



# ASSAY

A NEWSLETTER ABOUT ACID SULFATE SOILS

No 25. May 2000

## Algal bloom link to ASS

A major outbreak of Lyngbya algae - thought to be linked to general soil disturbance and acid sulfate soil (ASS) iron leachate - has seen Queensland issue public health warnings for Moreton Bay.

Scientists have warned that the toxic blue green algae can cause blisters, eye irritations and trigger asthma attacks.

'We have an estimated 100,000 tonnes of toxic algae causing major economic, ecological and medical impacts,' says Dr Bill Dennison, from University of Queensland who heads a major research project.

Since February, the algae has covered about 40 square kilometres of shallow estuary areas at Deception Bay and North Stradbroke Island. "I have watched the bloom spread at up to 100 square metres per minute," he said. Blue green algal blooms are common in freshwater but rare in Australian coastal waters. "The cause seems to be a combination of high levels of humic acid, soluble



**Drained wetland at Yarrahappinni, NSW with pH 2.8 soil which fire has stripped of almost 1m of peat. Kempsey Council is considering Yarrahappine Wetland Trust plans to open floodgates and gradually introduce salt water to the site.**

iron and increased phosphorous due to land disturbance from forestry, sand extraction, housing development and effluent. "Algae also needs a lot of sunny days and at least 24 degrees water temperature.

Commercial fishermen say the algae has killed thousands of hectares of seagrass essential to fish, prawns, turtles and dugongs. Catches have halved and algae contaminated nets have been dumped. Brisbane's Courier Mail newspaper last month quoted the Old Environment Minister, Rod Welford as saying the algae may be linked to canal estate developments in ASS as well as sewerage works. "Even washed up on beaches it causes health problems,' Mr Welford warned.

More than 300 tonnes of toxic blue green algae were collected from beaches around Bribie Island and Deception Bay and the outbreak has hit tourist operators with reports of Easter holiday bookings being cancelled. "The algae grows within the seagrass and sucks the oxygen out of it - entangling the grass which is uprooted and carried away with tides. It then dries, fouling beaches with putrid, rotting, sulphur-smelling debris which releases nitrogen into water," Bill said.

For further information please contact Bill Dennison on email: [w.dennison@botany.uq.edu.au](mailto:w.dennison@botany.uq.edu.au).

The ABC Quantum science show recently featured a segment on an algae which spreads in effluent rich ASS swamplands in USA. The University of Maryland, USA has a good web site on toxic algal blooms. Try <http://www.som1.umaryland.edu/AquaticPath/toxalg/> or <http://www.mdsg.umd.edu/fish-health/pfiesteria/index.html>.

## ASS manual second edition

NSW Dept of Land and Water Conservation (DLWC) ASS Resource Officer Mitch Tulau is re-editing and updating the NSW ASS Manual, 1998.

The NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC) will publish the

second edition. The new manual will include an updated laboratory chapter, a substantially revised drainage section, plus new information on NSW legislation, policy frameworks and remediation strategies. Mitch will edit the second edition with assistance from ASSMAC Technical Coordinating Committee and original authors. Mitch is keen to get reader comments on any sections of the current manual which may need updating.

Contact - Mitch on 02 6563 1212 or email: mtulau@dlwc.nsw.gov.au. Copies of the second edition can be ordered through the Dept of Planning, on (02) 9391 2222.

### Conservation costs inquiry

The House of Representatives Standing Committee on Environment and Heritage invites submissions on the impact on landholders of conservation controls.

The Committee will consider:

- the impact of conservation measures imposed by governments on landholders and farmers;
- international developments in ameliorating the cost of conservation;
- how to establish the private and public components of conservation;
- how to equitably share the costs.

Conservation measures may involve a wide range of activities such as expanding remnant vegetation, environmental flows in rivers, salinity controls, ASS water quality management and care of wetlands.

Full details are at <http://www.aph.gov.au/house/committee/environ>

or telephone the secretariat's Ian Dundas on (02) 62774579.

## TECHNICAL NEWS

### ASS seismic survey

Seismic surveying of river base sediments is being used, possibly for the first time in Australia, to assess ASS as part of a major urban development in SE Qld.

Gilbert and Sutherland Pty Ltd, in conjunction with Geo Coastal and University of NSW, are using seismic surveys plus geomorphic surveys for ASS

assessment of a large flood mitigation project near Mooloolaba.

The new seismic method needs to be calibrated against traditional soil core laboratory analysis - but at a ratio of only one lab test per nine seismic tests is required.

