

ABANDONED MINE FEATURES ASSESSMENT

MORAWA-YALGOO ROAD GEOTECHNICAL REPORT

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1 INTRODUCTION

The Department of Energy, Mines, Industry Regulation & Safety (DEMIRS) engaged WML Consultants (WML) to undertake a non-intrusive (visual) geotechnical assessment of shafts located in close proximity to the Yalgoo Morawa Road, near the former townsite of Gullewa, within a 50 m buffer zone of the Morawa-Yalgoo Road in Yalgoo, Western Australia, to determine the current safety risk for each feature and document this in an assessment report, together with the identification of preliminary rehabilitation options and recommendations for disturbance investigations required to confirm preliminary rehabilitation options. These features consist primarily of deep shafts, lateral workings, stopes, and collapsed shafts. WML assessed a total of 29 underground mine features, of which 21 abandoned underground mine features were included in the feature inventory (within the 50 m buffer zone) and an additional 4 inventory features were assessed due to their close proximity to the buffer zone and potential for interconnectivity. 4 additional features were recorded by WML during the on-site investigation. This report presents the results of the non-intrusive geotechnical investigation and details the findings of the different types of features identified on site.

The geotechnical study was authorised by DEMIRS via a variation to the Purchase Order 504427.

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 along the Yalgoo-Morawa Road, approximately 75 km northeast of Morawa and 55 km southwest of Yalgoo, within the Shire of Yalgoo, in Western Australia. The abandoned mine features are situated within a 50 m buffer zone along approximately 950 m length of the Morawa-Yalgoo Road. There are two main clusters of features following different lodes, one in the north and one approximately 250 m further south. There are many more mine features within the locality however the features nearest the road represent the greatest risk to the public thus a 50 m zone either side of the road has been identified by DEMIRS in consultation with the Shire of Yalgoo for site investigation. The ground surface across majority of the site is not highly vegetated and is covered with low lying grass, weeds, and wildflowers. Medium trees and small shrubs are scattered across the site. The vegetation is denser further to the south of the site.

The ground conditions in the northern half of the site comprise of rock from the near surface, while the ground conditions to the south are relatively gravelly and comprise a much thicker layer of soils from the surface. Majority of the features have been individually fenced off with star pickets and wire and some signage posts have been erected at selected shaft features directly adjacent to the road, however these barricades are in very poor condition and at some features completely ineffective. Some features have had wood or metal gates placed across the top of the main shaft void.

A white headframe is visible in the northern portion of the site and to the west of the Morawa-Yalgoo Road. There is also a small open pit and a tailings storage facility, which is visible from the road. An active mine site is situated to the west of the site.

4 previously unidentified features were recorded by WML within the 50 m buffer zone of the Morawa-Yalgoo Road.

Based on available topographical information, the existing ground surface appears to slope gently downwards from north to south, with relative levels (RLs) ranging between approximately 309 m AHD to 214 m AHD.

Based on the features that have been mapped on the DEMIRS inventory, including those in the surrounding area, there appears to be 4 distinct mineralisation strikes trending northeast to southwest and a localised cluster of what are likely to be exploratory shafts and features in the most southern portion of the site. The location of the mine features is shown on the site maps, 12009-G-D-001 – 003.

1.2 Client supplied information

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

- Abandoned mine feature data set in excel format, including inventory definitions and data field explanatory notes, ‘Features of interest – 50 m Morawa Yalgoo Rd’, prepared by DEMIRS.
- Shapefiles of abandoned mine features, prepared by DEMIRS.

1.3 Objectives of this report

The objectives of the intrusive geotechnical investigation were 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.
 - Potential for noxious or flammable gases.

2 HISTORICAL INFORMATION & DESKTOP STUDY

2.1 Published geology

Based on the available published information, the geology of the area comprises an antiformal sequence of interbedded volcanic and sedimentary rocks intruded by feldspar porphyries. The north limb is partly intruded by later granite. There are 3 different narrow high-grade quartz-sulphide veins in the area named King Solomon, New Phoenix and Christmas Gift, all trending east-west, dipping north at moderate to steep angles and are approximately 0.5 to 2 meters thick. This is hosted within 4 different lithological horizons of basalt and andesites.

The 1:250,000 scale Geological Map 'Yalgoo' indicates that the site is underlain by the following geological units:

- **Colluvium (Qcs):** rock fragments, gravel, sand and silt (in the southern half of the site)
- **Mafic rocks (Ab):** Mafic volcanic rocks with minor mafic and ultramafic intrusive rocks, minor felsic rocks.

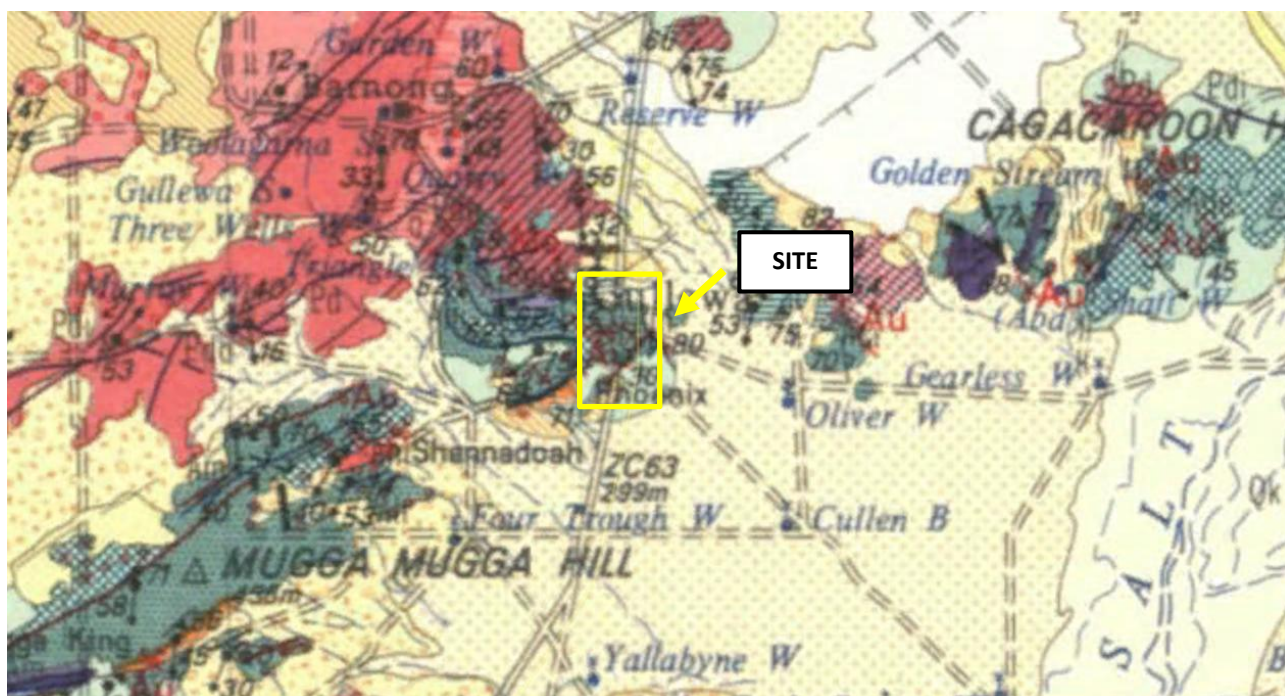


Figure 1: Extract from the 1:250,000 scale Geological Map "Yalgoo"

2.2 Historical mining

Gold was discovered in Gullewa in 1894 by an Irishman, Jim Byrne, and his partner Gray. Other prospectors immediately followed, and the townsite was established in 1898, however, is now abandoned. Historic mining took place between the years 1897 to 1919 and again between 1932 to 1942.

The King Solomon Mine (also known as New Phoenix) is located approximately 50 km south-west of Yalgoo, along the Yalgoo to Morawa Road. The site is distinguished by the remains of a white headframe. Some minor pyrite/chalcopyrite can be found in the dirt at what used to be the ore pile below the headframe.

The King Solomon Gold Mine ore consists of quartz, pyrite, pyrrhotite, and chalcopyrite, as described by geologist E.S. Simpson. Very little information related to mining activities in the area was available at the time of this report. No information regarding the depth of shafts, lateral workings, or extent of mining was found during the desktop study. The only recorded data pertaining to the depth of the shafts at the King Solomon's Mine in Gullewa relates to an incident documented in the Geraldton Guardian and Express newspaper from Sat 9 Jul 1938, when 2 miners fell from a staging bridging a total drop of 70 feet (21 m) which resulted in a death and an injury.

By 1896, considerable machinery had been installed: two sets of poppet legs, winding gear, boiler, engine steam pumps, and a ten head stamp battery with wooden frame. An extensive cyanide plant was also used in 1904.

3 FIELD PROGRAMME

3.1 Non-intrusive fieldwork (Part 1)

Fieldwork for the non-intrusive investigation was carried out between the 27th and 29th of September 2024, by qualified WML geotechnical engineers and trainee engineering technicians seconded from the Yamatji Sea Ranger program and comprised:

- Field mapping to observe each of the existing mine features (e.g. measuring the geometry) and to take record photographs and videos.
- 3D LIDAR scanning of the features.
- Dynamic Cone Penetrometer (DCP) tests.
- Ground probing and prodding using a metal rod.
- Testing for presence of noxious and flammable gasses, at each feature location.
- Detection of groundwater at each feature location.

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

3.1.1 Field mapping, down hole scanning

Features were field mapped by geotechnical engineers from WML to target evidence of voids and geotechnical deformation. LiDAR scanning was undertaken using a 3D LiDAR scanner device which was lowered down mine shafts and stopes. Underground lateral workings and drives were identified via these scans and details are provided on the accompanying feature summary notes sheets appended to this report (see Appendix A).

3.1.2 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 shaft features 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 (in shallow collapsed shafts or backfilled features), a dip meter was not lowered.

3.1.3 Gas monitoring

All features were tested for presence of noxious and flammable gasses. Readings were taken to measure levels of CH₄, CO₂, H₂S, O₂, CO, and lower explosive limit (LEL), and the outputs are shown in the field notes attached in Appendix A.

It should be noted that no noxious / flammable gasses were detected during the investigation.

3.1.4 Dynamic Cone Penetrometer (DCP) testing

The Dynamic Cone Penetrometer (DCP) test is an in-situ, manual penetration test that measures the penetration resistance of the soil and provides an indication of the relative density. The test is conducted by driving a cone-tipped rod into the ground surface using a 9 kg weight dropped from a standard height. The number of drops (called blows) is recorded for each 150 mm depth, and the process continues till the target depth is achieved. The number of blows is also correlated to a relative density and is used to describe the condition of the in-situ material. DCP testing was undertaken in accordance with AS 1289.6.3.2.

DCPs were undertaken within the base of the features, where safe and accessible to do so, to determine the base conditions and identify any areas of potential void risk.

On the surrounding ground surface, DCP testing typically encountered shallow refusal on a weathered rock profile, overlain by a thin layer of sandy silty gravels. Results are included on the feature summaries attached in Appendix A.

4 FINDINGS

4.1 Summary of features

A total of 28 underground mining features were recorded and mapped during the non-intrusive field investigation in September of 2024.

WML have undertaken an assessment of the rock mass quality of the features during the site investigation, undertaken DCPs in the base of collapsed shafts to assess the collapse potential, and have investigated the size, shape and assessed for the presence of underground lateral workings via 3D LiDAR scanning in the features. The 3D LiDAR scanning was undertaken down the features to investigate the potential for near surface underground lateral workings which may cause subsidence and ground collapse.

Based on the available information gathered during the desktop study, and onsite observations, the ground conditions across the site were observed to have differing properties in the north and the south. The northern portion of the site displayed highly weathered, moderate quality and reasonably competent rock mass from the ground surface. This rock quality appears to progressively weaken and become increasingly soil the further south along the road. In the south, the ground conditions from the surface comprises pisolithic gravels and displayed very crumbly and soil-like conditions from the surface and was typically cemented lateritic gravels and very poor quality rock mass.

Based on the 28 features observed on site, we have grouped the features into 5 distinct categories on a risk-rating basis as summarised in Table 1 below.

Feature S0229137 no longer presents as a feature and has likely been bladed flat for drilling works in the area, therefore, it is not included in the classification table below. Details on this feature are included in the field summary notes appended to this report.

