ASSAY

A NEWSLETTER ABOUT ACID SULFATE SOILS

No 29. December 2001

Assay has a new editor

Welcome to the latest edition of ASSAY. After a hiatus of six months, following the departure of the previous editor, Jon Woodworth, we welcome Heather Shearer as the new ASSAY editor. Heather has been appointed as ASS Information Officer located at NSW Agriculture, Wollongbar Agricultural Institute. Her position is National Landcare Program funded.

Heather was previously the Network Manager for Wetland Care Australia (Ballina), and managed their National wetland information network, including editing the *WetlandLink* Bulletin, the Wetlands Alive Journal and the Wetland Care Australia website. Prior to this, she worked as a project officer for the Murray Wetlands Working Group (DLWC) in the far West of NSW. She is a resident of Ballina, on the north coast of NSW, and has a particular interest in coastal floodplain ecology.

"I look forward to editing Assay", said Heather, "and intend to continue the tradition of publishing quality Acid Sulfate Soil information in Assay. I also intend to update the Acid Sulfate Soils webpage, including information on Acid Sulfate Soils research, case studies and news."

"I encourage anyone with news on acid sulfate soils, their management and research, to contact me at Email - *heather.shearer@agric.nsw.gov.au* or Tel - 02 6626 1344."

Heather Shearer

Acid Sulfate Soils database (ASSIST) update

Call for Expressions of Interest

ASSAY wishes to update the ASSIST database list of people who are working in the field of acid sulfate soils. The database is available to the public on request, and in the future, on the webpage, and aims to encourage networking and communication about ASS. We encourage ASS researchers, consultants, academics, landowners, managers and government officers to be involved. Please note that inclusion in the ASSIST database does not imply recommendation by ASSAY or the Acid Sulfate Soils Management Advisory Committee.

To change your existing list address, or to be included in ASSIST for the first time, simply contact: Heather Shearer, NSW Agriculture, Bruxner Highway, WOLLONGBAR, NSW 2477.
Tel - 02 6626 1344, Fax - 02 6628 1744
Or Email *heather.shearer@agric.nsw.gov.au*

NEWS - INTERNATIONAL ACID SULFATE SOILS CONFERENCE

Update on the 5th International Acid Sulfate Soils Conference

The 5th World Acid Sulfate Soils Conference, *"The Sustainable Management of Acid Sulfate Soils"* will be held from the 25th-30th August, 2002, in Tweed Heads, NSW.

Researchers, land managers and legislators have become very aware of the potential environment degradation from the unsustainable use of acid sulfate soils. The Conference Program is organised around four broad themes important in achieving sustainable management of acid sulfate soils:

- **Characteristics of Acid Sulfate Soil Hazards;**
  Field Monitoring; Lab Analysis, Remote Sensing, Geomorphology and Pedology
- **Management of Acid Sulfate Soils;**
  Neutralisation techniques, Broad-acre agriculture, Aquaculture, Acid Mine Drainage, and Engineering
- **Planning, Legislation and Regulation;**
  Industry, Public, and NGO's
- **Communication and Education.**
  A special session for the dissemination of scientific results to managers of acid sulfate soils.

Field Trips

The conference fee includes a field day, which will feature visits to Acid Sulfate Soil Hotspots on the Richmond River (NSW) or Rocky Point (QLD) and Tweed River and Cudgen Catchment (NSW). At these sites, researchers will discuss the environmental problems caused by acid sulfate soils and management of these acid sulfate hotspots by industry and local government.

Post-Conference Field Trip

If there is sufficient interest, a post conference field trip will be organised. The focus of the trip will be the management and characteristics of acid sulfate soils within New South Wales. The trip will include visits to sugar cane, pastoral, agro-forestry and viticulture land-uses on acid sulfate soils. Interested parties should contact Leigh Sullivan,
Tel (02) 6620 3742 Email - *lsulliva@scu.edu.au*

For more information on the conference,

Contact Ben Macdonald, Conference Director,

Email *bennettmacdonald@bigpond.com*

Website: *http://www.out.at/acidsoil*

Deadline for abstracts 1/3/2002

NATIONAL ACID SULFATE SOIL PROJECTS

2nd Round of Coastal Acid Sulfate Soil Program (CASSP) projects funded

In September 2001, the previous Federal Minister for the Environment and Heritage, Senator the Hon Robert Hill, announced funding for 6 new CASSP Projects. The latest projects complement the 9 projects already funded around NSW, Queensland and SA, and include:

Management Options for Acid Sulfate Soils

Location - East Trinity, Cairns, Queensland.