Consultant Neil Sutherland says the seismic profiling provided clear discrimination of the Holocene and Pleistocene boundaries located at depth beneath a waterway,

"We used a small refined acoustic source with a return signal recorded by a series of hydrophones towed behind a boat" he said.

"By coupling the geomorphic description, laboratory and seismic data we have been able to plot a very detailed site transect enabling us to target detailed soil testing in the most pyritic areas" he said.

The project involves moving an estimated one million cubic metres of material, a portion of which has potential ASS, as part of a major flood mitigation works. The project will be completed by Lensworth Cawana Waters Pty Ltd in conjunction with the State Government.

Contact: Drew Mckenzie - Ph - 07 5578 9944.

**AUSTRALIAN LABORATORY SERVICES P/L**

**PROVIDING NATA ACCREDITED ANALYSIS FOR**

• POCAS	• TOS
• TAA	• S <sub>POS</sub>
• TPA	• NAG

FOR MORE INFORMATION ON THESE AND OUR OTHER SERVICES, PLEASE CONTACT:

<b>BRISBANE</b>	Ian Wallace Tel: (07) 3243 7222 Email: ianw@als.com.au	Fax: (07) 3243 7218
<b>SYDNEY</b>	Brian Williams Tel: (02) 9841 9500 Email: brianw@als.com.au	Fax: (02) 9841 9530

## Using cement kiln dust

Queensland Cement Ltd recently commissioned an extensive study of Cement Kiln Dust (CKD), an alkaline by product of cement manufacturing.

A paper in the Australian Water Association magazine (February 2000) shows that CKD is suitable for ASS treatments.

It reports on the chemical analysis and discusses the ecological and other effects of CKD, sometimes known as Lean Lime, on water quality and soil chemistry when used as an ameliorant in ASS. Detailed testing and comparison with ag-lime (crushed screened limestone), has shown that CKD is a suitable material for ASS management.

The report states that recycling industrial by-products requires a scientific and systematic approach for legal reasons and to produce a saleable product. Due to the chemical and physical nature of the kiln dust, (predominantly finely ground limestone), it has potential as a low cost source of lime for the agricultural and road construction companies.

## Townsville council test kit

Townsville City Council has developed a cheap ASS test kit which uses only 6 per cent hydrogen

peroxide, instead of the usual 30 per cent solution.

Council's Environment Management Officer, Angelika Hesse says the kit is used by Council staff during construction works to help identify ASS and the need for further laboratory testing. More than 80 per cent of Townsville is situated below AHD which means that there is a lot of ASS not currently mapped.

Hydrogen peroxide reacts with pyrite and provides a cheap, fast method for determining the presence of potential ASS. Angelika says that the traditional peroxide method (in the NSW ASS Manual) uses a very caustic 30 % strength industrial peroxide. This raises a lot of Occupational Health and Safety concerns while the 6% strength peroxide is much safer for their outdoor staff to use. It's a quick test used before plant operators disturb soil for shallow drains, small infrastructure projects or tree planting (where concern is more for tree health). "While the reaction may take a bit longer to "fizz" comparative trials show it generally works just as well as stronger peroxide. The field sampling complements lab sampling.

If ASS is detected, follow up laboratory testing, at Council's own laboratory, estimates the correct lime neutralising rates. Council also tests all soil deliveries at its rubbish tip. "The last place you want a whole load of acid generated is at a rubbish tip with



Townsville City Council and Qld ASS Investigation Team (QASSIT) recently held a two day workshop which included this field trip to Ross River led by (QASSIT) Col Ahern (centre right).

lots of chemicals and heavy metals present," she said.

Council also developed an internal ASS operational procedure to identify ASS risks and prevent disturbance during construction and drain maintenance works. The 20 page document covers identification, impacts and remediation options.

Council puts all of its ASS soil test information on an ASS database which also includes EIS, and consultant reports for developments. This is linked to a GIS mapping system, and our new town planning scheme so developers get early information and can make more informed decisions about impacts, and costs, of proposed projects.

For an electronic copy of Council's procedures contact Angelika via email: amh@townsville.qld.gov.au. or Ph (07) 4727 9313.

## Two metre deep lime treatment

The NSW Department of Land and Water Conservation (DLWC) is incorporating a two metres depth of agricultural lime to treat a mine tailings dump at Chipping Norton in Sydney's south-west.

Project consultant Ian White says the 10 hectare site, on the banks of Georges River, contains a 14m depth of very high concentration pyritic materials from past top soil mining.

DLWC previously used electrode dewatering using direct electrical current to generates alkalinity - but this proved too costly.



**A two-metre thick layer of agricultural lime which excavators will mix through very pyritic slimes near Sydney's Georges River.**

"Instead we are now incorporating large quantities of lime using excavators in tandem, one to work up the soil and the other to work in the lime.

