Australian Government

Department of Agriculture, Fisheries and Forestry

Department of the Environment and Heritage

28th of October 2005

Ms Louise Geil
Secretary
Senate Environment, Communications, Information Technology and the Arts Committee
Parliament House
Canberra ACT 2600

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Senate Environment, Communications, Information Technology and the Arts Committee

Dear Ms Geil

Inquiry into the extent and economic impact of salinity

During the Senate Salinity Inquiry hearing on Tuesday the 6th of September 2005, the joint DAFF/DEH delegation offered to provide further information on matters raised by the Senate Inquiry Committee:

- Estimates of how many hectares of land have been removed from agricultural production to-date due to salinity (see proof Hansard, page 8);
- The criteria for determining the NAP priority areas (see proof Hansard, page 9);
- Further briefing on the Upper South East Dryland Salinity Program in South Australia, with specific references to the drain design and depth, consultation with landholders and effect on soils (see proof Hansard, page 14);
- Information on any work that has been undertaken in the eastern states that looks at the impacts of salinity on biodiversity (see proof Hansard, page 17);
- Clarify the revised projected salinity impact figures for WA – is it only the time frame that has changed or the equilibrium figures as well (see proof Hansard, page 17).

Please find the information in the appended document.

Yours Sincerely

Malcolm Forbes
First Assistant Secretary
Natural Resources Management Programmes Division
Department of the Environment and Heritage

Inquiry into the extent and economic impact of salinity

DAFF/DEH joint team additional information

Senator TROETH, ECITA 8 and 9:

1. *Estimates of how many hectares of land have been removed from agricultural production to-date due to salinity (see proof Hansard, page 8);*
2. *The criteria for determining the NAP priority areas (see proof Hansard, page 9).*

1. *Estimates of how many hectares of land have been removed from agricultural production to-date due to salinity (see proof Hansard, page 8)*

The year 2000 paper "Our Vital Resources: A National Action Plan for Salinity and Water Quality" identified that at least 2.5 million hectares (5% of cultivated land) is currently affected by salinity. Currently, there are no precise figures as to how much land had to be *removed* from agricultural production because of salinity.

2. *The criteria for determining the NAP priority areas (see proof Hansard, page 9)*

This matter was addressed in the Government's response to the ANAO Audit Report no. 17 2004-05 on "The Administration of the National Action Plan for Salinity and Water Quality".

The threats of salinity across the landscapes differ in terms of severity and type. As a consequence, determining the priority areas for financial assistance to address salinity and water quality was essential. Agencies, in their early advice to Ministers, recognised that program funds should be preferably targeted to areas that were "ready to commence detailed action planning or where investment now will avoid costly degradation in the future". The selection of the regions became an iterative process. In October 2000, Australian Government Ministers considered an indicative list of 15 possible regions from which 8 to 12 were to be selected. These regions were identified on the basis that they covered "the majority (around three quarters) of the area currently identified as being highly affected or causing salinity (2.5 million hectares) or having water quality problems or at salinity risk (15 million hectares)".

However, after consideration of the scale of the salinity and water quality problems in the Australian landscape, Australian Government Ministers were interested in expanding the program to cover "all of the areas for priority action" although this was not specifically defined. This involved increasing the indicative list of regions from up to 12 regions to 20 most affected catchments, as well as increasing the budget from $500 million over five years to $700 million over seven years. The final selection of the regions was progressively negotiated with the States / Territories. By May 2002, the Australian Government and all States had accepted a final list of 21 "priority regions" and entered into an intergovernmental agreement to formalise the program. Because of the scale and the diversity of these 21 regions, some 34 regional bodies are responsible for the delivery of the program at sub-regional level.

Inquiry into the extent and economic impact of salinity

Senator WORTLEY, ECITA 14:

- *Further briefing on the Upper South East Dryland Salinity Program in South Australia, with specific reference to drain design and depth, consultation with landholders and effect on soils (see proof Hansard, page 14);*

The Upper South East Program (USE Program) is an integrated scheme incorporating environmental and engineering sub-programs designed to respond to the regional salinity and flooding problem, whilst at the same time providing for the conservation and enhancement of biodiversity assets across the landscape with a particular focus on the delivery of environmental flows to the region's wetlands.

Governance of the Program is overseen by the Upper South East Program Board. Members include representatives of landholders, the new South East NRM Board, South Australian Farmers Federation and the Conservation Council of South Australia as well as State and Australian Government (Department of the Environment and Heritage and Department of Agriculture, Fisheries and Forestry) officials. Day-to-day administration of the Program is undertaken by officials of the South Australian Department of Water, Land and Biodiversity Conservation.

Groundwater Drainage in the Upper South East

Dryland salinity in the Upper South East is the result of shallow saline groundwater bringing salt close to the soil surface where it is concentrated by evaporation. There are 2 groundwater systems influencing the Upper South East region: an unconfined aquifer and a deeper confined aquifer. It is the unconfined aquifer that is the source of salinity problems in the region. Regional groundwater flows under the ground from western Victoria and moves slowly across the USE region due to the very limited gradient, before draining to the sea in the west. Surface water moves south to north.

Groundwater drains intercept the water table and drain saline water from the soil profile, which reduces the 'wicking' effect of salts up into the root zone during summer. Less root zone salinity results in a greater number of more productive pasture options for landholders and better quality surface runoff for wetlands. Saline water from the Central and Northern Catchment drains enters the Coorong via Salt Creek.

