



# ASSAY

A NEWSLETTER ABOUT ACID SULPHATE SOILS

No 16. December 1997

## Victoria may soon join the ASS "club"

The Victorian Environmental Protection Agency (EPA) may need to formulate an ASS policy following preliminary reports of ASS in parts of Melbourne's Yarra delta which are earmarked for large-scale development.

Environmental officer with the EPA, Steve Cambridge, says that soil tests currently underway should determine if the Coode Island silts contain pyritic material. Results are due in early January.

Major "City Link" projects, including a tunnel and a new freeway, are proposed for the area. Steve is currently reviewing the NSW Acid Sulfate Soils Management Advisory Committee guidelines as a possible basis for new Victorian EPA guidelines. For further information please telephone Steve Cambridge on (03) 96285519.

## ASS and reflooding

Pam van Oploo has written to ASSAY with the following summary of a recent paper about drained-salt marsh sediment chemistry and reflooding.

Much discussion on the management of ASS is currently directed to the possibility of flooding ASS lands with inter-tidal water to restore the environment to its former condition before drainage. A paper that deals with this issue appears in *Biochemistry* 36 : 275-303. (1997), entitled, "Effects of historic tidal restrictions on salt marsh sediment chemistry", by J.W. Portnoy and A.E. Giblin. The soils the authors examined are acid sulfate, but sites ranged from diked (drained) marshes, seasonally-flooded marshes and those in natural pristine condition.

The authors concluded that restoration of seawater flow to diked marshes was likely to extend flooding depth and duration as dyking has led to compaction and subsidence (as much as 90cm) which cannot be reversed. Introduction of seawater will also lower redox potential

and increase cation exchange thereby increasing  $\text{NH}_4$ ,  $\text{Fe}^{2+}$  and  $\text{PO}_4$  mobilisation. The impact of such a large-scale release of nutrients on surface water quality and the health of aquatic species has not been quantified.

In seasonally flooded marshes they suggest that "management actions that either improve drainage or restore seawater supply will induce rapid sediment oxidation, subsidence and nutrient mobilisation". They conclude that "open water rather than intertidal salt marsh may be the unintended result of programs which reintroduce copious seawater flow too quickly".

Hence the need for caution and informed decision making when addressing the viability of such a management strategy.

Pam van Oploo: <p2105707@saturn.geog.unsw.edu.au.

## Pros and cons of seawater buffering

The Queensland Acid Sulfate Soil Investigation Team (QASSIT) is currently studying the pros and cons of allowing the buffering effect of sea water to be considered during environmental impact statements for new developments.

QASSIT's Col Ahearn says that he has major reservations about using sea water as a main buffering agent (instead of incorporating lime) on developments because the acid strips the bicarbonate from seawater.

"Oysters, crabs and other marine creatures need bicarbonate and there is not enough research available to prove that sea water buffering is safe for the environment.

"We also have to be careful about setting a precedent for the use of salt water as a buffer agent in any new developments," he said

For further information, please contact Col Ahearn on telephone (07) 38969510

## Floodgate management for Yarrahapinni

The Yarrahapinni Wetlands Reserve Trust recently submitted a development application to Kempsey Shire Council seeking permission to open Yarrahapinni floodgates to tidal seawater to help remediate drained ASS.

Richelle Hughes and Peter Nelson, from Newcastle's Shortland Wetlands Centre Consultancy, prepared the EIS. Peter and Richelle were able to submit a very detailed EIS as they had spent three years studying the Yarrahapinni's vegetation, benthos, and water quality and water birds. The Yarrahapinni project aims to improve degraded wetland areas, expand estuarine plant communities, improve water quality and neutralise exposed acid sulfate soils.

Stage 1 involves a three month trial to keep one gate open; Stage 2 involves one floodgate permanently opened; while Stage 3 sees the managed opening of all five floodgates. Much of land is public SEPP14 wetlands, however written consent from nearby landholders is needed before Stage 2 or Stage 3 can start. Sustainable Futures Planning and Design, and R J Smith and Associates, are preparing a management plan for the

overall rehabilitation and future use of the Yarrahapinni broadwater.

For further information, contact Robert Pitt at Kempsey Shire Council on (02 65) 626077 or Peter Nelson (0249) 516311; Email at Shortlands Wetlands Centre - bipjn@cc.newcastle.edu.au; or Peter Cumming on (0266) 453933.

## Mosquitoes breed in ASS ponded pasture

The use of ponded pasture as a treatment for severely affected ASS should consider the effect on mosquito populations and the insects' threat to human health according to Clive Easton, an entomologist with Tweed Shire Council in NSW.

He says newly created acid waterbodies are becoming prime breeding sites for salt marsh mosquitoes. These mosquitoes breed prolifically in water with pH levels as low as 2.7 and are effective vectors of debilitating Ross River and Barmah Forest viruses.

Very few mosquito larvae predators can survive in these acid waterbodies. However over time, some ecological maturation takes place and mosquito breeding potential declines. Similar mosquito breeding potential occurs where ASS exist in other coastal districts throughout NSW, Northern Territory, WA and QLD.