The site will become a public recreation area with wetland areas.

Contact Ian White on Ph (02) 6249 0660.

## ASS scholarship awards

This year's round of ASSPRO Scholarship Awards, funded by ASSMAC, will fund three new projects by university honours students.

Helen Marston, Andrew Kinsela and Naomi Rittie from the University of New South Wales (UNSW), Sydney, are researching ASS drainage waters along the north and mid-north coast of NSW.

Helen and Naomi are examining soil acidity levels in canelands at McLeods Ck, (Tweed R.). Andrew will compare the chemistry of ASS drainage discharge from both McLeods Ck, nearby Clothiers Ck (Cudgen Lake Catchment), and Rossglen (Camden Haven River).

Helen Marston will determine the extent to which past land use practices and current measurement methodologies can account for observed spatial variations in levels of soil acidity found in the McLeods Ck cane fields (see Smith 1999\* and Patterson 1999\*). Helen will combine accurately surveyed (A.H.D +/- 5 mm) soil profile descriptions, soil laboratory results, and two DEMs (data elevation models) based on Yang's PhD work (1995) and 1962 and 1993 air photos.

Naomi Rittie is studying the soil chemical changes associated with mole drains in ASS sugarcane fields. Her work will be part of ongoing research to assess the effectiveness of the 0.3-0.5 metre mole drains under both traditional mounded sugarcane blocks and more recently laser-levelled areas.

Andrew Kinsela will address a question raised from preliminary measurements by McArthur (1999) that show a good relationship between titrable acidity and pH of ASS drainage waters at Rossglen. He will investigate spatial and temporal relationships between continuously monitored EC and pH and measured ionic composition and titrable acidity in ASS drainage waters. Results from this work will be important in determining the relative usefulness of pH and EC water quality results for ASS drainage discharge. Jodie Smith, Rachael

Patterson, and Cameron McArthur have recently completed honours theses available through the School of Geography, UNSW.

Contact: Assoc. Prof. Mike Melville at the School of Geography, UNSW on (02) 9385 4391 or e-mail: m.melville@unsw.edu.au

## Farm forestry

The Federal Government Coast and Clean Seas program recently granted NSW State Forests \$183,000 for field trials to evaluate tree planting to control ASS leachate.

State Forest's Brendan George will coordinate the project to evaluate suitable species, planting methods, potential income, hydrological changes and farmer education strategies.

"We will evaluate a range of native species which are acid and salt tolerant and capable of transpiring rainwater from storm events thereby reducing acid discharge to waterways," he said.

Some forestry areas may be planted for harvesting, while others will be planted and left to grow naturally with income from planned "carbon credit" systems.

NSW Agriculture, University of NSW, Southern Cross University and Tweed Shire Council are project collaborators with trials sites planned at



**A stand of mature melaleuca and swamp oak trees on very low elevation ASS near Harwood, NSW**

Cudgen, Tuckean and Maria River (Hastings Shire).

Brendan stressed that forestry is not suitable on undrained or undisturbed sites. "It is just another tool which can help reduce acid discharge to waterways. "We will be looking closely at melaleuca, shallow-rooted trees which can readily transpire surface water but which stay dormant during drought. "These trees are currently used in Thailand, Indonesia and Malaysia for firewood, paperbark products (paper, packaging etc) and essential oils," he said. For a copy of a paper which Brendan presented about trees for a broadacre



**A stand of mature melaleuca trees in the Tuckean Swamp, NSW, growing next to sugar cane on drained ASS soils. This species is commercially valuable for its timber, bark and essential oils from its leaves**

remediation at workshop in Lismore last year contact ASSAY editor on email at: jon.woodworth@agric.nsw.gov.au.

Contact Brendan George on 02 9872 0136 or brendan@sf.nsw.gov.au

## Cane industry exemptions

The NSW sugar cane industry is close to finalising ASS best practice guidelines to have all cane farms operating under an approved self regulation procedures for ASS earth works and drain cleaning .

Under the proposal, still to be ratified by the Department of Urban Affairs and Planning (DUAP), farmers will be exempted from lodging council development applications for routine drain or farm works. "We issue all farmers with acid hazard and drain management plan for their farm-lands," said Rick Beattie from Broadwater Sugar Mill. The guidelines mirror conditions in Council local environment plans for ASS. The guidelines apply to all existing cane lands with production area entitlements (PAE"s).

The relevant sugar cooperatives and councils will conduct annual audits of the level of farmer compliance.

The guidelines do not apply to new drains and earthworks in areas without a PAE, which are sub-

ject to full Council development assessment. Rick said an industry wide soil sampling project as well as ASS education over recent years will enable farmers to understand and comply with the guidelines.

