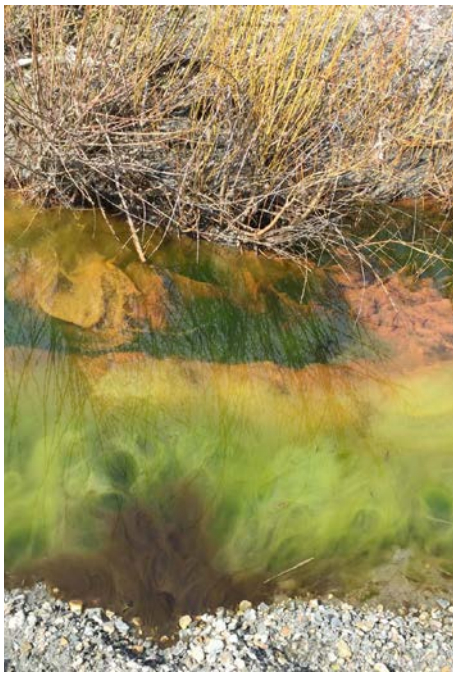
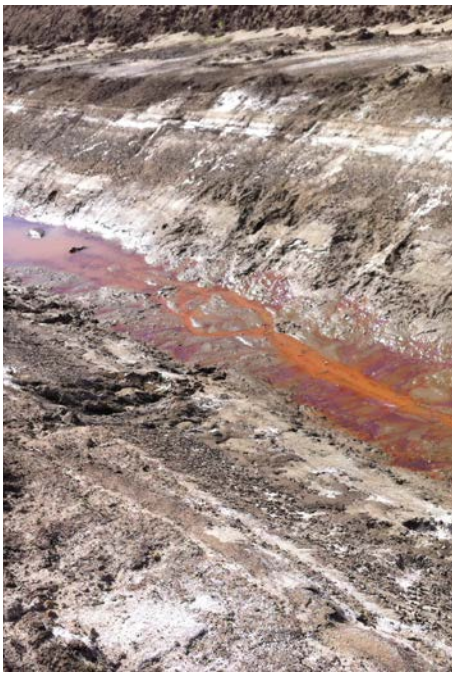
Environmental Analysis Laboratory

Southern Cross University

Acid sulfate soil and rock price list

Edition 17.1.1





Refer to our website for additional section Price Lists **www.scu.edu.au/eal**

Southern Cross University

ABN: 41 995 651 524

Environmental Analysis Laboratory

ASPAC

NATA

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ANALYTICAL SERVICES

Environmental Analysis Laboratory (EAL)

The Environmental Analysis Laboratory (EAL) in the Division of Research, Southern Cross University, is set up as an commercial, teaching and research facility. EAL specialises in a range of environmental testing services for waters, acid sulfate soils, agricultural soils, composts, potting mixes, landscape soils, plants and effluent monitoring. EAL employs over 30 professional staff and utilises the following instruments: Perkin Elmer ICPOES 4300DV; Perkin Elmer ICPOES 8300DV; ELAN DRC-e ICPMS; NexION 300D ICPMS; NexION 350D ICPMS with FLEXAR HPLC; LECO SC832 CS Analyser; LECO TruMac CNS Analyser; CRS Analysers; Lachat FIA Nutrient Analysers; Smartchem Nutrient Analyser; Soxtherm Oils and Grease Analysers; Bruker XRD; Leica SEM with EDAX; Pan-analytical XRF; Malvern Mastersizer Hydro2000MU Laser Particle Size Analyser; Waters Ion Chromatography system; Shumatsu TOC Analyser; Thermo-Finnigan IRMS; NewWave Laser Ablation System with Agilent ICPMS; Mantech AutoMax 197 pH/EC Analyser.

Specialists in the School of Environment, Science and Engineering, Southern Cross GeoScience and the Division of Research can also provide complete sampling, data interpretation and report production services. This includes specialists in soil science, geology, geochemistry, plant and fisheries biology, palaeontology, hydrology, marine biology and ecology.