Funded for $249,686

This project will demonstrate innovative management of a serious acid sulfate soils problem at East Trinity, near Cairns. It will utilise the mechanisms of liming and managed tidal exchange as buffering agents. The intention is to progressively and cautiously replace the existing acidified freshwater/brackish unmanaged wetland at Hills Creek catchment, with a managed tidal wetland system.

Contact: Col Ahern, Project Manager, Department of Natural Resources and Mines,

Tel: - 07 3896 9510;

Email - *Col.Ahern@dnr.qld.gov.au*

Active Floodgate Management on a Sub-catchment Basis, Tuckean Swamp

Location - Northern NSW.

Funded for $115,592

The Tuckean Swamp is part of a large sub-catchment, which drains into the Tuckean Broadwater and Richmond River. This project will implement floodgate works, drain management strategies and drainage diversion for environmental flows. The project will demonstrate an integrated and coordinated implementation strategy for sub-catchment remediation.

Contact: Michael Wood, Project Manager, Richmond River Country Council

Tel: - 02 6621 8314

The Belongil Catchment Rehabilitation Project - Developing a Model for the Re-establishment of Melaleuca Wetland and the Management of Acid Sulfate Soils

Location - Byron Bay, NSW.

Funded for $249,000

This project will demonstrate an innovative technique using wastewater to inhibit acid sulfate oxidisation and re-establish a wetland. This project is stage 1 of a longer-term project, the Belongil Catchment Rehabilitation project. It aims to use well-treated and disinfected effluent from West Byron Sewerage Treatment Plant to re-establish and maintain, along with the use of drop boards, and a 24 hectare Melaleuca wetland to control and minimise acid sulfate events. Stage 1 will establish 5 hectares of Melaleuca plants, install and commence irrigation to promote growth and neutralise acid drainage

- The first meeting of the Project Steering Committee has been held.
- The project is also the subject of a successful Australian Research Council grant.
- The Australian Research Council application and grant has strengthened the collaborative partnership between Byron Council and Southern Cross University.
- Stage 1 of the CASSP project is progressing with baseline monitoring and assessments.
- A further trial planting of Melaleuca started on the 19th November.
- Work on the effluent irrigation network has progressed with the design complete

Contact: Phil Warner, Project Manager, Byron Shire Council, Tel: - 02 6626 7000

Email - *Phil.Warner@byron.nsw.gov.au*

Installing dropboards at Belongil

Vetiver Grass Hedges for Control of Runoff and Drain Stabilisation

Location - Pimpama, Queensland.

Funded for $40,628.

A simple, value-for-money project that will investigate the use of vetiver grass as riparian vegetation on the sides of existing drains, which export acid sulfate runoff. The grass does not self-seed and is not invasive. The establishment of the grass is likely to control stream bank erosion, lower frequency of drain maintenance, trap sediments in runoff water and lower the water table in the drain. It is anticipated these effects will reduce the amount of acid and nutrients reaching the drain and the surrounding waterways.

Stream bank erosion in particular may be a major factor in exposing ASS in the drain wall to oxidation and leaching. It is hoped that Vetiver Grass will demonstrate an economic and environmentally effective means of managing existing drainage. It is proposed that stabilisation may also promote the adoption of best management such as wider and shallower drains, as bank erosion will no longer impact on drain performance.

Contact: Evan Thomas, Project Manager, Gold Coast City Council, Tel: - 07 5582 8430

The Townsville Southbank Coastal Acid Sulfate Soil Remediation Project

Location - Townsville, Queensland.

Funded for $250,000

This project will use wastewater to demonstrate a means of reducing acid and heavy metal runoff from 12 highly acidified, abandoned, aquaculture ponds on some 50 hectares of the south bank of the Ross River at Townsville. A range of neutralising materials and techniques will be employed to create an innovative fresh and saltwater wetland filtering system. The pond walls will be neutralised by mixing the top half with agricultural lime and the bottom half using a technique from another CASSP funded project, lime slotting. Once construction is completed, the top ponds will receive freshwater from a wastewater treatment plant. This water will flow through the wetland system to the bottom 4 ponds, which will have buffering capacity as a result of tidal exchange.