A management plan has been developed to ensure that the drainage scheme conserves and enhances the natural wetland values of the region. An important element of this is to re-establish the historic wetting and drying cycles of these wetlands as far as is possible, incorporating seasonal and annual variations in freshwater flow. The drainage works have been constructed to allow relatively good quality water in winter (when the majority of the region's rain falls) to be diverted into nearby wetlands, with regulators used to control water levels and prevent premature drying. In summer, saline groundwater is directed along the drain.

Removal of salt from the soil profile can result in structural decline in some soils within the USE. Where it does occur, sodicity unlike salinity, can be effectively managed by combinations of gypsum application, ripping, mulching, clay spreading and establishing optimum plant/crop species. Sodicity may be viewed as part of the progression to more productive soils.

Flood Management

While the region has experienced below average winter rainfall for over a decade, it has at times been subject to widespread flooding and waterlogging due to the low gradients which are a feature

of the area. The flooding compounds the salinity impact and reduces the area of productive land for extended periods. Drainage designs in the USE Program also seek to manage flows in these events.

Consultation With Landholders

The Upper South East Project Team and the Upper South East Program Board have been working in consultation with landholders regarding designs for drain depth, drain profile and drain alignment. The major focus of that consultation has been on achieving the best possible balance between environmental and agricultural productivity outcomes. Consultation involves a series of cycles that build towards a decision, commencing with the gathering of information; options assessment; conceptual design, and detailed design and implementation. At each of these stages, consultation occurs with the four key stakeholder groups: Technical Panel, Landholders, Environmental Management Advisory Group, and the Program Board. The complexities of achieving multiple outcomes for uses and users and the variations across the region mean that it is inevitable that there are different perspectives on the 'correct' balance between agricultural production and environmental issues.

Inquiry into the extent and economic impact of salinity

Senator SIEWERT, ECITA 17

1. *Information on any work that has been undertaken in the eastern states that looks at the impacts of salinity on biodiversity (see proof Hansard, page 17);*
2. *Clarify the revised projected salinity impact figures for WA – is it only the time frame that has changed or the equilibrium figures as well (see proof Hansard, page 17).*

1. *Information on any work that has been undertaken in the eastern states that looks at the impacts of salinity on biodiversity (see proof Hansard, page 17);*

Overall, there have been few studies on the impact of salinity on biodiversity in Eastern Australia (Sue Briggs, CSIRO Sustainable Ecosystems, pers. com.). The most comprehensive report on the matter was prepared by a Task Force established by the Standing Committee on Conservation for the Australian and New Zealand Environment Conservation Council (ANZECC) in June 2001. This report outlines the impact of salinity on biodiversity in each State as detailed below.

South Australia:
The salinity risk to biodiversity in SA is summarised in the table below:

Impact	Current	2020	2050
Remnant vegetation (ha)	18,000	22,000	25,000
Rivers ephemeral (km)	160	190	210
Wetlands (ha)	45,000	52,000	57,000
Wetlands of National Significance (no.)	4	4	4

Tasmania:
Salinity impacts on biodiversity are greatest in the low rainfall areas (<700mm/year) where there has already been considerable impact on biodiversity following European settlement. Vegetation associated with wetlands, lowland plains and river flats including herbaceous wetland communities, grasslands and several types of woodlands , which are already some of Tasmania's most endangered vegetation types, are at high risk. Fourteen forest types and fifteen non-forest vegetation types are at medium risk.

Victoria:
Up to 4 – 8% of all records of threatened flora in Victoria are predicted to located in shallow water tables by 2050 and 9 – 17% of all threatened fauna. More threatened species are currently associated with shallow water table areas in the Wimmera regions than elsewhere in the State. There are considerable but not uniform threats to many forested areas in the State. In the Mallee, rising water tables are generally considered a threat in lowland areas only. There is a general increase in salinity close to the Murray River.

Australian Capital Territory:
The low levels of stream salinity are not expected to have any marked impact on local biodiversity. There is no information about the impact of dryland salinity on native vegetation.

New South Wales:
Areas of remnant woody vegetation affected by, and at risk from, salinity include 13,500 ha (2000), 51,400 ha (2020) and 173,000 ha (2050). These figures are substantial underestimates as they only include forests (not woodlands) on freehold land.

Queensland:
There is little specific data on impacts on flora and fauna. Like South Australia and Victoria, it is expected that wetlands and rivers are most at risk from increasing salinity.

2. *Clarify the revised projected salinity impact figures for WA – is it only the time frame that has changed or the equilibrium figures as well (see proof Hansard, page 17).*

The most recent report published about these figures is the "Salinity Investment Framework: Agricultural Land and Infrastructure" from the Department of Agriculture of Western Australia (July 1995). An area between 2.9 and 4.4 million hectares was assessed to have a salinity hazard, down on the 6 million hectares that are now seen as an overestimate.

The time to equilibrium has increased in response to the lower rate of watertable rises due to below average rainfall since the early 1990's. As part of the salinity risk assessment, an "urgency" rating was developed for each soil-landscape zone to assess approximately how long it would take the groundwater system to come to equilibrium and the area of salinity to stabilise. An urgency map has yet to be produced using these ratings.

A new analysis of salinity hazard and time to equilibrium is planned for 2006.