Important Notes on Charges, Turnaround Times and Results

The following points apply to sample analysis:

- Sample specific quotes can be negotiated and customised at competitive rates on request.
- Payment is requested on delivery of samples (cash, eftpos, cheque payments accepted). Invoices are available to regular clients. Minimum charges apply.
- Sub-contracted analyses are sent to approved laboratories.
- On-site sample collection by qualified staff is available at a basic rate of $110.00 +GST per hour.
- Turn around times for individual projects will vary depending on the size and complexity of the task, but most will be completed within five to ten working days of receiving samples.
- URGENT turn around times are available on request and only for selected tests. These incur 100% surcharge for 24 hour, 50% for two day and 25% for three day service.
- Results are supplied in Excel and PDF report format detailing the analytical results, in relation to standard guidelines where available.
- Sample Receipt Notices, Results and Invoices are supplied by email and may be posted or faxed if requested.

Confidentiality and Quality Assurance

Confidentiality is an integral part of our quality assurance certification. Analytical results are kept confidential and no results will be released to a third party without client consent.

Strict quality control procedures are applied to all chemical, physical and bacteriological analyses. This involves frequent use of replicates to monitor precision, and standard reference materials and blanks to monitor accuracy. The laboratory is also routinely involved in inter-laboratory comparisons and trials, including the Australian Standards National Low Level Nutrient Collaborative Trials (NLLNCT) program. EAL is a member of ASPAC (Australian Soil and Plant Analysis Council) which includes a regular Quality Assurance Program for soils and plants. EAL also assists in the formulation of suitable laboratory methods for acid sulfate soil analysis.

EAL is a NATA (National Association of Testing Authorities) accredited laboratory (Lab. Acc. No. 14960). EAL has accreditation on selected tests and is continually updating the number of tests directly accredited by NATA. Please refer to the final page for a list of NATA and ASPAC accredited procedures.

EAL uses many industry accepted method references as the base for NATA, ASPAC and other in-house methods of testing. These references include *Standard Methods for the Examination of Water and Wastewater* (APHA), *Australian Standards* (AS), *Acid Sulfate Soils Laboratory Methods Guidelines* (Ahern, McElnea and Sullivan) and *Soils Chemistry Methods - Australasia* (Rayment and Lyons).

Instructions for Submitting Samples

Sample Collection and Preservation for Acid Sulfate Soil/Rock Samples

- Collect a representative soil or rock sample
- EAL prefers one tightly packed 70 ml vial or small rock core or dust sample (vials available free on request)
- Alternatively, 200 g required (half a plastic lunch bag is most suitable; double bag to exclude oxygen)
- Refer to ASSMAC (Acid Sulfate Soils Management Advisory Committee) guidelines for sample collection
- Site/paddock name, and date of sampling, needs to be on the sample bag

Complete EAL Chain of Custody (COC)

- Download a COC from the EAL website ***www.scu.edu.au/eal***
- Complete all relevant details on the COC
- Use Test Codes from the Price List e.g. AS-PACK-001
- Cheque, eftpos and credit card are the preferred methods of payment

Package and Send Samples

- Acid sulfate soils should be stored/delivered cold (in an esky with freezer bricks)
- If acid volatile sulfur is required then an additional vial is recommended and both vials should be frozen immediately
- Enclose the COC in a sealed plastic sleeve along with any other instructions
- Samples can be dropped off in person at EAL. The university gatehouse will provide directions; follow the green and white EAL signs posted around the university. Client parking is reserved below the laboratory client entrance.
- Samples can also be sent by post or courier. TNT or TOLL are our preferred couriers, they can be contacted on 131 150 or 131 531, respectively. Please use the following delivery labels below:

COURIER ADDRESS:

TO: SOUTHERN CROSS UNIVERSITY
Environmental Analysis Laboratory (EAL)
Ground floor, N Block, Military Road
EAST LISMORE NSW 2480

EAL Contact No. ***02 6620 3678*** *or*
Graham Lancaster Mob: 0419 984 088

NOTE: URGENT DELIVERY OF SAMPLES FOR TESTING

POSTAL ADDRESS:

TO: SOUTHERN CROSS UNIVERSITY
Environmental Analysis Laboratory (EAL)
PO BOX 157
LISMORE NSW 2480

