakeholders are concerned that the NAIF project will facilitate significant additional pressures for the expansion of irrigated agriculture in northern Australia.	Correspondence and discussions with environmental groups, 2005 – 2006.
Changes to the NAIF project goal and objectives have reduced some of the NAEA's original concerns. There is a need to strengthen the link between the sustainability framework and the statutory planning process. There is a need to capture information about why some irrigation developments did not proceed as well as about those that did.	Draft notes from NAIF/NAEA meeting April 2006
Feedback suggests that NAIF is having an impact in northern Australia through increasing focus on its future management and encouraging shared knowledge. Some stakeholders see this as an important role for NAIF. Participants in a northern Australia break-out group were unambiguously looking for a more strategic, systems approach to achieve sustainable irrigation in the north and are looking for leadership to emerge. NAIF is seen to be in a position to contribute to that leadership.	Notes from NWC WSA irrigation call workshop, Canberra, March 2006
The CRC IF considers that the NAIF project is now operating very well and that discussion on life of	CRC IF Quarterly Report to March

NAIF beyond mid 2007 needs to be ongoing.	2006
LWA considers that the NAIF project is continuing to make solid progress with much of the critical strategic planning and operational processes now in place.	LWA letter to PI in response to Milestone 4 Report, March 2006.
There are valuable lessons gained from capturing and comparing stakeholder views about past, present and future of irrigation in the case study areas. There appear to be very significant opportunities for transferring knowledge and approaches (for example the Lower Burdekin Knowledge Platform concept) between case study sites. The focus of most discussions with stakeholders in Townsville and the Lower Burdekin was frequently the institutional arrangements and policy settings rather than the biophysical characteristics.	Notes from NAIF SC and stakeholder event, Townsville, February 2006.
Irrigation may be a means of improving diversification in northern Australia to achieve more economic stability rather than new large scale stand alone developments. Some stakeholders consider that issues such as weeds, pests, diseases, feral animals and fire may be more damaging to the environment than irrigation. The small, fragmented population with access to limited resources is seen as a limitation to irrigation development. There are feelings of isolation, few support structures and a lack of critical mass. In addition to the need for security of water supply for long term investment decisions there is a need for clearer guidelines for approvals to subdivide and greater certainty about obtaining permission for future sub-divisions. There is strong interest in irrigation mosaics as a preferred form of irrigation in northern Australia.	Notes from NAIF SC and stakeholder event, Darwin, May 2005.

ATTACHMENT 3

STATUS OF WORK PLAN DELIVERABLES

(As presented to NAIF Steering Committee on 19/4/06)

Activity	Deliverable	Due	Status	Comment
1.1	Monitoring & reporting strategy	20/12/05	Completed	Updated Monitoring & Evaluation Plan sent to SC on 10/3/06
1.2 (i)	Communication risk management plan	31/12/05	Completed	Updated Stakeholder Engagement & Communication Strategy sent to SC on 10/3/06
1.2 (ii)	Stakeholder participation plan	31/01/05	Completed	Incorporated into SE&C Strategy
1.2 (iii)	Coordination of SRG	Ongoing	Completed	M&E Plan, SE&C Strategy and Work Plan forwarded to members. Contact with members building gradually
1.2 (iv)	General stakeholder engagement activities	Ongoing	Completed	Incorporated into SE&C Strategy
1.3	Maximising beneficial links - activities to be agreed with SC on an ongoing basis	Ongoing	On track	High profile links with National Water Commission, RiverSymposium, ANCID, UNESCO HELP program etc.
2.1	Report: Guide to northern Australia institutional frameworks	31/12/05	Delayed and change proposed.	Draft requires further work before forwarding to NT/WA/QLD/Australian government representatives for review. Activity 2.1 and 5.1.6 now being finalised in tandem and will be available by mid May.
2.2	Report: Overview of irrigation in northern Australia	31/5/06	Delayed.	The original request was for information to be provided by January 2006. At this stage the only information received is for the Daly, although draft information has also been received for QLD sites. Completion of the report will take up to 3-4 months following receipt of the necessary information due to variability in information and the need for considerable formatting, editing and graphics work. A new timeframe will be advised upon receipt of information.
2.3	Report: Comparisons &	31/5/06	On track.	Progressing well and a draft report should be available by the due date.

	learnings from the Daly, Ord & Burdekin irrigation systems			
3.1	Report: An overview of the hydrology of northern Australia	31/8/06	On track and change proposed.	Progressing well and a draft report should be available by the due date. Title of draft report changed to better reflect the content.
3.2	Recommendations to SC re further work on groundwater flow classification system for northern Australia	31/5/06	On track and change proposed.	Recommendations will be dependent on lessons from Activity 2.3. Due date should be amended to 30/6/06.
4.1	Report: Current understanding of irrigation mosaics	31/8/06	On track.	Report outline has been prepared. References and analytic solutions are currently being identified.
4.2	Report: Research findings, modelling results and applications for irrigation mosaics in northern Australia	28/2/07	On track.	Report outline has been prepared.
4.3	Irrigation mosaics modelling and analysis tools	31/1/07	On track.	Paper reviewed on two dimensional analytical models. Further work will be guided by 4.1 and 4.2.
5.1.1	Bayesian network model	31/8/05	Completed.	Model presented at 2005 IAA conference. Testing and refinement of model with stakeholders is included in QLD case study.
5.1.2	Report: indicator frameworks for assessing irrigation sustainability	31/1/05	Completed.	
5.1.3	PhD confirmation report	31/8/04	Completed.	
5.1.4	Report: Ecological risk assessment for the wetlands of the Lower Burdekin	30/11/05	Completed.	
5.1.5	TBL: Evaluation reports of participatory meetings	30/9/05	Completed.	
5.1.6	Tools to assist individuals and communities to identify control structures and	30/4/06	On track and change proposed.	Activity 2.1 and 5.1.6 now being treated in tandem and will be finalised together by mid May.

	influences			
5.2.1(i)	Journal paper: A sustainability framework for designing and evaluating irrigation planning processes: An approach for northern Australian communities	31/3/06	Slightly delayed & change proposed.	Further project analysis has identified the need for a report summarising work to date for the development of the sustainability framework. This report is currently under review within the project team and will be available in late April/early May. The original paper is no longer consistent with Bart Kellet's research plan and will not be pursued.
5.2.1(ii)	Paper to SC: Recommended approach for finalising and delivering the sustainability framework	31/3/06	Slightly delayed & change proposed.	This report will build on 5.2.1(i) to set out the approach for finalising and delivering the Sustainability Framework. While the project team's thinking on development of the sustainability framework has progressed significantly through involvement in a wide range of NAIF related activities, further time and discussion is required to consolidate ideas and prepare this paper. The draft paper should now be available by 30/6/06.
5.3.1(i)	Operational agreement between NAIF and NT key contact for NT case study	31/3/06	On track	Draft case study with NT key contact for consideration.
5.3.1(ii)	Stakeholder engagement strategy for NT case study agreed	31/3/06	On track	Incorporated into 5.3.1(i) and currently with NT key contact for consideration.
5.3.2	Report: State of knowledge relevant to irrigation in the Douglas-Daly-Katherine catchment	31/7/06	On track	Incorporated into case study and currently with NT key contact for consideration.
5.3.3	Report: Community visions for irrigation in the Douglas-Daly-Katherine, future scenarios and response options, and learnings for the sustainability framework	31/3/07	On track & change proposed.	Data gathering is incorporated into case study proposal and currently with NT key contact for consideration. Rather than a separate report for each case study area Bart Kellett will capture this work is his research and write up as journal paper given in 5.6.1
5.4.1(i)	Operational agreement between NAIF and QLD key	31/3/06	On track	Draft case study with QLD key contact for consideration.