Table 1: Summary classification of abandoned mine features

Category	Description	Features	Risk Rating (see Section 4.2)
Shallow trenches / shafts:			
1	Shallow trenches and shafts which likely have a low to minimal risk of false floors. Further investigation via intrusive and geophysical methods is required to evaluate the base conditions.	S0229135 S0229140	Likely low to negligible (risk of voids / false floors) Medium (risk of trips and falls into holes, causing injury)
Vertical shafts which form a stope:			
2	Vertical shafts which dip away to form a stope. The bases of these features are filled with soil, collapsed rock, and vegetation. The narrow portions of the stopes within these features are not likely to collapse based on the reasonably competent rock mass quality observed. Should the deeper sections of these features collapse, it is not expected to cause significant surface subsidence based on rock mass observations and the narrow-mined lode widths evidenced in the LiDAR scans, and the depth of the voids below the ground surface. If shallow sections of these stopes are noted during geophysical testing, depending on the size of the voids, these are more likely to cause significant surface subsidence in the event of void collapse. Further investigation via intrusive and geophysical methods is required to evaluate the base conditions. <i>*S0229131 comprises a shallow drive which requires collapsing and breaking in with an excavator.</i>	S0229131* S0229132	Low to Negligible (risk of voids in the base) Low (risk of stope collapse) Medium to High (risk of trips and falls into holes, causing injury or death) Low (risk of surface subsidence, deep voids) High (risk of surface subsidence, shallow voids)
Shallow shafts with unknown base conditions:			
3a	Shallow shafts with unknown base conditions. The bases of these features may also be filled with loose soils, vegetation, rocky backfill material, etc. Further investigation via intrusive and geophysical methods is required to evaluate the base conditions.	S0227534 S0229119 S0229139 WML01*	Low to medium (risk of failure of rehabilitation method, significant injury due to falling into a feature)

Category	Description	Features	Risk Rating (see Section 4.2)
	<p><i>*WML01 may be a deep shaft however the opening is currently obscured. This needs to be cleared, and a LiDAR scan undertaken.</i></p> <p><i>*WML02 is 2 m deep, however, LiDAR scanning detected a false floor and scanned 2 m beyond this. It is potentially a deep shaft. There is also a small drive 0.75 m below ground level (bgl).</i></p>	WML02* WML03	
Collapsed shafts with soft / unknown base conditions:			
3b	<p>Collapsed shafts with soft base conditions. The bases of these features are filled with loose silty soils and vegetation directly over the shaft opening.</p> <p>The rock mass at these feature locations is very poor and displays very crumbly and soil-like properties (i.e. cemented pizolithic gravels) from the ground surface.</p> <p>Further investigation via intrusive and geophysical methods is required.</p>	S0227529 S0227530 S0227533 WML04	High (risk of failure of rehabilitation method, significant injury due to falling into a feature)
Deep shafts with no shallow lateral workings:			
4	<p>Deep shafts with no evidence of shallow underground workings / drives (> 6 m deep). The LiDAR scanning did not detect evidence of underground lateral workings / drives within the top 6 m.</p> <p>Any surface expression of collapse of deep underground lateral workings are likely to be minimal / insignificant based on narrow lodes mined.</p> <p>No further geotechnical investigation is required for these features.</p> <p><i>* S0227515, S0229158 (potentially?), S0229159, S0229160: deep lateral workings / drives were identified within these features.</i></p>	S0227515 S0227528 S0227531 S0229117 S0229118 S0229157 S0229158 S0229159 S0229160 S0229161 S0337532	High (risk of major injury due to falling into a feature) Low (risk of shallow lateral workings, risk of surface subsidence)
Deep shafts with shallow lateral workings:			
5	Deep shafts with shallow underground lateral workings / drives (< 6 m deep) which was evidenced in the LiDAR scanning.	S0229133 S0229136 S0229138	High (risk of major injury due to falling into a feature)

Category	Description	Features	Risk Rating (see Section 4.2)
	<p>Any surface expression of collapse of underground lateral workings may cause some surface subsidence. The mined lode is shallow enough that it poses surface subsidence risk. It may be necessary to break out and collapse the shallow drives / lateral workings.</p> <p>Further investigation via intrusive and geophysical methods is required.</p>		High (risk of shallow lateral workings collapsing causing surface subsidence)

4.2 Risk assessment

The mining features are all situated within 50 m of the Morawa-Yalgoo Road. The risk these features pose to road users has been considered in the risk assessment. Some of the features are easily locatable and visible directly to the side of the road and pose high risk to humans who may venture out to explore the features. Some other features are obscured and are more difficult to spot and are typically situated behind trees or shrubbery. The area in general, particularly the northern half of the site, is relatively scarce of vegetation cover and road users seeking privacy during a rest break may want to venture several meters off the side of the road behind a tree or a shrub. Given that the limited vegetation in the area is typically situated directly adjacent to a mining feature, this poses high risk to humans as these features are typically deep shafts and falling down one is likely to result in serious injury or death.

All the features, particularly the deep shafts, pose high risk to road users at night as the road and surrounding area is unlit and some of the shafts are situated within the shoulder of the road. The shoulders of the road also may serve as 'informal' vehicle rest bays for road users to pull over adjacent to the abandoned mine shafts. There is also the Old Cemetery adjacent to the site, which serves as a tourist attraction, which also encourages tourists to stop and explore the area. The abandoned mine shafts situated within the shoulder of the road pose a risk to road users pulling off the road should they need to stop their vehicle for any reason, particularly in low light conditions.

A risk assessment has been undertaken for each of the mining features identified on site, as they exist in their current conditions, and have been grouped via the 5 feature categories as detailed in Table 1 and the risk assessment matrix is shown in Table 2.

This is a preliminary risk assessment only, and further investigation including intrusive geotechnical and geophysical methods is required to further evaluate and assess the mine features and finalise this risk assessment.

Table 2: Risk assessment matrix

LIKELIHOOD	CONSEQUENCE					
		1. Insignificant – Dealt with by in house first aid	2. Minor – Treated by medical professionals, hospital outpatients	3. Moderate – Significant non- permanent injury overnight hospital stays	4. Major – Extensive permanent injury e.g. loss of fingers, extended hospital stay	5. Catastrophic – Death, permanent injury e.g. loss of hand, quadriplegia
	A. Almost certain to occur in most circumstances	MEDIUM 8	HIGH 16	HIGH 18	CRITICAL 23	CRITICAL 25
	B. Likely to occur frequently	MEDIUM 7	MEDIUM 10	HIGH 17	HIGH 20	CRITICAL 24
	C. Possibly and likely to occur at some time	LOW 3	MEDIUM 9	MEDIUM 12	HIGH 19	HIGH 22
	D. Unlikely to occur but could happen	LOW 2	LOW 5	MEDIUM 11	MEDIUM 14	HIGH 21
	E. May occur but only in rare circumstances	LOW 1	LOW 4	LOW 6	MEDIUM 13	MEDIUM 15

Category 1: Shallow shafts and trenches – likely low risk of false floors

- The features are typically shallow shafts and trenches. These features, in their current state, may pose medium risk of injury to children and adults, livestock, and pets due to trips, falls, falling into the shafts. The likelihood of falling into a shaft is possibly and likely to occur at some time, which may yield moderate consequences. These features should not be trafficked with a 4x4 vehicle. **3C = Medium 12.**
- No noxious or flammable gasses were detected within these features. **1E = Low 1.**
- The base of these features is unlikely to comprise a false floor, however, further intrusive investigation work is required to validate this assumption and to determine the risk level. **3D = Medium 11.**
- It is unknown whether shallow lateral workings are located within these features. Geophysical survey is recommended to assist in determining this. As the rock in the area of these features is relatively competent, it is unlikely that any large surface subsidence may be expressed in the event of void collapse. **2D = Low 5.**

Category 2: Vertical shafts which dip away to form stopes

- There exists low risk of the shaft opening up and collapsing as the features form into stopes. Should a void open up beneath the rehabilitated feature, this may cause minor and insignificant surface settlement or the reformation of the void, possibly generating moderate injuries to humans, and is considered a medium risk. **3C = Medium 12.**
- These features pose a high risk to human life as falling down a shallow shaft may result in significant injury. Should the stope subsequently cave in on itself, this may result in death. While this event is unlikely to occur,

it could happen at some time in the future, as the stopes begin to collapse in on themselves over time. **5D = High 21.**

- The narrow portions of the stopes within these features are not likely to collapse based on the reasonably competent rock mass quality observed. Should the deeper sections of these features collapse, it is not expected to cause significant surface subsidence based on rock mass observations and the narrow-mined lode widths evidenced in the LiDAR scans, and the depth of the voids below the ground surface. The likelihood of any significant surface expression if deeper lateral workings were to collapse is low. **3D = Medium 11.**
- It is recommended that geophysical testing be undertaken to determine presence of any shallow lateral workings around the feature. If shallow sections of these stopes are noted during geophysical testing, depending on the size of the voids, these are more likely to cause significant surface subsidence in the event of void collapse. The likelihood of any significant surface expression if shallow lateral workings were to collapse is high. **3B = High 17.**
- No noxious or flammable gasses were detected within these features. **1E = Low 1.**

Category 3a: Shallow shafts (unknown / obstructed base conditions – risk of false floors)

- There exists a medium/potential risk of voids opening up and collapsing / subsidence. This risk needs to be validated via excavator ramming and shallow test pitting in the base of the features. At the moment, the potential exists for a false floor at the base of these features and poses risk to the rehabilitation method and construction personnel. Should a void open up beneath the rehabilitated feature, this may cause moderate amounts of surface settlement or the reformation of the void, possibly generating moderate injuries to humans, and is considered a medium risk. **3C = Medium 12.**
- 3D LiDAR void scanning and visual assessments suggest no presence of significant lateral workings within the top 3 m of these features. There exists the potential for underground lateral workings below the depths which are visible, however, the likelihood of any significant surface expression if lateral workings were to collapse is low. **2D = Low 5.**
- The features are typically shallow shafts. These features, in their current state, may pose medium risk of injury to children, adults, livestock, and pets due to trips, falls, and falling into the shafts. The likelihood of falling into a shaft is possibly and likely to occur at some time, which may yield moderate consequences. These features should not be trafficked with a 4x4 vehicle. **3C = Medium 12.**
- No noxious or flammable gasses were detected within these features. **1E = Low 1.**

Category 3b: Collapsed shafts with soft / unknown base conditions

- There exists a high risk of the shafts opening up and collapsing / subsidence. This risk needs to be validated via excavation of loose material from the base of the collapsed shafts, and ramming. This poses high risk to the rehabilitation method and construction personnel as well as humans. Should a void open up beneath the rehabilitated feature, this may cause moderate amounts of surface settlement or the reformation of the void, possibly generating severe injuries to humans, and is considered a high risk. **5C = High 22.**
- There exists the potential for underground lateral workings around the features. As the rock mass is very poor and crumbly in these locations, the likelihood of any significant surface expression if shallow lateral workings were to collapse is moderate. **3C = Medium 12.**
- These features, in their current state, may pose medium risk of injury to children, adults, livestock, and pets due to trips, falls, falling into the shafts. The likelihood of falling into a shaft is possibly and likely to occur at some time, which may yield moderate consequences. These features should not be trafficked with a 4x4 vehicle. **3C = Medium 12.**
- No noxious or flammable gasses were detected within these features. **1E = Low 1.**

Category 4: Deep shafts with no shallow lateral workings

- These features are deep shafts that are situated behind trees / shrubs and are within 50 m of the road. The risk of road users venturing out to seek privacy around these features during a rest break is high and likely as is the

risk of tripping or falling into the shaft. This could lead to catastrophic consequences such as severe injury and death. **5C = High 22.**

- Shallow drives (< 6 m) were not detected within these features and poses low risk to the rehabilitation method and construction personnel – should voids collapse in the area around the rehabilitated feature, this is unlikely to cause any surface settlement. **3E = Low 6.**
- No noxious or flammable gasses were detected within these features. Additionally, some of these features contain groundwater, displacing any potential gas. **1E = Low 1.**

Category 5: Deep shafts with shallow lateral workings

- These features are deep shafts that are situated behind trees / shrubs and are within 50 m of the road. The risk of road users venturing out to seek privacy around these features during a rest break is high and likely as is the risk of tripping or falling into the shaft. This could lead to catastrophic consequences such as severe injury and death. **5C = High 22.**
- Shallow drives (< 6 m) were detected within these features and poses high risk to the rehabilitation method and construction personnel – should voids collapse in the area around the rehabilitated feature, this may cause surface settlement. **4C = High 19.**
- No noxious or flammable gasses were detected within these features. Additionally, some of these features contain groundwater, displacing any potential gas. **1E = Low 1.**

5 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.

6 REFERENCES

1. Geological Series Map 1:250,000 Scale 'Yalgoo'.
2. Geraldton Guardian and Express (WA: 1929 - 1947). Sat 9 Jul 1938. Page 3. NEGLIGENCE DENIED. *GULLEWA MINE CASE – TO BE HEARD AT GERALDTON*.
3. Standards Australia. 2017. *Geotechnical Site Investigations*. AS 1726:2017. SAI Global.