Contact: Craig Wilson, Project Manager, Townsville Port Authority Tel: - 07 4781 1611

The South Australian Inventory of Acid Sulfate Soil Risk (Atlas)

Location - South Australia.

Funded for $158,502

This project aims to identify the distribution of potential ASS and ASS in South Australia as a basis for avoiding future disturbance. It will develop an inventory of ASS risk in the form of maps covering the entire South Australian coastline and a 'world wide web' accessible database, which will include soil properties, and map. The project will build on the National Land and Water Resources Audit and superimpose the ASS map on the estuaries classification map. The project aims to produce a multi-scale atlas, based on a mapping scale of 1:100 000, but with a State overview of 1:250 000 with the ability to zoom in at a regional scale. The project comprises two important components: the mapping activities and in conjunction, the project will deliver a

set of ASS planning policies at State and local government level for South Australia.

Contact: Richard Merry, Project Manager, CSIRO Land and Water Tel: -08 8303 8422,

Email - *Richard.Merry@csiro.au*

For further information on these projects and the Coastal Acid Sulfate Soils Program, look at the website:

http://www.ea.gov.au/coasts/programs/cassp/index.html or

Contact: Trevor Costa - 02 6274 1030, *cassp@ea.gov.au or trevor.costa@ea.gov.au*

STATE (NSW) PROJECTS

NSW ASS Hot Spot Remediation Program

Work is progressing well on the Acid Sulfate Soil Hot Spot Remediation Program. One year has passed since the Premier's announcement of $3.4 million for the remediation of seven acid sulfate soil hot spots.

The program is co-ordinated by Ms Jane Gibbs of the New South Wales Department of Land and Water Conservation's Ecosystems Branch based in Newcastle. Local councils act as site managers for each of the hot spots. Ongoing technical support is provided to local councils by DLWC North Coast regional staff Alan Cibilic, Peter Haskins, Mitch Tulau and Glenn Atkinson.

The program aims to reduce the frequency, intensity and duration of acidic discharges from seven hot spots situated in the Tweed, Clarence, Macleay, Hastings, Manning and Shoalhaven catchments.

"Draft concept management plans will be developed during the first half of 2002 and will incorporate previous information gathered at each of the hot spots as well as stakeholders views on future management options," said Jane.

"A key component of the program is ensuring adequate technical and scientific input throughout the development of strategies. In addition to the ongoing technical support provided to site managers by DLWC, ASSMAC has nominated members of an ASS Hot Spots Technical Committee," Jane added.

Professor Ian White chairs the Technical Committee. Other members are Dr Greg Bowman, Dr Bruce Blunden, Associate Professor Mike Melville, Dr Jes Sammut and Dr Peter Slavich.

Contact: Jane Gibbs by phoning (02) 4960 5082 or email *jkgibbs@dlwc.nsw.gov.au*

Cudgen Lake Hotspot

Previous projects and research in the Cudgen Lake catchment carried out by Tweed Shire Council and University of NSW have been conducted within the Hotspot area, but did not cover the entire area. In recognition of this, Tweed Shire Council (site manager for the Hotspot project) has recently produced a news bulletin for property owners and other key interest groups in the area, to bring them up to date. Tweed Shire Council has also established a Cudgen Lake Hotspot Advisory Committee, and started collating all relevant information regarding the area.

A key feature of the project is the inclusion

of Drainage Union and property owner representatives on the advisory committee. As most affected lands are privately owned, Tweed Shire Council will be working closely with property owners throughout this project. Tweed Shire Council intends to develop a draft management plan over the coming months, and hopes to finalise the plan by mid 2002 so that the required works can be completed in the 2002 dry season.

Key features of this hotspot include the new Pacific Highway section (Yelgun - Chinderah bypass) that crosses it, and the adjoining Cudgen Lake Reserve. Both the Roads and Traffic Authority (RTA) and the NSW National Parks and Wildlife Service will be consulted throughout.

