

## Project Overview

### Carrapateena Geology Laboratory Requirements

#### DOCUMENT CONTROL HISTORY

Revision	Description	Author(s)	Reviewer(s)	Approver	Date
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## CARRAPATEENA - SCOPE OF WORK(EOI)

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### EXECUTIVE SUMMARY

This document is an overview of the pending Scope of Work covering information for the specifications in provision of laboratory services for the Carrapateena geology department.

Whilst this information can be used to develop contracts relating to the services for Carrapateena underground operations, it in no way is a directive by OZ Minerals of the performance of The Works under the contract(s).

**There are additional Metallurgy components that are not identified and not developed as of yet however they will be included within the tender scope.**

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### 1.0 SCOPE OF WORK (SOW) - DESCRIPTION

This document is to be treated as a generic overview of the upcoming Scope of Work for the provision specifications of laboratory services for the Geology department for OZ Minerals Carrapateena operations.

#### 1.1 Underground Geology Samples

A "Near Site Facility" (Port Augusta or Whyalla) is to be utilised to provide professional analysis services with the below table 1 of elements:

OZ Minerals Geology estimates an average of approximately 70 underground geological samples per day to be submitted for analysis. The volume will be reviewed on a regular basis and updates provided to the Contractor on a quarterly basis.

Delivery of samples will occur daily via the OZ Minerals/Kokatha courier agreement from Carrapateena directly to the laboratory in Port Augusta or Whyalla.

Most underground geology samples delivered to the "Near Site Facility" will be loose broken rock grab samples in calico bags with a weight between approximately 2.5 to 8.0kg (historic average weight 3.8kg/sample).

The maximum turnaround time from receipt of sample to delivery of analytical results for a regular batch shall not exceed 72hrs for the 15 elements listed in table 1 for XRF analysis. Turnaround time for the remaining elements (Au, Ag and F) will be additional 72hrs if they are sent to an Adelaide based "Offsite Facility" for analysis via the procedures listed in Table 1.

##### 1.1.1 Analysis Requirements

The "Near Site Facility" shall perform the following Services:

- Sample preparation utilising pulverisers, screens, drying ovens, crusher, secondary crush prior to milling, pre and post weighing of samples, dry weighing of samples etc.
- Mill clean out materials (barren wash).
- X-Ray Fluorescence Spectrometry analysis of the 15 elements shown in Table 1.
- Fire assay, Multi Acid Digest, ICP-OES finish, Specific ion electrode (From Lithium Borate Fusion) as per table 1.
- Table 1 shows the current analysis methods. Alternative methods are open to consideration if they align reporting accuracy and turnaround time delivery.

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*Table 1. Current Methods and Procedures for Underground Geology samples.*

Fire Assay		Multi Acid Digest, ICP-OES finish		Specific ion electrode (From Lithium Borate Fusion)		XRF	
(1 element)		(1 elements)		(1 element)		(15 element)	
Element	DL ppm	Element	DL ppm	Element	DL ppm	Element	DL ppm
Au	0.01	Ag	0.2	F	50	Al	10
						Ba	10
						Ca	10
						Cl	1
						Co	10
						Cu	10
						Fe	10
						K	10
						Mg	10
						Mn	1
						Pb	10
						S	10
						Si	100
						Ti	1
						U	4

**1.2 Diamond Drill Core Samples**

OZ Minerals estimates an average of approximately 75 drill core samples per day to be submitted for analysis. The volume will be reviewed on a regular basis and updates provided to the Contractor on a quarterly basis.

Delivery of core samples will occur once per week via the OZ Minerals site transport contractor directly to the "Offsite Facility" in Adelaide.

Most samples delivered to the Contractor's laboratory will be half NQ drill core with a weight approximately 2.5 to 4.0kg. Half core and full core BQTK and LTK60 may also be used at similar masses. Half HQ drill core and on rare occasions RC samples (both approximately 5kg) may also be used.

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The maximum turnaround time from receipt of sample to delivery of analytical results for a regular batch shall not exceed 21 days. On occasions where results are time-sensitive, a faster turnaround needs to be achievable on request, the specific turnaround time will be negotiated upon contract execution, however, 10 or 14 days will need to be achievable. If this urgent turnaround time is achieved, these requests will incur an agreed upon surcharge, as a percentage on top of that individual job cost.

A standard suite of 58 elements will be analysed from core samples, with additional elements and techniques required on occasion as requested (refer to Table 2).

### 1.2.2 Analysis Requirements

The "Offsite Facility" shall perform the following Services:

- Sample preparation utilising pulverisers, screens, drying ovens, crusher, secondary crush prior to milling, pre and post weighing of samples, dry weighing of samples etc.
- Mill clean out materials (barren wash).
- Aqua-regia digest, ICP-MS finish.
- Fusion digests including Lithium Borate fusion digest package (39 elements by ICP-MS and OES)
- Sodium Peroxide fusion including F and other elements by ICP-OES and MS.
- Multi acid digest package including 18 elements by ICP-OES and MS.
- Fire assay/AAS gold analysis with the option to include the disposal of fire assay waste materials
- Low level fire assay
- Fluorine analysis by specific ion electrode from Lithium Borate Fusion/Sodium Peroxide Fusion
- Table 2 shows the current analysis methods. Alternative methods are open to consideration if they align reporting accuracy and turnaround time delivery.

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Table 2. Methods and Procedures for Drill Core samples

Fire Assay		Lithium Borate Fusion digest, ICP-OES finish		Lithium Borate Fusion digest, ICP-MS finish		Multi Acid Digest, ICP-OES finish		Specific ion electrode (From Lithium Borate Fusion)	
(1 element)		(17 elements)		(21 elements)		(18 elements)		(1 element)	
Element	DL ppm	Element	DL ppm	Element	DL ppm	Element	DL ppm	Element	DL ppm
Au	0.01	Al	100	Ga	1	Ag	0.2	F	50
		Ba	1	Hf	0.5	As	2		
		Ca	50	In	0.5	Bi	0.1		
		Ce	1	Rb	0.5	Cd	0.1		
		Cr	5	Sn	5	Co	0.2		
		Fe	100	Th	0.5	Cs	0.1		
		La	1	U	0.5	Cu	10		
		K	50	W	3	Mo	1		
		Mg	50	Y	1	Nb	0.5		
		Mn	20	Pr	0.5	Ni	10		
		Na	50	Nd	1	Pb	10		
		P	100	Sm	1	S	50		
		Sc	2	Eu	0.5	Sb	0.5		
		Si	100	Gd	1	Se	2		
		Ti	50	Tb	0.5	Sr	0.2		
		V	5	Dy	0.5	Ta	0.1		
		Zr	5	Ho	1	Te	0.2		
				Er	1	Zn	10		
				Tm	0.5				
				Yb	1				
				Lu	0.5				

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