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><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></div>	REVISIONS					NAMES PRINTED IN FULL		DATE	CLIENT DEMIRS	DRAWING TITLE MOROWA-YALGOO ROAD MINE REHABILITATION FEATURE CATEGORY MAP AREA - SHEET 1	CONSULTANT DRAWING NUMBER 12009-G-D-001	
						DESIGNED	I. GOLIJANIN	DEC '24			PROJECT MOROWA-YALGOO ROAD REHABILITATION	12009-G-D-001
						DRAWN	C. HICK	DEC '24	12009-G-D-001			
						VERIFIED						A
	A	ISSUED FOR CLIENT REVIEW			I.G.	03.12.2024	C.H.					
	N°.	DESCRIPTION			APPROVED	DATE	DRAWN	APPROVED				



<div><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></div>	REVISIONS				NAMES PRINTED IN FULL		DATE	CLIENT	DRAWING TITLE	CONSULTANT DRAWING NUMBER
					DESIGNED	I. GOLIJANIN	DEC '24	DEMIRS		
					DRAWN	C. HICK	DEC '24			
					VERIFIED			PROJECT		
	A	ISSUED FOR CLIENT REVIEW	I.G.	03.12.2024	C.H.			MOROWA-YALGOO ROAD REHABILITATION	MOROWA-YALGOO ROAD MINE REHABILITATION FEATURE CATEGORY MAP AREA - SHEET 2	12009-G-D-002
N°.	DESCRIPTION		APPROVED	DATE	DRAWN	APPROVED				12009-G-D-002



<div><div><div>WML</div><div>Consulting Engineers</div></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 DEMIRS	DRAWING TITLE MOROWA-YALGOO ROAD MINE REHABILITATION FEATURE CATEGORY MAP AREA - SHEET 3	CONSULTANT DRAWING NUMBER 12009-G-D-003	
						DESIGNED	I. GOLIJANIN	DEC '24				
						DRAWN	C. HICK	DEC '24				
	A	ISSUED FOR CLIENT REVIEW			I.G.	03.12.2024	C.H.	VERIFIED		PROJECT MOROWA-YALGOO ROAD REHABILITATION	12009-G-D-003	A
	N°.	DESCRIPTION			APPROVED	DATE	DRAWN	APPROVED				



APPENDIX A

FIELD NOTES





CATEGORY 1

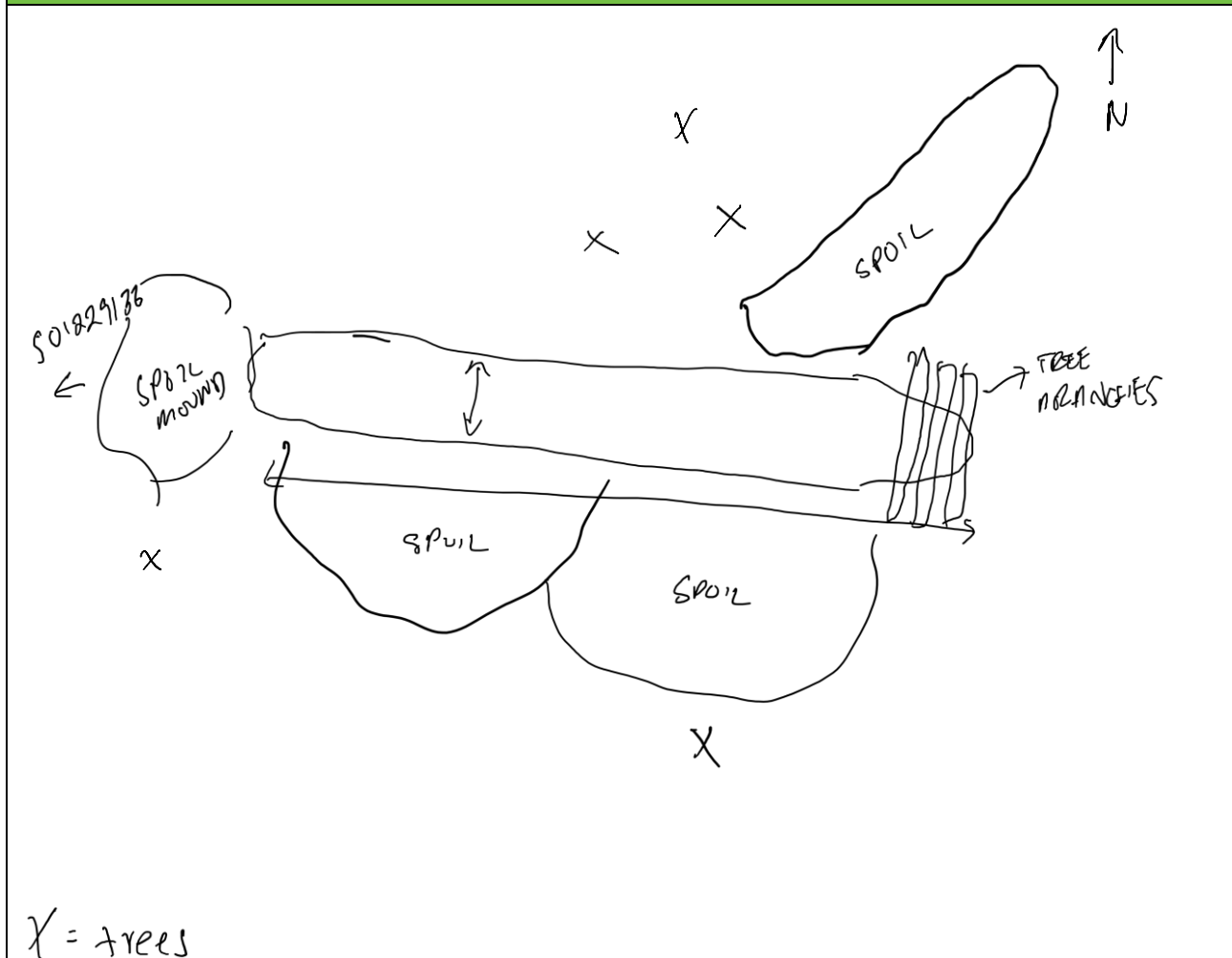


FEATURE S0229135

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658290 Longitude: 116.316329	Disturbance: ram with excavator Geophysical: yes – where the feature stopes.
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 7 x 1.7 x 2.8 deep Approximate Volume (m³): 20-25 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and the surrounding ground surface is relatively free of vegetation. There are some small trees around the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Shallow stope / trench in the east-westerly direction. The feature was likely at one stage joined to S0229136. A small spoil pile is situated to the southern brim side of the feature. LiDAR scan was undertaken. DCP testing was not undertaken due to presence of rock from the ground surface.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.1% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass from the ground surface, however the rock is more competent further north of the site.	Backfill with surrounding spoil material and imported fill.

Sketch of Feature:




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229135	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

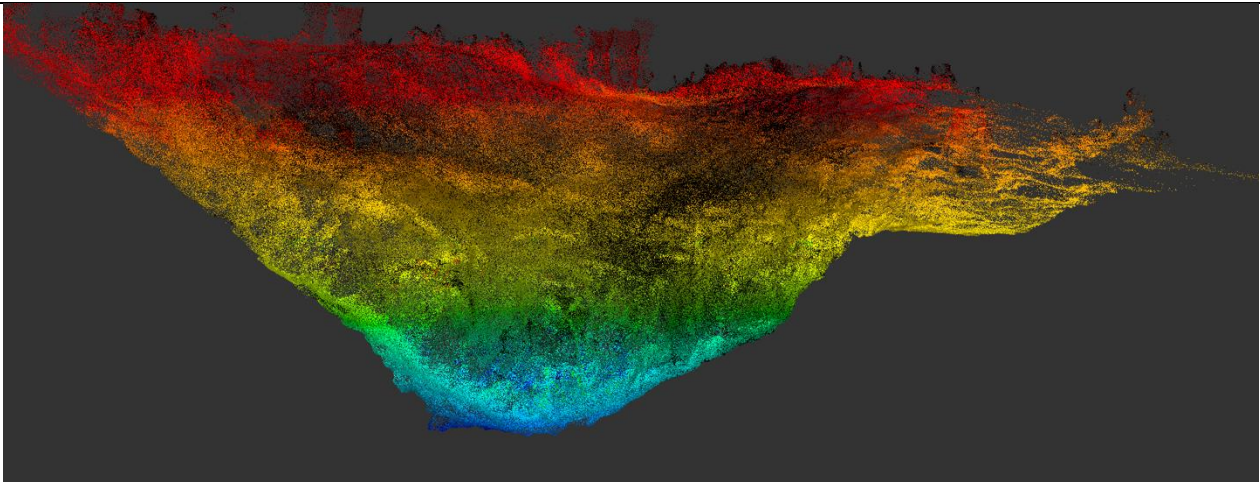


Figure 1

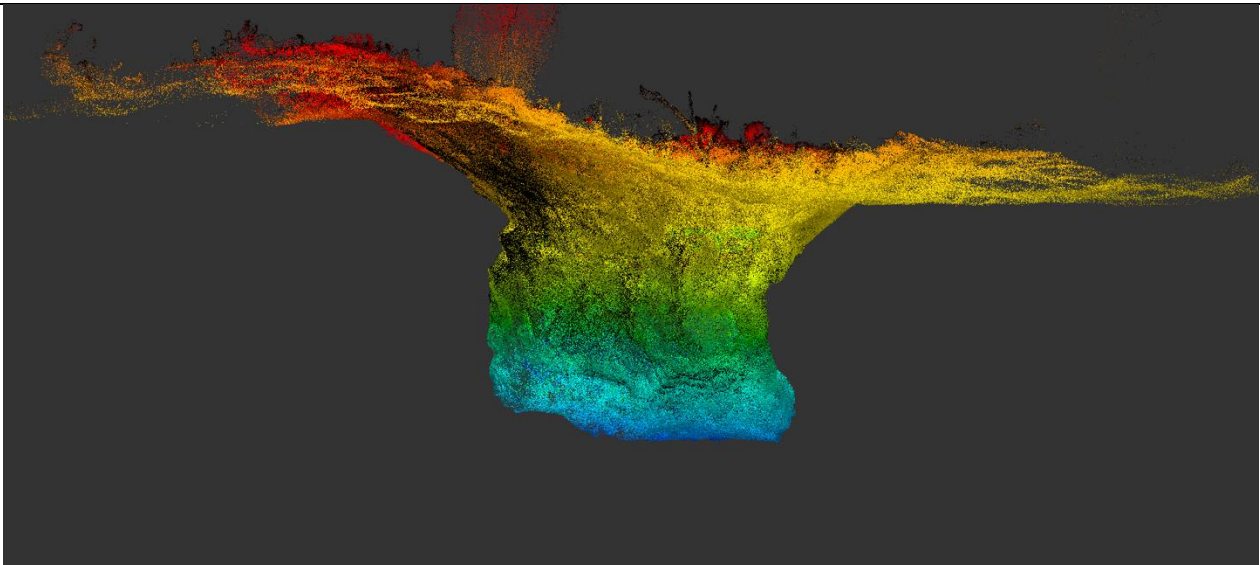



Figure 2

	Feature S0229135	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0122940

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.659220 Longitude: 116.315830	Disturbance: ram with excavator Geophysical: alongside the road to determine whether shallow drives exist below the road.
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 8.8 x 2.2 x 3.4 Volume (m³): 45-50 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass. The surrounding area is relatively free of vegetation. The road is directly to the west of this feature.
Description / comments / observations:	Noxious / flammable gas readings:
Trench like feature with a circular hole adjacent to the road (west). There is a small drive in the direction of the road however the lidar scans do not suggest this extends beneath the road. There is a moderate sized spoil pile around the feature. The ground surface surrounding the feature is hard based on DCP results.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass.	Backfill using surrounding existing spoil material. Cave in circular hole area during the rehabilitation.

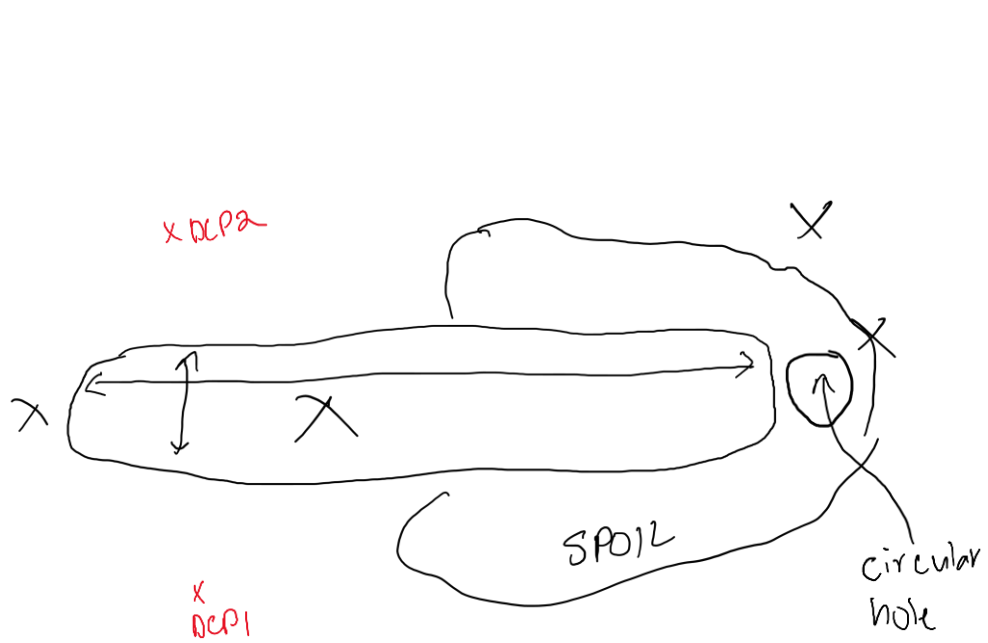
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	5	7		
0.15 – 0.30	R	R		
0.30 – 0.45				
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229140	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

