



Australian Government

MSL975041 Perform fire assay techniques

Release: 1

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Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to MSL975010 Perform fire assay techniques. Conditional/optional prerequisite removed – code retained. Foundation skill information added. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to safely extract a range of precious metals from their host matrices in readiness for analysis. The unit also covers the ability to select and/or modify laboratory methods to suit particular ores and to ensure total recovery.

This unit applies to laboratory personnel working in the mineral assay industry sector.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

MSL973023 Perform fire pouring techniques

Competency Field

Testing

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 **Classify ore samples and**

1.1 Review client request to identify sample/analysis requirements, preparation methods and equipment

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select fluxing method	involved
	1.2 Inspect samples, compare with specifications, record and report any discrepancies
	1.3 Conduct visual and simple chemical tests to identify the type of sample and sulphide concentrations
	1.4 Review client sample/analysis history and identify possible chemical interferences
	1.5 Decide whether non-standard fluxing is required
	1.6 Select sample weight and flux to optimise precious metal recovery and purity
2 Prepare for precious metal recovery	2.1 Identify hazards and workplace safety procedures associated with the sample, preparation methods, reagents and equipment
	2.2 Examine the recommended preparation method to identify the critical steps that will affect the quality of analytical results
	2.3 Plan parallel work sequences to optimise the throughput of multiple sets of samples
	2.4 Assemble all required equipment, materials, reagents and check they are fit for purpose
3 Recover precious metals from ore sample	3.1 Weigh required amounts of sample and flux components to achieve an acceptable button and fluid slag
	3.2 Select the type and size of pot to suit sample method and client requirements
	3.3 Mix charge to ensure homogeneity and optimal collection of precious metal
	3.4 Set and monitor furnace temperature/time to ensure complete fusion
	3.5 Separate slag and button with minimal loss of lead

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	collector
	3.6 Maintain sequencing in order to track samples, buttons and prills throughout the recovery process
	3.7 Separate lead collector from the required precious metal and check for contamination, losses and evidence of other precious metals
	3.8 Minimise personal exposure to hazards and the release of collectors to the work environment
	3.9 Collate laboratory documentation and the prepared sample and present for analysis
4 Troubleshoot and correct failed recovery	4.1 Monitor all stages of recovery for indicators of potential loss
	4.2 Recognise undesirable recovery conditions and decide whether the process requires correction
	4.3 Choose an appropriate corrective action and re-start the process
	4.4 Document any adjustments made to standard methods and re-sequencing of samples
	4.5 Seek advice when problems are beyond scope of responsibility or knowledge
5 Perform daily maintenance of assay equipment	5.1 Segregate and dispose of waste in accordance with workplace requirements
	5.2 Grade and inspect pots using established criteria prior to storage for re-use
	5.3 Inspect furnaces for cracks, unserviceable components and remove slag
	5.4 Inspect and clean extractive systems
	5.5 Report defective equipment and consumable requirements to appropriate personnel

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

- Problem solving skills to:
 - identify indicators of poor recovery and contamination
 - apply knowledge of mineral chemistry and fire assay techniques to solve recovery and contamination problems.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Equivalent to MSL975010 Perform fire assay techniques, Release 1.

Links

Training Package Companion Volumes -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>