EAL Contact No. ***02 6620 3678*** *or*
Graham Lancaster Mob: 0419 984 088

NOTE: URGENT DELIVERY OF SAMPLES FOR TESTING

Contact Details

Laboratory Position	Contact	Phone / Fax	Email
Administration	Reception	02 6620 3678 / 02 6620 3957	eal@scu.edu.au
Laboratory Manager/Director	Graham Lancaster	0419 984 088	graham.lancaster@scu.edu.au
Acid Sulfate Co-ordinator	Nadia Toppler	0447 011 070	nadia.toppler@scu.edu.au

ACID SULFATE SOIL, ROCK AND WATER

DISCOUNTED TESTING PACKS

All packs have preparation and digest/extract charge included

ITEM CODE	ACID SULFATE SOIL AND ROCK (PACKS)	PRICE excl. GST	PRICE incl. GST
AS-PACK-006	**Acid Sulfate Rock** Includes Net Acid Producing Potential (NAPP), NAGpH and Net Acid Generation (NAG) (single addition peroxide acidity), Acid Neutralising Capacity (ANC-BT) and Total Sulfur (combined in NAPP equation).	$90.00	$99.00
AS-PACK-010	**Acid Sulfate Rock plus Chromium Reducible Sulfur** Includes Net Acid Producing Potential (NAPP), NAGpH and Net Acid Generation (NAG) (single addition peroxide acidity), Acid Neutralising Capacity (ANC-BT) and Reduced Inorganic Sulfur (S-CR) (combined in NAPP equation).	$110.00	$121.00
AS-PACK-007	**Acid Sulfate Soil pH-F and pH-FOX Testing** Includes moisture content, drying and ring mill grinding. Field based technique modified for lab use. Results should be used in conjunction with field descriptions to indicate which samples require further laboratory testing.	$20.00	$22.00
AS-PACK-004	**Acid Volatile Sulfide and Reduced Inorganic Sulfide** Includes Acid Volatile Sulfide (S-AV) and Reduced Inorganic Sulfur (S-CR).	$120.00	$132.00
SS-PACK-054	**Incubation - Chip Tray** This method is used to assess the effectiveness of a soil's Acid Neutralising Capacity (ANC). Includes pH-F before and pH-INC after 9 weeks incubation, with further incubation to 19 weeks where 4 <= pH-INC <= 6.5.	$60.00	$66.00
SS-PACK-073	**Incubation - Slab** This method is used to assess the effectiveness of a soil's Acid Neutralising Capacity (ANC). The incubation is maintained and pH-INC taken fortnightly until the soil pH changes by at least 0.5 pH unit to below 4, or for at least 8 weeks until pH-INC is stable.	$180.00	$198.00
AS-PACK-001	**Net Acidity - Basic** Includes Net Acidity and liming rate with analysis of Reduced Inorganic Sulfur (Chromium Reducible Sulfur; S-CR), KCl extractable pH (pH-KCl), Actual Acidity (Titratable Actual Acidity; TAA) where pH-KCl < 6.5. Retained Acidity (Net Acid Soluble Sulfur; S-NAS) recommended where pH-KCl < 4.5 and Acid Neutralising Capacity (ANC-BT) where pH-KCl >= 6.5.	$70.00	$77.00
AS-PACK-008	**Net Acidity - Complete** Includes Net Acidity and liming rate with analysis of Reduced Inorganic Sulfur (Chromium Reducible Sulfur; S-CR), KCl extractable pH (pH-KCl), Actual Acidity (Titratable Actual Acidity; TAA) where pH-KCl < 6.5, Retained Acidity (Net Acid Soluble Sulfur; S-NAS) where pH-KCl < 4.5 and Acid Neutralising Capacity (ANC-BT) where pH-KCl => 6.5.	$90.00	$99.00
AS-PACK-011	**Net Acidity Treatment Validation** Includes Net Acidity and liming rate with analysis of Reduced Inorganic Sulfur (Chromium Reducible Sulfur; S-CR), KCl extractable pH (pH-KCl), Actual Acidity (Titratable Actual Acidity; TAA) where pH-KCl < 6.5 and Acid Neutralising Capacity (ANC-BT) where pH-KCl => 6.5. Routine TAT of 3 days with a reduced surcharge of 50% for 24 h TAT (limited to 15 samples).	$100.00	$110.00