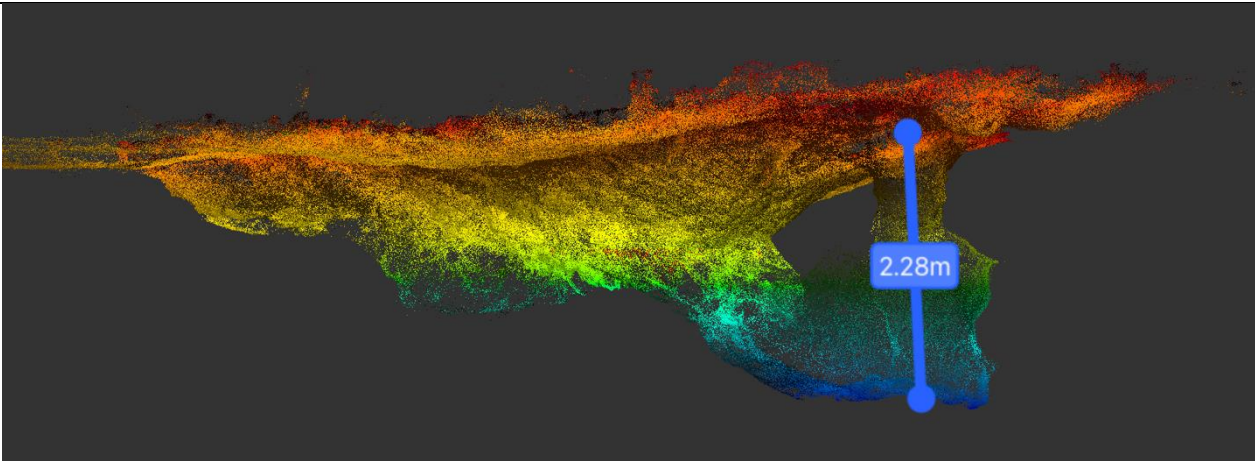


Figure 1

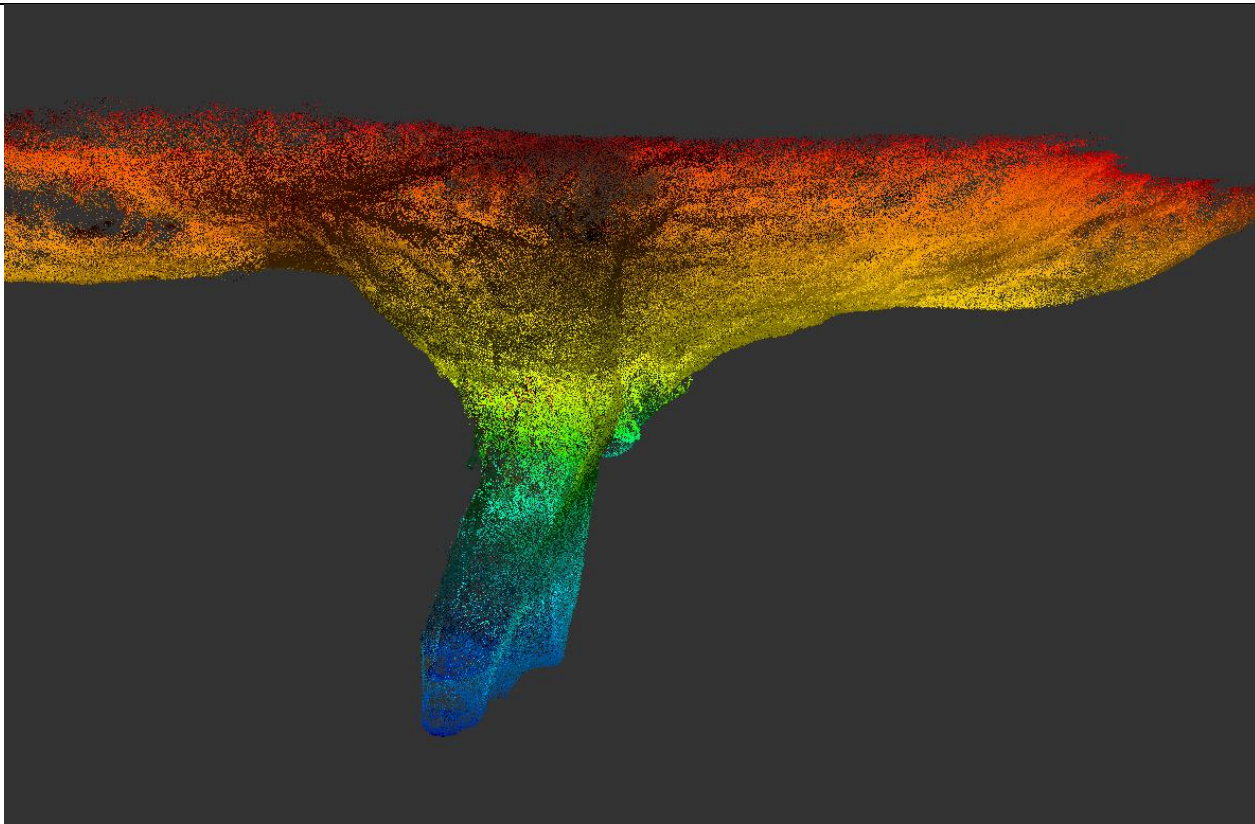



Figure 2

	Feature S0229140	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24



CATEGORY 2



FEATURE S0229131

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.6587 Longitude: 116.3166	Disturbance: clear out, rescan, and ram with excavator Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.2 x 0.9 x 1.5 Approximate Volume (m³): 2-5 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by loe to medium lying grass, and the surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
The feature exists as a stope with a narrow drive in eastern direction which extends for approximately 1 m and is 1 m deep below the ground surface. A small spoil pile surrounds the brim of the opening and wooden props support the feature opening. DCP testing indicates the ground surface around the feature is relatively dense.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.7% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Rock is evidenced from the surface of the feature.	Break in and collapse feature in on itself.

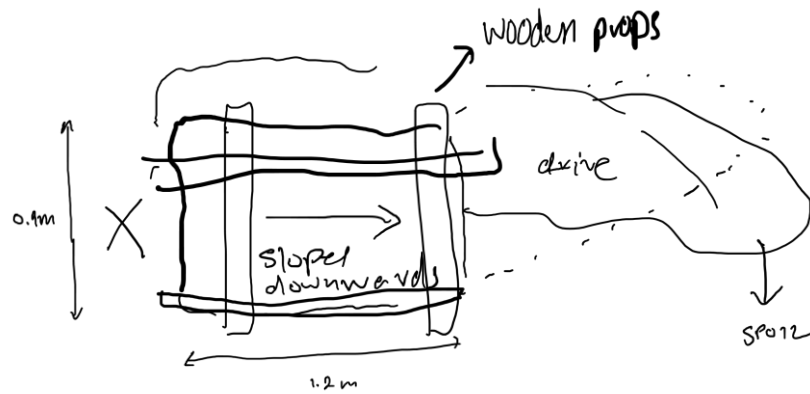
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	7			
0.15 – 0.30	R			
0.30 – 0.45				
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229131	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

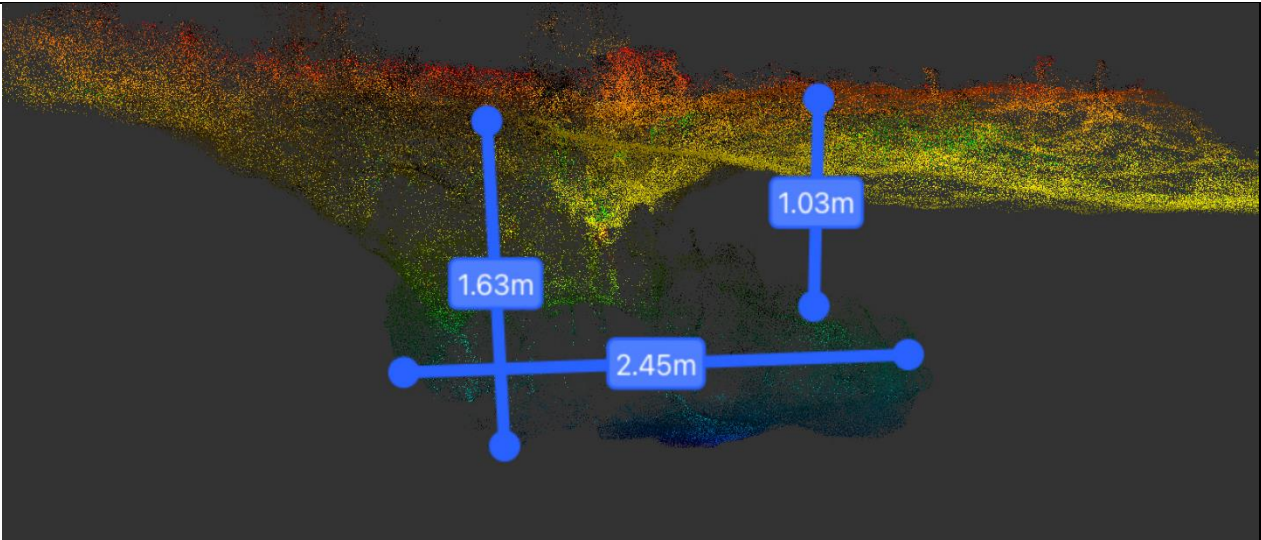


Figure 1

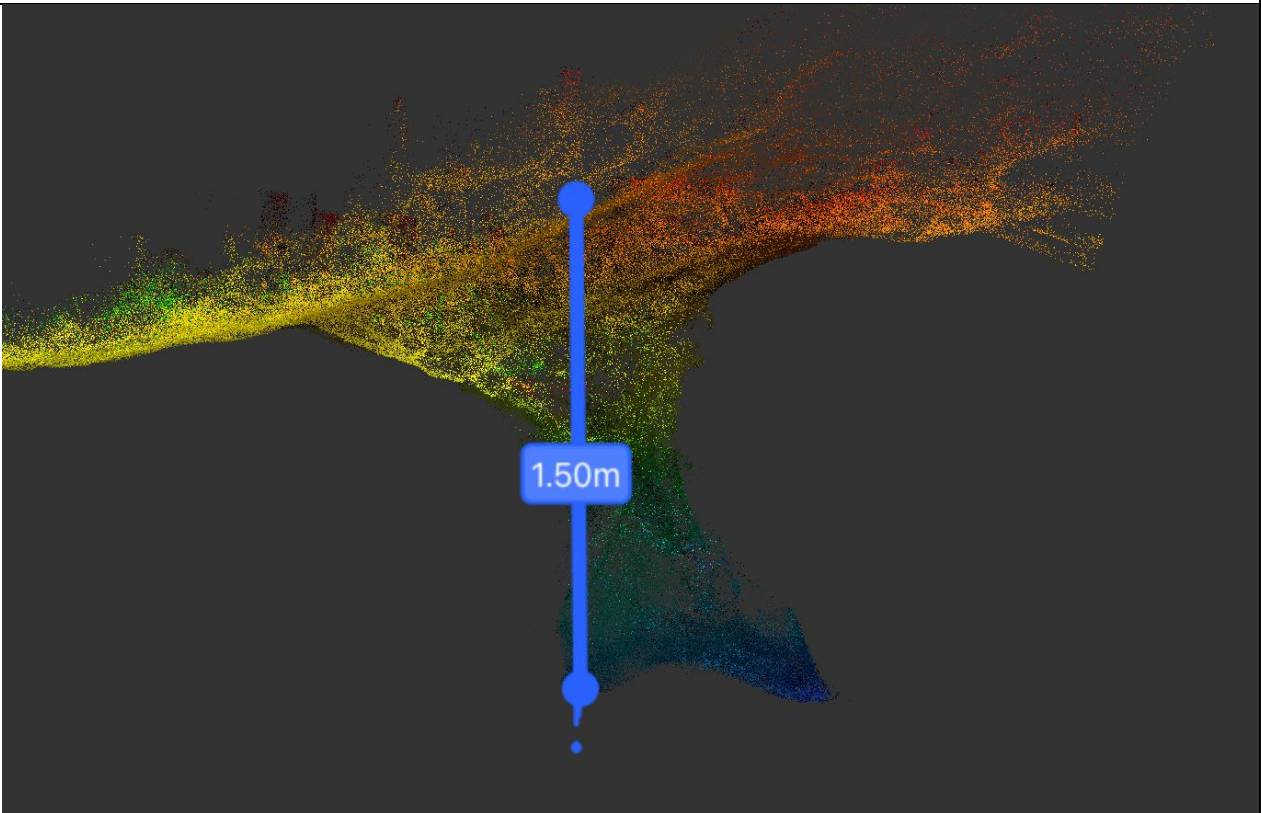



Figure 2

	Feature S0229131	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/14

FEATURE S01229132

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.6588 Longitude: 116.3164	Disturbance: Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.3 x 1.8 x 7.5 Approximate Volume (m³): 5-10 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and the surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
The feature is a shaft stoping to the east and is potentially connected to the features to the east. Wooden props hold the opening. The floor of the feature slopes downwards to the east to form the stope. The LiDAR scans did not show visibility of the drive from feature S0122138, which suggests they are no longer connected. The feature is narrow (approx. 1 m wide) at the base. DCP testing around the feature indicates the surrounding ground surface is hard.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass evidenced in the walls of the feature. Cemented lateric soils.	Mirafi plug cone backfill.