	contact for QLD case study			
5.4.1(ii)	Stakeholder engagement strategy for QLD case study agreed	31/3/06	On track	Incorporated into 5.3.1(i) and currently with QLD key contact for consideration.
5.4.2	Report: State of knowledge relevant to irrigation in the Lower Burdekin	31/7/06	On track.	Incorporated into case study and currently with QLD key contact for consideration.
5.4.3	Report: Community visions for irrigation in the Lower Burdekin, future scenarios and response options, and learnings for the sustainability framework	31/3/07	On track & change proposed.	Data gathering is incorporated into case study proposal and currently with QLD key contact for consideration. Rather than a separate report for each case study area Bart Kellett will capture this work is his research and write up as journal paper given in 5.6.1
5.5.1(i)	Operational agreement between NAIF & WA key contact for WA case study	31/3/06	Delayed.	New WA water governance arrangements have slowed progress. Case study options under discussion with meeting on 11th April to confirm preferred option. Case study work plan to be prepared subsequent to that decision.
5.5.1(ii)	Stakeholder engagement strategy for WA case study agreed	31/3/06	Delayed.	As above.
5.5.2	Report: State of knowledge relevant to irrigation in the (to be determined) catchment	31/7/06	Delayed.	As above.
5.5.3	Report: Community visions for irrigation in the (to be determined), future scenarios and response options, and learnings for the sustainability framework	31/3/07	Delayed.	As above.
5.6.1	Report: Towards a sustainability framework for supporting community	30/4/07	On track & change proposed.	Recent thinking suggests that this will be a journal paper rather than a report, entitled something like “Communities shaping and adapting to change in irrigation regions across Northern Australia”.

	decision making regarding irrigation in northern Australia: Lessons from three case studies			
5.6.2	A sustainability framework for supporting community decision making regarding irrigation in northern Australia	30/6/07	On track.	

ATTACHMENT 4

DRAFT HOTLINK DIRECTORY TO NORTHERN AUSTRALIA'S WATER AND IRRIGATION MANAGEMENT

TO BE PROVIDED AS A SEPARATE FILE

NORTHERN AUSTRALIA IRRIGATION FUTURES PROJECT

DALY RIVER CASE STUDY

DRAFT WORKPLAN

Updated 8 May 2006

NORTHERN AUSTRALIA IRRIGATION FUTURES PROJECT

DALY RIVER CASE STUDY WORKPLAN

1. BACKGROUND

Deciding on whether to irrigate in northern Australia, and if so what irrigation should look like, where it should be located, and how it should be managed, requires improved understanding of river and catchment attributes and the risks associated with irrigation.

The Northern Australia Irrigation Futures (NAIF) project is funded by a suite of private and public investors including the National Program for Sustainable Irrigation (NPSI), the CRC for Irrigation Futures (CRC IF), the Australian Government and the Governments of Queensland, Western Australia and the Northern Territory with the goal of providing new knowledge, tools and processes to support debate and decision making regarding irrigation in northern Australia.

Of particular interest in this work are the similarities and differences between the various jurisdictions, the aim being to help develop a shared approach to understanding and managing the north of Australia. The NAIF Stage 2 Work Plan focuses on collating and developing knowledge on northern water systems, understanding the concepts of irrigation mosaics and developing, testing and applying a sustainability framework.

While this work is of critical importance to the above Governments, as evidenced by the support they are providing to the project, the governments also have particular needs and want to see the NAIF project linked with on-ground activities of importance to each government. Using case study sites that address specific needs of the governments and the project is the preferred way to achieve this.

The Work Plan emphasises the important role of case studies to provide insights to inform the development of the sustainability framework and help ensure that the framework has practical application. The case studies will also:

- Allow the NAIF project to link closely with and draw from other activities taking place in the case study areas
- Help ensure that the sustainability framework can provide for the incorporation of ecological, social, economic and cultural values by those wishing to use the framework
- Help ensure that the risks and limitations of irrigation are clearly identified and
- Help ensure that the NAIF Stakeholder Reference Group has the opportunity to understand the direct relevance of decisions about irrigation in northern Australia to the future of those individuals and communities.

Three case studies are being established, covering a highly developed irrigation system, a semi-developed system and a ‘greenfield’ location.

This paper provides the work plan for the nominated case study site for the Northern Territory, the Daly River. This Daly River case study work plan and has been developed in accordance with the NAIF Stage 2 Work Plan.

2. THE DALY RIVER CASE STUDY

The Daly River Region offers arguably the best potential for irrigation development in the northern part of the Northern Territory, while also being widely recognised for its conservation values. The region is subject to increasing demands for irrigated agriculture and horticulture. At the same time, community concerns and pressures are mounting for better planning to protect water-dependent and terrestrial ecosystems. Natural resource management challenges in the Daly River Region represent the range of planning needs for sustainable water resource development based on controlled access to natural river flows and groundwater in northern Australia.

Currently licensed allocations plus estimated potential stock and domestic use (which is not required to be licensed) totals approximately 54,500 ML/year (surface and groundwater uses combined). The 67 water licences granted in the region account for 47,500 ML/year, of which some 35,000 ML/year is for irrigation.

In addition to current licensed and stock and domestic use, 69 water licence applications, equivalent to a further 55,000 ML/year potential demand, are yet to be considered for granting. These applications represent an additional demand of 53,300 ML/year for irrigation.

Water allocation planning and adaptive management frameworks must be based on the sound understanding of the natural variability of water resource systems and their response to increasing demand for consumptive uses. This understanding depends on reliable information for two elements of planning – the levels of use and the natural variability in the availability of regional water resources. Deficient information in either of these two planning elements prevents best practice water allocation planning.

The National Water Initiative provides a framework for water access entitlements, water allocation planning and better monitoring and accounting of water resources. The Northern Territory Government has established a *'Sustainable development and management of water resources in Northern Australia: a model approach'* project to provide the information necessary to apply the key elements of the National Water Initiative in the context of northern Australian rivers. The project will provide for the development of catchment-specific adaptive management frameworks to protect economic, environmental and other community values.

The enhanced information on water use and water availability that will result from the project will be used directly to improve water allocation planning and management in the Daly River Region, for consideration as models that could be applied to other regions in northern Australia.

Recognising that national standards for metering are currently under development, innovative solutions to the difficulties for metering and monitoring that are unique to the particular environmental, social and economic circumstances on northern Australia will be pursued through the project. These will include options for greater participation in monitoring by landholders and the use of automatic data loggers and telemetering.

The project will draw on and provide input to the work of the NAIF project, to provide a model approach to ensuring that water allocation planning for northern Australian tropical river catchments is based on the best practicable water resource and water use information. To

achieve that end, the NT Government project involves three major components:

(a) Enhanced metering of surface and groundwater extraction
(b) Integrated water resource monitoring based on hydrologic modelling and
(c) Regional water allocation plans.

In relation to the NAIF project, the Northern Territory Government wants:

- Ongoing input for better understanding of groundwater systems and surface water groundwater interactions, particularly regarding karstic aquifer systems and their ability to supply water for both irrigation and maintenance of water quality and water quantity in the Daly River
- Assistance in pulling together and making sense of existing surface and groundwater data (with potential to feed this into a groundwater classification system for northern Australia)
- Assistance in understanding why irrigation systems have developed the way they have and what lessons can be used to better direct future developments (to be derived from an analysis of the Ord, Katherine-Douglas-Daly and lower Burdekin irrigation areas) and
- Assistance in understanding key features (advantages / disadvantages) of mosaic systems, including the likely fate of solutes used in irrigation.

The Daly River case study meets the NAIF requirement for a case study focussing on a semi-developed irrigation system.

3. CASE STUDY ACTIVITIES

As far as possible, NAIF activities in the Daly River case study will be linked to the activities of the Daly River Management Advisory Committee. The Daly River case study will contribute to the following activities identified in the NAIF Work Plan:

Work Area 1: Project Management and Delivery
Activity 1.3: Maximising beneficial links
The Project Team (Keith Bristow) has lead responsibility. In particular, it is envisaged that the NAIF Project can operate as an external "honest broker" between competing conservation and development interests in the Daly Region, through the promulgation of science-based information to underpin planning for ecologically sustainable development and conservation of environmental and cultural values. Opportunities for transferring the Lower Burdekin Knowledge Platform concept to the Daly will be discussed as part of this activity.

