

# ABANDONED MINE FEATURES ASSESSMENT

## WHEAL ELLEN GEOTECHNICAL REPORT

April 2025

11953-G-R-001 Public Document



**WML**  
Consulting Engineers

Document History and Status				
Revision	Prepared By	Reviewed By	Purpose of Issue	Date
-	IG	SM	Public Issue	15/04/2025

<b>Issued to:</b>	Department of Energy, Mines, Industry Regulation & Safety (DEMIRS)
<b>WML Project Number:</b>	11953
<b>Document Name:</b>	11953-G-R-001 Public Document

**WML Consultants Pty Ltd**

*I Golijanin*

Ivana Golijanin  
Geotechnical Engineer  
Author

*Simon Maris*

Simon Maris  
Principal Geotechnical Engineer  
Reviewer

For and on behalf of WML Consultants Pty Ltd

**WML Consultants Pty Ltd**

ISO 9001 | ISO 14001 | ISO 45001

Level 2, 91 Havelock St, West Perth, WA 6005 | 08 9722 3566  
First Floor, 25A Stephen St, Bunbury, WA 6230 | 08 9722 3544  
Suite 1, 45 Brookman St, Kalgoorlie, WA 6430 | 08 9021 1811



# CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>5</b>
1.1	Site description .....	5
1.2	Client supplied information. ....	5
1.3	Objectives of this report .....	6
<b>2</b>	<b>FIELD PROGRAMME.....</b>	<b>7</b>
2.1	Intrusive fieldwork.....	7
2.1.1	<i>Field mapping, down hole scanning.....</i>	<i>7</i>
2.1.2	<i>Dimensions &amp; groundwater readings.....</i>	<i>7</i>
2.1.3	<i>Ground probing.....</i>	<i>7</i>
2.1.4	<i>Machine excavated test pits / ramming .....</i>	<i>7</i>
<b>3</b>	<b>FINDINGS.....</b>	<b>8</b>
3.1	Summary of known features.....	8
<b>4</b>	<b>CLOSURE.....</b>	<b>11</b>
<b>5</b>	<b>REFERENCES .....</b>	<b>12</b>

**TABLES**

Table 1: Summary classification of abandoned mine features ..... 9

**APPENDICES**

**LIMITATIONS**

**DRAWINGS**

**APPENDIX A**

- Field Notes
- Category 1A
- Category 1B
- Category 2
- Category 3
- Category 4
- Category 5
- Category 6

## 1 INTRODUCTION

The Department of Energy, Mines, Industry Regulation & Safety (DEMIRS) engaged WML Consultants (WML) to undertake an intrusive geotechnical assessment of abandoned mine features at Wheal Ellen, in Northampton, Western Australia and to update the proposed 2020 rehabilitation options report. These features include shafts, open cuts, stopes, costeans, and shallow workings. 25 abandoned mine features occurring below ground level, detailed in the 2020 non-intrusive geotechnical report prepared by GHD were further investigated, alongside 12 features which were also detailed on the provided DEMIRS database. Above ground features were not assessed as these included dumps, stockpiles, tailing storage facilities, buildings, and infrastructure, which do not present a below ground void safety risk. This report presents the results of the intrusive geotechnical investigation and details the findings of the different types of features identified on site.

The geotechnical study was authorised by DEMIRS via Purchase Order 502890 Rev 3, dated 27<sup>th</sup> of August 2024.

This report and the information presented herein must be read in conjunction with the attached “*Report Limitations*”.

### 1.1 Site description

The site is located approximately 2 km south-west from the Northampton townsite, in Western Australia, and is accessible via Drage Road. The abandoned mine features are situated within a gated area and is restricted from the public. The ground surface across majority of the site is covered with low to medium lying grass, weeds, medium trees and small shrubs are scattered across the site. The southern portion of the site (near the old workings) is more densely vegetated than the central portion (near the main shaft and material stockpiles). An unsealed access track passes through the site and runs alongside the mapped abandoned mining features.

Based on the available topographical information and information presented in the existing geotechnical report prepared by GHD (Wheal Ellen Mine Shafts and Open Pits Geotechnical Assessment and Remediation Methodology Report), the RLs of the site ranges from approximately 110 m AHD to 130 m AHD, and slopes gently downwards from north-east to south-west.

A watercourse passes directly adjacent and to the west of the northern strike of features (to the east of the access track). A watercourse also runs alongside the features mapped as the old working in the southern area of the site. Drainage gulleys and erosion channels were observed in the central portion of the site (to the west of the access track and around the main mine workings). Old head workings and material stockpiles are present in this area.

The previous investigation and inventory photographs from 2000 and 2020 indicated groundwater levels to be slightly lower than those encountered on site by WML in November 2024 and the base of some open cut features were photographed as dry in the inventory photographs from 2000, while the same feature bases were observed to comprise groundwater at the time of WML’s investigation.

There is 1 distinct strike positioned in a north easterly direction. The location of the mine features is shown on the site maps, 11953-G-D-001 – 003.

It should be noted that WML have not assessed any tailings storage facilities, dumps, material stockpiles, buildings, or infrastructure as these do not present a below ground void safety risk.

### 1.2 Client supplied information.

The following information was made available from the Client for the purpose of this report:

- Drone aerial imagery, circa 2020, prepared by DPLH.
- Abandoned Mines Inventory feature photographs at Wheal Ellen, circa 2000 and 2020, prepared by DEMIRS.
- Historical maps, surveys, and longitudinal sections of Wheal Ellen Lead Mine, provided by DEMIRS.
- Abandoned mine feature data set in excel format, prepared by DEMIRS.
- Remediation Methodology Report. Wheal Ellen Mine Shafts and Open Pits Remediation, October 2020, prepared by GHD.

- Geotechnical Report. Wheal Ellen Mine Shafts and Open Pits Geotechnical Assessment and Remediation Methodology, October 2020, prepared by GHD.

### 1.3 Objectives of this report

The objectives of the geotechnical investigation was to assess the following characteristics:

- Geometric characteristics of the features, including any lateral workings (e.g. dimensions, volume, shape).
- Base conditions and presence of material or obstructions of the features.
- Structural stability and subsidence potential or risk zones.
- Underground connectivity between features.
- Presence of groundwater or hydrogeological features which may have an impact on rehabilitation.
- Surface hydrology flow which may impact upon features.
- The presence of flora and fauna within the features.

## 2 FIELD PROGRAMME

### 2.1 Intrusive fieldwork

Fieldwork for the intrusive investigation was carried out between the 17<sup>th</sup> and 19<sup>th</sup> of November 2024, by qualified WML geotechnical engineers and comprised:

- Field mapping to observe each of the existing mine features (e.g. measuring the geometry) and to take record photographs and videos.
- Flora and fauna was visually assessed by geotechnical engineers and any information about these is generic only.
- 3D LiDAR scanning of the features.
- Ground probing.
- Detection of groundwater at each feature location using a dip meter.
- Shallow test pits, excavated with a 10t excavator with a 900 mm bucket.

The fieldwork was undertaken in accordance with WML's Safety Management Plan.

Each location for intrusive ground investigation was checked for underground services against Dial-Before-You-Dig plans, prior to any excavations works.

#### 2.1.1 Field mapping, down hole scanning

Features were field mapped by geotechnical engineers from WML to target evidence of voids and geotechnical deformation. The data gathered from 3D scanning has been combined with existing data sets and the results of the geophysical investigations, to support the void risk assessments and rehabilitation recommendations.

#### 2.1.2 Dimensions & groundwater readings

Each feature, where safe to do so, was investigated using hand tools to measure the voids and determine the ground conditions at both the base of the feature and of the surrounding area. The dimensions of the features were measured using a laser pointer measuring device and / or tape measures. A dip meter was also lowered down the features where water was observed via 3D scanning and / or visually to determine the presence and depth of water from the top of the surrounding ground level. Where the base conditions of features were observed to be dry, a dip meter was not lowered.