Methods used to manage acid sulfate soils and reduce the discharges of acid waters that are being developed at research sites in NSW (like the nearby McLeods Creek area) will be assessed for use in this hotspot. Property owners can expect to hear more over the coming months.

Further information contact: Mark Tunks (Tweed Shire Council) - 02 6670 2440)

or Alan Cibilic (NSW Department of Land and Water Conservation) - 02 6640 2012

Email - *acibilic@dlwc.nsw.gov.au*

Everlasting Swamp Hotspot

Due to previous work in the area from 1998, Clarence River County Council (CRCC) has accepted the role of site manager for this Hotspot project. The site is bisected by Sportsmans Creek, and Woody / Reedy Creeks, and covers almost 30 square kilometers of valued wetland and agricultural land. The Sportsmans Creek Drainage Union manages the Sportsmans Creek weir, built in 1927 to exclude salt water from most of the hotspot area. CRCC manages 12 drains in the area, plus flood protection levees and floodgates on Woody and Reedy Creeks.

Management options have been identified in discussions with property owners from 1998. These, and additional options, were recently presented to landowners via a news bulletin. Property owners have also nominated for a local Hotspot advisory committee, which is a sub-committee of the Clarence Floodplain Project. Existing drainage system management plans are expected to be incorporated into the hotspot plan, which will be developed over the next 6 months or so.

Through the Hotspot project, CRCC also hopes to be able to assist the Sportsmans Creek Drainage Union to develop a management plan that meets the drainage provisions on the Water Management Act 2000.

Further information - Greg Wilkinson (CRCC) - 02 6642 3277

Email *crcc@crcc.nsw.gov.au*

or Alan Cibilic (NSW Department of Land and Water Conservation) - 02 6640 2012.

Email *acibilic@dlwc.nsw.gov.au*

ASSPRO Project - Liquid level regulation apparatus

The "Liquid Level Regulation Apparatus" is an innovative and cost effective floodgate device designed by Australian Aqua Services, Wauchope. It automatically controls water flow to pre-determined heights on either side of the device. It is activated by changes in water height, like tidal cycles and water releases. If there is an upstream increase in water level, the device can automatically release the water to tide level.

The apparatus is cost-effective, priced between $5,000 and $10,000, comparable to other floodgate apparatus. However, because it can be set automatically it is virtually maintenance free, saving substantially on operation and maintenance costs. Another benefit is saving on OH&S costs. Because the device is automatic, there is no need to install extra infrastructure like steps and guard-rails, all of which can add substantially to costs.

The device can be fitted to existing floodgates, and provide passage to aquatic life. Monitoring instruments can easily be fitted, allowing data such as flow rates, water quality and pH to be automatically collected. The device is flexible in design, and can be made to suit each individual location, shaped to suit the site, discharge flow and tidal heights.

The device is a 60cmø x 240cm long, recycled plastic, pipe fitted to the river face of the floodgate with a flexible, eurothane, coupling. The coupling provides the essential ability for the pipe to rise and fall with the tide. The modified floodgate still operates as a regular floodgate, closing on the rising tide and opening on the falling tide. Volume of water decanted is regulated by the tide lifting the mouth of the pipe out of the water. The rate of lift is regulated by fine tuning the pipe with floats and or ballast. The desired water height in the drainage system is controlled by drop-board weirs at the back of the floodgate structure.

In acid sulfate soil areas, operation of the device allows controlled decanting of saltwater into agricultural and flood mitigation drainage systems. The use of saltwater is efficient in buffering acid leachate, but can be risky, with possible tidal overtopping of drains, resulting in pasture loss from salinisation and possible formation of acid scalds. Use of this device provides increased confidence in saltwater volume and drain water height control, retention of flood mitigating capacity, low operation and maintenance regimes and is robust enough to withstand floods.

A trial installation of the "Liquid Level Regulation Apparatus" has been in operation at Oceania Agriculture's tea tree plantation, "Minnamurra", Port Macquarie, since July 2001. The unit was installed at a triple floodgate unit on the Maria River. Prior to this, the existing floodgates were only manually opened on rare occasions, and a reservoir of highly acidic water had collected upstream.