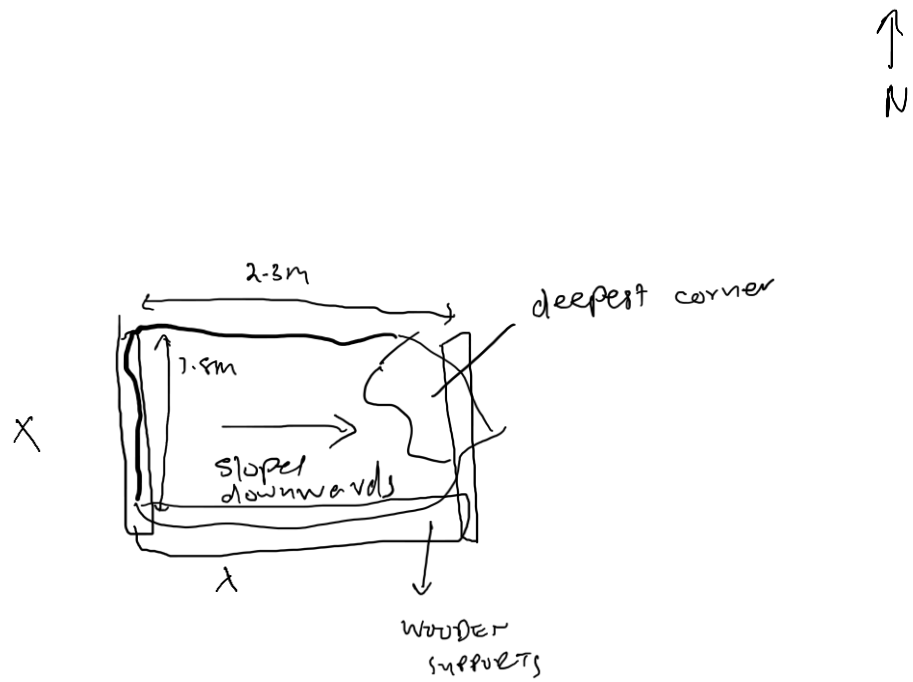
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	R			
0.15 – 0.30				
0.30 – 0.45				
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S01229132	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

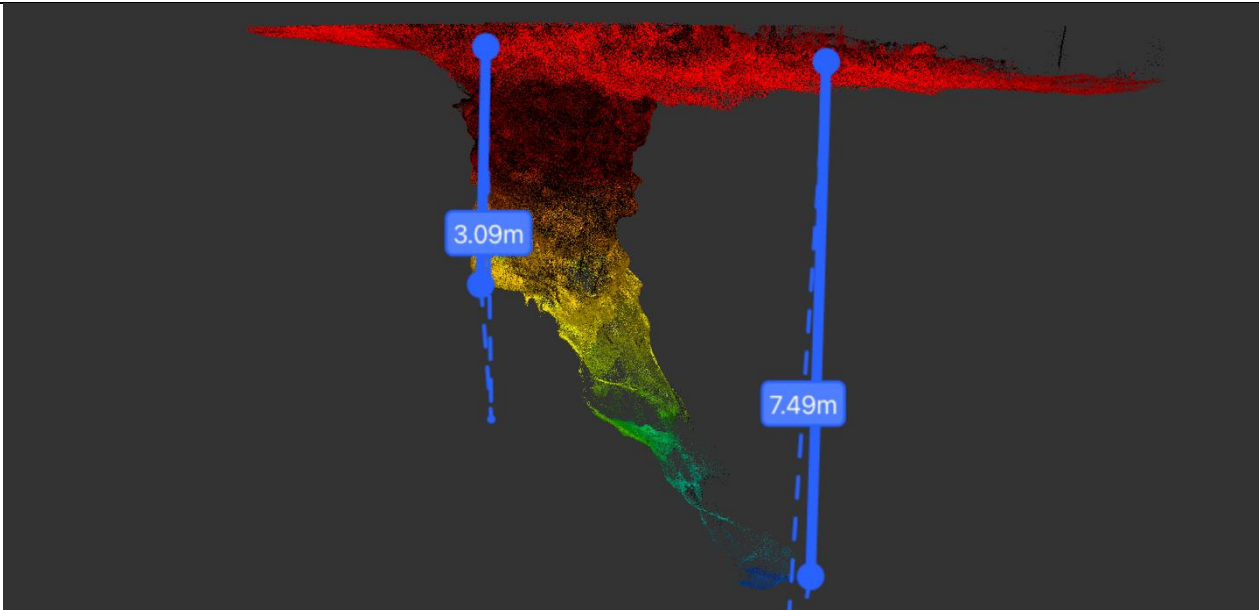



Figure 1

	Feature S0229132	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24



CATEGORY 3A



FEATURE S0227534

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.661629 Longitude: 116.315700	Disturbance: clear the metal grate, re-scan, and ram base with excavator. Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.2 x 2.8 x 3.2 Approximate Volume (m³): 15-20 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Irregularly shaped shaft feature. Spoil pile surrounds the opening. Small blind spots (size: 0.75 x 0.6 & 1 x 2) were detected during the 3D LiDAR scan which may suggest presence of lateral drives at shallow depths below the ground surface – this needs to be rescanned once the metal grate is removed to confirm this. DCP testing on the ground surface around the feature suggests it is reasonably firm.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor crumbly soil like (cemented pizolithic gravels) rock mass from the ground surface. The feature has near vertical walls.	Mirafi cone plug or backfill.

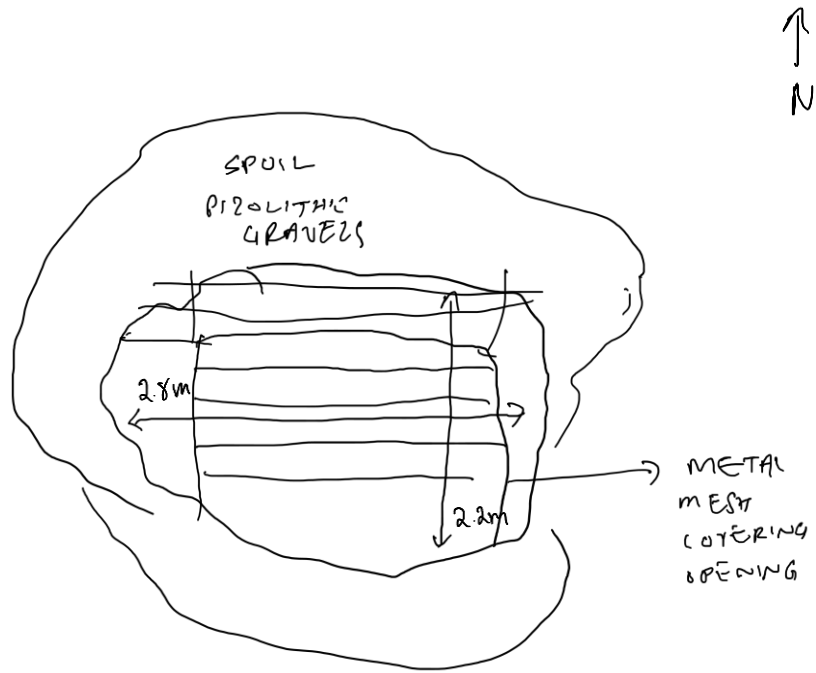
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	5			
0.15 – 0.30	18			
0.30 – 0.45	R			
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:



X = trees

PHOTOGRAPHS

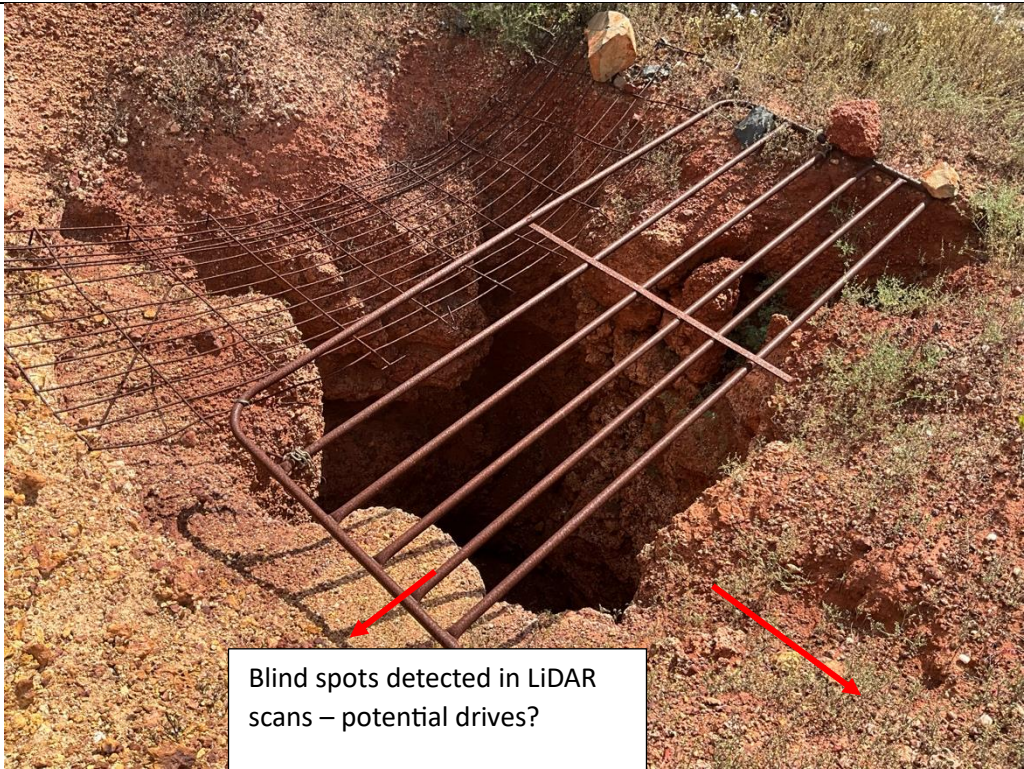



Figure 1

	Feature S0227534	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

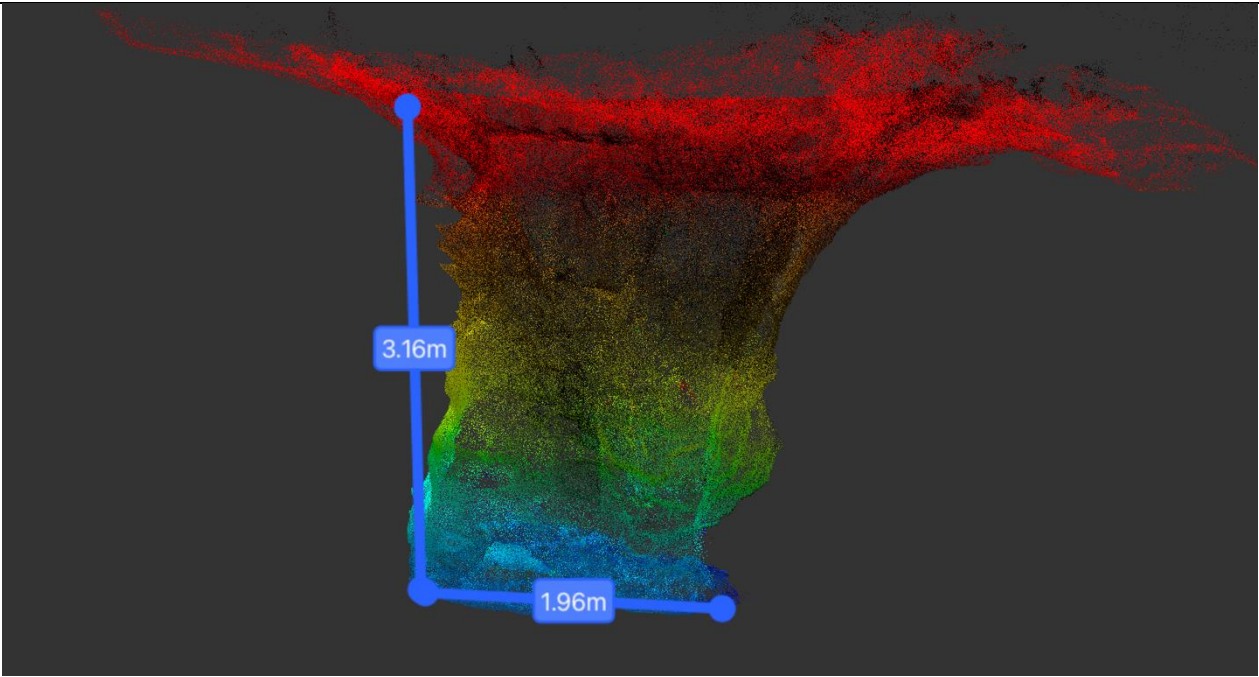



Figure 1

	Feature S0227534	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229119

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658629 Longitude: 116.315180	Disturbance: ram base Geophysical:
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1 x 2.8 x 3 Approximate Volume (m³): 8 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by some grass, and the area surrounding the feature is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
Square shaft feature with the potential for false floor as base is filled with soil. No spoil was noted around the feature. DCP testing around the feature indicates the ground surface is relatively hard. LiDAR scan was undertaken.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Near vertical rock walls.	Backfill or mirafi cone plug.