Work Area 2: Context Setting and Northern Australia Inventory
Activity 2.2: Review of past and present in irrigation in northern Australia
The Project Team (Cuan Petheram) has lead responsibility for the report *Overview of Irrigation in Northern Australia*. The Department of Natural Resources, Environment and the Arts (NRETA) (John Gilmour) will coordinate NT Government input into the report and it will be provided to the Project Team by 05/06/06.

Activity 2.3: Comparisons and lessons from the Burdekin, Daly and Ord irrigation systems
The Project Team (Cuan Petheram) has lead responsibility for the report *Comparisons of the Daly, Ord and Lower Burdekin irrigation systems*. NRETA (John Gilmour) will coordinate information on the Daly and it will be provided to the Project Team by 30/04/06.

Work Area 3: Understanding Water Systems of Northern Australia

Activity 3.1: Review of tropical water systems

The Project Team (Cuan Petheram) has lead responsibility for the report *Hydrology of northern Australia*.[2] NRETA (John Gilmour) will coordinate NT Government input into the report (including in relation to the Daly) and it will be provided to the Project Team by 30/06/06. No specific information requirements have been identified at this time.

Work Area 4: Understanding Irrigation Mosaics

Activity 4.1: review of the current understanding of irrigation mosaics

The Project Team (Freeman Cook) has lead responsibility. NRETA (John Gilmour) will coordinate NT Government input. The report "Current understandings of irrigation mosaics" will be completed by 31/8/2006.

Activity 4.2: Application of modelling and analysis tools to northern Australia

The Project Team (Freeman Cook) has lead responsibility. NRETA (John Gilmour) will coordinate NT Government input. The report "Research findings, modelling results and applications for irrigation mosaics in northern Australia" will be completed by 28/2/2007.

Work Area 5: Developing, Testing and Applying a Sustainability Framework

Activity 5.5.1: Case study development

The Project Team (Jeff Camkin) has lead responsibility. NRETA (Brent Williams) will coordinate NT Government input. This document is the deliverable for this activity.

Activity 5.5.2: Collating existing information and research activity

Existing information and knowledge, current research activities and knowledge and research gaps will be examined in collaboration with Charles Darwin University (CDU) and the establishment of a Daly River Discussion Group of researchers. CDU will compile responses to an initial questionnaire to identify current research activity in the Daly from which a consolidated list of current research will be compiled. The Project Team (Jeff Camkin has lead responsibility) will undertake an analysis of the research to identify knowledge and research gaps. NRETA (John Gilmour and Brent Williams) will coordinate NT Government input into the gap analysis. CDU (Michael Douglas) and NAIF will convene a workshop of researchers in mid 2006 to present current research, discuss the gap analysis and research priorities. The timeframe for completion will be determined in consultation with CDU.

Activity 5.5.3: Exploring visions, future scenarios and response options

This area of the Daly River case study will be a collection of activities to capture the lessons from this semi-developed irrigation system which may have broader application in northern Australia. As far as possible the activities will be linked with the activities of the Daly River Management Advisory Committee.

(1) The Project Team (Jeff Camkin has lead responsibility) will convene a forum of key players with Dr Henrique Chaves from the University of Brasilia involving presentations on NAIF, the UNESCO HELP Basin Sustainability Index and water resource management in Brazil. This will take place in Darwin in August 2006. DNRETA (Brent Williams) will provide logistical support.

[2] Note change in title from the previous title *State of knowledge of groundwater flow systems of northern Australia* reflecting increased focus on surface-groundwater interactions.

(2) The Project Team (Bart Kellett has lead responsibility as part of his PhD program) will capture and analyse stakeholders' personal views on lessons from the Daly River, including pressures, responses and adaptive capacity of the community. NRETA (Brent Williams) will assist with logistics, including identification of participants. This work will be completed by November 2006.

(3) The Project Team (Bart Kellett has lead responsibility as part of his PhD program) will use the information from (1), together with similar information from the Lower Burdekin and Ord River irrigation areas, to make comparisons between the three irrigation areas in relation to pressures, responses and adaptive capacity of the community. This work will be completed by January 2007. NRETA (Brent Williams) will coordinate NT Government review of the comparison output.

(4) The NAIF Project Team (Jeff Camkin has lead responsibility) will monitor and, upon invitation and where appropriate, take part in meetings and other activities of the Daly River Management Advisory Committee to help identify lessons for incorporation into the sustainability framework and to help transfer lessons from other NAIF case study areas. The Lower Burdekin Knowledge Platform will be discussed in this context.

4. EXPECTED BENEFITS FROM THE DALY RIVER CASE STUDY

As a semi-developed irrigation system the Daly provides an opportunity to identify and transfer lessons from its development that may have application in other developing or proposed irrigation systems across northern Australia. Specifically, this case study is expected to:

- Provide an overview of the history of irrigation at the Daly River and the lessons from it
- Collate understanding of groundwater systems, particularly surface water groundwater interactions in karstic aquifer systems
- Improve understanding of irrigation mosaics
- Secure base data / knowledge for use in the sustainability framework, particularly the visioning, and the planning and assessment components
- Assist the identification of characteristics that increase a community's capacity to adapt to change and
- Help provide insights into the changes required, if any, to improve regional natural resource planning and management to ensure ecologically sustainable development and conservation of environmental and other public benefit outcomes.

5. STAKEHOLDER ENGAGEMENT & COMMUNICATION

The primary objectives of stakeholder engagement and communications in this case study, as outlined in the NAIF Stakeholder Engagement and Communication Strategy, are:

- To ensure that practical issues of importance to local stakeholders are identified for inclusion in the development of a sustainability framework
- To identify commonality and differences between case study areas to inform the development and testing of the framework.

Existing state/territory government networks will be used to identify relevant stakeholders and issues of importance to them. Where possible, existing government processes will be used as the mechanism for stakeholder engagement in this case study area.

The key stakeholders for this case study are well known to NRETA. These include:

1. *Daly River Management Advisory Committee, comprising*:
   - non-Indigenous landowners
   - Indigenous landowners and native title interests
   - Aboriginal Reference Group of traditional owners
   - commercial tourism and recreational interests
   - government water manager
   - government conservation and recreation manager
   - government land use planner
   - government regional development planner

2. *Indigenous Groups:*
   - Daly Region Aboriginal Reference Group
   - Northern Land Council
   - Wardiman Aboriginal Association
   - Wagiman Aboriginal Association

3. *Environmental Interests*
   - NT Integrated Natural Resource Management Board Inc
   - Environment Centre of the Northern Territory
   - Northern Australia Environmental Alliance

4. *Resource User Associations*
   - NT Agricultural Association
   - Northern Territory Horticulture Association
   - Northern Territory Cattlemen's Association
   - Katherine Region Tourist Association
   - Amateur Fishermen's Association of the Northern Territory
   - NT Minerals Council

5. *Local Government:*
   - Nauiyu Nambiyu Community Government Council
   - Katherine Town Council

6. *Researchers*
   - Charles Darwin University
   - Environmental Research Institute of the Supervising Scientist
   - CSIRO.

The Project Team (Jeff Camkin) has lead responsibility for overall NAIF stakeholder engagement. NRETA (Brent Williams) will assist in coordinating stakeholder engagement for the Daly River case study activities. Stakeholder engagement will focus around involvement in individual case study activities.

6. RESOURCING

The NT Government, through NRETA, has made the following commitments towards resourcing the NAIF Project:

- Initial commitment of 0.3 p.a. FTE in-kind support
- Additional commitment of $50,000 p.a. (exclusive of GST) towards the costs associated with the Sustainability Specialist position.

Initially the in-kind support has been largely focussed on hydrogeology expertise applied in the Context Setting, Northern Australia Inventory and Understanding Groundwater Systems of Northern Australia work areas. From June 2006 the focus will start to shift to the need for in-kind support from officers who have a relationship with the Daly River stakeholders and understand the issues relevant to this case study.

7. MONITORING AND EVALUATION

The Project Team (Jeff Camkin) has lead responsibility for coordinating monitoring and evaluation. Case study stakeholder perspectives will be captured through repeatable questionnaires to measure the NAIF project impact and Project Status Reports will include narrative examples that indicate progress towards the project outcomes.

