Analysis 2024

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Wheal Jane Laboratory

Wheal Jane Laboratory is a wholly owned subsidiary of the Wheal Jane Group of companies. It is equipped with the latest sample preparation and analytical equipment offering a comprehensive range of services.

The laboratory was previously part of the technical support department for the Wheal Jane poly-metallic processing plant and associated mines operated by RTZ in Cornwall. After the closure of the last operating tin mine in 1998, the laboratory has continued to operate on a commercial basis, offering its services throughout the UK and around the world.

The laboratory is mainly involved in mining-related analysis work and consultancy but is also involved in environmental soil and water analysis. Separate systems and preparation areas are used depending on the nature of the samples, to avoid the risk of contamination.

Consultation

In order to achieve the most appropriate and cost-effective analysis for clients, a number of factors are considered and discussed prior to the commencement of any work. Factors considered would include sample weights, grind, preparation, analytical methods and techniques, and storage or return of samples.

Analysis costs are normally based on a maximum of twenty working days. However, the laboratory specialises in fast turnaround and can offer a service to suit any client. An additional charge may apply to guaranteed three, five or ten-day turnaround analysis. For large batches or repeat work, discounts may apply. Again, this is discussed before the commencement of any work.

Reporting & Invoicing

Security and confidentiality are ensured through a comprehensive logging and unique numbering system. Reporting of test reports and results is by e-mail on or before the agreed turnaround dates. Hard copy test reports are available on request. Invoicing is normally on completion of the work or project to the same address as the reporting address unless otherwise agreed.

Sample Preparation

The sample preparation facility includes separate environmental chambers and ovens for drying soil samples, stream sediments, sludge, rock chip, cores and concentrates. Jaw, roll and cone crushers, disc mills and bench top grinders are used to reduce samples to the appropriate particle size for analysis. Various sample splitting equipment and techniques are used to ensure that all sub-samples are representative.

X-Ray Fluorescence (Code-O1)

X-Ray Fluorescence (XRF) analysis is carried out using various presentation methods, including loose powders, pressed pellets and solutions. The technique is used for whole rock analysis, fast process control mineral processing samples with full matrix correction capabilities. It is capable of analysing the full range of elements from sodium to uranium.

Sulphur/Carbon Analyser (Code O2)

Two LECO SC-144DRPC analysers are operated by the laboratory. These can be used for total sulphur and/or carbon analysis or combined with wet chemical methods to enable speciation.

Inductive Coupled Plasma (Code O3)

The Agilent 720 Inductive Coupled Plasma Optical Emission Spectrometer (ICP-OES) provides simultaneous analysis of most of the periodic table. Analysis of water, effluent, mining and soil samples is possible down to ppb levels.

Atomic Absorption (Code O4)

The laboratory operates two iCE 3300 Atomic Absorption Spectrometers (AAS) which provide accurate quantitative analysis of trace elements in effluent and water samples. Mining and soil samples can be analysed after acid digestion or fusion.

Spectrophotometer (Code O5)

A DR 3900 VIS Spectrometer measures the intensity of wavelengths in a spectrum of light, compared with the spectrum from a reference source to provide routine cation and anaion analysis of water and effluent samples.

Precise & Chemical Assays (Code M1-M40)

Traditional wet chemistry methods compliment the instrumentation techniques. The laboratory uses a wide range of classic titrametric and gravimetric analytical methods, in conjunction with modern instrumentation techniques such XRF, ICP-OES and AAS. A wide range of single and mixed acid digestions are used to produce total and partial attacks as required. This is particularly useful in analysis of copper, lead and zinc ores when mineral identification is required. For whole rock analysis or resistant oxide mineralisation, appropriate fusion attacks are used.

Geochem Price List

Unless otherwise stated, all prices are based on a 20 working day turnaround from the date being received and logged into the laboratory system. A premium for three, five and ten-day guaranteed turnaround times will be applied. Discounts may apply for bulk projects or repeat work and will be discussed with clients before the commencement of work.

Sample Preparation

Samples submitted dry and ground to less than 45 micron require no further sample preparation. Drying, crushing, splitting, sizing and grinding of samples for analysis can be carried out as required. For samples of less than 1kg the standard preparation costs apply. For larger samples the cost of crushing and splitting increases by £2.00 per kg.