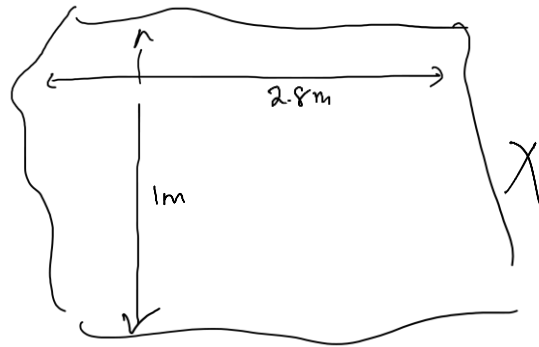
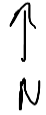
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	12			
0.15 – 0.30	R			
0.30 – 0.45				
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:




X

X = trees

PHOTOGRAPHS



Figure 1

	Feature S0229119	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

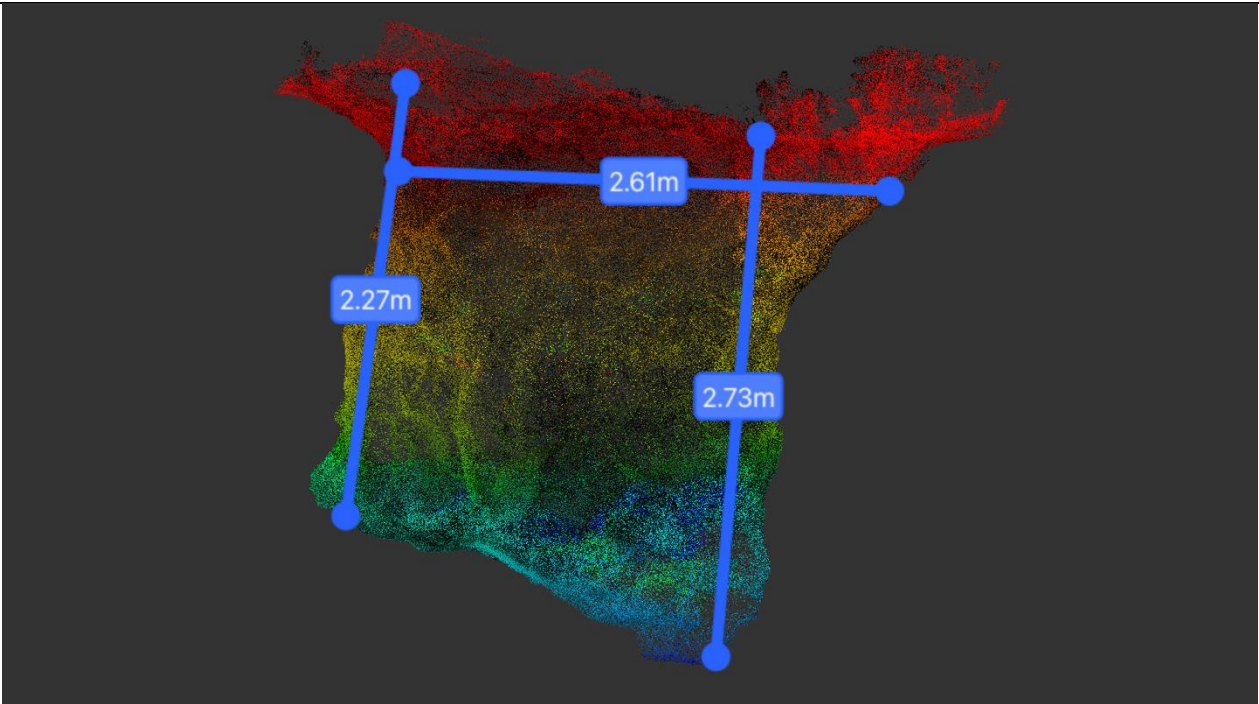


Figure 1

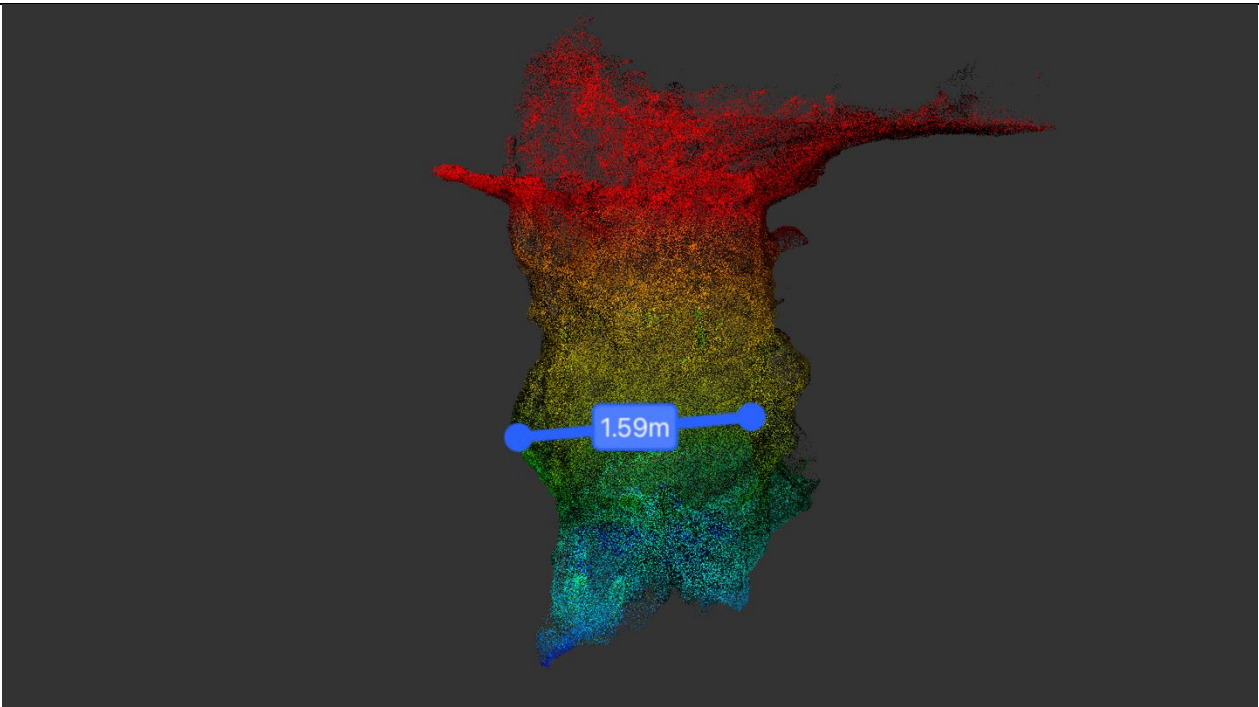



Figure 2

	Feature S0229119	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229139

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.659130 Longitude: 116.315980	Disturbance: ram with excavator and clear scrap metal rubbish. Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 4.6 x 5.3 Volume (m³): n/a Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass. The surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
Irregular shaped feature. There is a small spoil pile surrounding the brim. The base is covered in vegetation and rubbish. It is potentially connected to S0122138 however, any previously existing drives may be backfilled now. The ground conditions of the base are relatively hard as evidence by DCP results. No LIDAR scan undertaken.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Walls of the feature are obscured by rubbish in the base of the feature.	TBD after disturbance fieldwork. Likely to be backfill or mirafi cone plug.

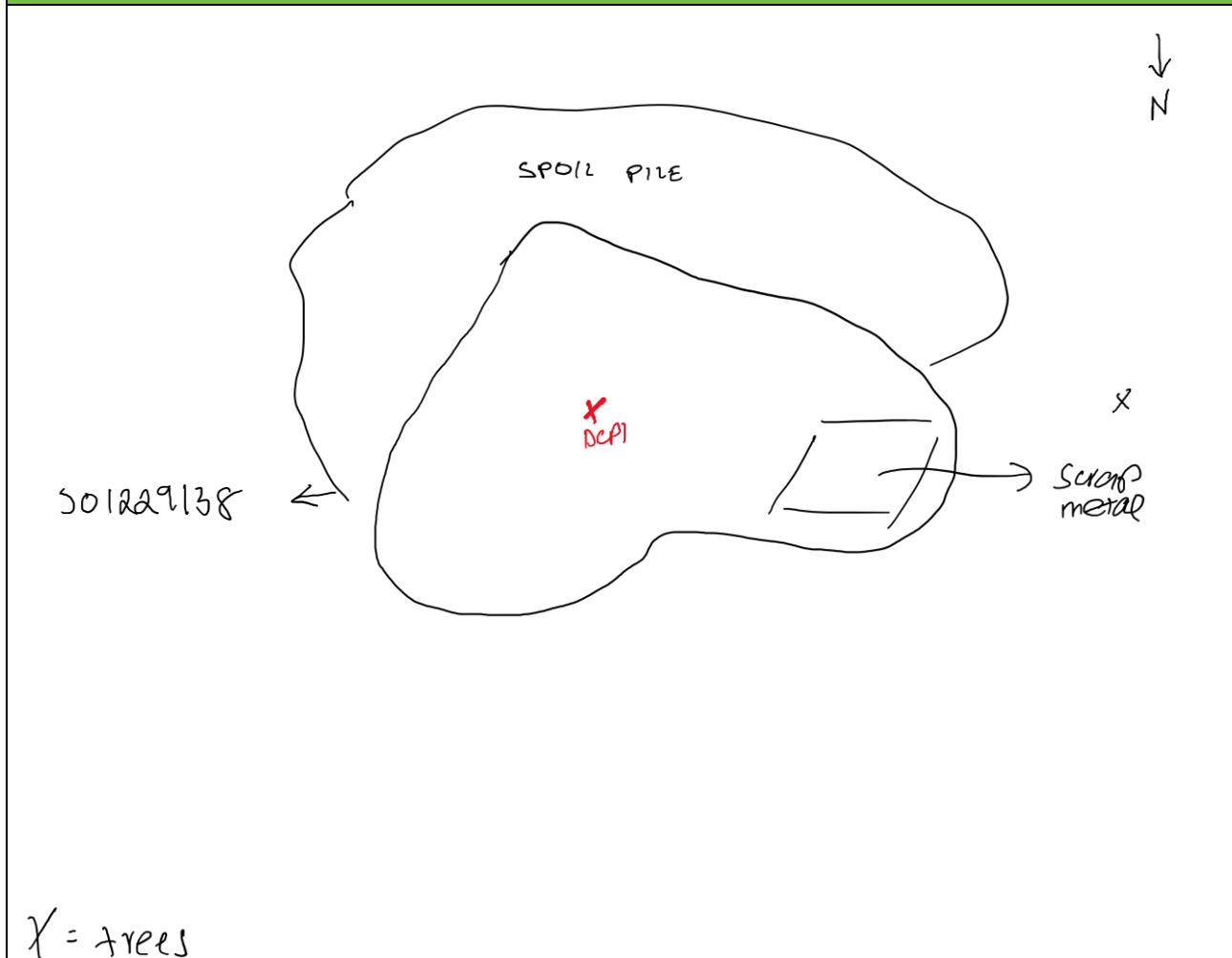
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	7			
0.15 – 0.30	12			
0.30 – 0.45	R			
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature S0229139	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE WML1


Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658636 Longitude: 116.315549	Disturbance: ram with excavator and clear out to scan if possible. Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1 x 1 x unknown depth Volume (m³): n/a Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small shrubs surround the feature. The surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
The feature is a backfilled shaft with tree branches and a large spoil mound around it. The feature was once fenced off however, the fence is now in ruins and the feature appears like a spoil pile but is not. The feature may be of significant depths based on the characteristics of the nearby features, it is also in the line of strike of some deep shafts, and requires further investigation.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass as evidenced in the walls of the feature.	Pending results of phase 2 works.

PHOTOGRAPHS



Figure 1

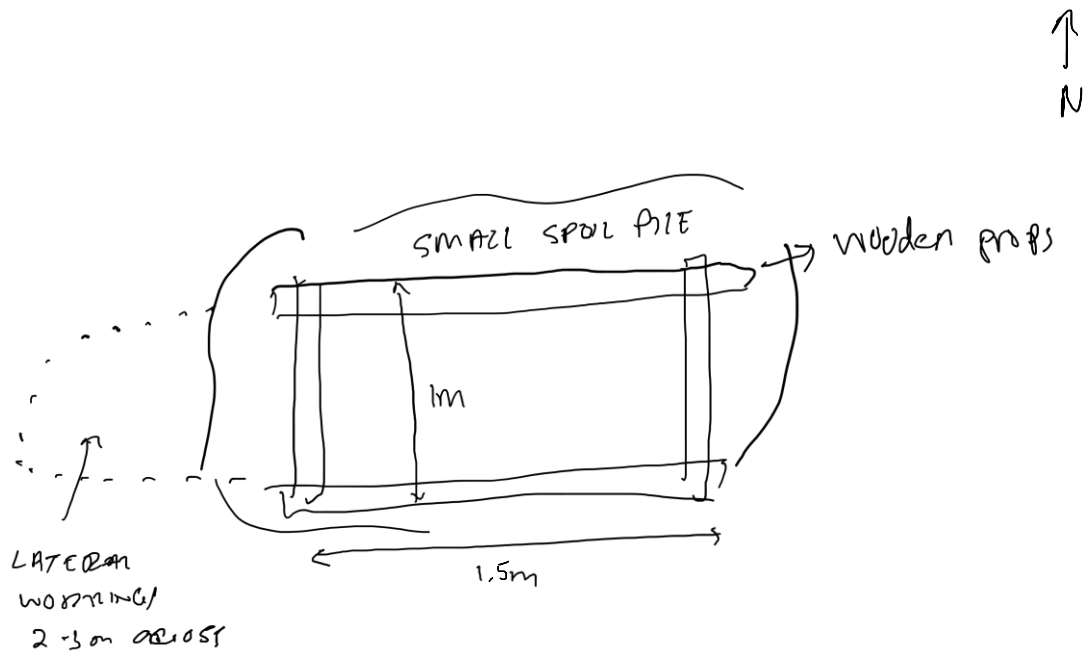
	Feature WML1	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE WML2

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658100 Longitude: 116.314568	Disturbance: ram base with excavator and clear out. Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.5 x 1 x 4.2 Volume (m³): 5-7 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small shrubs surround the feature. The surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
The feature is a square shaft with a potential for a false floor. Soil and rubbish were noted in the base. No spoil material was surrounding the opening of the feature. The LiDAR scans detected a shallow drive extending laterally 3-4 m to the west which is 0.75 m bgl. The base of this feature is likely significantly deeper as the LiDAR scans detected some points below the base of the visible floor to 4.2 m.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Near vertical rock walls. Highly weathered – rock may be dug with an excavator?	Break out drive and collapse in on itself. Mirafi soil plug the base of the shaft.