Contact: Rick Beattie at Broadwater Sugar Mill on Ph (02) 6620 8257.

## Drainage role in acid management

CSIRO researcher Freeman Cook and Queensland researcher Ted Gardner's hydrological research on a six hectare ASS sugar cane paddock in SE Qld shows that evapotranspiration is the main water table influence.

In the 12 months to August 1999, drainage removed 60 mm of water per hectare per annum while surface runoff totalled 800 mm per hectare per annum.

"While most of the water leaves as surface water, most of the acidity is coming from the drains - 6,300 moles of acidity per ha per year in drains (135 m apart) and 2,500 moles in surface runoff," he said. "By making drains further apart and shallower we can prevent most of the acid water leaving the site," he said.

"This study backs up work by White, Melville and Macdonald in the Tweed Valley which shows the value of laser levelling, with infilling of field drains, to reduce acid export to waterway," he said.

"Where existing watertables exist, drains should not intersect them. On the study site, the drains can be designed to reduce discharge of water from soil while removing good pH surface water.

## Canal drain reshaping trial

The Federal Government's Coast and Clean Seas program is partly funding drain redesign of about 1.3km of a major acid producing drain in the Richmond River's Tuckean Swamp, NSW.

The \$25,000 Meerschaum Vale Canal redesign project will widen the existing deep drain.

About 19,500 cubic metres of drainage spoil will be limed and used as fill material. Tuckean Landcare Group Coordinator, Michael Wood, says raising the drain base over such a long distance would significantly reduce acid discharge into the drain and make routine drain weed cleaning easier. To foster plant cover and reduce erosion on drain banks, cattle troughs will be installed and fencing erected to exclude stock.

## Environment Information Technology Pty Ltd

*Serving Australian Science & Technology since 1979*

- ✱ Environmental monitoring, project design and installation
- ✱ Designers and manufacturers of data recorders, sensors and telemetry systems
- ✱ Authorised Citect (SCADA) system integrators and software developers
- ✱ Water monitoring including depth, pH and EC
- ✱ Automatic weather stations and environmental data recording systems
- ✱ Remote "real time" viewing and data recall via cell phone, PSTN and UHF radio

### **CONTACT:**

*Col Peak*

*Phone: 02 6628 3400*

*Web: [www.eitechnology.com.au](http://www.eitechnology.com.au)*

*Member: Aust. Assoc. Ag. Consultants - Aust. Inst. Science & Technology*

"The project builds on a successful project to raise and widen a smaller 2 km cane farm drain in the Tuckean using new laser guided excavator technology. Landholders will do the fencing and help monitor water pH improvements. Technical support NSW Agriculture Graeme Robertson; DLWC and Mark Rosicky SCU.

### Sampling kit and book for landholders

NSW Agriculture is developing a simple soil kit to help landholders estimate the distribution and depth of ASS materials on their property.

The kit, plus an instruction book, with photographs, diagrams and a step by step approach to testing pH and estimating ASS pyrite content, will be ready for purchase in August.

Project coordinator Ms Alice Woodhead says the farm test kit is an adaptation of the NSW sugar industry's successful farm field testing of ASS. "The cane industry project involved farmers, and a trained extension officer, recording pH and other soil features in the field.

"We have developed the test kit and booklet in response to requests from grazing, tea tree and other landholders who saw how well the sugar cane project worked and want more information about ASS on their properties.

"While the NSW ASS risk maps help landholders identify their properties" broad risk category, the test kit will help measure insitu soil pH, and an oxidised pH which will help farm management of ASS.

There are two soil sampling kits - a cheap version with chemicals (such as six per cent hydrogen peroxide) which are available from supermarkets or

swimming pool shops, or a more expensive, commercial version suitable for councils and regular soil testing using the peroxide field test.

During a trial of the test kit in the Macleay catchment in April, landholders found the results easy to understand. "Before the trial, farmers knew from the risk maps that they had ASS but were unsure at what depth it was located or how to manage it," Alice said.

The project is funded through the NSW Government's Acid Sulfate Soil Program and also involves Michael Wood (Tuckean Landcare Group) and Abigail Jenkins (NSW Agriculture).

The kit is a first cut soil test which may identify the need for more detailed laboratory testing for large earthworks or modifications to farms.

For further information contact Alice Woodhead, 02 6626 1215. (NB see story re another test kit Technical news section)

### Tea tree oil book

NSW Agriculture is updating and expanding its tea tree book Tea tree oil to deal with a wide range of topics including ASS.

