Australian Government

MSL954002 Prepare mineral samples for analysis

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MSL954002 Prepare mineral samples for analysis

Modification History

Release 1. Supersedes and is equivalent to MSL954002A Prepare mineral samples for analysis

Application

The unit of competency covers the ability to reduce given mineral samples to representative client samples and analytical portions that meet client requirements for analysis. Personnel are also required to recognise problems and invalid preparation steps and take appropriate corrective actions.

This unit of competency is applicable to technical assistants working in the mineral assay and construction materials testing sectors.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Sampling

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.
1	**Interpret and schedule client requirements**	1.1 Review client request to identify sample/analysis requirements, preparation methods and equipment involved
		1.2 Inspect samples, compare with specifications, record and report any discrepancies
		1.3 Liaise with client when samples and/or request forms do

			not comply with workplace procedures
		1.4	Identify hazards, safety equipment and safe work procedures specified for the sample, preparation methods, reagents and equipment
		1.5	Plan parallel work sequences to optimise throughput of multiple sets of samples
		1.6	Assemble all required equipment materials, reagents and check they are fit for purpose
2	**Prepare client samples for analysis**	2.1	Estimate safe times for the preparation of required sample portions
		2.2	Split samples to obtain representative sub-samples as required
		2.3	Safely operate comminution equipment
		2.4	Monitor texture of the samples as an indicator of particle size and adjust milling times accordingly
		2.5	Monitor sample compaction and build up of residues on equipment and rectify as necessary
		2.6	Record preparation difficulties that may impact on quality or cause additional client costs
		2.7	Report any departure from preparation methods or client specifications
		2.8	Label client samples and record chain of custody information
		2.9	Store all client samples in accordance with workplace procedures
3	**Use non-destructive methods to prepare laboratory portions for**	3.1	Examine the recommended preparation method to identify critical steps that will affect the quality of analytical results
		3.2	Closely follow each preparation step with particular attention to safety, precision and minimisation of cross-contamination of samples

	analysis	3.3	Monitor parameters that indicate completion or failure of each preparation step
		3.4	Analyse and record invalid preparation steps and take corrective action before repeating the procedure
		3.5	Present laboratory portions for analysis in appropriate containers with all required chain of custody documentation
4	**Maintain a safe work environment**	4.1	Apply established safe work practices and use personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel
		4.2	Minimise the generation of waste and environmental impacts
		4.3	Ensure the safe disposal of all hazardous waste and spent/surplus samples
		4.4	Clean, care for and store equipment and reagents as required

Foundation Skills

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

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the competence of testing and calibration laboratories; laboratory safety; quality and environmental management; sampling of specific ores and particulate materials; and labelling, storage, handling and transport of hazardous materials
- national work health and safety (WHS) standards and codes of practice, national environmental protection measures, and national measurement regulations and guidelines
- specific codes, guidelines and procedures, such as National Association of Testing Authorities (NATA) accreditation requirements and principles of good laboratory practice (GLP)
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; maintenance schedules; material safety data sheets (MSDS); safety procedures; material, production and product specifications; production and laboratory schedules; workplace recording and reporting procedures; and waste minimisation and safe disposal procedures
- sampling procedures for specific samples, sites and clients (labelling, preparation, storage, transport and disposal), and published preparation methods

Materials sampled

Materials sampled include, but are not limited to, one or more of:

- solids, such as rocks, minerals, soils, sands and stream sediments
- pulverised core and other drill samples, such as rotary air blast (RAB), reverse circulation (RC) and aircore samples
- powder concentrates
- dump samples and grab samples

Sample preparation methods

Sample preparation methods include one or more of:

- sorting, boxing and drying
- sieving
- primary crushing (e.g. 10 mm, 2 mm)
- fine pulverising (e.g. 100 micron, 75 micron)
- partial digestion requiring separation (e.g. aqua regia)
- complete digestion (e.g. multi-acid digest)

- non-destructive (e.g. LIF, Li2B4O7 disks)
- solvent extraction (e.g. di isobutyl ketone dibK)

Hazards

Hazards include, but are not limited to, one or more of:

- dust, silica and fibrous materials
- asbestiform minerals
- chemicals, such as hydrofluoric acid, bromine, perchloric acid, aqua regia and cyanide
- lead-based compounds, free-mercury and nickel compounds
- noise and vibration
- crushing, entanglement and cuts associated with moving machinery
- manual handling of heavy loads, such as sample bags, containers, racks and trolleys
- heat exhaustion/stress and fatigue

Safe work procedures

Safe work practices include, but are not limited to, one or more of:

- ensuring access to service shut-off points
- recognising and observing hazard warnings and safety signs
- labelling of samples and hazardous materials
- using direct extraction and fume hoods
- using guards for moving machinery parts
- providing noise insulation
- following established manual handling procedures
- regularly cleaning equipment and work areas using workplace procedures
- reporting of abnormal emissions and airborne contaminants to appropriate personnel
- using PPE, such as masks, gloves, boots, goggles, coats, ear muffs and safety boots

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSL954002A Prepare mineral samples for analysis

Links

MSA Training Package Implementation Guides - http://mskills.org.au/training-packages/info/