#### 2.1.3 Ground probing

Ground probing was undertaken within Category 5 features to determine the general size and shape of the shafts obscured by silty materials or groundwater levels. These features have been documented in the historical maps to comprise typically of shafts / passes that have been turned into open cuts. Determining the location of the shafts and their sizes is significant to determine the risk ratings of these features, designing rehabilitation solutions and its constructability.

#### 2.1.4 Machine excavated test pits / ramming

Test pitting works were undertaken utilising a 10t excavator with a 900 mm bucket. Test pitting in the base of Category 1a features uncovered presence of backfilled shafts. These shafts have been well backfilled, and the soils are reasonably compact. Scratching and excavations in the remainder of the features investigated, typically refused on shallow rock up to depths of 2 m bgl.



### 3 FINDINGS

#### 3.1 Summary of known features

A total of 37 mining features occurring below ground level were recorded and mapped during field investigation in November of 2024.

Based on the poor to moderate quality rock mass identified on majority of the site, the 3D LiDAR scans, and the available historical information which suggests there are relatively narrow lodes, and therefore, narrow voids (this was also evidence through 3D LiDAR scanning) we have determined that the collapse of any below ground lateral voids below 10 m depth to be of very low risk to humans as minimal surface deformation / subsidence would be expressed. Therefore, the risk of ground movement from collapse of any underground lateral workings is deemed to be very low. Furthermore, these mine workings are more than 150 years old and are still stable.

Based on the 37 features assessed on site, we have grouped the features into 6 distinct categories as summarised in Table 1 below.

It should be noted that Features S0113107, S0113123, and S0113136 could not be located on site; it is likely that these features have been rehabilitated in the last 24 years.

**Table 1: Summary classification of abandoned mine features**

Category	Description	Features	
<b>1a</b>	<p>Rehabilitated features.</p> <p>The investigation methods confirmed the stability of base conditions of the features.</p> <p><i>*S0113107, S0113223 &amp; S0113136: these features could not be located on site – they are presumed to be rehabilitated.</i></p>	<p>S0113107*</p> <p>S0113111</p> <p>S0113114</p> <p>S0113123*</p> <p>S0113127</p>	<p>S0113128</p> <p>S0113129</p> <p>S0113134</p> <p>S0113136*</p> <p>S0113137</p>
<b>1b</b>	<p>Shallow workings and trenches/costeans that appears to be minor depressions within the ground surface, or imperceptible impressions.</p> <p>The investigation methods confirmed the stability of base conditions of the features.</p>	<p>S0113105</p> <p>S0113106</p> <p>S0113115</p> <p>S0113126</p> <p>S0113131</p>	<p>S0113132</p> <p>S0113139</p> <p>S0113160</p> <p>S0113167</p>
<b>2</b>	<p>Small depressions / shallow workings / costeans / trenches.</p> <p>The investigation methods confirmed the stability of base conditions of the features.</p>	<p>S0113104</p> <p>S0113118</p> <p>S0113125</p>	<p>S0113133</p> <p>S0113163</p>
<b>3</b>	<p>Shallow shafts and excavations with soft / unknown base conditions. The base of these features may also be filled with loose soils, vegetation, rocky backfill material, etc.</p> <p>The investigation methods suggest the base conditions of these features are potentially unstable.</p>	<p>S0113122</p> <p>S0113143</p>	
<b>4</b>	<p>Backfilled or waterlogged deep shafts. The available historical information suggests these are shafts / passes which extend to significant depths beneath the ground surface (&gt; 15 m) and are potentially interconnected at depth.</p> <p>These features are likely to extend to significant depths below what is visible (i.e. scannable) and are likely to comprise false floors. The base conditions of the shafts are unknown and are potentially unstable.</p>	<p>Old Workings Shaft</p> <p>Old Workings Pass</p> <p>S0113103</p> <p>S0113130</p>	
<b>5</b>	<p>Open pits and deep shafts that have been excavated to form open pits. These features are waterlogged and at the time of the investigation, the exact dimensions and location of the shafts were unknown. The available historical information suggests these are shafts / passes which extend to significant depths beneath the ground surface (&gt; 15 m) and are potentially interconnected at depth.</p> <p>These features are likely to extend to significant depths below what is visible (i.e. scannable) and are likely to comprise false floors. The base conditions of the shafts are unknown and potentially unstable.</p> <p><i>*S0113147: this feature is a backfilled shaft that is situated within a drainage gully. The rehabilitation for this feature is likely to be similar to the other features in this category.</i></p>	<p>S0113147*</p> <p>S0113151</p> <p>S0113149</p> <p>S0113097</p>	
<b>6</b>	<p>Deep shafts. The available historical information suggests these are shafts / passes which extend to significant depths beneath the</p>	<p>Pass No 1 North</p>	

	<p>ground surface (&gt; 15 m) and are potentially interconnected at depth.</p> <p>These features are likely to extend to significant depths below what is visible (i.e. scannable) and are likely to comprise false floors. The base conditions of the shafts are unknown and potentially unstable.</p>	<p>S0113145</p> <p>S0113158</p>	
--	---	---------------------------------	--

## 4 CLOSURE

This report is intended for distribution to the public.

We trust that the information provided within this report satisfies your present requirements and meets with your approval. Should you have any queries, please do not hesitate to contact the author of this report.

We draw your attention to the attached "*Report Limitations*" included with this report. This information sheet is intended to provide additional information about this report and information included within it. This information is provided not to reduce the level of responsibility accepted by WML but to ensure that all parties that rely on this report, and the information contained herein, are aware of the responsibilities that each assumes in so doing.

## 5 REFERENCES

1. Fremantle Trading Co. Ltd. March 1969. 100ft to an inch scale map. *Wheal Ellen. Northampton WA*. Ref 10837.
2. n.d. 50ft to an inch scale map. *Wheal Ellen Lead Mine. Northampton*. Ref 5744.
3. n.d. Geological Map. *Wheal Ellen. Northampton*. Ref 1689.
4. 1926. Plan of Workings. Longitudinal Section. *Wheal Ellen Lead Mine. Northampton WA*. Ref 1685.
5. Standards Australia. 2017. *Geotechnical Site Investigations*. AS 1726:2017. SAI Global.
6. Fremantle Trading Co. Ltd. October 1925. Longitudinal Section. 100ft to 1 inch scale map. *Wheal Ellen Northampton WA*. Ref 10836.
7. GHD. October 2020. Remediation Methodology Report. *Wheal Ellen Mine Shafts and Open Pits Remediation*.
8. GHD. October 2020. Geotechnical Report. *Wheal Ellen Mine Shafts and Open Pits Geotechnical Assessment and Remediation Methodology*.





# **LIMITATIONS**



# REPORT LIMITATIONS



This geotechnical report is provided for the sole use by the Client. This report must not be applied for any other purpose or project except the one originally contemplated without written authorisation from WML. WML accepts no responsibility for the use of this report / document, in whole or in part, in other contexts or for any other purpose.

WML have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, documents and information supplied, and previous experience. If changes occur in the nature or design of the project, however minor, it is recommended WML review this report to assess their impacts and provide additional recommendations, if any. WML does not assume any responsibility or liability for problems that arise due to developments on site of which we were not informed.

This report utilises data and information provided by third parties, including, but not limited to sub-consultants, published data, and the Client. This information has been assumed to be correct unless otherwise stated. WML assumes no responsibility for assessments made partly or entirely based on information provided by third parties or for the adequacy, incompleteness, inaccuracies, or reliability of any data provided by third parties.

It is the responsibility of the Client to transmit the information, recommendations, and limitations of this report to the appropriate organisations or people involved in design of the project, including, but not limited to developers, builders, owners, buyers, architects, engineers, and designers.

WML's opinions are based on upon information that existed at the time of the production of this report and ground conditions encountered at the time the site study was performed. This geotechnical report should not be relied upon if its adequacy has been affected by: the passage of time, by man-made events, such as construction on or adjacent to the site, or by natural events, such as floods, earthquakes, or groundwater fluctuations. In the event of the above changes, WML should be contacted to determine if this report is still reliable or whether additional testing is required.