The following achievement criteria, performance indicators and data sources apply are drawn from the NAIF M&E Plan for application to the Daly River case study:

Achievement Criteria	**Performance Indicator**	**Data Source**
A comprehensive, practical and usable framework for supporting debate and decisions about irrigation in northern Australia	Acceptance of framework by key stakeholders	Documented feedback from case study stakeholders on framework
Wider knowledge of key biophysical features relevant to irrigation in northern Australia	Comprehensive collation and interpretation of key knowledge and understandings of northern Australian landscapes	Documented feedback from case study stakeholders on NAIF project questionnaires
Successful project communications	Case study stakeholders are part of NAIF Stakeholder Network and receiving quarterly project updates	Project records on membership of Stakeholder Network
Effective implementation and coordination	Project partners maintain investment for project duration	CSIRO/NT Govt Funding Agreement maintained

ATTACHMENT 6

NORTHERN AUSTRALIA IRRIGATION FUTURES PROJECT

LOWER BURDEKIN CASE STUDY

WORKPLAN

Updated 13 April 2006

NORTHERN AUSTRALIA IRRIGATION FUTURES PROJECT

LOWER BURDEKIN CASE STUDY WORKPLAN

1. BACKGROUND

Deciding on whether to irrigate in northern Australia, and if so what irrigation should look like, where it should be located, and how it should be managed, requires improved understanding of river and catchment attributes and the risks associated with irrigation.

The Northern Australia Irrigation Futures (NAIF) project is funded by a suite of private and public investors including the National Program for Sustainable Irrigation (NPSI), the CRC for Irrigation Futures (CRC IF), the Australian Government and the Governments of Queensland, Western Australia and the Northern Territory with the goal of providing new knowledge, tools and processes to support debate and decision making regarding irrigation in northern Australia.

Of particular interest in this work are the similarities and differences between the various jurisdictions, the aim being to help develop a shared approach to understanding and managing the north of Australia. The NAIF Stage 2 Work Plan focuses on collating and developing knowledge on northern water systems, understanding the concepts of irrigation mosaics and developing, testing and applying a sustainability framework.

While this work is of critical importance to the above Governments, as evidenced by the support they are providing to the project, the governments also have particular needs and want to see the NAIF project linked with on-ground activities of importance to each government. Using case study sites that address specific needs of the governments and the project is the preferred way to achieve this.

The Work Plan emphasises the important role of case studies to provide insights to inform the development of the sustainability framework and help ensure that the framework has practical application. The case studies will also:

- Allow the NAIF project to link closely with and draw from other activities taking place in the case study areas
- Help ensure that the sustainability framework can provide for the incorporation of ecological, social, economic and cultural values by those wishing to use the framework
- Help ensure that the risks and limitations of irrigation are clearly identified and
- Help ensure that the NAIF Stakeholder Reference Group has the opportunity to understand the direct relevance of decisions about irrigation in northern Australia to the future of those individuals and communities.

Three case studies are being established, covering a highly developed irrigation system, a semi-developed system and a ‘greenfield’ location.

This paper provides the work plan for the nominated case study site for Queensland, the Lower Burdekin. This Lower Burdekin case study work plan and has been developed in accordance with the NAIF Stage 2 Work Plan.

2. THE LOWER BURDEKIN CASE STUDY

Some of Queensland's earliest irrigation started in the Burdekin delta and this has now expanded to some 80,000 ha of irrigation, involving both groundwater and surface water.

The Burdekin River Project was a major land and water resource development in the dry tropics of North Queensland implemented since 1980 with the assistance of both Australian and Queensland Government funding. Construction of the Burdekin Falls Dam, located some 100 kilometres south east of Charters Towers was completed in 1987. Downstream irrigation is focussed in the Ayr-Home Hill area, the 'Lower Burdekin', some 80 kilometres south east of Townsville.

The principle objective of the Lower Burdekin Project was to provide adequate water supplies for the irrigation of sugarcane, rice and other crops on new lands to be opened up in the Lower Burdekin to ensure continued regional economic growth. It was proposed that the scheme would provide for the irrigation of an additional 50 000 hectares of lands either side of the Burdekin River. A further objective was to provide additional water for urban and industrial growth in the twin cities of Townsville and Thuringowa.

The Project is now effectively complete and the works are owned and operated by SunWater. The dam is operated in conjunction with pre-existing weirs on the Burdekin and Haughton rivers. Pump stations, located on Clare Weir, divert water into main channels on each bank of the river from which water is supplied to individual farms by a system of distribution channels.

The State Government is responsible for overseeing the sustainable allocation and management of both the groundwater and surface water in the area. There are currently three water service providers. The North and South Burdekin Water Boards are autonomous statutory bodies which carry out water activities, including water distribution, in the North and South Burdekin Water Areas, respectively. Sunwater is a government owned corporation that owns and operates the Burdekin-Haughton Water Supply Scheme, a predominantly surface water scheme inland of the delta.

The Queensland Government wants to:

- Ensure that the case study research connects with water and natural resources planning and management agendas, initiatives and programs broadly supported by the State Government to address the issues that face irrigation communities in the lower Burdekin
- Increase local community and broader stakeholder understanding of how the lower Burdekin works hydraulically and hydrologically, including frameworks and information (perhaps a local knowledge base or platform) needed for whole of water cycle accounting and solute transport accounting
- Help in providing and populating a risk management framework that assists the community and government to better understand and deal with the biophysical, economic and social risks to achieving sustainable irrigation practise in the area
- Help in developing / analysing options for moving the irrigation community towards a more sustainable state and reporting thereon and
- Ensure that lessons from the Burdekin are available to apply in the specifications for new schemes.

The Lower Burdekin meets the NAIF requirement for a case study focussing on a highly developed irrigation system.

3. CASE STUDY ACTIVITIES

The Lower Burdekin case study will contribute to the following Activities identified in the NAIF Work Plan:

Work Area 1: Project Management and Delivery
Activity 1.3: Maximising beneficial links
The Project Team (Keith Bristow) has lead responsibility. In collaboration with DNRMW the project team will establish a working group of key stakeholders which will meet on a regular basis to facilitate and guide implementation of the Lower Burdekin case study activities. This will also provide an opportunity to link NAIF with other key activities in the Burdekin (Trent Road etc). Opportunities for transferring the Lower Burdekin Knowledge Platform concept to other locations in northern Australia will be examined as part of this activity.

Work Area 2: Context Setting and Northern Australia Inventory
Activity 2.2: Review of past and present in irrigation in northern Australia
The Project Team (Cuan Petheram) has lead responsibility for the report *Overview of Irrigation in Northern Australia*. The Department of Natural Resources, Mines and Water (DNRMW) (Pushpa Onta) will coordinate Queensland Government input into the report (including the Lower Burdekin) and it will be provided to the Project Team by 30/4/06.

Activity 2.3: Comparisons and lessons from the Burdekin, Daly and Ord irrigation systems
The Project Team (Cuan Petheram) has lead responsibility for the report *Comparisons of the Daly, Ord and Lower Burdekin irrigation systems.* DNRMW (Pushpa Onta) will coordinate information on the Lower Burdekin and it will be provided to the Project Team by 30/4/06.

Work Area 3: Understanding Water Systems of Northern Australia
Activity 3.1: Review of tropical water systems
The Project Team (Cuan Petheram) has lead responsibility for the report *"An overview of the hydrology of northern Australia"*.[3] DNRMW (Pushpa Onta) will coordinate Queensland Government input into the report (including in relation to the Lower Burdekin) and it will be provided to the Project Team by 30/6/06. No specific information requirements have been identified at this time.

Work Area 5: Developing, Testing and Applying a Sustainability Framework
Activity 5.5.1: Case study development
The Project Team (Jeff Camkin) has lead responsibility for case study development. DNRMW (Peter Gilbey) will coordinate QLD Government input. This document is the deliverable for 5.5.1.