Author Bob Colton of NSW Agriculture says that since the 50 page book was first published in 1990 the tea tree industry has expanded greatly.

"The book will cover plantation site selection and drainage considerations, ASS identification, as well as acid and soil management strategies," he said.

It will be available for purchase in July at NSW Agriculture offices for about \$15.

Co-authors of Tea Tree Oil (Agfact p6.4.6 sec-

		<b>DAVID MITCHELL LTD</b>				
		Northern Region				
		PO Box 223, Corinda Qld 4075				
Phone 07 32786322		Fax 07 32786229				
<ul style="list-style-type: none"> <li>▶ Producers and Suppliers of Ground Limestone</li> <li>▶ Lime for Correction of Acid Sulphate Soils</li> <li>▶ Hydrated Lime for Acid Water Neutralisation</li> </ul>						
<i>Further enquiries can be made by phoning our free call number 1800 679 997</i>						
Tamaree Group	Riverton	Warwick	Attunga	Woodstock	Ootann	
07 5483 1300	02 6737 5261	07 4667 9155	02 6769 5501	07 4778 8844	07 4094 8322	

ond edition 2000) include John Murtagh, James Drinnan and Bede Clarke. Contact: Bob Colton on Ph (02) 6391 3171. (see following story re council test kit)

### Using weirs in drains

Bruce Blunden has investigated how to improve groundwater and drain water quality by manipulating drain water levels using weirs in flood mitigation drains.

A PhD student at the University of Wollongong, Bruce has done his work on a site near Berry on the NSW South Coast. Groundwater elevation data measured prior to the installation of the weirs showed that significant groundwater drawdown was caused by the low water level in the drains. Drawdown from the drains, in conjunction with high rates of evapotranspiration, caused the groundwater elevation to fall into the ASS layer, oxidising pyrite and generating sulfuric acid. High hydraulic gradients due to the low water level in the drains caused the rapid transport of acid from the groundwater into the drains which discharge into Broughton Creek.

Installation of the weirs raised the water level in the drains so that it was maintained above the ASS layer. The weirs promoted higher groundwater elevations by reducing the influence of groundwater drawdown from the drains. The lower hydraulic gradient established under the influence of the higher drain water levels maintained by the weir reduced the rate of acid discharge from the groundwater to the drain.

However, higher groundwater levels did not substantially improve the groundwater quality. High concentrations of stored acidity in the soil profile ensured that the groundwater had low pH and high concentrations of dissolved aluminium (30-100 mg/L).

Implementation of weirs in flood mitigation drains was shown to be beneficial in terms of reducing the generation of "new" acid from the oxidation of pyrite in the pyritic soil as well as slowing acid discharge. However, the management of groundwater elevation alone will not substantially improve groundwater quality without due attention to the "stored" acid in the soil profile.

The University of Wollongong ASS team lead by Associate Prof. Buddhima Indraratna is also investigating and developing a range of strategies or tools

for better ASS management. This includes; simulation modelling of pyrite oxidation and acid generation (Dr Anand Tularam) and field trials of controlled saline intrusion into acid drains (Dr Anand Tularam/William Glamore).

Contact: Buddhima Indraratna Ph (02) 42213046 or email: b.indraratna@uow.edu.au

## NSW NEWS

### NSW fisheries floodgate team

Biologist Frederieke Kroon is the new principal investigator for a project examining fish and invertebrate recruitment through floodgate management. The project is funded by the Fisheries Research and Development Corporation with NSW Fisheries assistance. Project sites include the Clarence, Hunter and possibly Macleay catchments. NSW Fisheries" Phillip Gibbs coordinated the earlier project work. Graham Housefield is a project support officer.

Contact: Frederieke Kroon - Ph (02) 4916 3807.

### Drain and floodgate management

Clarence River County Council (CRCC) and the Department of Land and Water Conservation

 <b>SMEC</b>
<b>SMEC AUSTRALIA PTY LTD</b> Snow Mountains Engineering Corporation
<b>Acid Sulfate Soil Assessment and Management</b> <b>Innovative and Effective Solutions</b>
<i>SMEC Australia provides comprehensive ASS Assessment, Management and Technology Development services through a multi-discipline team of environmental scientists and engineers.</i>
<ul style="list-style-type: none"> <li>• soil conservation, agriculture • hydrology, hydrogeology, water quality, modelling • stakeholder and government agency liaison &amp; consultation • eco-system studies and research • large and small scale civil designs and project implementation • public and private sector across Australia and overseas • technology development &amp; implementation • advanced rapid field assessment technologies incl. PASSFinder reducing cost and turnaround, improving data resolution • consulting, secondment, contracting</li> </ul>
For further information please contact: Daniel Cramer: Phone: 61/2/9903 4424; Fax:61/2/9955 6113; e-mail: daniel.cramer@smec.com.au (ACN 065 475 149)

(DLWC), will host a free one day workshop, Floodgate and Drainage System Management, on May 29 at the South Grafton Ex-Servicemen's Club.