The subsurface conditions identified within this report are based only upon investigation locations where subsurface tests have been conducted and / or samples obtained, which are explicitly representative of the specific sample or test location. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and unknowns or variations in ground conditions between test locations that cannot be inferred or predicted. Actual subsurface conditions may differ significantly from those indicated in this report. Specific warning is also given that many factors, either natural or artificial, may render ground conditions different from those which pertained at the time of the investigation. WML does not accept any responsibility for any variance in the ground conditions that may exist across the site. If unexpected subsurface conditions are encountered, WML shall be notified immediately to review those conditions and provide additional and/or modified recommendations, as necessary.

This geotechnical assessment is based upon judgment of the investigation data, visual observations of the site and materials encountered, along with the proposed land use and project specifications. The findings and recommendations presented within this report represent professional opinions and estimates and should not be taken as fact unless explicitly stated. In general, statements of fact are limited to what was done and / or what was observed on site.

The recommendations provided in this report are preliminary only; final recommendations can only be given after observing the actual subsurface conditions revealed during construction. WML does not assume responsibility or liability for the recommendations in this report if construction observation has not been performed by a WML geotechnical engineer.

Our services did not include any contamination or environmental assessment of the site or adjacent sites. The equipment and techniques used to perform a geoenvironmental study differ from those used to perform a geotechnical investigation. If you require any geoenvironmental information for your project, WML can advise on further steps to be undertaken.

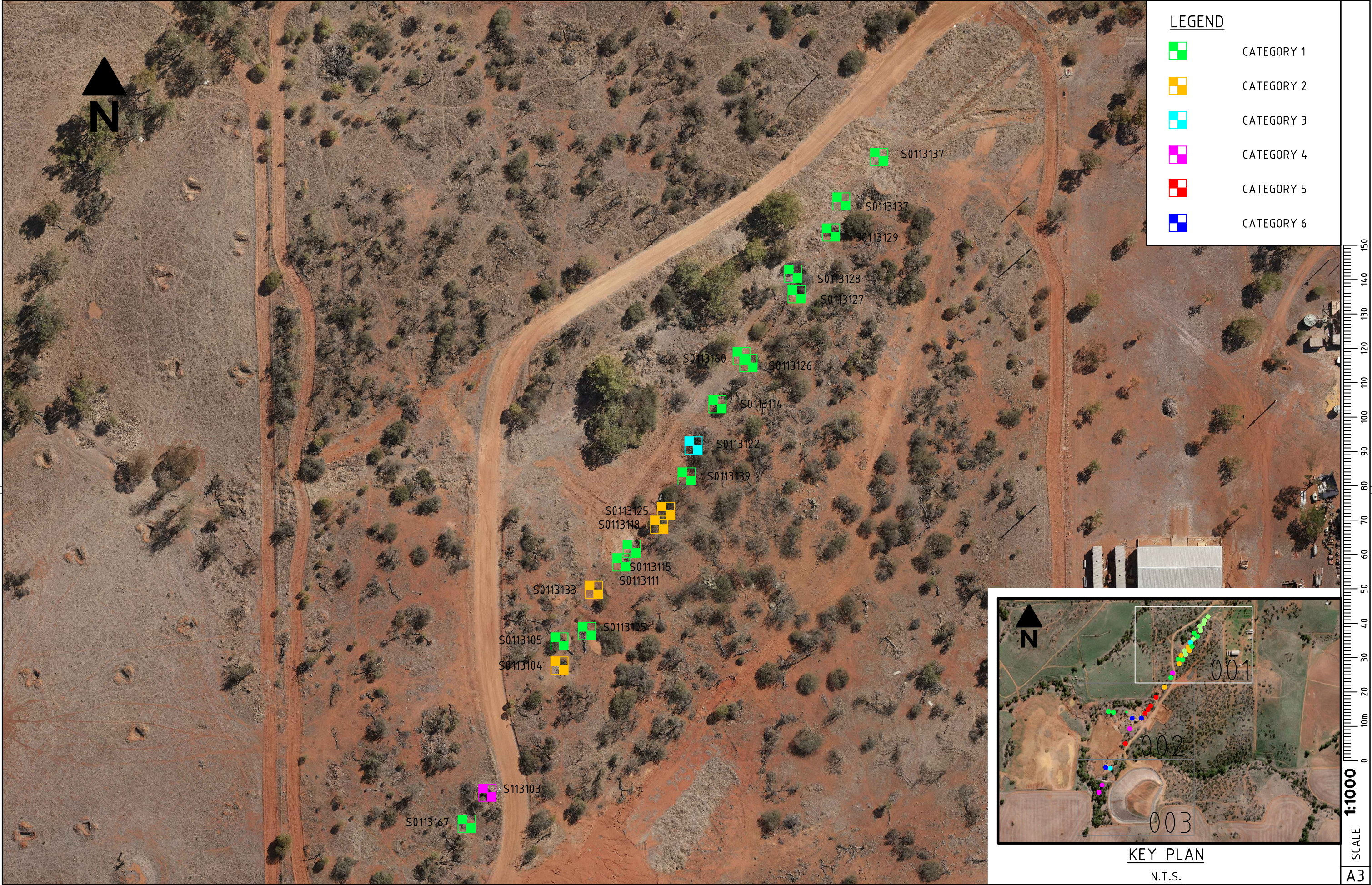
WML have performed our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty, expressed or implied, is made as to the professional advice included in this report.