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature WML2	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

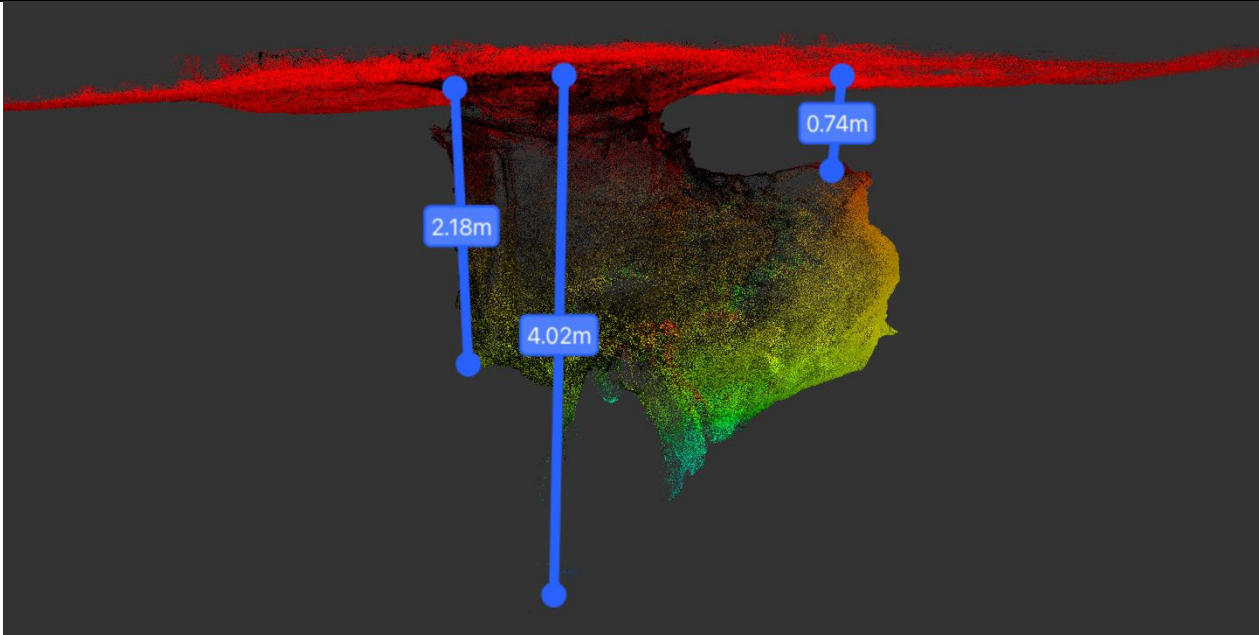



Figure 1

	Feature WML2	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE WML3

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.655603 Longitude: 116.316215	Disturbance: ram with excavator and clean out rubbish. Geophysical: yes – may be drives?
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.5 x 1.9 x 2.2 Volume (m³): 5-7 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass. The surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular shaft feature with potential for a likely false floor. Soil and tin were observed in the base of the feature. A reasonably small spoil pile surrounds the opening. DCP testing on the surrounding ground indicates the ground surface is relatively firm.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Highly weathered rock. Near vertical rock walls.	Backfill or mirafi cone plug backfill.

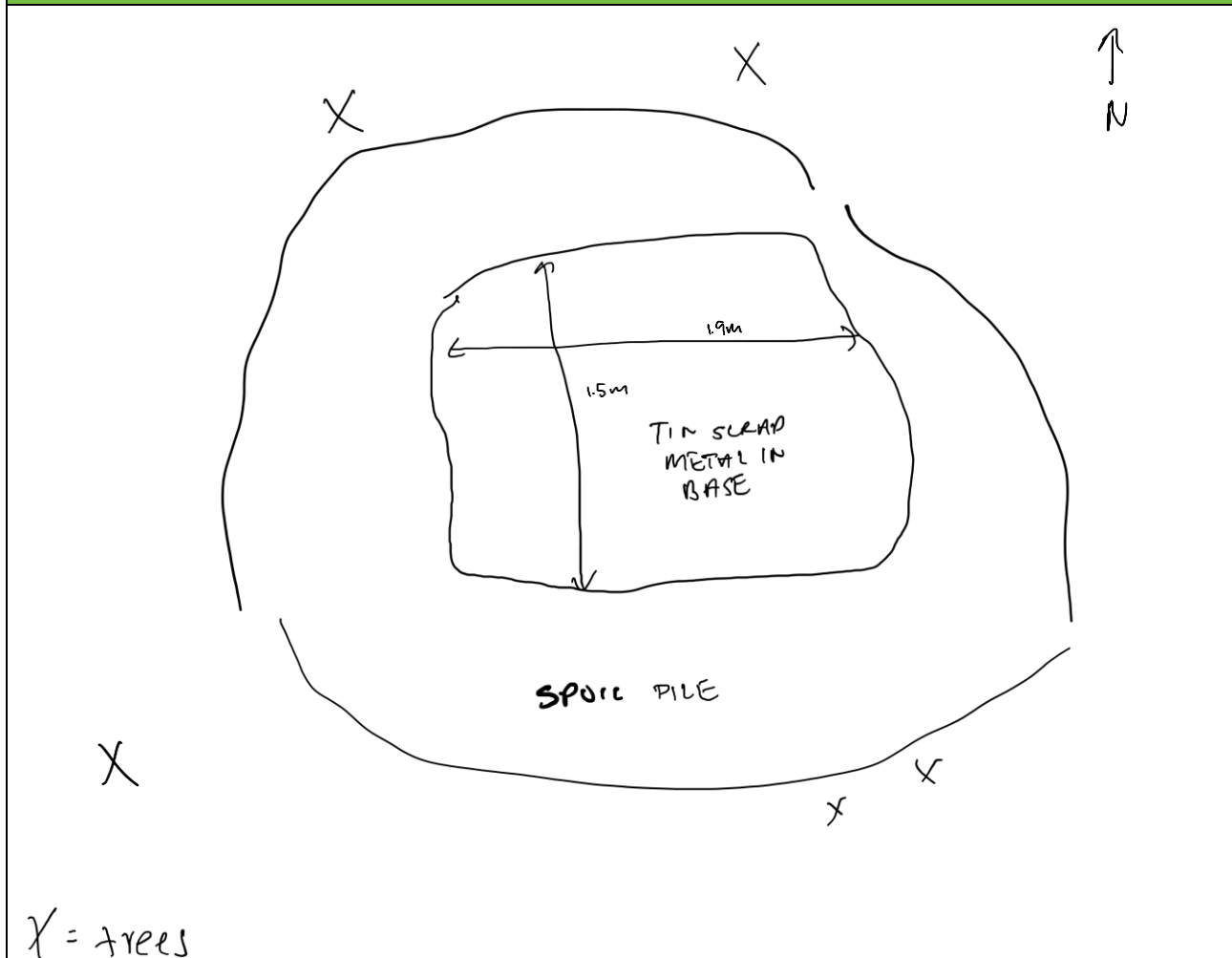
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	12			
0.15 – 0.30	R			
0.30 – 0.45				
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature WML3	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

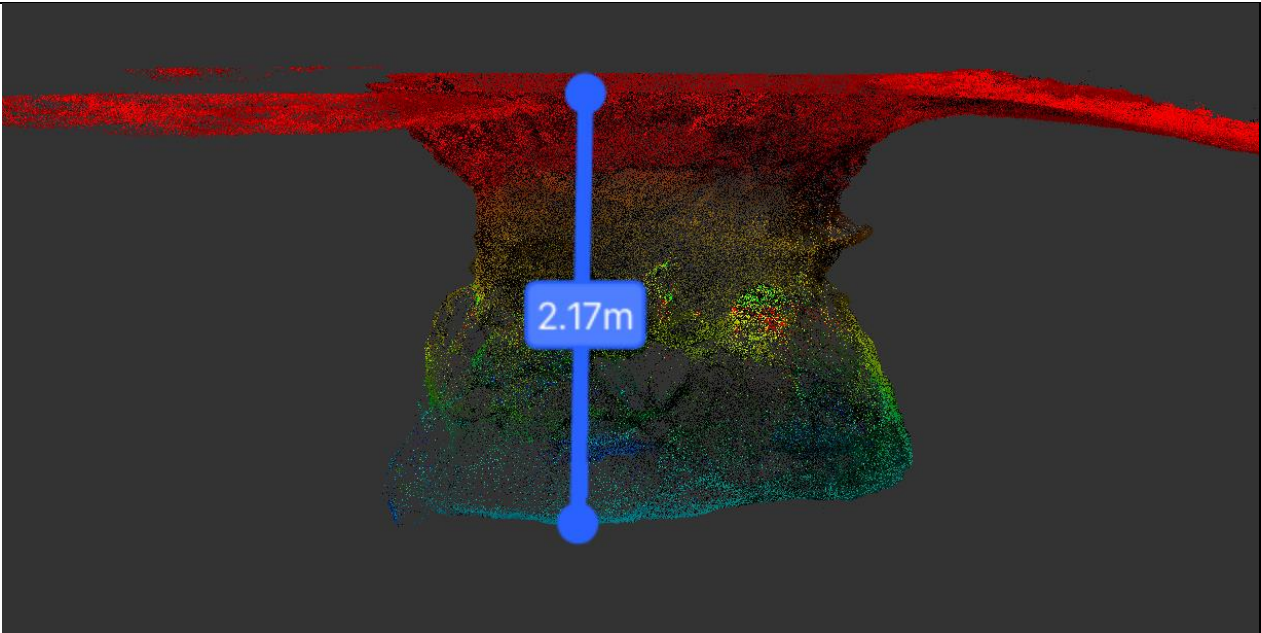



Figure 1

	Feature WML3	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/8/24



CATEGORY 3B



FEATURE S0227529

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662289 Longitude: 116.315450	Disturbance: clear out base of feature, attempt to rescan if a shaft is uncovered, or ram base. Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.7 x 3.6 x 1.5 Approximate Volume (m³): 10-12 Depth to groundwater (m): not encountered. Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, small shrubs and small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Collapsed shaft feature. Pea gravel and gravelly soils backfilling the shaft. Reasonable size spoil pile surrounds the feature. It is likely to be significantly deeper and it is unknown whether lateral workings exist.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.1% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Sandy and pisolithic gravels from the ground surface.	Mirafi cone or concrete cone plug ?

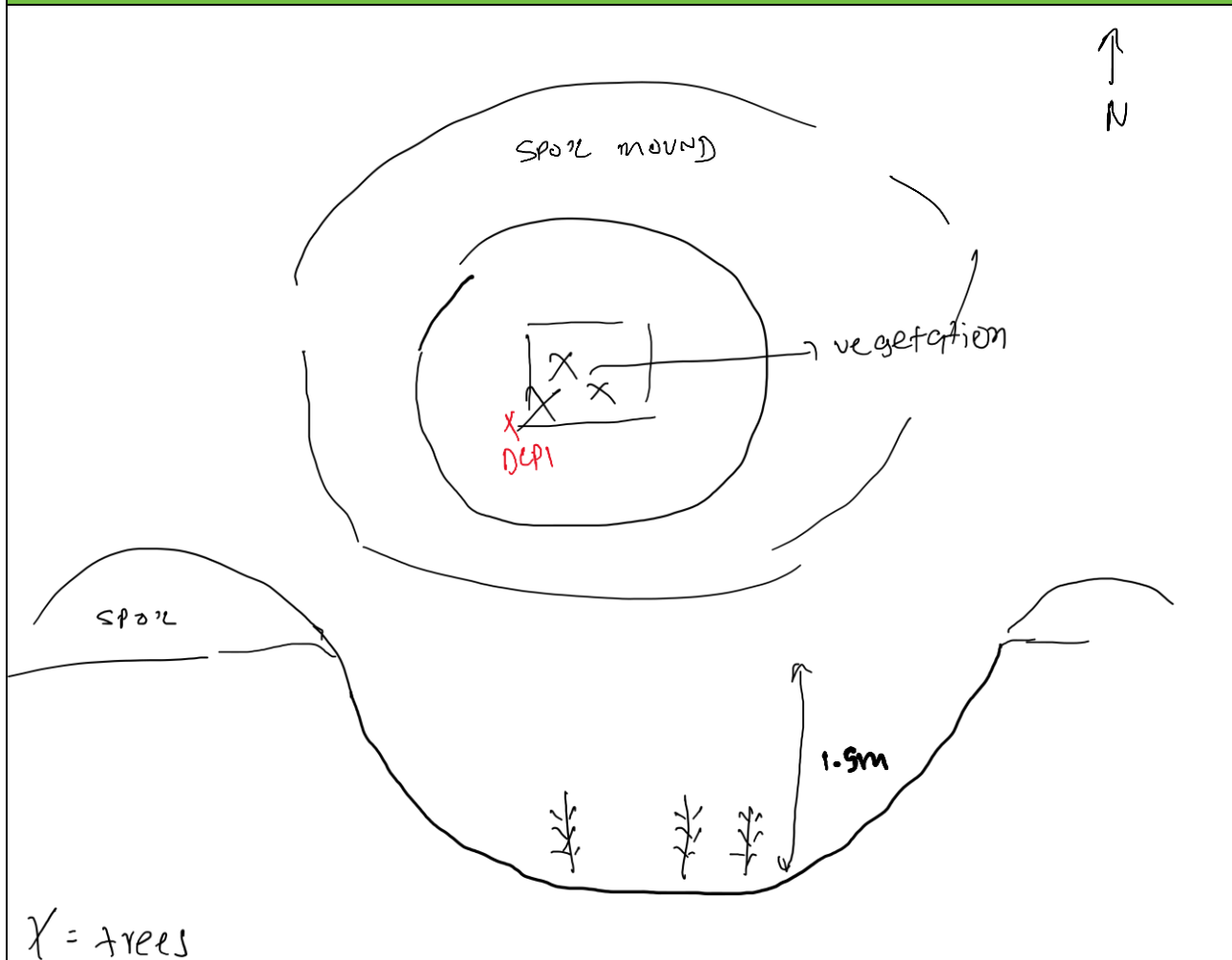
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	4			
0.15 – 0.30	7			
0.30 – 0.45	R			
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature S0227529	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0227530

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662420 Longitude: 116.315630	Disturbance: clear out base, attempt to rescan if a shaft is uncovered, or ram with excavator Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 4.4 x 6.4 x 1.6 Approximate Volume (m³): 35-40 Depth to groundwater (m): not encountered. Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and the trees are relatively dense around this feature compared to the rest of the site.
Description / comments / observations:	Noxious / flammable gas readings:
Collapsed shaft feature. Pea gravel and gravelly soils backfilling the shaft. Small size spoil pile surrounds the feature. It is likely significantly deeper. Wooden pillar props on the base surface alongside vegetation. The base conditions are soft as evidenced by DCP results.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.1% O₂: 20.70% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Sandy and pisolithic gravels present from the ground surface.	Mirafi cone or concrete cone plug ?