Activity 5.5.2: Collating existing information and research activity
Existing information and knowledge, current research activities and knowledge and research gaps will be examined. This will be largely achieved through the Lower Burdekin Knowledge Platform synthesis of current understanding of the biophysical functioning of the Lower

[3] Note change in title from previous "State of knowledge of groundwater flow systems of northern Australia" which reflects increased focus on surface-groundwater interactions.

Burdekin. Information from Activities 2.2 and 2.3 will provide important input to this. The Project Team (Jeff Camkin) has lead responsibility. DNRMW (Peter Gilbey) will coordinate QLD Government input. The report "State of knowledge relevant to irrigation developments in the Lower Burdekin" is the key deliverable for this activity. This work will be completed by 31 July 2006.

Activity 5.5.3*: Exploring visions, future scenarios and response options*
This area of the Lower Burdekin case study will be a collection of activities to capture the lessons from this fully developed irrigation systems which may have broader application in northern Australia.

(5) The Project Team (Bart Kellett has lead responsibility as part of his PhD program) will hold workshops and conduct questionnaires with stakeholders to complete the development of a Bayesian network model of farm scale nitrate leaching to examine links between modelling and learning. This work will be completed by July 2006.

(6) The Project Team (Jeff Camkin has lead responsibility) will convene a forum of key stakeholders with Dr Henrique Chaves from the University of Brasilia involving presentations on NAIF, the UNESCO HELP Basin Sustainability Index and water resource management in Brazil. This will take place in the Lower Burdekin in August 2006. DNRMW (Peter Gilbey) will provide logistical support.

(7) The Project Team (Bart Kellett has lead responsibility as part of his PhD program) will capture and analyse stakeholder's personal views on lessons from the Lower Burdekin, including pressures, responses and adaptive capacity of the community. DNRMW (Peter Gilbey) will assist with logistics, including identification of participants. This work will be completed by November 2006.

(8) The Project Team (Bart Kellett has lead responsibility as part of his PhD program) will use the information from (3), together with similar information from the Daly and Ord River irrigation areas, to make comparisons between the three irrigation areas in relation to pressures, responses and adaptive capacity of the community. This work will be completed by January 2007. DNRMW (Pushpa Onta) will coordinate QLD Government review of the comparison output.

(9) A workshop of key players will be convened towards a monograph on technical water management issues in the Lower Burdekin. This will feed into the Lower Burdekin Knowledge Platform and will take place early 2007. DNRMW (Peter Gilbey) will take lead responsibility on logistics with assistance from the Project Team, particularly in designing the forum.

4. EXPECTED BENEFITS FROM THE LOWER BURDEKIN CASE STUDY

As a highly developed irrigation system the Lower Burdekin provides an opportunity to identify and transfer lessons from its development that may have application in other developing or proposed irrigation systems across northern Australia. Specifically, this case study is expected to:

- Provide an overview of the history of irrigation in the Lower Burdekin and the lessons from it
- Improve understanding of tropical groundwater systems by focusing on this mature irrigation and water management regime
- Secure base data / knowledge for use in the sustainability framework, particularly the monitoring and reporting component, and the risk assessment component. It will be useful to build on any knowledge platforms available through this project or other initiatives in the region
- Link with other CRC IF research in the region, especially triple bottom line reporting for sustainability and transformational change pathways that move the irrigation community and its stakeholders to a more sustainable future
- Assist the identification of characteristics that increase a community's capacity to adapt to change and
- Help provide insights into the changes required to improve the sustainability of the system and its surrounds
- Provide lessons from the Burdekin which can be applied in terms of reference and/or specifications for new schemes.

5. STAKEHOLDER ENGAGEMENT & COMMUNICATION

The primary objectives of stakeholder engagement and communications in this case study, as outlined in the NAIF Stakeholder Engagement and Communication Strategy, are:

- To ensure that practical issues of importance to local stakeholders are identified for inclusion in the development of a sustainability framework
- To identify commonality and differences between case study areas to inform the development and testing of the framework.

Existing state/territory government networks will be used to identify relevant stakeholders and issues of importance to them. Where possible, existing government processes will be used as the mechanism for stakeholder engagement in this case study area.

The key stakeholders for this case study are well known to the DNRMW and include:

- North Burdekin Water Board (NBWB)
- South Burdekin Water Board (SBWB)
- Sunwater
- Burdekin Dry Tropics Board
- BRIA Irrigators
- CSR
- Burdekin Shire Council (BSC)
- QLD Department of Natural Resources, Mines and Water (DNRMW)
- Queensland Department of Primary Industry and Fisheries (DPI&F)
- Queensland Environmental Protection Authority (EPA)
- Great Barrier Reef Marine Park Authority (GBRMPA)
- Australian Centre for Tropical Freshwater Research (ACTFR)
- CSIRO.

The Project Team (Jeff Camkin) has lead responsibility for overall NAIF stakeholder engagement. The DNRMW North Region (Peter Gilbey/Gary Jensen) will assist in coordinating stakeholder engagement for the Lower Burdekin case study activities. Stakeholder engagement will focus around involvement in individual case study activities.

6. RESOURCING

The Queensland Government, through the DNRMW, has made the following commitments towards resourcing the NAIF Project:

- Initial commitment of 0.3 p.a. FTE in-kind support
- Additional commitment of $65,000 p.a. (exclusive of GST) towards the costs associated with the Sustainability Specialist position.

Initially the in-kind support has been largely focussed on hydrogeology expertise applied in the Context Setting, Northern Australia Inventory and Understanding Groundwater Systems of Northern Australia work areas.

From March 2006 the focus will start to shift to the need for in-kind support from officers who have a relationship with the Lower Burdekin stakeholders and understand the issues relevant to this case study.

7. MONITORING AND EVALUATION

The Project Team (Jeff Camkin) has lead responsibility for coordinating monitoring and evaluation. Case study stakeholder perspectives will be captured through repeatable questionnaires to measure the NAIF project impact and Project Status Reports will include narrative examples that indicate progress towards the project outcomes.

The following achievement criteria, performance indicators and data sources apply are drawn from the NAIF M&E Plan for application to the Lower Burdekin case study:

Achievement Criteria	Performance Indicator	Data Source
A comprehensive, practical and usable framework for supporting debate and decisions about irrigation in northern Australia	Acceptance of framework by key stakeholders	Documented feedback from case study stakeholders on framework
Understanding of key biophysical features relevant to irrigation in northern Australia	Comprehensive collation & interpretation of key knowledge & understandings of northern Australian landscapes	Documented feedback from case study stakeholders on NAIF project questionnaires
Successful project communications	Case study stakeholders are part of NAIF Stakeholder Network and receiving quarterly project updates	Project records on membership of Stakeholder Network
Effective implementation and coordination	Project partners maintain investment for project duration	CSIRO/QLD Govt Funding Agreement maintained

ATTACHMENT 7

NAIF PUBLICATIONS AND PRESENTATIONS

(Updated 5-05-06)

NAIF PUBLICATIONS AND PRESENTATIONS

NAIF PUBLICATIONS:

Kellett, B.M., Walshe, T. & Bristow, K.L. 2005. Ecological Risk Assessment of the Wetlands of the Lower Burdekin. CSIRO Land and Water Technical Report No. 26/05. 30 pp.

Bristow, K.L. & S. MacKinnon. 2005. Northern Australia Irrigation Futures (NAIF) - Research, Frameworks and Sustainability. IAA Journal, Vol 20 No. 2 pp. 54-55.

Kellett, B., Bristow, K.L. & P.B. Charlesworth. 2005. Indicator Frameworks for Assessing Irrigation Sustainability. CSIRO Land and Water Technical Report No. 01/05

NAIF PRESENTATIONS AT CONFERENCES, WORKSHOPS AND MEETINGS

Bristow, K.L., Petheram, C. & Kellett, B.M. 2005. Irrigation in northern Australia – is it worth the risk? ASA-SSA national Conference, 6-10 November, Salt Lake City, Utah, USA (Agron. Abstr. 2005 CD-ROM)

Kellett, B.M., Bristow, K.L., Moore, G., Beilin, R. and F.h.s. Chiew. 2005. Reflecting on stakeholders' perceptions in an ecological risk assessment workshop. In: Proceedings of the Environmental Research Event Conference. 29th November – 2nd December, 2005, Hobart, Tasmania.