# DRAWINGS

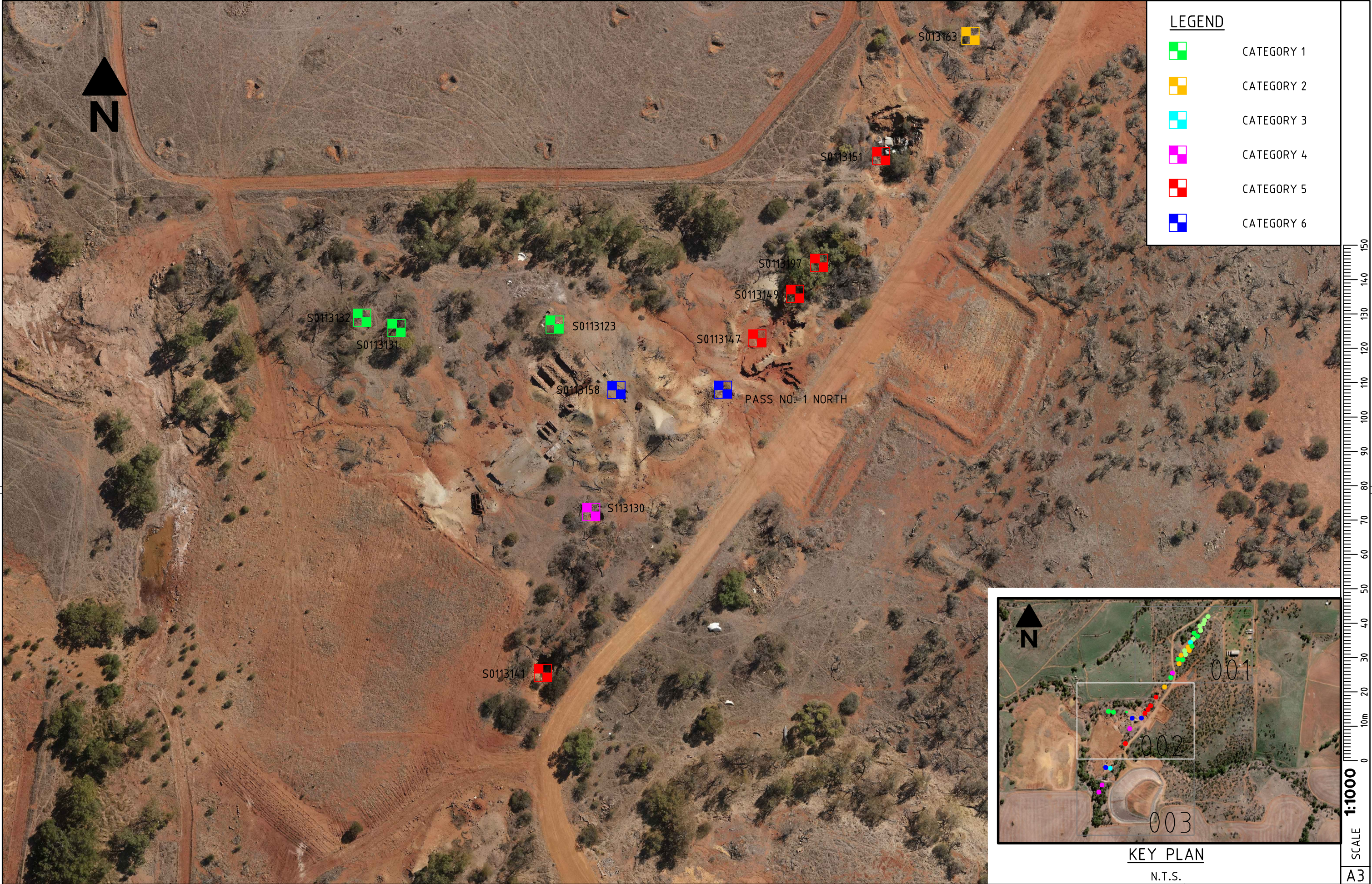






<div><div>WML</div><div>Consulting Engineers</div><div>Civil   Geotechnical   Structural</div></div> <div><div>BUNBURY +61 8 9722 3544 KALGOORLIE +61 8 9021 1811 PERTH +61 8 9722 3566 wml.com.au</div></div>	REVISIONS					NAMES PRINTED IN FULL		DATE	CLIENT	DRAWING TITLE WHEEL ELLEN MINE REHABILITATION FEATURE CATEGORY MAP AREA - SHEET 1	CONSULTANT DRAWING NUMBER 11953-G-D-001	
						DESIGNED	I. GOLIJANIN	NOV '24	DEMIRS			
						DRAWN	C. HICK	NOV '24				
	B	FINAL ISSUED		I.G.	28.03.2025	C.H.			PROJECT		11953-G-D-001	B
	A	ISSUED FOR CLIENT REVIEW		I.G.	29.11.2024	C.H.	VERIFIED		WHEEL ELLEN MINE VOID REHABILITATION			
Nº.		DESCRIPTION		APPROVED	DATE	DRAWN	APPROVED					





LEGEND

- CATEGORY 1
- CATEGORY 2
- CATEGORY 3
- CATEGORY 4
- CATEGORY 5
- CATEGORY 6

WML

Consulting Engineers

Civil | Geotechnical | Structural

BUNBURY  
+61 8 9722 3544

KALGOORLIE  
+61 8 9021 1811

PERTH  
+61 8 9722 3566

wml.com.au

REVISIONS					NAMES PRINTED IN FULL		DATE
					DESIGNED	I. GOLIJANIN	NOV '24
					DRAWN	C. HICK	NOV '24
B	FINAL ISSUED	I.G.	28.03.2025	C.H.	VERIFIED		
A	ISSUED FOR CLIENT REVIEW	I.G.	29.11.2024	C.H.			
Nº.	DESCRIPTION	APPROVED	DATE	DRAWN	APPROVED		

CLIENT	DEMIRS
PROJECT	WHEEL ELLEN MINE VOID REHABILITATION

DRAWING TITLE	WHEEL ELLEN MINE REHABILITATION FEATURE CATEGORY MAP AREA - SHEET 2
---------------	---

CONSULTANT DRAWING NUMBER	11953-G-D-002
11953-G-D-002	B





<div><div>WML</div><div>Consulting Engineers</div><div>Civil   Geotechnical   Structural</div></div> <div><div>BUNBURY +61 8 9722 3544</div><div>KALGOORLIE +61 8 9021 1811</div><div>PERTH +61 8 9722 3566</div><div>wml.com.au</div></div>	REVISIONS					NAMES PRINTED IN FULL		DATE	CLIENT	DRAWING TITLE	CONSULTANT DRAWING NUMBER
						DESIGNED	I. GOLIJANIN	NOV '24	DEMIRS		
						DRAWN	C. HICK	NOV '24			
	B	FINAL ISSUED		I.G.	28.03.2025	C.H.	VERIFIED		PROJECT		
	A	ISSUED FOR CLIENT REVIEW		I.G.	29.11.2024	C.H.			WHEAL ELLEN MINE VOID REHABILITATION		11953-G-D-003
N°.	DESCRIPTION			APPROVED	DATE	DRAWN	APPROVED			WHEAL ELLEN MINE REHABILITATION FEATURE CATEGORY MAP AREA - SHEET 3	11953-G-D-003





# APPENDIX A

## FIELD NOTES





CATEGORY 1A






PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113111	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2


	Feature S0113114	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1

	Feature S0113127	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




## PHOTOGRAPHS



**Figure 1**



**Figure 2**


	Feature S0113128	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	19/11/24



PHOTOGRAPHS



Figure 3

	Feature S0113128	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	19/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113129	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2


	Feature S0113134	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1

	Feature S0113137	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



CATEGORY 1B






PHOTOGRAPHS



Figure 1


	Feature S0113106	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS




Figure 1

	Feature S0113106	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24

PHOTOGRAPHS



Figure 1


	Feature S0113115	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1


	Feature S0113126	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS




Figure 1

	Feature S0113131	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24

PHOTOGRAPHS



Figure 1


	Feature S0113132	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1


	Feature S0113139	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1


	Feature S0113160	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1

	Feature S0113167	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24





CATEGORY 2


## PHOTOGRAPHS



**Figure 1**



**Figure 2**


	Feature S0113104	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1


	Feature S0113118	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1


	Feature S0113125	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



## PHOTOGRAPHS



**Figure 1**

	Feature S0113133	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113163		
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24





CATEGORY 3






PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113122	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113143	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24





