

Putting the tape over on-farm water storages

SMK Consultants has available a GPS co-ordinated hydrographic survey instrument system which, among other applications, can be used to measure on-farm water storages when partially or completely full. Initially the proposal was started in response to a joint venture project with NCEA and USQ to commercially test this type of equipment. This followed their research over the past couple of years to develop accurate measurement of farm water storage capacities.

Previous requests from some landholders to measure 'wet' storages provided additional impetus for the concept. The joint venture collaboration will research protocols for survey data collection and the reduction and interpretation of this data. Ultimately the results of this project will provide an efficient balance between survey methods and costs associated with hydrographic surveys.

The hydrographic instruments consist of a data recorder connected to a transducer which is mounted in

an aluminium boat. The boat traverses the site recording position and water depth to build a profile of the storage surface beneath the water line.

Traverse lines can be controlled via a track guidance hand-held computer connected to the data logger. This ensures a reasonable level of uniformity in the data capture process. The data collected is downloaded and processed to provide the capacity of water stored within the farm storage.

The ability to observe (and measure) features and grade changes within a storage provides a high level of confidence in the results provided.

IMPORTANCE OF MEASUREMENT

Measurement of storages when dry is relatively simple and can provide accurate figures for a variety of purposes such as:

- Crop water availability;
- Water use efficiency programs; and,
- Storage loss measurement.

But when dams are 'wet' it is a time consuming and generally inaccurate task to gather data beneath the water surface via weighted lines and tape measures. The major problem with results obtained in this fashion is being able to accurately locate features such as embankment batters, borrow areas and undulations present within the storage area.

This is particularly evident when knowledge of the original manner in which each storage was constructed is doubtful or non-existent.

Another way in which this type of equipment may be used is to confirm water storage volumes as properties are sold or leased.

Anecdotal evidence suggests there have been instances where purchasers have been advised of a particular storage volume only to discover the figure was not correct. Obviously, these situations can create unnecessary problems for all parties involved in the sale. It should be noted that many of the more recent storages built do have reasonably accurate capacity figures.

Some examples of the benefits as far as property sales are concerned are:

- Agents avoiding unforeseen anomalies in representing water storage volumes in brochures or advertisements;

- Vendors being satisfied the product they are selling is genuine — that is, a water storage with a confirmed capacity of water;
- Purchasers having confidence they are getting what they pay for and as a result, being consistent with any future budgets upon which they have made their purchase;
- Confirmation of the value of water stored at time of sale — that is, being able to attach an accurate capacity to a certain rate (\$) per megalitre; and,
- Proof that water storage capacities are consistent with any existing or future legislation enforced by State and local authorities — for example, pre-documented storage capacities captured under moratorium guidelines.

Measurement of dry storages is directly related to storage size and shape, variations in features within the embankments and ground conditions for access. Survey of 'wet' sites is not influenced by ground conditions. But if a full capacity survey is required on a partially filled site, additional RTK GPS survey may be needed. On this basis a similar cost to dry storage measurement would be a reasonable assumption for costs.

Further Information: Mike Henderson SMK Consultants Pty Ltd
Ph: 07 4671 2445.