Restricting the initial flooding to the winter period will decrease breeding potential while mosquito control will be needed, particularly if ponds are near residential areas. Several recently developed biological larvicides offer safe selective control of mosquito larvae on ASS sites. For further information contact Clive Easton, Tweed Shire Council, on (0266) 720440.

## Upcoming events

### ASS training for NSW Government staff

A free training course for government and council staff who have to deal with ASS management and remediation works will be run during February.

The one-day course will cover remediation techniques, lime treatment, water table management, and the technical resources which are available to help handle ASS sites. The training program is an initiative of



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ASSMAC and is funded through the State Government's Acid Soil Action Program.

Lecturers will include Ian White (ANU); Bruce Blunden, (Wollongong University); Glen Atkinson (Department of Land and Water Conservation) as well Roy Lawrie (NSW Agriculture). The workshop dates are:

February 19: South Coast Moruya - Jane Brook 0244 7410000

February 24: Mid Coast - Kempsey - Glen Atkinson 0265 631212

February 25: North Coast - Grafton - Jon Woodworth 0266 261 344

### **Environment forum for sugar industry**

The first national forum devoted exclusively to environmental issues in the Australian sugar industry will be held at Mackay on 24-25 March 1998.

The Sugar Environment Forum will be conducted by CANEGROWERS, the Qld canegrowing industry's peak body.

Field tours will feature, acid sulfate soils, riparian areas, farm planning; and green cane harvesting in cold, wet areas.

Keynote speaker is Dr Peter Ellyard, who is a senior consultant to the UN Environment Program, UNESCO and the UN Development Program. For details please contact Jennifer Marohasy on telephone (07) 38646444 or Email: [jennifer\\_marohasy@canegrowers.com.au](mailto:jennifer_marohasy@canegrowers.com.au).

### **Excavation workshop**

Nine Port Macquarie excavation operators recently attended an environmental workshop to learn about liming methods, legislative requirements, ASS field testing and how to identify ASS.

The workshop was organised by the Acid Sulfate Soil Management Advisory Committee as part of the NSW Government's Acid Soil Action program. Presenters included NSW ASS Information Officer, Jon Woodworth, Glen Atkinson from the Department of

Land and Water Conservation and David Pensinni from Port Macquarie Council.

Port Macquarie Council jointly sponsored the workshop, and David spoke about Council's new Local Environment Plan for ASS, as well as ASS risk maps.

### **NSW Coastal Policy released**

The NSW Government has announced a ban on development of canal estates as part of a new Coastal Policy. The policy covers land and water use, pollution controls and development on 5,000 square kilometres of coastal land. Minister for Planning Craig Knowles says that with more than 80 per cent of people now living on the coast, the Policy aims to plan for future growth. The NSW Coastal Committee will be upgraded under changes to the Coastal Protection Act proposed by the Government.

The Act has a new definition of the coastal zone - land one kilometre along the shoreline as well as land within one kilometre of coastal rivers, lakes and estuaries. For further information please contact Daphne Sider on (029) 2284499.

### **Economic spinoff from ASS work**

Tweed valley cane farmer Robert Quirk says that ASS research is not only helping improve water quality but is increasing farm profits.

"By using lime to treat acidity, and by using minimal tillage techniques which add organic matter to the soil we start a chemical process which generates enough heat in the cane mounds to let us plant during winter. "This is giving us a two month headstart on our normal growing season. "We will trial the new planting program this coming season," Robert said.

\* The NSW Canegrowers Productivity Board has awarded Robert a special environmental award for his work on ASS. For further information please telephone Robert Quirk on (02) 66777 227.

### **Water demand by sugar cane on ASS**

The Sugar Research and Development Corporation (SRDC) and the CRC for Sustainable Sugar Production have jointly funded a project to predict and measure acidity production and export from sugar cane grown on ASS.

Ted Gardner from the Qld Department of Natural Resources says the project at Rocky Point Mill near Pimpama just north of the Gold Coast will:

- measure and predict the hydrological effect of sugar cane on ASS.
- manipulate surface and subsurface drainage regimes using laser levelling, drain infilling and irrigation to vary water tables and rates of acid production.
- enable the transfer of information from a three year crop cycle experiment to other Qld and NSW cane growing ASS areas.
- show how farm-scale management methods can reduce or prevent acid production.

Ted will surround cane paddocks with plastic sheets, agricultural drains and flumes so he can measure total water and solute inputs and outputs.

He is using a Sugar CRC funded model designed by Dr Mabo Suzuki. The two-dimensional model of solute, water and oxygen transport, incorporates acid production chemical reactions. Freeman Cook from CSIRO is a joint project leader on the program. For more information please contact Ted Gardner on fax 07 38969591 or Email: gardnet@dnr.qld.gov.au.

### **Tuckean coordinator**

Michael Wood, a graduate from Southern Cross University's School of Resource Science and Management has started work as coordinator of for the Richmond River's Tuckean sub-catchment.