Bristow, K.L. & C. Petheram. 2005. Irrigation and groundwater systems in northern tropical Australia. ANCID Conference, Mildura, Victoria (24-26 October 2005)

Petheram, C. & Bristow, K.L 2005. Groundwater flow systems: the neglected component in irrigation siting and design. ANCID Conference, Mildura, Victoria (24-26 October 2005)

Bristow, K.L. 2005. Northern Australia Irrigation Futures. Land and Water Australia Sustainable Irrigation Program Investors Forum, Mildura, Victoria (23 October 2005)

Bristow, K.L. 2005. The Northern Australia Irrigation Futures Project. Environmental Research Institute of the Supervising Scientist (ERISS), Darwin, Northern Territory (7 October 2005)

B.M. Kellett & K.L. Bristow. 2005. Risk and Resilience for Adaptive Irrigation Planning. CRC for Irrigation Futures Annual Forum, Mildura, Victoria (19-21 September 2005)

Bristow, K.L., C. Petheram & B.M. Kellett. 2005. Northern Australia Irrigation Futures: An update. CRC for Irrigation Futures Annual Forum, Mildura, Victoria (19-21 September 2005)

Bristow, K.L., Jolly, P., Smith, I., Petheram, C. & P.B. Charlesworth. 2005. Groundwater systems and their potential role in irrigation in northern Australia. Workshop on Groundwater Surface Water Interaction in the Tropics, Darwin, NT, Australia (26-27 May 2005)

Kellett, B.M. Bristow, K.L., Charlesworth, P.B., Malano, H., Moore, G. & F. Chiew. 2005. Accounting for stakeholders' assumptions and cultural understandings in environmental risk assessment for irrigation: A groundwater nitrate case study. Irrigation Association of Australia (IAA) Conference on Restoring the Balance. Townsville, QLD, Australia (17-19th May 2005)

Bristow, K.L., Charlesworth, P.B., Thayalakumaran, T., Narayan, K.A. & C. Petheram. 2005. Water and irrigation management on the Burdekin coastal floodplain. OzWater WaterShed Conference, Townsville, QLD, Australia (5-7th May)

Bristow, K.L. 2005. Northern Australia Irrigation Futures. Northern Australia Environment Alliance, Brisbane, QLD (22 February 2005)

Kellett, B.M. 2005. A Sustainability Framework to Guide Irrigation Development in Northern Australia. BBIFMAC Office, Ayr (14 February 2005)

Kellett, B.M. 2005. A Sustainability Framework to Guide Irrigation Development in Northern Australia. The University of Melbourne, Melbourne (4 February 2005)

Bristow, K.L. 2005. Northern Australia Irrigation Futures. SunWater, Ayr, QLD (1 February 2005)

Bristow, K.L. 2005. Irrigation within a broader sub-catchment context: The lower Burdekin. CSIRO Floreat Park, Perth, WA (28 January 2005)

Bristow, K.L. 2005. Northern Australia Irrigation Futures. WA Water Task Force, Perth. (27 January 2005)

Bristow, K.L. 2004. Northern Australia Irrigation Futures. CRC for Irrigation Futures Sustainability Challenge Workshop, Stamford Airport Hotel, Sydney, (17 November 2004)

Kellett, B.M. 2004. A Sustainability Framework to Guide Irrigation Development in Northern Australia. PhD Introductory Seminar, CSIRO Land and Water, Davies Laboratory, Townsville (15 October 2004)

Bristow, K.L. 2004. Northern Australia Irrigation Futures: An Update. ANCID Conference, Barossa Valley, Tanunda, South Australia (10-13 October 2004)

Bristow, K.L. 2004. Northern Australia Irrigation Futures. Land and Water Australia Sustainable Irrigation Program Investors Forum, Barossa Valley, Tanunda, South Australia (10 October 2004)

Bristow, K.L. 2004. Northern Australia Irrigation Futures. CRC for Irrigation Futures Annual Workshop, University of Western Sydney, Sydney (20 September 2004)

Kellett, B.M. 2004. A Sustainability Framework to Guide Irrigation Development in Northern Australia. CRC for Irrigation Futures Annual Workshop, University of Western Sydney, Sydney (20 September 2004)

Bristow, K.L. 2003. Northern Australia Irrigation Futures: Building a basis for developing sustainable irrigation across northern Australia. ANCID Conference, Shepparton, Victoria, Australia (19-22 October 2003)

Bristow, K.L. 2003. Northern Australia Irrigation Futures: Building a basis for developing sustainable irrigation across northern Australia. Land and Water Australia Sustainable Irrigation Program Investors Forum, Shepparton, Victoria, Australia (19 October 2003)

RADIO:

Northern Australia Irrigation Futures. ABC North West WA Radio News (6 May 2004)

Water futures. Curtin FM Seeling Solutions with Retirees WA (27/3/2003)

TELEVISION:

Tropical river systems and North Australian Irrigation Futures. ABD6 State Television News, Darwin (2 February 2004)

WORKSHOPS, SEMINARS AND MEETINGS FACILITATED BY OR FEATURING NAIF

(Updated 15/5/06 11:50 PM)

Participant numbers (#) does not include NAIF team members or NAIF consultants)

Seminars Meetings Workshops	Date	#	Organisations Represented
2006			
NWC/NAIF meeting, Canberra	12 May	17	• National Water Commission, including Chairman/CEO Ken Mathews and 14 staff • NRETA, NT • DNRWM, QLD • DAFF • NPSI
NT Cross Project Collaboration tele-meeting	4 May	3	• Environmental Research Institute of the Supervising Scientist, NT • NRETA
North Queensland Local Gov't Association	4 – 5 May	100	• Mayors and Councillors from > 25 Councils in north Queensland • LGA staff • Local Businesses
Meeting, Ayr, NQ	26 April	7	• NBWB councillors
Meeting, DNRMW, Brisbane	20 April	3	• NAEA/WWF • NAEA/Wilderness Society • NAEA/Queensland Conservation
Meeting, Dept of Water, Perth	11 April	10	• Department of Water • Office of Water Strategy • Department of Agriculture • Water Corporation • Department of Industry Resources
NT Cross Project Collaboration tele-meeting	7 April	4	• Environmental Research Institute of the Supervising Scientist, NT • Charles Darwin University
Meeting, Perth	6 April	3	• WA Department of Water • South Africa Dept. of Water Affairs and Forestry
Indigenous Values of Water Workshop, Darwin	5 & 6 April	28	• University of Melbourne • CSIRO • Northern Land Council • Daly River Aboriginal Reference Group • Murray Lower Darling Rivers Indigenous Nations • Australian National University • Kimberley Land Council • NT Department of Resources, Environment and Arts • Aboriginal Areas Protection Authority • Wadjigan • Wagiman
Colloquium on Sustainable Landscapes –	4 April	≈ 70	• South Africa Dept of Water Affairs and Forestry (attendance facilitated by NAIF) • 9 other experts from USA, Canada, NZ and

Seminars Meetings Workshops	Date	#	Organisations Represented
Future Dilemmas and Opportunities, CSIRO Perth			Australia • Land and Water Australia • CSIRO • WA Dept of Water • Various other state and private sector organisations
Meeting CRC IF Research Mark II	29-30 March	8	• CRC IF • NPSI • CSU • UNE • CSIRO
Workshop National Water Commission on WSA program – northern Australia session facilitated by NAIF	29-30 March	≈ 20	• National Water Commission • Dept of Agriculture, Forestry and Fisheries • Land and Water Australia • Ord Irrigation Cooperative • Gascoyne Water Cooperative • WA Department of Environment • WA Office of Water Strategy • Centre for Aboriginal Horticulture • NT Agricultural Association • Plantation Management Services • South Burdekin Water Board • North Burdekin Water Board • Burdekin Shire Council • Department of Natural Resources, Mines & Water • Meatant Consultancy • Sunwater • ANCID
Meeting, Office of Water Strategy, Perth	21 March	4	• WA Office of Water Strategy • WA Dept of Water
Meeting, Home Hill, NQ	16 March	8	• SBWB councillors
CRC IF Sustainability Program	6 March	7	• CRC IF • University of Western Sydney • University of Melbourne • Charles Sturt University • CSIRO
Meeting, CSIRO Perth	27 February	1	• WA Dept. of Agriculture
Meeting, QLD DNRMW	23 February	1	• QLD Dept Natural Resources, Mining and Water
Meeting, James Cook University	22 February	1	• James Cook University
Meeting, James Cook University	21 February	2	• Australian Centre for Tropical Freshwater Research
NAIF Steering Committee tour of the Burdekin	15 February	20	• QLD Dept. Natural Resources, Mines and Water • National Program for Sustainable Irrigation • Dept of Agriculture, Forestry and Fisheries • Sunwater • Ord Irrigation Cooperative • NT Dept. Environment, Natural Resources and Arts • Land and Water Australia • CRC IF • University of New England