This workshop will bring together operators, council engineers, technical officers and other drain managers to learn more about floodgate and drain management issues and solutions. CRCC has circulated a survey to identify the training needs of drain management officers in designing the training day. CRCC's Alan Cibilic expects participants to come from as far away as Tweed Heads and Newcastle.

Guest speakers will outline current projects and advances, industry representatives will present information on, and display, products, and site visits will allow the opportunity to see first hand some examples of operational equipment and management options.

Contact; Alan Cibilic on Ph 02 6642 3277 or email: acibilic@hotmail.net.au

### North coast water workshop

More than 100 natural resource officers, council staff, industry and community representatives

**GREENSPAN**  
TECHNOLOGY

**Monitoring  
Quality**

pH  
Turbidity  
Conductivity  
Dissolved Oxygen  
Depth/Pressure

Quality System  
Quality Endorsed Company  
ISO 9001  
LIC 3067  
Standards Australia

Ph: +61 7 4660 1888  
Fax: +61 7 4660 1800  
www.greenspan.com.au

recently attended a two-day Coastal Floodplain Management Workshop.

NSW Department of Land and Water Conservation hosted the workshop at Maclean and Grafton. It included a field trip of ASS problem areas and floodgate trial sites on Goodwin Island, Shark Creek and Coldstream River.

The workshop reviewed a wide range of water quality studies, remediation projects and planning directives including ASS impacts. A report of the workshop will help north coast water management groups, estuary management committees catchment management boards and estuary management committees, councils, industry groups to better coordinate their work.

During day one, NSW Agriculture's North Coast Regional Director John Williams explained that NSW had 250,000 hectares of high risk areas, of which 150,000 ha are disturbed.

"To get an idea of the scale of the problem, there are an estimated 55,000 ha of ASS hotspot areas which have up to 50 tonnes of acidity per hectare stored in the soil," he said. He said the main remediation strategy is to decrease the frequency and volume of acid discharges through drainage redesign, floodgate controls and strategic liming of drains.

NSW Fisheries Northern Regional Manager, Craig Copeland explained how drainage and floodgates prevent fish passage and have stopped much of the natural flood cycles which deposit nutrients into the rivers. Other speakers included Peter Haskins (DLWC) on the history of flood mitigation works; Mark Tunks (Cudgen Lake); Robert Quirk (NSW cane farmer); John Huegill, NSW Fisheries floodgate project, Nigel Blake DLWC Grafton and Alan Cibilic (Clarence River County Council).

Day two included a wider range of environmental issues and workshops to identify the various groups, agencies and industries involved in tackling water quality issues.

Contact Rob Learmonth on Ph (02) 6628 6009.

### ASS underlie Aussie icon

ASS have made headlines for Olympic games organisers with fears they may pollute Sydney's Bondi beach where a large beach volleyball stadium

will be built.

A report by the Coastal studies Unit at Sydney University found that 320 pylons to be screwed into the beach to support the 10,000-seat stadium would, when removed, bring dark soils to the surface.

"Such soils pose a risk especially during pile extraction of contamination to beach sand by fine grained dark-coloured sediment," says the report which Waverly Council commissioned.

The soil could be spread by the surf and possibly contain acid-sulfate leachate, the report said. The beach was handed over to the Olympic Coordination Authority to begin construction on May 1. (Sydney Morning Herald, April 20).

### ASS factored in highway work

The Snowy Mountains Engineering Corporation (SMEC) has won the contract for ASS management on the Yelgun to Chinderah Pacific Highway upgrade in the Tweed Valley. About half of the 23kms of new highway will traverse very pyritic (5% pyrite) ASS mud.

Daniel Cramer, spokesman for SMEC, said that the ASS studies would utilise much of the local data for Cudgen already developed by ASS researchers Ian White and Mike Melville and the NSW RTA. "Extensive ASS testing, treatment and rehabilitation are included in the \$200 million project's Environment Control Plan," he said.

"We will minimise disturbance by using pile driven protected piers (instead of excavating holes) and use soil embankment versus box culvert drainage," he said.

Contact: Daniel Cramer - Ph (02) 9903 4424.

### Hastings ASS projects

The Hastings Camden Haven Catchment ASS Action Committee is seeking National Heritage Trust and Coastal Acid Sulfate Soils Program (CASSP) funds for ASS remediation projects in the Hastings, Camden Haven, Stewarts and Maria Rivers.