Michael will work closely with the Tuckean Landcare group and NSW's Richmond River Catchment

Management Committee to develop practical on-ground ASS remediation trials and ground water management options. The part time position is funded for 12 months through the Federal Government's National Heritage Trust. Michael has previously undertaken ASS research in the Bungawalbyn area. For further information please telephone Michael Cook on (0266) 286009.

### **ASS taskforce**

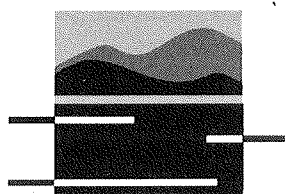
A short-term, Taskforce comprising representatives of the NSW Acid Soil Management Advisory Committee, the Environment Protection Authority, Department of Planning, and Department of Land and Water Conservation is currently drafting a cabinet minute about ASS issues.

NSW Government will consider the issues paper early next year.

### **Advertising**

ASSAY now accepts advertising. For \$250 a quarter page per edition or \$500 for a half page you can reach more than 1500 readers interested in Acid Sulfate Soil issues. Contact the ASSAY editor, Jon Woodworth, now on (0266) 261344 to book your advertisement.

Next issue of ASSAY will be printed in early March, 1998.



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## Planning workshops.

More than 150 council officers and state government departmental staff have attended a recent training workshop about ASS. The project was coordinated by Yolande Stone (Dept Planning and Urban Affairs) and Bruce Blunden (Wollongong University) with assistance from Glen Atkinson (Department Land and Water conservation) and Roy Lawrie (NSW Agriculture). Workshops were held at Berry, Port Stephens and Maclean. A further workshop was held at Homebush Bay on December 17 following concerns about Occupation Health and Safety issues at the nearby Olympic Games site.

For further information please contact Yolande Stone on 02 93912156 or Email: stoney@mail.ccsu.nsw.gov.au.



*Glen Atkinson and Yolande Stone dig up Iron monosulfide deposits from a drain at Maclean, during the ASS Planning Workshop field day.*

## “Goodoil” on ASS

The Good Oil Plantation at Port Macquarie has applied for an irrigation license to use groundwater from a recently widened drain on a large property adjacent to the Maria River. One end of the drain has been blocked, preventing drain water flowing into the Maria River.

The company has also applied about 50 tonnes of lime to spoil from the drain, some of which is ASS material. The company hopes to move some of the spoil, lime it

and use the treated material for a mound on which to erect buildings, subject to council approval.

\* Meanwhile, Australian Tea Tree Industry Association Secretary, Pat Bolster says the industry has developed best practice management guidelines for ASS areas which she has urged all tea tree growers to adopt to prevent ASS disturbance. To obtain the Guidelines, please telephone Pat Bolster on (02) 66742925.

## Environmental “Oscar” for ASS project

Gold Coast dredging company, Neumann Contractors, has won the Case Earth Awards for its acid sulfate soil remediation work on the Pacific Highway by-pass at Chinderah in Northern NSW.

Neumann Contractors were Queensland finalists in their category for jobs above \$10 million. At the national awards in Perth recently, the company won first in its category, and was outright winner from a field of 20 Australian environmental best practices projects. General manager, Ian Carstens says his company supplied 728,000 cubic metres of solid fill from the Tweed River for the \$50 million bypass.

“As a by-product, the job produced 70,000 cubic metres of slimes and silts loaded with pyrites, which if exposed to air could have produce sulfuric acid,” he said.

With scientists from Griffith University’s Environmental Science Division, Neumanns designed a plant capable of de-silting the tailwater and treating the ASS slimes and produced valuable topsoil from the silt. For further information, telephone Ian Carstens on (07) 55892700.

## Cudgen works

The Federal Government has announced a \$133,000 grant over three years to Tweed Shire Council for studies which will enable remediation of ASS runoff at Cudgen Lake. Tweed Shire Council officer Mark Tunks is coordinator for the Cudgen Lake Catchment Committee which is carrying out the project. Stage one of the project will include installation of water data loggers and soil sampling to find the exact location of acid discharges into the Lake.

A total of \$30,000 has also been allocated through the NSW Government’s Acid Soil Action for remediation

works after the on-site investigations are completed. Tweed Shire Council and Clean Up Australia are also contributing to the project.

For further information please telephone Mark Tunks on (0266) 720440

### Queensland news

About 60 land owners and representatives from industry, councils and government departments attended the Queensland Acid Sulfate Soil Investigation Team's (QASSIT) Maryborough ASS workshop on Tuesday 25 November. Col Ahern and Kylie Hey (QASSIT), and Peter Wilson (Dept Natural Resources, Bundaberg) discussed general ASS issues as well as local issues. The ASS Workshop at Nambour, which was coordinated by Maroochy Shire Council attracted more than 70 participants.

### ASS database

For copies of the new ASS database, ASSIST, please Email your request to woodwoj@agric.nsw.gov.au or fax (0266) 281744

### Recent publications

Pease, M.I., Nethery, A.G. and Young, A.R.M. (1997) Acid sulfate soils and acid drainage, lower Shoalhaven floodplain, New South Wales. Wetlands (Australia), 16 (2), 56-71.

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