Seminars Meetings Workshops	Date	#	Organisations Represented
QLD Stakeholder Meeting, CSIRO Townsville	14 February	40	• NAIF Stakeholder Reference Group • Local canegrowers • North Burdekin Water Board • South Burdekin Water Board • Burdekin Shire Council • QLD EPA • Great Barrier Reef Marine Park Authority • James Cook University • Australian Centre for Tropical Freshwater Research • QLD Dept. of Natural Resources, Mines & Water • Sunwater • BSES • Mulgowie Farming Operations • CSIRO • Dept. of Agriculture, Forestry & Fisheries • Ord Irrigation Cooperative • NT Dept. Environment, Natural Resources and Arts • Land and Water Australia • National Program for Sustainable Irrigation
Meeting, Office of Water Strategy, Perth	9 February	1	• Office of Water Strategy
NT Cross Project Collaboration tele-meeting	2 February	4	• NT Dept Natural Resources, Environment & Arts • Environmental Research Institute of the Supervising Scientist (by email) • Charles Darwin University (by email)
2005			
Meeting, Office of Water Strategy, Perth	7 December	3	• Office of Water Strategy • Dept of Water • Dept of Agriculture
Meeting, Water Smart Australia, Canberra	2 December	≈ 30	• National Water Commission • National Farmers Federation • Victorian Farmers Federation • Cotton Australia • Twynam Agricultural Group • Ricegrowers Association of Australia • Irrigation Association of Australia • NSW Irrigators Council • South Australian Murray Irrigators • SunWater • CRC for Irrigation Futures • National Program for Sustainable Irrigation • SA Murray Darling NRM Board • NT Agricultural Association • Pratt Water • Aust. National Committee on Irrigation & Drainage • Cth Dept of Agriculture, Forestry & Fisheries • Southern Rural Water • CSIRO (Jeff Camkin)
Meeting, CSIRO, Perth	2 December	3	• Dept of Water
Meeting, Office	1 December	10	• Office of Water Strategy

Seminars Meetings Workshops	Date	#	Organisations Represented
of Water Strategy, Perth			• WA Irrigation Review Steering Committee • Dept of Water (formerly Dept of Environment) • Dept of Agriculture • Water Corporation
Cross Project Collaboration tele-meeting	1 December	2	• NT Dept Natural Resources, Environment & the Arts • Environmental Research Institute of the Supervising Scientist
Meeting, CSIRO, Perth	1 December	1	• Dept of Industry Resources
Meetings, Darwin	23-24 November	10	• NT Dept Natural Resources Environment & the Arts • NT Dept of Primary Industries, Fisheries and Mining • Amateur Fishing Association of NT • NT Horticultural Association • Charles Darwin University • Environmental Research Institute of the Supervising Scientist • CSIRO Sustainable Ecosystems • Aust. National Committee on Irrigation & Drainage
Meetings organised by ANCID, Darwin	21-22 November	12	• Aust. National Committee on Irrigation & Drainage • NT Dept Natural Resources, Environment & the Arts • Ord Irrigation Cooperative • NT Dept of Primary Industries, Fisheries and Mining • Charles Darwin University • Environmental Research Institute of the Supervising Scientist
NT Cross Project Collaboration tele-meeting	31 October	4	• NT Dept Natural Resources, Environment & the Arts • Environmental Research Institute of the Supervising Scientist • Charles Darwin University
Meeting, Environmental Research Institute of the Supervising Scientist (ERISS), Darwin	7 October	12	• SSD • Environmental Research Institute of the Supervising Scientist • NT Dept Natural Resources, Environment & the Arts • NT Dept of Primary Industry, Fisheries and Mining • Cth Department of Environment and Heritage • WWF • CSIRO
Meeting, Northern Australia Groundwater Systems, NRETA, Darwin	3-5 October	6	• NT Dept Natural Resources, Environment & the Arts • QLD Dept of Natural Resources and Mines • CSIRO
CRC IF Annual Research Forum, Mildura	19-21 September	>80	• CRC Irrigation Futures • CSIRO Land and Water • QLD Dept Natural Resources, Mines and Energy • National Program for Sustainable Irrigation • Land and Water Australia

Seminars Meetings Workshops	Date	#	Organisations Represented
			• VIC Dept of Primary Industries • University of Melbourne • University of Southern Queensland • University of South Australia • University of Western Sydney • Charles Sturt University • NSW Agriculture • South Australian Research and Development Institute
Meeting, Sustainability Challenge, North Burdekin Water Board Case Study, Ayr	27 July	14	• North Burdekin Water Board • South Burdekin Water Board • CSR • QLD Dept of Natural Resources and Mines • Burdekin Shire Council • Canegrowers • CSIRO • University of New England • BSES
Meeting, Sustainability Challenge, North Burdekin Water Board Case Study, Ayr	30 June	6	• North Burdekin Water Board • CSIRO • University of New England • BSES
Workshop, Lower Burdekin Knowledge Platform, Ayr	17 June	≈ 30	• North Burdekin Water Board • South Burdekin Water Board • Sunwater • Burdekin Dry Tropics Board • Burdekin Shire Council • Canegrowers • QLD Dept of Natural Resources and Mines • BBIFMAC • QLD Dept of Primary Industry and Fisheries • BSES • James Cook University ACTFR
ERA workshop, Ecological Risk Assessment for the Wetlands of the Lower Burdekin	1 June	25	• North Burdekin Water Board • South Burdekin Water Board • Burdekin Dry Tropics Board • Townsville City Council • Canegrowers • Dept of Natural Resources and Mines • BBIFMAC • Dept of Primary Industry and Fisheries • EPA • ACTFR • University of Melbourne • University of Western Australia • Great Barrier Reef Marine Park Authority • Australian Sweet Forage Pty Ltd • Earth Environmental Consulting • Haughton Catchment Committee • Creek to Coral Waterwatch • CRC for Irrigation Futures • Burdekin Productivity Services Ltd

Seminars Meetings Workshops	Date	#	Organisations Represented
			• Monash University • CSIRO Land and Water
NT Stakeholder Meeting, Darwin	30 May	≈ 26	• NAIF Steering Committee • NT Dept Infrastructure Planning and Environment • NT Dept Business Industry & Resource Development • CSIRO • Environmental Research Institute of the Supervising Scientist • Land & Water Australia • NT Agricultural Association • NT Cattleman's Association
Workshop: Groundwater surface water interaction in the tropics, Darwin	26-27 May	≈ 40	• SKM • QLD University of Technology • QLD Dept Natural Resources & Mines • Charles Darwin University • CSIRO • NT Dept Infrastructure Planning and Environment • NT Dept Business Industry & Resource Development • EWL Sciences Pty Ltd • Australian National University • Ord Irrigation Cooperative
ERA Workshop: Irrigation in the Katherine-Daly region, Darwin	18 May	≈ 25	• NT Dept Infrastructure Planning and Environment • NT Dept Business Industry & Resource Development • Charles Darwin University • NT Horticultural Association • Environmental Research Institute of the Supervising Scientist • Cth Department of Environment and Heritage • CSIRO
Darwin meetings	17 May	7	• Sue Jackson, CSIRO • Peter Jacklyn, CRC Savanna's • Peter Jolly et al, NT DIPE
SunWater, Ayr	10 March	1	• Shaun Davidge – Project Manager: Water for Bowen
Sustainability Challenge Project Meeting, Charles Sturt University, Albury	25 February	≈ 20	• CRC Irrigation Futures • CSIRO Land and Water • QLD Natural Resources and Mines • South Australian Research and Development Institute • University of Western Sydney • Charles Sturt University • NSW Agriculture
Northern Australia Environment Alliance (NAEA), Brisbane	22 February	4	• Stuart Blanch – Manager Freshwater WWF Australia • Kerryn O'Connor - Wilderness Society • Henry Boer - Queensland Conservation Council • Matthew Durack – CRC IF
CRC IF Sustainability Challenge, Townsville, Ayr	15-17 February	≈ 10	• CRC IF Sustainability Challenge (Christen, Shepherd) • North Burdekin Water Board