CATEGORY 4






PHOTOGRAPHS



Figure 1

	Feature Old Working Pass	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



3D LIDAR SCAN

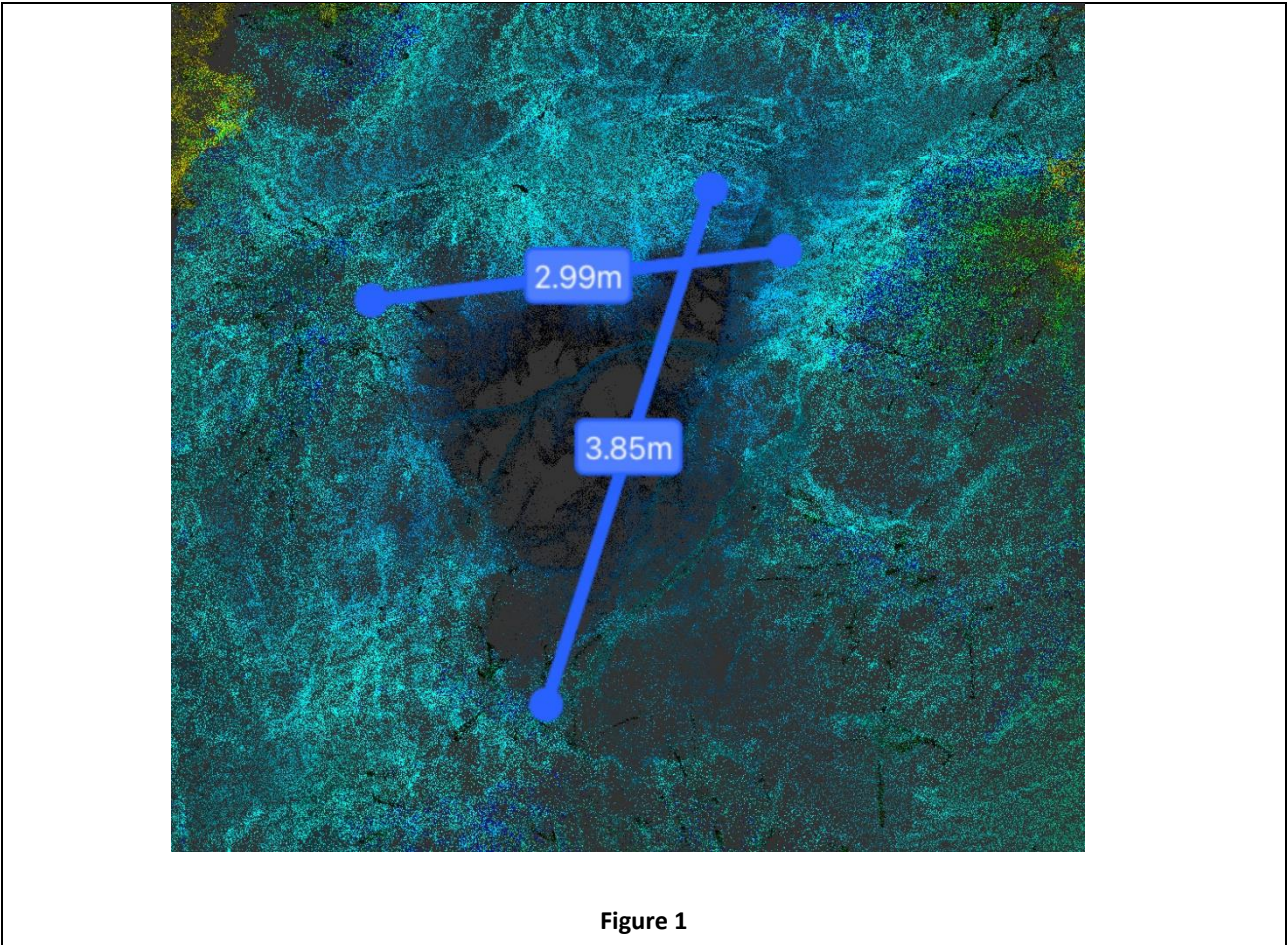



Figure 1

	Feature Old Working Pass	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature Old Working Shaft	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



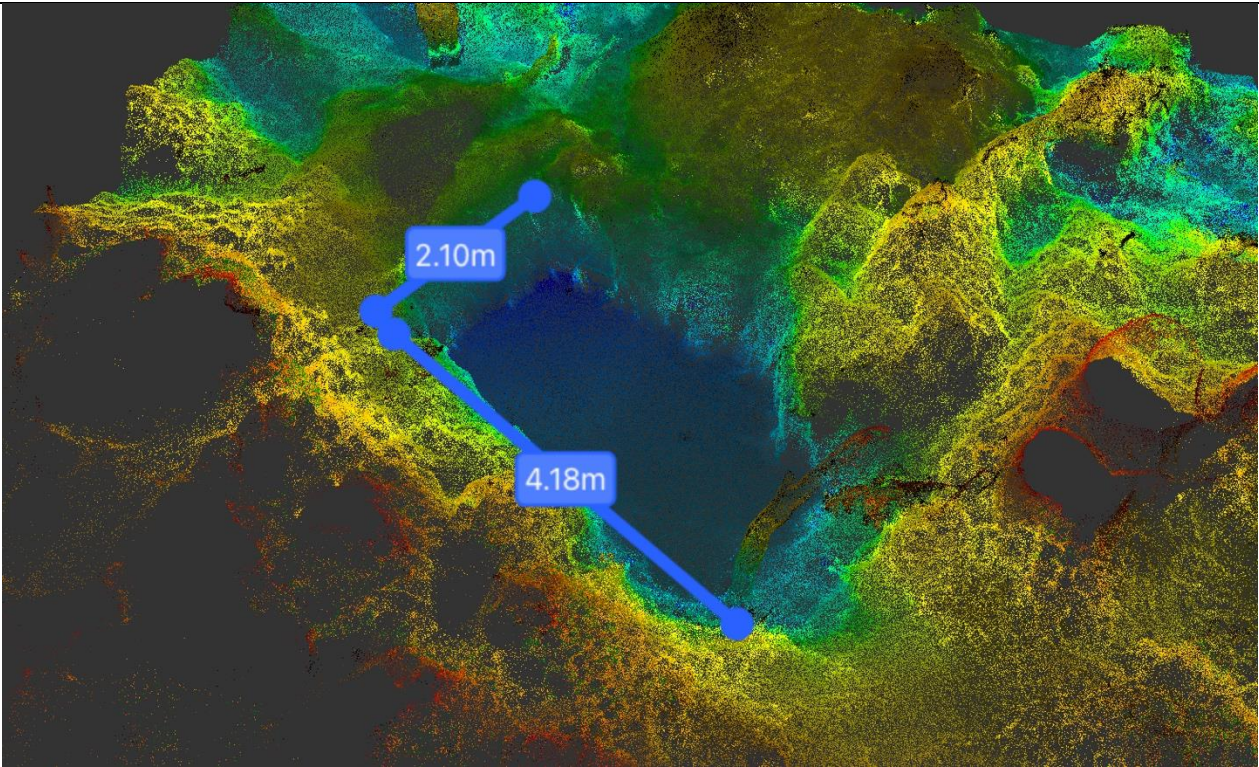



Figure 1

	Feature Old Working Shaft	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113103	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	19/11/24



3D LIDAR SCAN

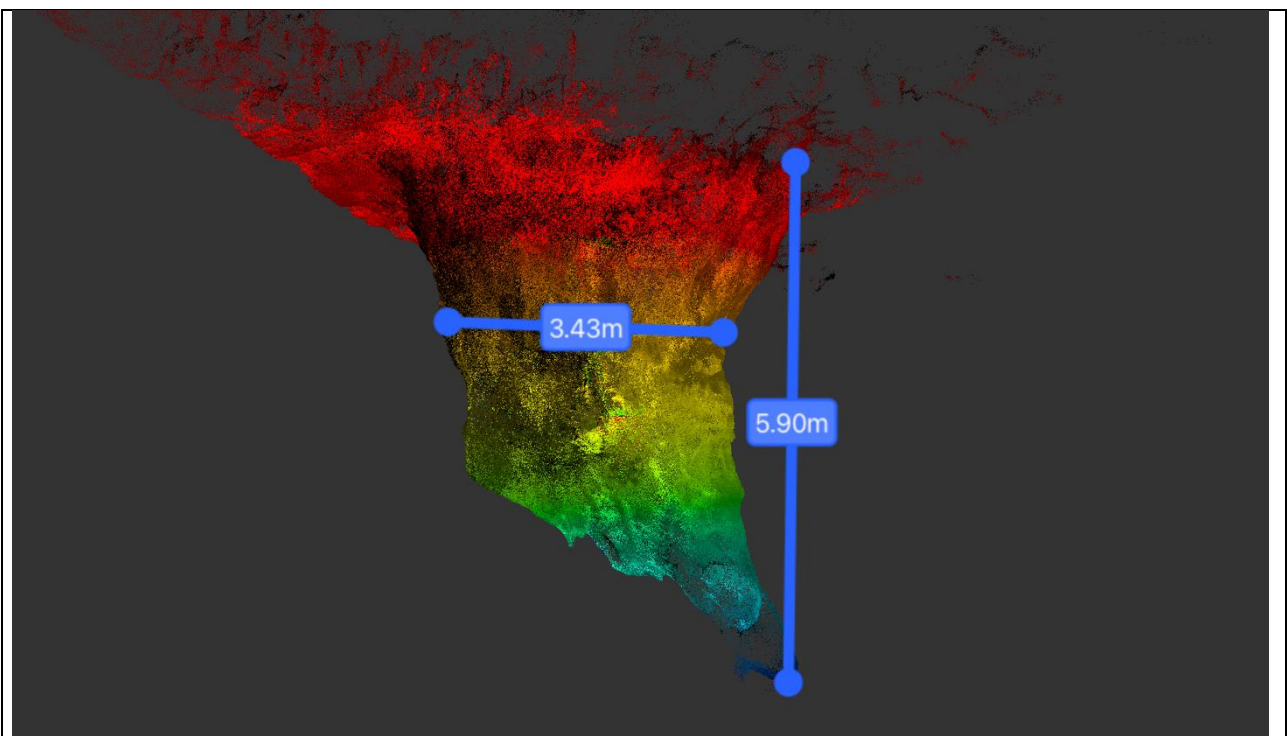



Figure 1

	Feature S0113103	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	19/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113130	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



