Appendix M Methods for Modelling Recharge Sensitivity

Recharge sensitivity is modelled by integrating known data sets including

- Elevation (Digital Elevation Model)
- Soils mapping
- Land use mapping
- Climate overlays (rainfall & temp)
- Aquifer info/ hydrogeology mapping

The model predicts the area of land that could be affected by salinity as a result of deep drainage of irrigation water from that location. It was assumed that under standard practice irrigation in the midlands, 20mm of water drains below the soil profile. (This figure is conservative, actual measured deep drainage in the Back Creek area was in the range of 35 – 50 mm)

A 4ha grid cell analysis was undertaken using MODFLOW to predict the potential wider impact of the deep drainage on the surrounding landscape.

The information presented indicates that irrigation in some areas could precipitate ground water rise over much larger areas than the area actually irrigated.

Expression of salinity in this process is defined as a rise in groundwater levels to within 2m of the soil surface. – This may not mean that saline discharge at the surface will occur, but there may be reductions in productivity of pastures, greater risks from cropping and changes in species composition in natural areas plus groundwater salinity increasing (due to evaporation processes now occurring).

The modelling suggests there is relatively lower recharge sensitivity in the Southern Midlands and in the Campbell Town area whilst there is significantly higher sensitivity in the Isis River catchment, upper Blackman River catchment, upper Lake River catchment, the York Plains, Tunbridge, Ross and Conara areas.

The model highlights the ‘leakiness’ of some landscapes and as a result is a guide to identification of areas where irrigation may have the greatest impact on the surrounding landscape.