Seminars Meetings Workshops	Date	#	Organisations Represented
			• BBIF MAC • SunWater
BBIFMAC, Ayr	14 February	10	• Burdekin Bowen Integrated Floodplain MAC
University of Melbourne – Confirmation Seminar, Melbourne	4 February	25	• University of Melbourne • CRC for Irrigation Futures • National Program for Sustainable Irrigation
Sunwater, Ayr	1 February	3	• SunWater
WA Water Task Force, Perth	27 January	≈ 15	• See minutes of meeting
2004			
CRC IF Sustainability Challenge Project Workshop, Sydney	17 November	23	• CRC Irrigation Futures • CSIRO Land and Water • SunWater • QLD Natural Resources and Mines • South Australian Research and Development Institute • University of Western Sydney • Charles Sturt University • NSW Agriculture
ERA Workshop Townsville	10 November	25	• CSIRO Land and Water • National Program for Sustainable Irrigation • Monash University • Australia Centre for Tropical Freshwater Research • NT Dept of Infrastructure, Planning and Environment • QLD Dep. of Primary Industries • QLD Dept of Natural Resources and Mines • Ord Land and Water • Burdekin Bowen Integrated Floodplain MAC • Burdekin Dry Tropics Board • CSR
Seminar – Kellett; CSIRO Davies Laboratory Townsville	15 October	25	• CSIRO Land and Water • CSIRO Sustainable Ecosystems • QLD Environmental Protection Agency • QLD Natural Resources and Mines • North Queensland Area Consultative Committee • Individual Farmers
CRC IF Annual Conference	20 September	100	• CRC Irrigation Futures • CSIRO Land and Water • QLD Dept Natural Resource Mines and Energy • National Program for Sustainable Irrigation • Land and Water Australia • Victoria Department of Primary Industries • University of Melbourne • University of Southern Queensland • University of South Australia • University of Western Sydney • Charles Sturt University • NSW Agriculture

Seminars Meetings Workshops	Date	#	Organisations Represented
			• South Australian Research and Development Institute
Brisbane Workshop	3 August	18	• QLD Dept of Primary Industries and Fisheries • QLD Environmental Protection Agency • QLD Dept Natural Resources Mines and Energy • QLD Dept State Development and Innovation • CSIRO Sustainable Ecosystems • CRC Irrigation Futures • Land and Water Australia
Darwin Workshop	26-27 May	20	• Cth Bureau of Rural Sciences • CSIRO Land and Water • National Program for Sustainable Irrigation • Cth Dept of Fisheries, Forestry & Agriculture • NT Dept of Business, Industry & Resource Development • CRC for Irrigation Futures • Land and Water Australia • Cth Dept of Environment and Heritage • Environmental Research Institute of the Supervising Scientist • QLD Dept of Natural Resources, Mines & Energy • NT Dept of Infrastructure, Planning & Environment • WA Dept of Environment • WA Dept of Agriculture
Kununurra Meeting 2	7 May	2	• WA Dept of Agriculture
Kununurra Meeting 1	7 May	1	• WA Dept of Environment
Kununurra Seminar	6 May	9	• WWF • Ord Cucurbit Growers • WA Dept of Agriculture • Ord Land and Water • Ord Irrigation • Ord Irrigation Coop • Kimberley Primary Industries Association
Broome Seminar	5 May	6	• Environs Kimberley • Kimberley Land Council • Gray's Organic Produce • Individual Farmers • Kimberley Area Consultative Committee • Kimberley Sustainable Regions Advisory Committee
Karratha Seminar	5 May	3	• WA Dept of Environment • WA Dept of Agriculture
Perth Seminar	4 May	10	• WA Farmers Federation • WA Dept of the Premier and Cabinet • Irrigation Association of Australia, WA Region • CSIRO Land & Water • WA Dept of Environment • WA Dept of Industry and Resources • Conservation Council of WA • Pastoralists and Graziers Association of WA

ATTACHMENT 8

Analysis of Membership of NAIF Stakeholder Reference Group

Updated 5 May 2006

Ticks indicate substantial knowledge or experience in the field, not necessarily representation.

Name	Local g'ment	Indigenous communities	Community: rural, urban	Environment: land, marine	NRM bodies	Agriculture industries / Agribusiness – general, irrigation, investors	Other Industries: fisheries, aquaculture and/or mining	Media	Other skills/Summary
Robert Boshammer Kununurra, WA. Representing self.			✓			✓	✓		Irrigated agriculture, small business & marketing, remote communities, R&D
Barry Louvel Broome, WA. Representing self.		✓	✓			✓	✓		Working with aboriginal people, government policy, economic d'ment and industry sustainability, strategic planning, business, tourism
Geoff Strickland Perth, WA. Representing Dept of Agriculture.						✓			Agricultural research, development & sustainability, tropical pest m'ment, cotton research, Cotton CRC program leader, strong regional networks
John Etty Katherine, NT. Representing self.		✓	✓		✓	✓			Farming & irrigation experience, organic & sustainable farming, NTAA membership, member Daly Community Reference Group, training aboriginal communities on farming and nursery practices
Dan Halloran Katherine, NT. Representing NTAA		✓	✓			✓			Strong industry networks, experience negotiating with govt and indigenous landholders, collaboration with community and primary industry groups, engaging irrigation stakeholders, member Daly CRG

Marc Wohling Darwin, NT. Representing Northern Land Council		✓	✓	✓	✓				Facilitating aboriginal responses to economic development issues, NRM management framework, representation of 19 traditional owners across Daly River catchment, Daly ARG, wetlands, participatory processes
Patricia Julien Mackay, QLD. Representing self.				✓	✓	✓			Climatology/plant water update modelling, local conservation groups, teaching experience, developing communication & education tools
Vern Veitch Townsville, QLD. Representing Sunfish.				✓	✓		✓		Fisheries, GBRMP, wetlands assessment and management, acid sulphate soils, Aust Centre for Tropical Freshwater Research
Gianni D'Addario Dalton, NSW. Representing self.				✓	✓	✓			Mapping, conservation programs, education tools

ATTACHMENT 9

NAIF STEERING COMMITTEE MEETING DATES

NAIF Steering Committee meeting dates from the inception of the SC are recorded below. Those during the Milestone 5 reporting period are in italics.

SC Meeting #	**Date**	**Format**
17 (pending)	July 2006	Tele-link
16	*19 April 2006*	*Tele-link*
15	*14 February 2006*	*Face-to-face; Townsville*
14	1 December 2005	Tele-link
13	26 October 2005	Face-to-face; Mildura
12	13 September 2005	Tele-link
11	4 August 2005	Tele-link
10	12 July 2005	Tele-link
9	30 May 2005	Face-to-face; Darwin
8	21 April 2005	Tele-link
7	14 March 2005	Tele-link
6	14 February 2005	Tele-link
5	9 September 2004	Tele-link
4	21 May 2004	Tele-link
3	14 May 2004	Tele-link
2	15 April 2004	Tele-link
1	11 March 2004	Tele-link

ATTACHMENT 10

PRESENTATION TO NATIONAL WATER COMMISSION STAFF 12 MAY 2006

TO BE PROVIDED AS A SEPARATE FILE