All packs have preparation and digest/extract charge included

ITEM CODE	ACID SULFATE WATER (PACKS)	PRICE excl. GST	PRICE incl. GST
SW-PACK-016	**Acid Sulfate Waters** Includes pH, EC, Total Dissolved Salts (TDS) (calculation); Titratable Acidity; Dissolved Iron and Aluminium; Sulfate, Chloride, Sulfate:Chloride Ratio.	$70.00	$77.00

SINGLES TESTING

ITEM CODE	PREPARATION	PRICE excl. GST	PRICE incl. GST
SS-PREP-010	**Acid Sulfate Soil - Sample Preparation - Required for all samples.** Includes moisture content, drying and ring mill grinding. Required for all samples analysed on a dry weight basis.	$10.00	$11.00
SS-PREP-016	**Fizz Test for Carbonates** This method is used to indicate the presence of carbonates.	$3.00	$3.30
SS-PREP-007	**TOTAL Dry Weight - Air dry basis** Includes mass of the air dried sample.	$6.00	$6.60

All samples require Sample Preparation (SS-PREP-010) unless a Discounted Testing Pack is selected

ITEM CODE	ACID SULFATE SOIL AND ROCK (SINGLES)	PRICE excl. GST	PRICE incl. GST
SS-SING-090	**Acid Neutralising Capacity (ANC-BT)** This method is used to measure Acid Neutralising Capacity (ANC-BT) where pH-KCl > 6.5.	$30.00	$33.00
SS-SING-201	**Acid Neutralising Capacity by Total Inorganic Carbon (C-IN)** This method is used to measure Acid Neutralising Capacity (ANC) where the pH-KCl > 6.5.	$45.00	$49.50
SS-SING-089	**Acid Volatile Sulfide (AVS)** This method measures Acid Volatile Sulfides (S-AV). All samples should be frozen on collection and transported in an esky with freezer bricks.	$50.00	$55.00
SS-SING-088	**Chromium Reducible Sulfur (CRS)** This method measures Reduced Inorganic Sulfur (S-CR) and is not subject to interferences by sulfate minerals and organic matter.	$50.00	$55.00
SS-SING-064	**Electical Conductivity (1:5 H2O)**	$12.50	$13.75
SS-SING-102	**Net Acid Generation (NAG)** This method is used to determine the Net Acid Generation (NAG) of rock material. Includes NAGpH.	$40.00	$44.00
SS-SING-093	**Net Acid Soluble Sulfur (S-NAS)** This method estimates Retained Acidity where pH-KCl < 4.5.	$30.00	$33.00
SS-SING-163	**Peroxide Oxidisable Sulfur (S-POS)** This method estimates Reduced Inorganic Sulfur. It can include interferences from sulfate minerals and organic matter.	$85.00	$93.50
SS-SING-202	**pH - KCl extractable (pH-KCl)** This method is used to determine what further testing is required for Net Acidity calculations: Titratable Actual Acidity (TAA; pH-KCl < 6.5), Net Acid Soluble Sulfur (S-NAS; pH-KCl < 4.5), Acid Neutralising Capacity (ANC-BT or C-IN; pH-KCl => 6.5).	$20.00	$22.00
SS-SING-101	**pH and Sulfate (1:1 H2O)** This method is used for classification of actual acid sulfate soil materials.	$30.00	$33.00
SS-SING-098	**Sulfur - KCl Extractable** This method is used to measure sulfur concentration after Titratable Actual Acidity (TAA) analysis.	$10.00	$11.00
SS-SING-208	**Texture - Full (NCST, 2009)** This method is used for acid sulfate soil action criteria.	$20.00	$22.00
SS-SING-095	**Titratable Actual Acidity (TAA)** This method measures Actual Acidity. Titratable Actual Acidity (TAA) titrated to pH 6.5.	$30.00	$33.00