Log in	£1.00
Drying	£4.00
Drying and moisture determination	£6.00
Crushing and splitting	£4.00
Pulverising	£4.00

Precise & Chemical Analysis (code M1-M15)

Routine precise methods include total fusion attacks, titrametric and gravimetric analysis. Additional determinations and prices are available on application.

Element (normally reported as)

Platinum (Pt)	£28.00
Gold (Au)	£28.00
Silver (Ag)	£26.00
Aluminium (Al)	£35.00
Chrome (Cr)	£35.00
Iron (Fe)	£35.00
Lithium (Li)	£35.00
Silica (SiO2)	£35.00
Sulphur (S)	£25.00
Sulphate (SO4)	£25.00
Titanium (Ti)	£35.00
Tin (Sn)	£35.00
Tungsten (WO3)	£35.00

Loss on Ignition (LOI) 1hour @ 600c	£12.00
Loss on Ignition (LOI) 1hour @ 1000c	£15.00

Instrumentation/Acid Digest (code M30/M40)

Various acid attack combinations are used depending on the elements required. Most have an AAS or ICP-OES finish. This enables the results for more than one element to be obtained from each attack. Elements obtained by various single and mixed acid attack methods include Cu, Pb, Zn, Co, Ni, As, Cd, Bi, Sb, Te, Se, Hg, Mo, etc. Depending on the elements, two or more attacks may be required.

Each acid attack (for the first element)	£26.00
Additional elements	£3.00

Sulphide & Oxide Methods (code M16-M18)

Dilute or weak acid attacks at a range of temperatures can be used to obtain specific copper, lead, zinc and iron soluble sulphides or oxides as required.

Each soluble analysis	£26.00
Combinations, etc.	
Cu(total) and Cu(soluble)	£48.00

X-Ray Fluorescence (code O1)

XRF un-calibrated analysis can be carried out on pressed pellets, loose powders, rock chips and solutions. These scans can be carried out using a standard-less program and reported as approximate percentages as metals or oxides. Alternatively, semi-quantitative scans can be reported as major, minor and trace elements. Calibrated programs can be set up for a wide range of elements using reference materials and classic chemical analysis methods. All calibrated programs are checked by other methods on one-in-five, one-in-ten, or one-in-twenty basis as appropriate.

XRF semi-quantitative scans	£38.00
Calibrated programs	
First element	£20.00
Additional elements	£4.00

LECO Analyser (code O2)

The LECO analyser can be used on its own for total sulphur and/or carbon analysis or combined with wet chemical methods to enable speciation.

S(tot)	£16.00
C(tot)	£16.00
S(tot) and C(tot)	£24.00
S(tot) and S(SO4)	£34.00
C(tot) and C(CO3)	£34.00

ICP-OES (code O3)

In addition to the individual methods and procedures listed, the ICP enables the determination of multiple suites simultaneously. These can be in the form of complex interpreted calibrated suites, calibrated semi-quantitative scans, or un-calibrated semi-quantitative scans depending on client requirements. A number of attacks can be used, including various acid digestions and/or fusions as appropriate.

Rare Earth Suite	(Precise)	(Scan)
Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th, Tm, U, Y, Yb	£150.00	£85.00

ICP semi-quantitative scans. Elements can be selected to individual requirements.

28 Element	£48.00
50 Element	£75.00

Multiple Analysis Suites (code M1-M40)

Regular suites of analysis carried out may include several different attacks or procedures and varying instrumentation techniques. The below suites are regularly requested and carry discounts compared to individual prices. Elements can be substituted from similar attacks at no extra cost on request.

Whole Rock Analysis (major matrix) SiO2, Fe, Al, P, S, Mn, Mg, Na, K, Ca, Cr, Ti and LOI	£98.00
Trace Analysis Cu, Pb, Zn, As, Cd, Ni, Co, Bi, Sb, Hg, Te and Se	£80.00
Full Analysis SiO2, Fe, Al, Mg, Mn, Cr, Ca, S, Cu, Pb, Zn, As, Cd, Ni, Co, Bi, Sb, Hg, Te, Se, Au and Ag	£200.00
Extended Full Analysis SiO2, Fe, Al, Mg, Mn, Cr, Ca, S, Cu, Pb, Zn, As, Cd, Ni, Co, Bi, Sb, Hg, Te, Se, Au, Ag, Na, K, Cl and F	£240.00

Precious Metal Suites (code M4/M5)

Precious metal elements can be supplemented as required or substituted from similar attacks at no extra cost on request.