3D LIDAR SCAN

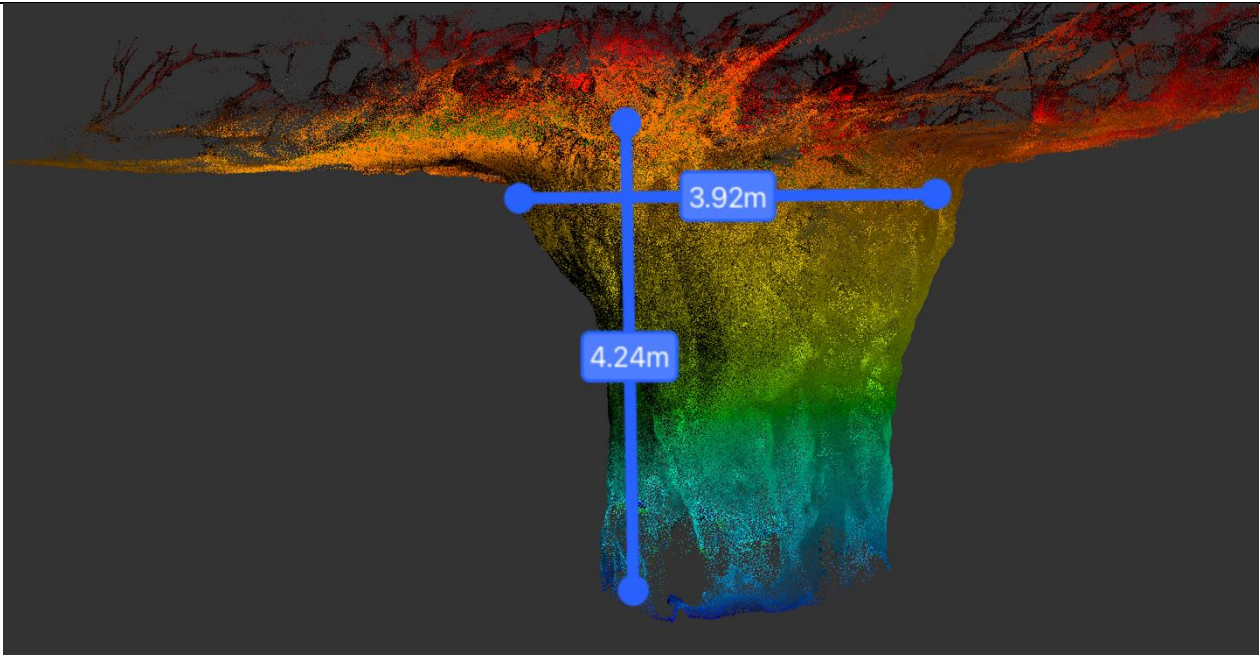



Figure 1

	Feature S0113130	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113141	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