Since installation of the apparatus, the owners report that one of the main benefits has been the automation of previous manual floodgate operation. The floodgate level can be set at a pre-determined height, to allow salt water flushing of the drainage system without danger of upland flooding. Because it is automatic, there is no danger of an operator forgetting to close the gate during rising tides.

The plantation owners have also noticed a significant decrease in weed infestation of the drains, as these have mostly been killed off by the salt water. However, they report that the greatest benefit is improvement in the water quality exiting from the property. As the property is in an acid sulfate "Hotspot", it has

attracted a lot of attention with regard to the pH of the water. Since installation of the device, the water quality monitoring has showed that the pH of the water exiting the property is tending more towards neutral than at any other time.

The device meets all requirements of State/National Clean Water Acts. Funding for the trial of the device has been provided by ASSMAC (Acid Sulfate Soils Management Action Committee) which is provided through ASSPRO (Acid Sulfate Soils Projects) and delivered through NSW Agriculture.

For further information, contact Peter Wall of Australian Aqua Services, on (02) 6585 2408, mobile 0417 196 875,

e-mail *jwall@midcoast.com.au*

Liquid level apparatus

Review of river deoxygenation after major floods

Major flooding across the northern rivers of NSW during February 2001 caused massive fish kills and many weeks of extremely poor river water quality. The fish kills were attributed to deoxygenation of river water. These effects were severe in Richmond, Clarence and Macleay Rivers.

Various agencies, councils and researchers had actively collected information during and after these floods. NSW Agriculture convened a workshop at Alstonville on 15 May, 2001 to review the collected information, identify the contributing factors and evaluate the implications for land and water management. 40 invited participants selected for their local and industry knowledge, expertise and roles in land and water management attended the meeting.

Presentations were made on the climatic conditions, the movement of floodwaters, water quality data and fishery impact. The flood impacts were compared to those of previous floods and estuary recovery processes were outlined. The review enabled a timeline of the main processes to be constructed and presentation of sufficient information to enable a general explanation of the main processes contributing to the deoxygenation.

Evidence was presented to show that large quantities of monosulfide rich black ooze, which is a gel-like sludge common in drains leading from acid sulfate hot spots, was mobilised as drains on the floodplain began to discharge. Data was also presented to show that these monosulfide black oozes (MBO) can completely deoxygenate water within minutes, if disturbed into the water column. Monitoring data showed a flow velocity dependent deoxygenation process operated in some drains. It is highly likely that some of the initial deoxygenation was associated with MBO mobilisation.

Data was also presented to show that 2-3 days after flood peak passed through the floodplain section of the river, the river water quality changed from brown sediment laden to black and anoxic. This change was associated with drainage flows entering the river from acid sulfate soil hotspot areas. These black, anaerobic, pH neutral drainage flows had very high concentrations of both dissolved carbon and iron. It was evident that the iron mobilised from acid sulfate soils was interacting with carbon from decaying organic matter and vegetation to produce water with a very high deoxygenation capacity. The drainage of this water was a major process contributing to the duration of the deoxygenation events.

Acid sulfate scalds are now developing on many of the low backswamps impacted by these flood processes. The combination of late summer floods, winter frosts and a dry spring has meant that many low backswamp areas remain devoid of vegetation cover. Acidic products, principally iron, were deposited on the soil surface of low backswamps during the weeks of flood inundation. These have created highly unfavourable conditions for re-

establishment of pastures or volunteer vegetation. Acidic products are also accumulating from evaporative discharge of shallow groundwater. These events highlight the need for management plans and remediation strategies for ASS hotpots and for further research.

Contact Dr Peter Slavich, NSW Agriculture, Tel - 02 66261200,
Email *peter.slavich@agric.nsw.gov.au*,

Pickled fish

In the first studies of their kind in Australia, NSW Fisheries researchers have found initial evidence juvenile fish avoid acidic water, potentially reducing fish numbers in areas with acid sulfate run-off.

NSW Fisheries is studying the response of juvenile fish to different pH (or acidity) levels in lab experiments at the Port Stephens Research Centre, as part of the "Fisheries Floodgate and Acid Drainage Research Project" (FRDC 1998/215).

The results of the first experiments with juvenile snapper show that when given a choice between water with pH 8.1 and water with pH 7.0, almost 100% of the juveniles avoided the more acidic water (pH 7.0).