The Hastings is a priority management area with five identified ASS "hotspots" areas as well as a large commercial fishery and oyster industry requiring good water quality.

At a recent strategic planning and funding workshop, hosted by the Action Committee, oyster

industry representative Laurie Lardner, explained how ASS impacts had almost halved the local oysters harvests this year.

"Oyster growers downstream of Fernbank Creek and Maria River suffered severe impacts while in Limeburners Creek acid plumes flushed in on incoming tides flowing through oysters leases," he said.

"Professional fishers and oyster growers have abandoned the Maria River and a NSW Fisheries officer told us that a clean up of abandoned leases could cost millions.

As well as a dedicated project management coordinator, the Action Committee is seeking funding for a wide range of floodgate management and water quality improvement projects.

ASS consultant Bob Smith identified at the meeting the need for drain manipulation trials to help landholders understand the issues. His 1999 report Improving Floodgate and Drain Management on the Hastings Floodplain; estimates that \$800,000 was required to modify 25 drains in the Maria River alone.

DLWC's Greg Bowman, explained the role of the CASSP while Hastings Council officer, Mat Rodgers briefed workshop participants on the existing ASS projects in the catchment.

Contact: Scott Henderson on Ph: (02) 6562

## Environmental Analysis Laboratory



Southern Cross University  
Centre for Coastal  
Management  
Northern NSW

### Consultancy & Research Service

*The Developer of and now specialising in the 'Chromium Reducible Sulphur - reduced inorganic sulphur' analysis technique.*

- 24hr turnaround time with Chromium Reducible Sulphur analysis
- provide routine analysis of TAA, TPA, Spos, POCAS, TOS, NAGP and ANC
- low cost actual and potential ASS screening techniques
- water acid sulphate leachate analysis
- all reports provide classification and interpretation

*For further information contact:*

Graham Lancaster

Tel: (02) 6620 3678 Fax: (02) 6620 3957

Email: glancast@scu.edu.au

Net: <http://www.scu.edu.au/schools/rsm/eal/index.html>



Certified  
Laboratory  
Practice

Lic No. 0052

6244, Fax: (02) 6562 5614 or Email: scott.henderson@agric.nsw.gov.au

## OTHER STATES

### Qld technical course

Queensland Environment Minister, the Hon Rod Welford is guest speaker at a Queensland Acid Sulfate Soil Investigation Team (QASSIT) technical course in Brisbane on 20-23 June, 2000.

Also included on day one will be Qld University researchers presenting data linking ASS to Lyngbya algae blooms in Moreton Bay

Day one also includes an introduction to ASS; identification of ASS effects on fish, oysters and aquatic organisms (UNSW), and an update on State Planning Policy.

Day two includes field assessment of ASS and assessment principles while day three deals with management and case studies. A field trip to a number of ASS sites concludes the course on day four. Please note, there will be limited spaces available for single day attendance.

Costs and full program details are available from Kylie Hey - email: Kylie.Hey@dnr.qld.gov.; Ph: (07) 3896 9819 or Fax: (07) 3896 9782.

## QASSMAC news

ASS consultant Neil Sutherland, recently replaced Bernie Powell as the Queensland ASS Management Advisory Committee (QASSMAC) chairperson. Neil is an agricultural scientist and prominent consultant for ASS management in SE Queensland and northern NSW.

Neil said QASSMAC is currently preparing ASS cost estimates for Queensland ASS treatments. "The study aims to give the Qld Government a quantification of ASS costs across the State," he said.

The desktop study will include the cost of mapping, soil analysis and neutralisation for housing industry, agriculture, local government, Department of Transport and port authorities.

"We hope to also provide initial estimates for the cost of impacts to fishing, tourism, agriculture and environment as well," he said.

Neil, who will coordinate the study, plans to publish a paper at the June ASS workshop in Brisbane (see previous story).

## Darwin's first ASS workshop

DLWC's ASS Resource Officer Mitch Tulau recently spent a week in the Northern Territory training consultants and agencies about ASS identification and management.

Topics included assessment, interpretation of laboratory analyses, legal and regulatory aspects, management plans and project design.

"ASS issues in the Territory are largely urban and infrastructure projects rather than agricultural, as is generally the case in NSW," he said. Major projects include canal estates, large aquaculture farms, and transport infrastructure related works. "When combined with eight metre tides, the potential for significant ASS ecological and economic impacts is high.

"Fortunately, the Territory is represented on the National ASS Working Party and can base its management strategies on existing Australian ASS research.