3D LIDAR SCAN

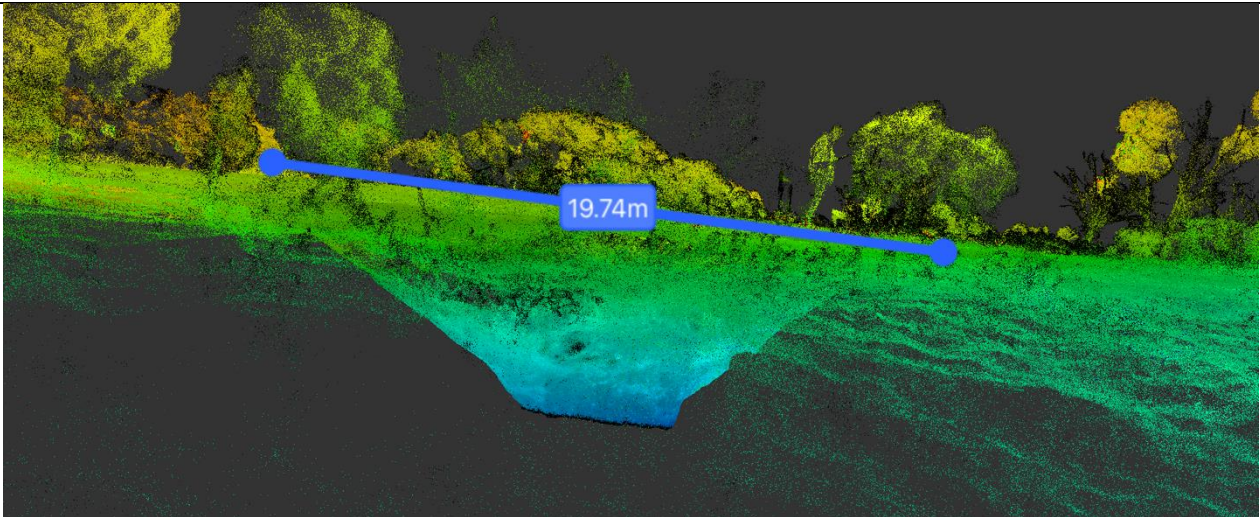


Figure 1

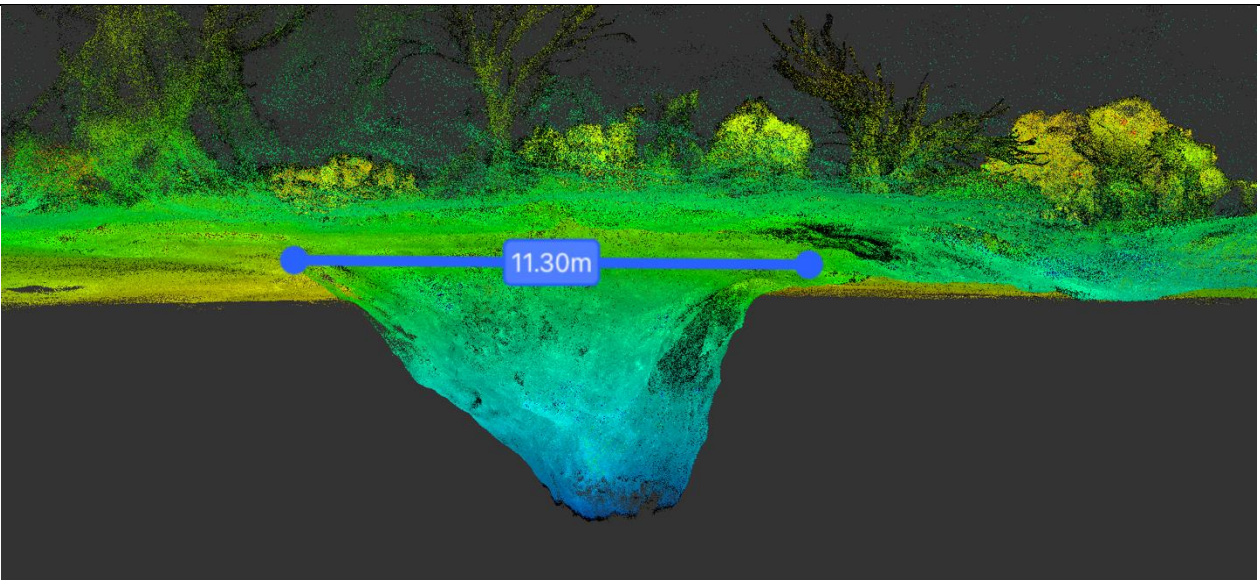



Figure 2

	Feature S0113141	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24





CATEGORY 5






PHOTOGRAPHS



Figure 1

	Feature S0113097	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



3D LIDAR SCAN

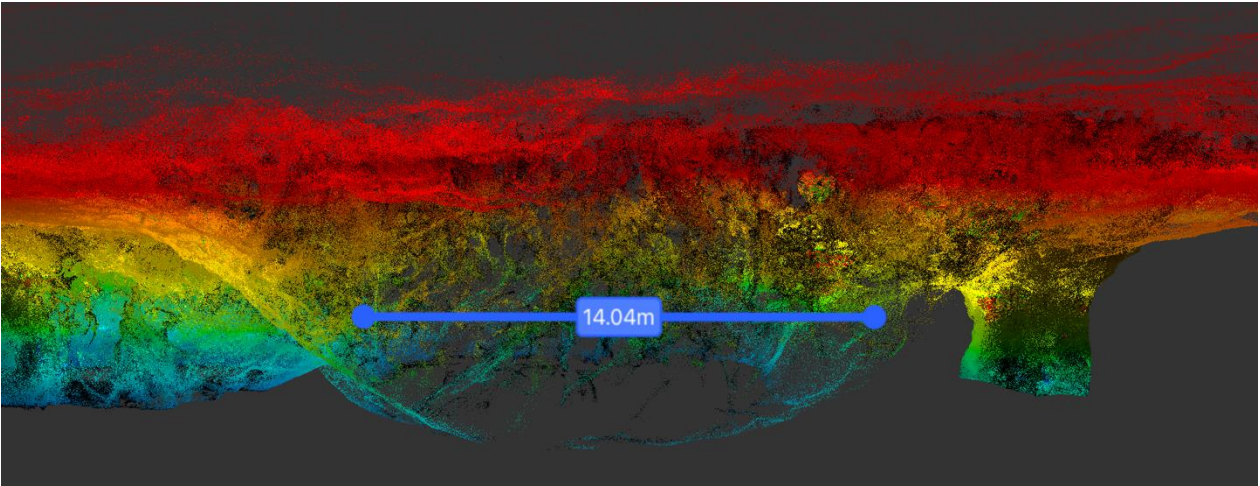



Figure 1

	Feature S0113097	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113147	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