Au and Ag	£50.00
Au, Ag and Pt	£65.00
Au, Ag, Pt, Pd and Rh	£75.00

Iron Ore Suites (code M1/M14, O1-O3)

Iron ore suites are based on standard XRF/ICP/LECO techniques, but these can be supplemented by dichromate titrations for Fe(total) at an additional cost of £15 per sample. Elements can be substituted from similar attacks at no extra cost on request.

Fe, Al, SiO2	£45.00
Fe, Al, SiO2, P2O5, Mn, Mg, S and LOI	£75.00
Fe, Al, SiO2, P2O5, Mn, Mg, S, K, Ti, Na Ca and LOI	£95.00

Additional Standard Suites (code M4/M5, M30/M40 and O2)

Cu and S	£40.00
Cu, Pb and Zn	£32.00
Cu, Pb, Zn and S	£46.00
Cu, Pb, Zn, S and Ag	£69.00
Cu, Pb, Zn, S and Au	£71.00
Cu, Pb, Zn, Au and Ag	£80.00
Cu, Pb, Zn, S, Au and Ag	£94.00

Leach Products & Solutions (code O3)

Carbon Analysis	
Au	£30.00
Au and Ag	£35.00
Au, Ag and Cu	£40.00
Leach Solution	
Au	£12.00
Au and Ag	£14.00
Au, Ag and Cu	£16.00

Sample Storage

All fractions of soil, stream sediments, rock chips and cores are kept for 90 days from the date of arrival free of charge. Further storage can be arranged for a nominal charge, or samples can be returned at the clients request and cost. Environmental water samples are normally kept for 10 working days from reporting. Deterioration of water samples can occur even when refrigerated, so longer storage is not normal unless previously agreed with the client.

Environmental Price List

Soil, stream sediments and water samples are analysed using environmental suites and BS standards. Appropriate acid digestions and instrumentation such as AAS and ICP are used for routine analysis. Additional tests are below – price on application.

Standard Soils Determinations (Code S1-S8)

Turnaround	20 day	10 day
Cornish Suite (pH, Cu, Pb, Zn, As, Cd, Ni)	£44	£66
Cornish Suite plus S and SO4	£80	£120
CLEA Suite (pH, Pb, As, Cd, Cr, Ni, Hg, Se)	£47	£70
CLEA Suite plus Cu & Zn	£52	£78
CLEA Suite plus S and SO4	£83	£124
S or SO4 (BS 1377)	£22	£33
S and SO4 (BS 1377)	£40	£60
Additional Elements (Cd, Ni, Pb, Zn)	£32	£48

Water & Sludge Samples (Code W1-W7)

Due to the nature of environmental water samples, analysis is normally carried out as soon as samples are received to avoid oxidation or deterioration of the samples. Additional analysis and prices on application.

pH	£5
Total Suspended Solids (TSS)	£10
Total Dissolved Solids (TDS)	£10
Specific Gravity determination	£20
DR3900 tests	
Each determination	£24
Metals by AAS	
First element	£16
Additional elements (each)	£3
Metals by ICP-OES	
First element	£16
Additional elements (each)	£3
Titrations/Gravimetric	
CO3 and OH	£40
S or SO4	£25

Accreditation & Quality Control

Wheal Jane Laboratory operates to UKAS accreditation testing laboratory standards. Quality Control is a key part of the analytical service provided and increasingly important in both the mining industry and environmental sectors. The laboratory is committed to increasing the scope of its accreditation and certification. Environmental and management control systems meet as a minimum ISO 9001, ISO 14001 and ISO 17025 requirements. Laboratory facilities and equipment are maintained to ISO 17025 standards.

Precision is controlled by the use of appropriate certified reference materials, quality control samples and blanks, and by varying the numbers of duplicates analysed as appropriate to each batch. Small batches or individual samples are carried out in duplicate by different technicians or analysts as required. In addition, the laboratory operates an internal and external checking system for all routine analysis methods, including regular international round robin proficiency testing.

Wheal Jane Laboratory is committed to customer satisfaction by providing a niche personalised service to all its customers.

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