"However, the Territory still needs to incorporate ASS issues into its regulatory framework," he said.

## ASS fertiliser in WA

The Western Australian Water and Rivers

**WE CAN HELP YOU WITH ACID SULFATE SOILS**

- Inventors of the NAGP soil analysis method
- Inventors of water classification by Cl/SO<sub>4</sub>
- Expertise in mining, dredging and other extractions involving iron sulfides
- Assessment for agricultural, leisure and development projects
- Proficiency in management of earthworks involving acid sulfate soils
- Current and previous experience in NSW, Qld, Vic.
- Our specialised soil-coring rig can install up to 40 boreholes per day
- Development of catchment management studies
- Provision of expert witness representation in court

ACN 002 347 971

**Environmental & Earth Sciences Pty Ltd**



Soil is the Foundation of Life

PO Box 1000 St Kilda VIC 3182 P: (03) 9646 8760 F: (03) 9646 8738	PO Box 380 Nth Sydney NSW 2059 P: (02) 9922 1777 F: (02) 9922 1010
--	---

Commission plans to separate pyrite from ASS in the Vasse River before liming and processing for sale as a slow release fertiliser and soil conditioner for sandy soils.

The Vasse River, situated 250km south of Perth, adjoins the Vasse Estuary which is listed as an international RAMSAR wetland.

Ms Kate McGeachie a spokeswoman for the project contractors, Geo Catch Pty, says the project involves about 8,500 tonnes of ASS slimes.

"The ASS material seems to have occurred due to natural deposition as well as sediment from extensive land clearing in past 80 years," she said

"The project involves bunding sections of the river at a time, dewatering the areas and pumping sediment off site for mixing with filter cake and lime," she said.

The Commission is seeking funding assistance from the Federal Government for the project.

Contact: Ms McGeachie at email: [tingay@wantree.com.au](mailto:tingay@wantree.com.au)

## ASS diary

### Byron Bay ASS remediation workshop

NSW Public Works, DLWC and Byron Shire Council will hold a workshop on May 23rd to May 24th to debate the sustainability of Byron Bay's current sewage plant as well as ASS impacts. (Please note - invitation only) Contact: David Williamson - (02), 6620 1647.

**Tuckean Landcare Group Inc.** will visit Tweed catchment ASS management sites in June to examine floodgate management, and cane in-drain monitoring by Mike Mellville (UNSW). For further information contact Michael Wood on 02 66261 355.

### Remade Lands 2000

2nd International Conference on Remediation and Management of Degraded Lands.

Murdoch University, Western Australia

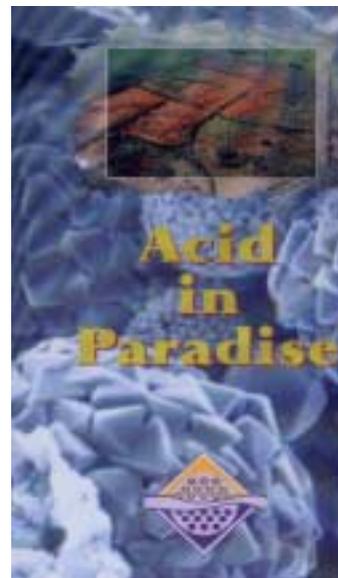
30 November - 1 December 2000

Contact: Dr Kuruvilla Mathew, Environmental Science, Murdoch University

Ph (08) 9360 2896; Fax (08) 9310 4997 or email [mathew@essun1.murdoch.edu.au](mailto:mathew@essun1.murdoch.edu.au)

## "Acid in Paradise" ASS video

Acid in Paradise, a 25 minute video about ASS is still available for purchase from NSW Agriculture. The video features animation on how pyrite formed, how oxidation has occurred as well as the impact of acid on waterways. It contains interviews with fishermen, oyster growers and farmers on current best management methods. The video was produced by Ian White in association with Maria Taylor from Media Associates, and was supported by the NSW Government's Acid Soil Action program. To order a \$25 copy (this includes postage) please telephone Eileen Tucker on 0266 261 347 or fax your request to 0266 281 744.



ASSAY is published quarterly for the acid soils information and awareness program which is funded by the Federal Government's Natural Heritage Trust.

**Editor:** Jon Woodworth

**Internet site:** <http://www.agric.nsw.gov.au/Arm/acidss/index.html>

**Address:** C/o Assay Editor  
NSW Agriculture  
WOLLONGBAR NSW 2477

**Phone:** 02 66261 344

**Fax:** 02 66281 744

**email:** [jon.woodworth@agric.nsw.gov.au](mailto:jon.woodworth@agric.nsw.gov.au)

*Typeset and design by Sharon Bailey*