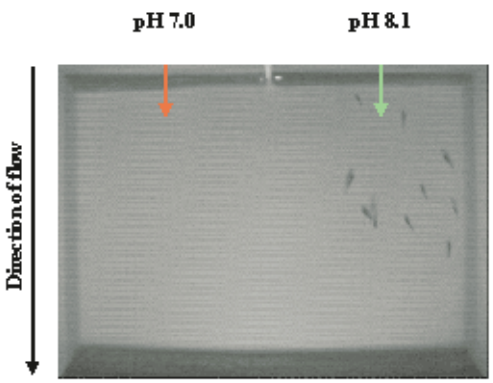
"This is a significant finding," NSW Fisheries research scientist, Dr Frederieke Kroon said. "It suggests acid sulfate run-off may reduce the potential number of snapper in an area because juveniles may be staying away from large parts of nursery habitat due to acid levels."

NSW Government scientists are now conducting experiments with Australian bass, yellow-fin bream, and school prawns. "Ultimately, these experiments will show us what acid levels might be tolerable in drainage systems with managed floodgates, without affecting recruitment of juveniles," Dr Kroon said.

To conduct the experiments, NSW Fisheries has constructed an experimental set-up to run two parallel flows of water. The water qualities in each flow can be altered to obtain the desired acid concentration. Juvenile fish in the channel can actively choose between the two different water qualities. The behaviour of the juveniles is monitored with remote video camera, and the positions of the fish are subsequently analysed using video-image software.

Dr Kroon said "The findings of the experiments may help to explain the decline in some fish populations, such as that of Australian bass in the Hastings and Manning rivers. In the Northern Hemisphere, scientists have observed that juveniles of species such as rainbow trout, brook trout, bluegills and largemouth bass, avoid water with low pH levels. However, up until now there has only been circumstantial evidence in Australia to suggest that acid drainage may affect the behaviour of

Juvenile Snapper Experiment



juvenile native fish. Our project is the first to look at the issue in this country."

Contact: - Dr Frederieke Kroon; NSW Fisheries - ph: (02) 4982 1232; or Email: *kroonf@fisheries.nsw.gov.au*

Partnership to investigate acid sulfate soils

Scientists will join forces with state and local authorities and industry representatives to tackle acid sulfate soils in the Gillman and Barker Inlet areas of South Australia. CSIRO Land and Water's Dr Rob Fitzpatrick announced a partnership between Commonwealth and State Government Agencies and industry to do the work.

Dr Fitzpatrick says that it is important for industry and land management authorities to understand the cause of acid sulfate soils and how they might be managed. "Acid sulfate soils are most commonly found in coastal regions where present-day mangroves and salt marshes, and prehistoric buried areas, have been cleared or disturbed", he says. These soils are usually safe if left undisturbed. "However, once you drain them, the sulfides within them react with the oxygen in the air to create acidic conditions."

The new partnership will provide South Australia with an opportunity to advance its knowledge of acid sulfate soils and to set new benchmarks in management practises, according to Port Adelaide Enfield Council's policy planner Ms Shanti Ditter.

"The partnership includes funding for a PhD student to gather fundamental knowledge about acid sulfate soils in SA and develop innovative soil treatment methods such as bioremediation, liming and sea water flushing", says Ms Ditter.

The partnership includes; the Commonwealth's Coastal Acid Sulfate Soils Program, Port Adelaide Enfield Council, CSIRO, Land Management Corporation, Penrice Soda Products, Department of Environment and Heritage, Salisbury Council, Torrens Catchment Water Management Board, Northern Adelaide and Barossa Catchment Water Management Board and the St Kilda Mangrove Trail and Interpretive Centre. The Barker Inlet and Port Estuary Committee will act as the steering committee for the project.

Contact:

Dr Rob Fitzpatrick, CSIRO Land and Water, 08-8303 8511.

TECHNICAL NEWS

Acid Sulfate Soils Standards: helping meet the challenge for a better environment

In many circumstances, acid sulfate soils can be successfully managed by some basic management options, which include avoiding high-risk areas, mixing lime into the soil to neutralise the acid and immediately re-flooding material containing acid sulfate soils to prevent acid production. Results from several projects in an extensive research program undertaken by the Queensland Department of Natural Resources and Mines, CSIRO, the Cooperative Research Centre for Sustainable Sugar Production and the New South Wales Sugar

Milling Co. are leading to better management practices on acid sulfate soils, particularly in agricultural areas.