3D LIDAR SCAN

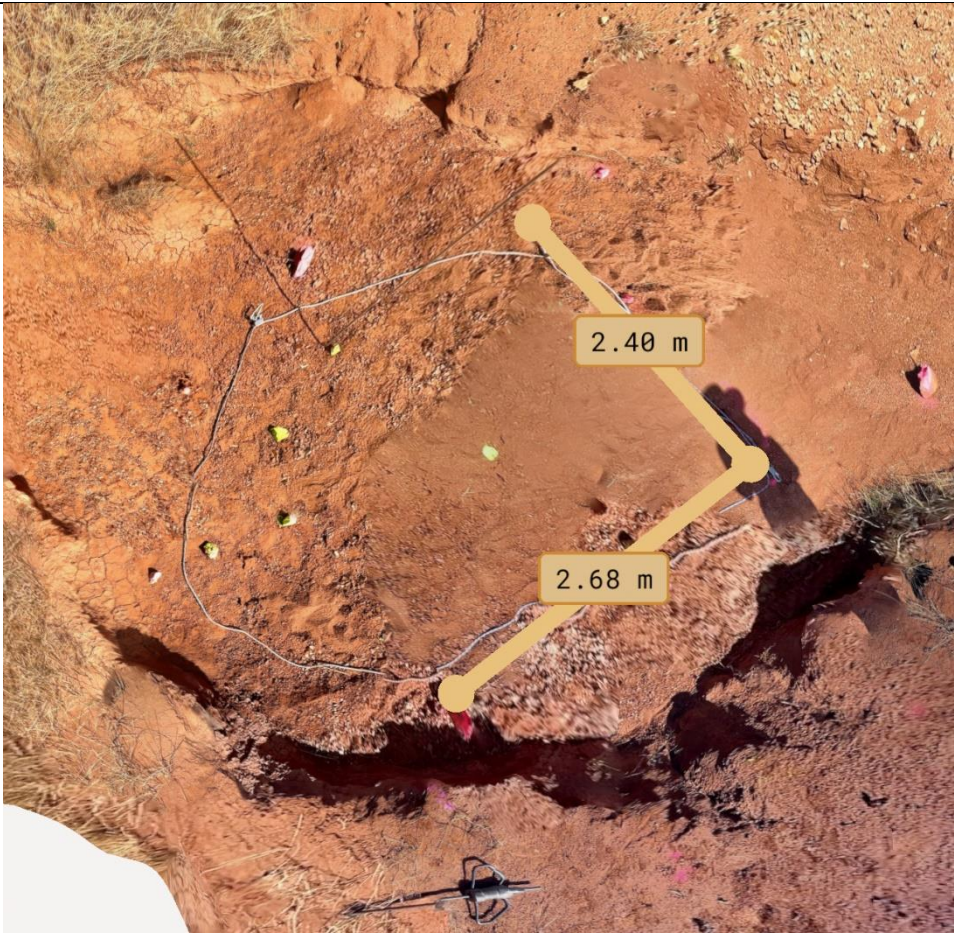



Figure 1


	Feature S0113147	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 1

	Feature S0113149	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



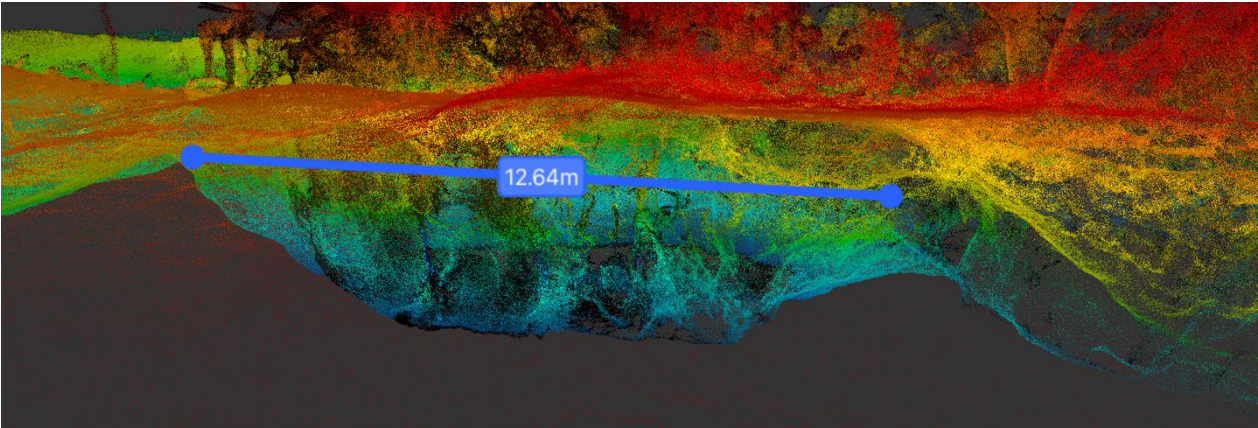


Figure 1

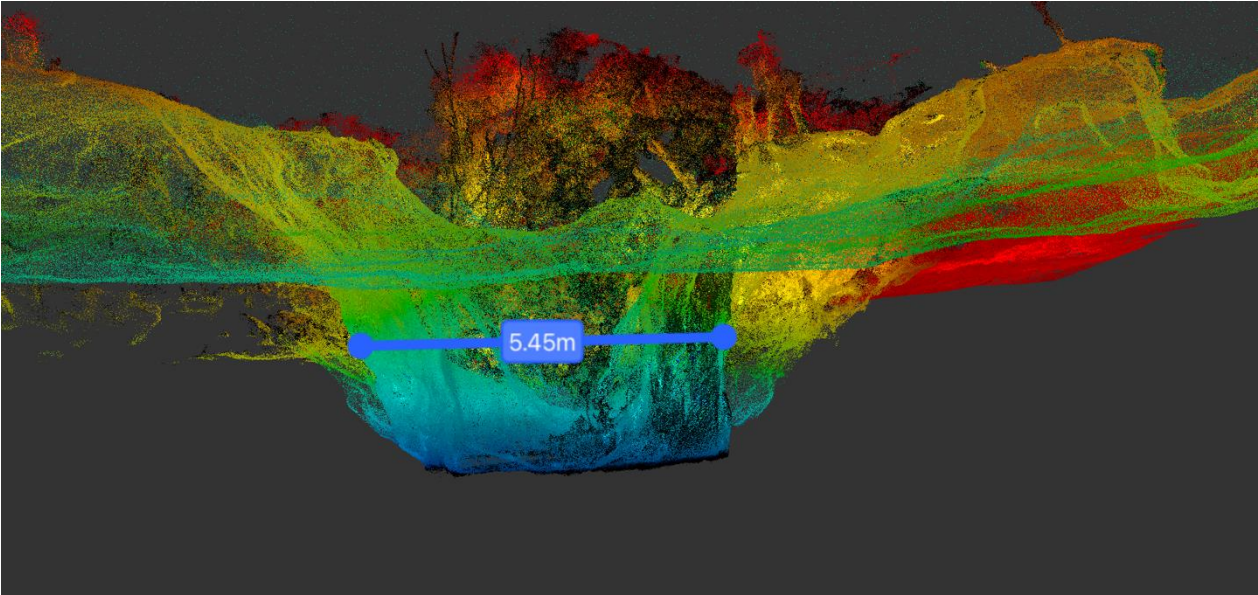



Figure 2

	Feature S0113149	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2


	Feature S0113151	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 3

	Feature S0113151	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



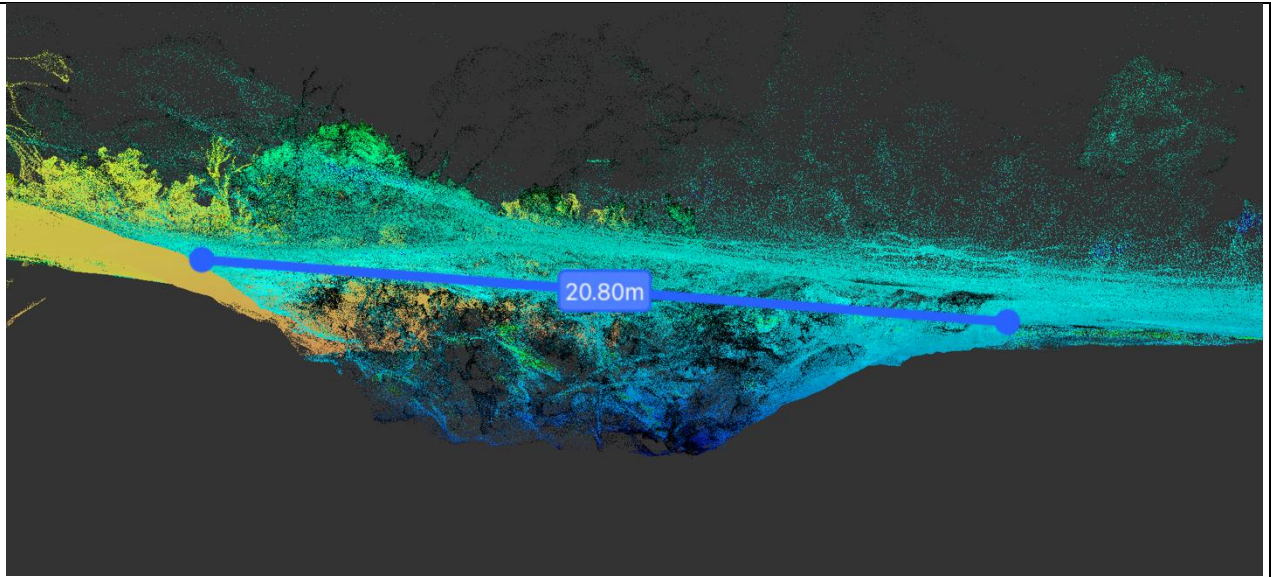


Figure 1

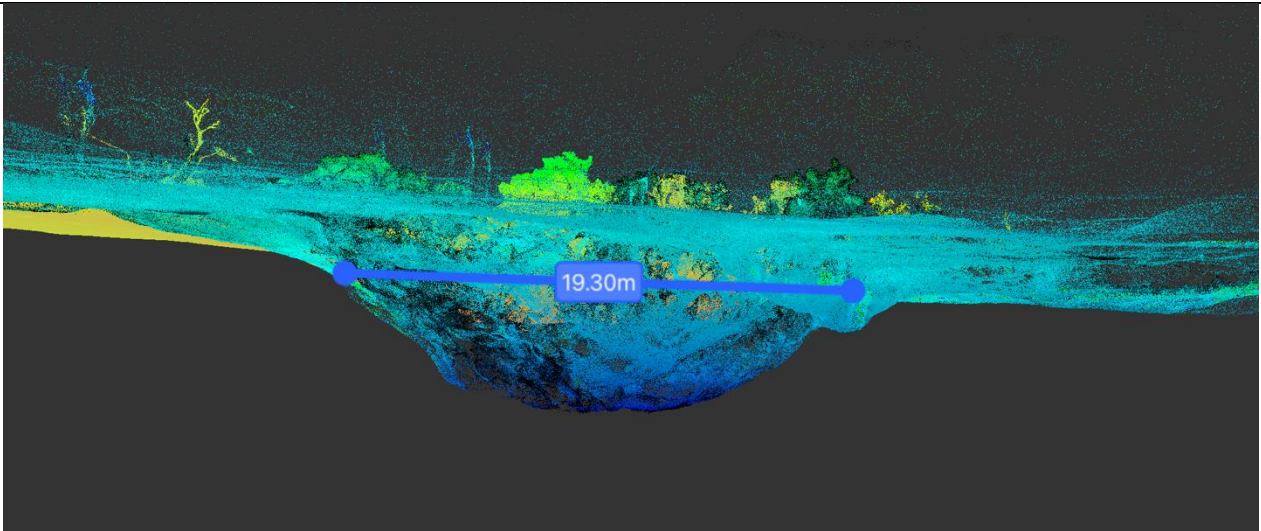



Figure 2

	Feature S0113151	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24





CATEGORY 6






PHOTOGRAPHS



Figure 1



Figure 2

	Feature Pass No. 1 North	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2


	Feature S0113145	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



PHOTOGRAPHS



Figure 3

	Feature S0113145	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0113158	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24



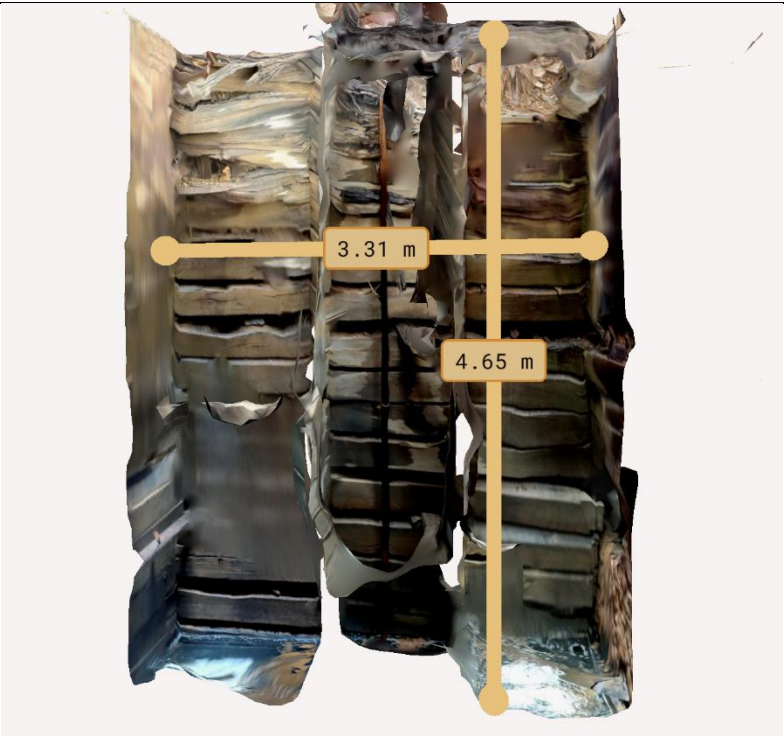



Figure 1



Figure 2

	Feature S0113158	Project No:	11953
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	18/11/24