



Australian Government

Department of Education, Employment and Workplace Relations

RIIPBE306A Conduct leaching process

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the conduct of leaching processes in the metalliferous mining industry. It includes planning and preparing for leaching circuit operations, starting up equipment in sequence, operating and monitoring equipment, conducting housekeeping activities, and shutting down in sequence and/or isolating equipment. Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

Application of the Unit

This unit is appropriate for those working in an operational role at worksites within:

- Metalliferous mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for leaching circuit operations	1.1. Access, interpret and apply compliance documentation relevant to the work activity 1.2. Receive, interpret and clarify shift changeover details 1.3. Communicate with other personnel using approved communication methods 1.4. Select personal protective equipment appropriate for work activities 1.5. Select appropriate type of auxiliary equipment for work activities 1.6. Perform equipment pre-start checks 1.7. Identify, address and report potential risks and hazards 1.8. Identify, address and report environmental issues 1.9. Adhere to emergency procedures 1.10. Use approved dust suppression and extraction methods 1.11. Ensure area is well ventilated
2. Start-up equipment in sequence	2.1. Carry out start-up procedures and completes start-up checks according to plant configurations and system requirements 2.2. Confirm plant is operational
3. Operate and monitor equipment	3.1. Read and interpret data from equipment indicators to determine leaching efficiency 3.2. Continuously inspect and monitor operations/plant and containment areas 3.3. Adjust equipment to optimise leaching 3.4. Add reagents to achieve operating parameters 3.5. Adjust flows to meet down stream requirements 3.6. Carry out operator level maintenance to maintain condition of equipment 3.7. Complete all required documentation 3.8. Pass on end of shift information to oncoming shift
4. Conduct housekeeping	4.1. Clean plant

activities	4.2. Identify, address and report hazards
5. Shutdown in sequence and/or isolate equipment	5.1. Shutdown and/or isolates equipment based on process and safety requirements 5.2. Perform <i>post shutdown</i> and/or isolation checks

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Specific skills are required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes the ability to carry out the following, as required to conduct leaching processes:

- apply legislative, organisation and site requirements and procedures for conducting leaching processes
- employ safe work practices
- fault finding
- handle hazardous substances
- identify hazards
- interpret reports
- maintain records
- monitor operations/report defects
- use hand and power tools
- use lifting techniques (manual, cranes and loads)

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes knowledge of the following, as required to conduct leaching processes:

- contaminant identification
- emergency procedures
- environmental principles
- equipment operating parameters
- equipment safety requirements
- hazardous substances procedures and consequences of spills
- isolation procedures
- leaching principles
- metallurgical and technical data
- operational procedures and checks
- pumping system and flow charts
- reagent types
- sampling
- leaching safety requirements
- types of ores

Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:</p> <ul style="list-style-type: none"> • knowledge of the requirements, procedures and instructions for conducting leaching processes • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of the leaching process • working with others to undertake and complete the leaching process in a way that meets all of the required outcomes • consistent timely completion of the leaching process that safely, effectively and efficiently meets the required outcomes
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • Assessment of this competency requires typical resources normally used in a resources and infrastructure sector environment. Selection and use of resources for particular worksites may differ due to the site circumstances. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate

	<p>cultural diversity.</p> <ul style="list-style-type: none"> • Aboriginal people and other people from a non English speaking background may have second language issues. • Where applicable, physical resources should include equipment modified for people with disabilities. Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	<p>This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • consistent achievement of required outcomes • first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • working with others to undertake and complete the leaching process
Guidance information for assessment	<p>Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.</p>

Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p>Relevant compliance documentation may include:</p>	<ul style="list-style-type: none"> • legislative, organisational and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
<p>Legislation may include Acts and regulations dealing with:</p>	<ul style="list-style-type: none"> • mining safety and health • mine inspection • OHS • explosives
<p>Auxiliary equipment may be anything that is portable and mobile that is not part of the fixed infrastructure, and may include:</p>	<ul style="list-style-type: none"> • compressors • distribution control systems (DCS) • feeders • gantry cranes and attachments and other mobile equipment • hand and power tools • hoses (water and air)
<p>Pre-start checks may include:</p>	<ul style="list-style-type: none"> • availability of equipment (e.g. conveyor) • detection of conditions that are unusual • fluid levels • job requirements • personnel availability • walk through plant
<p>Environmental issues may include:</p>	<ul style="list-style-type: none"> • drainage • dust (dump) • emissions • flora and fauna • hazardous chemicals • noise • recycling • run-off • spills

	<ul style="list-style-type: none"> • waste management and disposal • water quality
Start-up procedures may include:	<ul style="list-style-type: none"> • agitators • cameras and monitors • distribution control system • drive belts • hydraulic system • interlocks • launders • pipes and flanges • pumping system • screen inspections • scuttling pumps • suppression systems • valves • visual and audio warning devices and lights
Plant may include:	<ul style="list-style-type: none"> • agitators • airlines • conveyors • filters • grinding mills • heat exchangers • lines • overhead sprinklers • piping • pumps • reactors • streamlines • sumps/tanks • thickeners and clarifiers
The methods used to optimise the plant may include:	<ul style="list-style-type: none"> • oxygen levels • quantity of reagents
Indicator readings may include:	<ul style="list-style-type: none"> • air flows • current (e.g. agitators) • density • flow • levels • power • pressure • restrictions • speed (e.g. pumps)

	<ul style="list-style-type: none"> • unusual noises • vibrations
Leaching methods may include:	<ul style="list-style-type: none"> • acid • alkaline • bacterial leach • dump (run of mine ore) • heap (processed ore for leaching) • <i>in situ</i> • pressure
Monitoring may include the checking of:	<ul style="list-style-type: none"> • blockages and spillages • carbon levels and movement • feed rates • gas emission (e.g. cyanide) • in stream analysis (ISA) • mineral content • on stream analysis (OSA) • overloads • particle size indicators (PSI) • power draw • pressures • titrations • wear and tear
Equipment and plant cleaning methods may include:	<ul style="list-style-type: none"> • high pressure cleaning • hosing with water
Post-shutdown checks are like pre-start checks.	
Wet materials may include:	<ul style="list-style-type: none"> • agglomerated • crushed • slurry
Dry materials may include:	<ul style="list-style-type: none"> • calcine (dry prior to adding) • liquors (e.g. spent from electrolysis)
Contaminants are anything other than the ore. Common contaminants may include:	<ul style="list-style-type: none"> • chemicals • containers and packaging • fuels • metal • oils • plastic • timber

Unit Sector(s)

Beneficiation

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.