For example, large areas of sugar cane production occur on acid sulfate soils in Queensland and Northern New South Wales. Fish kills in these areas led to research projects seeking better ways to manage drainage systems in canelands by studying the pathways for acid export from the soil. Results indicated that the main pathway for acid export to the drains was via groundwater flow with only a small amount due to surface runoff. Moreover, the main components of the acidity exported in the drainage water were due to iron and aluminium rather than hydrogen ions (measured by pH). Hence minimising the groundwater flow by drainage design is a major method for minimising environmental impacts. Such practices are already well established in Northern NSW.

Specialised soil sampling equipment, sample storage and preparation and laboratory methods are an essential component of mapping and assessment of acid sulfate soils. The quality of laboratory testing procedures is paramount, for example, when calculating the amount of neutralising material required as part of the treatment process of acid sulfate soils management.

Government regulatory bodies now require stringent compliance testing to verify adequate quantities of liming materials have been used to treat acid sulfate soils prior to land developers releasing land for building purposes. Results from compliance testing can be used to settle court actions.

For several years the Department of Natural Resources and Mines and Southern Cross University (NSW) have conducted extensive work to develop a set of analytical methods for routine laboratory use on acid sulfate soils - methods that have generated much debate among soil scientists. It is now clear that some form of standardization in analytical methods that will assist in setting a basis for acid sulfate soils assessment procedures is vital.

Standards Australia's Technical Subcommittee EV/9/2 has introduced four new work items on its schedule, designed eventually to produce analytical methods for determining estimates of both the "sulfur and acidity trails" commonly used in the assessment of acid sulfate soils. The work group developing these Australian Standards met recently for the first time and agreed to add a Standard on the sampling and pretreatment of acid sulfate soils as a first priority. Members of the group included Col Ahern, Leigh Sullivan, Ian Wallace, Steve Dobos, Angus McElnea and representatives from other interested organisations and Government.

These Standards will be valuable tools for regulators, developers and others involved in the management of acid sulfate soils and another criteria for Acid sulfate soils listing us to meet our responsibility in ensuring a better environment.

Contact: Dr Glenn Barry (Chairman of Standards Australia's Technical Subcommittee EV/9/2 and Principal Scientist for the Department of Natural Resources and Mines, Natural Resource Sciences in Indooropilly, Queensland.)

Email: Glenn.Barry@dnr.qld.gov.au

Minister Opens Stage 1 of Wetland Rehabilitation

Stage 1 of the Yarrahapinni Wetlands Rehabilitation Project was opened in May by the Minister for Agriculture, Richard Amery. "This is the first part of a trial whose ultimate aim is the better management of this wetland and surrounding environment," Mr Amery said.

"It has taken a great amount of effort, negotiation and close cooperation to reach this point. Without the Yarrahapinni Wetlands Reserve Trust's dedication and determination, I believe we would still be looking at these floodgates as they were only a year ago. That is with no lifting mechanisms, no monitoring systems and no other real way of improving the wetland. The Trust has worked for years with landholders, the local community, industry groups, Kempsey Shire Council and various State Government agencies to advance wetland rehabilitation."

The Yarrahapinni Wetlands Reserve Trust has developed a Plan of Management for the wetland which provides for the controlled operation of the floodgates, allowing the Trust to manage water levels during non-flood periods and to restore tidal circulation within the lower part of the wetland. Issues of poor water quality that are associated with the discharges of acid sulfate soils into the waterways are also addressed in The Plan of Management.

Another key element of the trial is the monitoring of water quality and levels throughout the wetland. A network of six stations has been established, three of which provide round the clock water quality data. The network is supplemented by individual landholders who have been issued with hand-held monitors to record changes in salinity and the acidity of water. Mr Amery said that experience gained from the rehabilitation project could be useful for other wetlands projects on the coastal floodplains

Contact: Mike Hayes of the Yarrahappini Wetlands Reserve Trust on

Email *pricklef@midcoast.com.au*

Or look on their webpage

http://www.midcoast.com.au/~yarrahap/index.html

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