NATA ACCREDITED TESTS
(Lab Acc. No. 14960)

ID	Tests	Reference	Issue Date
S1	Soil pH and Conductivity	In-house (re Rayment & Lyons 3A1,4A1)	Jul, 2003
S4a	Total C, N, S by Dumas	In-house	Sep, 2013
S14	Acid Neutralising Capacity	In-house (re QASSIT Manual 19A2)	May, 2005
S15b	Total Organic Carbon in Soil by Dumas	In-house	Sep, 2013
S16-B	Titratable Actual Acidity	In-house (re QASSIT Manual 23)	May, 2005
S20	Chromium Reducible Sulfur	In-house (re QASSIT Manual 22B)	May, 2005
S21	Acid Sulfate Peroxide Screening	In-house	May, 2005
S38	Lead in Paint	In-house	Sep, 2011
W1	Turbidity	In-house	Sep, 2011
W4	Total N/Total P (Lachat)	In-house (re APHA 4500 P-H N-C)	Mar, 2000
W6	Nitrite in Waters (Lachat)	APHA 4500 NO3-I	Jul, 2003
W7	Nitrate in Waters (Lachat)	APHA 4500 NO3-F	Jul, 2003
W8	Ortho-Phosphate in Waters (Lachat)	APHA 4500 P-G	Jun, 2003
W9	Ammonia in Waters (Lachat)	APHA 4500 NH3-H	Jul, 2003
W25	Total Suspended Solids	APHA 2540-D	Jul, 2003
W26	BOD in Waters & Wastewaters	APHA 5210-B	Jul, 2003
W28a	Total Oils & Grease Automated	APHA 5520-D	Jan, 2003
W31	Water pH & Conductivity	APHA 4500-H & 2510-B	Jun, 2003
W32	ICPMS Metals Analysis in Soils & Waters (Al,Sb,As,Ba,Be,Bi,B,Cd,Ca,Cr,Co,Cu,Fe,Pb,Li,Mg, Mn,Hg,Mo,Ni,P,K,Se,Ag,Na,Sr,S,Tl,Th,Sn,U,V,Zn)	In-house (re APHA 3125)	Sep, 2011
W32a	Trace Metals in Saline Water (Al,As,Ba,Be,Bi,Cd,Cr,Co,Cu,Fe,Pb,Mn,Hg,Mo,Ni ,Se,Ag,Tl,U,V,Zn)	In-house (re APHA 3125)	Aug, 2013
W33	Soluble Chlorine as Chloride in Waters	In-house (by ICPMS)	Oct, 2013

ASPAC TESTS
(for Plant and Soil)

Tests	Reference
Soil pH	Rayment & Lyons 4A1, 4B1, 4B2
Soil Conductivity	Rayment & Lyons 3A1
Bray 1, Colwell, Olsen Phosphorus	Rayment & Lyons 9E2, 9B2, 9C2
Total Phosphorus	Rayment & Lyons 17C1
Exchangeable Cations - Ca,Mg,K,Na	Rayment & Lyons 15D3
Exchangeable Cations - H,Al	Rayment & Lyons 15G1
DTPA - Fe,Cu,Zn,Mn	Rayment & Lyons 12A1
Total Carbon and Nitrogen	Rayment & Lyons 6B2b, 7A5
Nitrate/Ammonium	Rayment & Lyons 7C2
Soluble Chloride	Rayment & Lyons 5A2
Extractable Boron	Rayment & Lyons 12C2
Extractable Sulfur	Rayment & Lyons 10D1
Phosphorus Buffer Index	Rayment & Lyons 9I2b
Ca,Mg,K,Na,Fe,Cu,Zn,Mn,P,S,Al,B	Rayment & Lyons 18F1
Soluble Chloride	ASPAC Method Code BB-32
Ca,Mg,P,K,Na,Si,B,S	ASPAC Method Code AE-24
C,N,S	ASPAC Method Code CA-37
Cd,Co,Fe,Pb,Mn,Mo,Se,Zn	ASPAC Method Code AE-24

Note: See EAL website under 'About' for current scope of accreditation for NATA and ASPAC