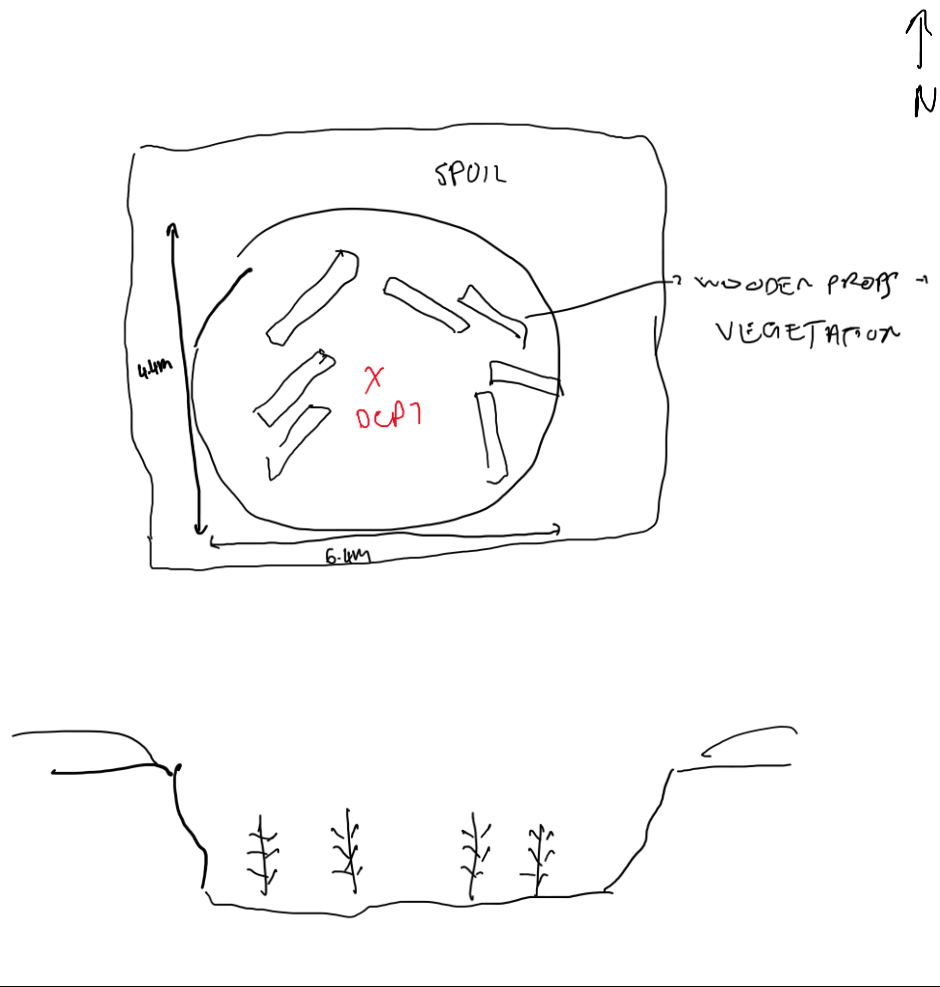
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	2			
0.15 – 0.30	2			
0.30 – 0.45	4			
0.45 – 0.60	4			
0.60 – 0.75	2			
0.75 – 0.90	3			
0.90 – 1.05	2			
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature S0227530	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0227533

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.663110 Longitude: 116.315450	Disturbance: ram with excavator and clean out soil. Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.7 x 5 x 2.5 Approximate Volume (m³): 15-20 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned to the west of a culvert beneath the road and silt wash runoff has backfilled the shaft. Drainage issues may affect remediation method unless elevated / propped from existing ground surface.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and the vegetation is dense surrounding the feature in this location. Small to medium sized trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Collapsed shaft. Siltwash has backfilled the feature and evidence of erosion to the east near the road (drainage underneath the road) is evidenced in the walls. Small spoil pile surrounds the opening. Very soft base conditions as evidenced by DCP results.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.9% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Silty sands with gravels present in the base. No visible evidence of rock walls in the feature.	Likely to be mirafi cone plug backfill pending disturbance works.

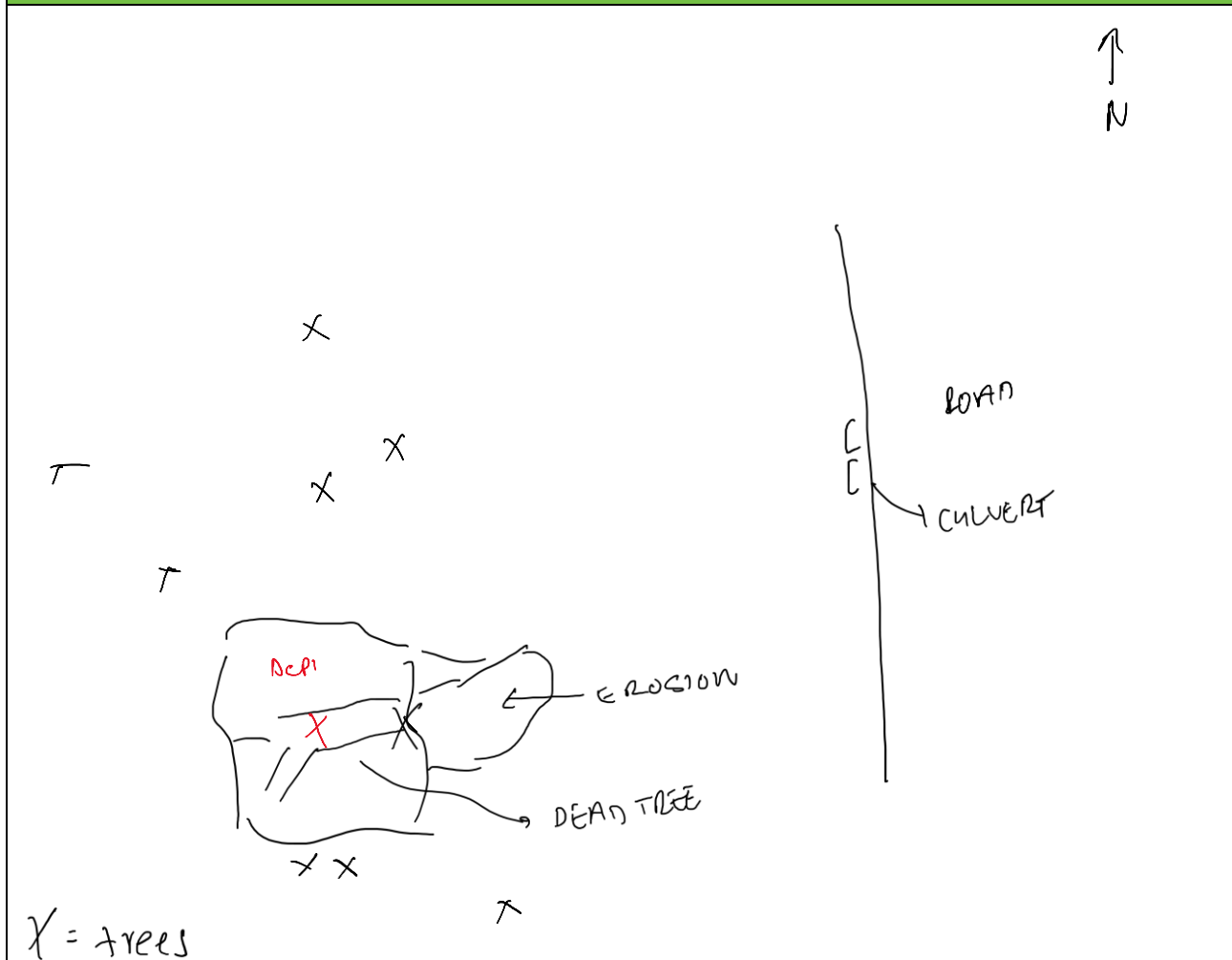
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	1			
0.15 – 0.30	0			
0.30 – 0.45	1			
0.45 – 0.60	2			
0.60 – 0.75	6			
0.75 – 0.90	2			
0.90 – 1.05	2			
1.05 – 1.20	1			
1.20 – 1.35	1			
1.35 – 1.50	1			
1.50 – 1.65	1			
1.65 – 1.80	1			
1.80 – 1.95	1			
1.95 – 2.10	1			

Sketch of Feature:




PHOTOGRAPHS



Figure 1



Figure 2

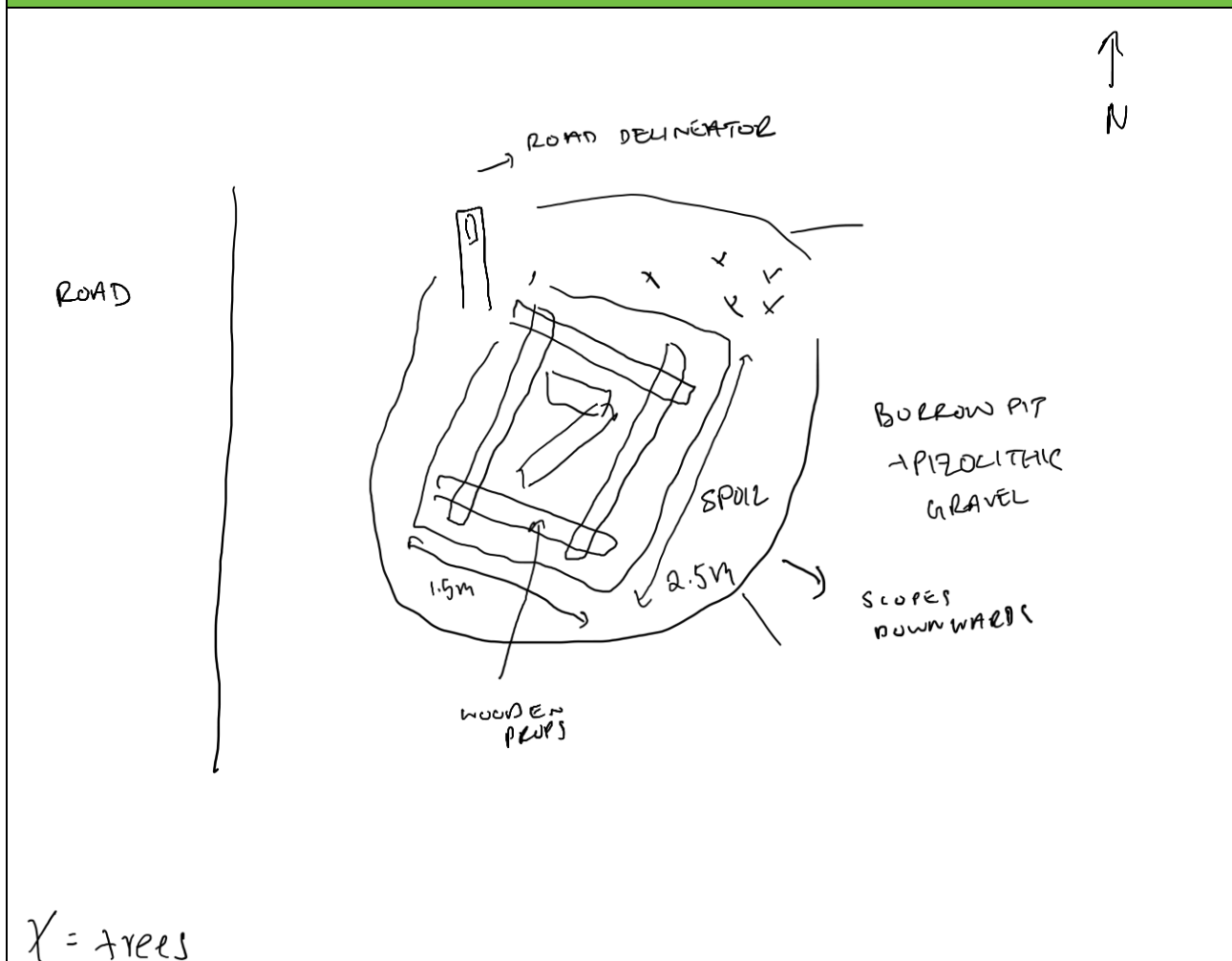
	Feature S0227533	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE WML4

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662156 Longitude: 116.316133	Disturbance: ram with excavator and clear out tin metal. Geophysical: yes?
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.5 x 1.5 x 1.1 Volume (m³): 3-4 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high ground and is elevated from the adjacent road; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass. The surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
The feature is a rectangular collapsed shaft. Pea gravel, wooden props and tin metal were observed in the base of the feature. A very small spoil pile surrounds the opening. Wooden pillars are propping the collar open. It is likely significantly deeper. A road delineator has been placed on the spoil pile to the west. A gravel stockpile is situated to the east nearby. A DCP was attempted, however, the base is obstructed. It is recommended the base be cleared, a scan undertaken, DCP to be done, and excavator ramming.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.9% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Cemented pizolithic gravels.	Mirafi cone plug – pending phase 2 results.


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature WML4	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

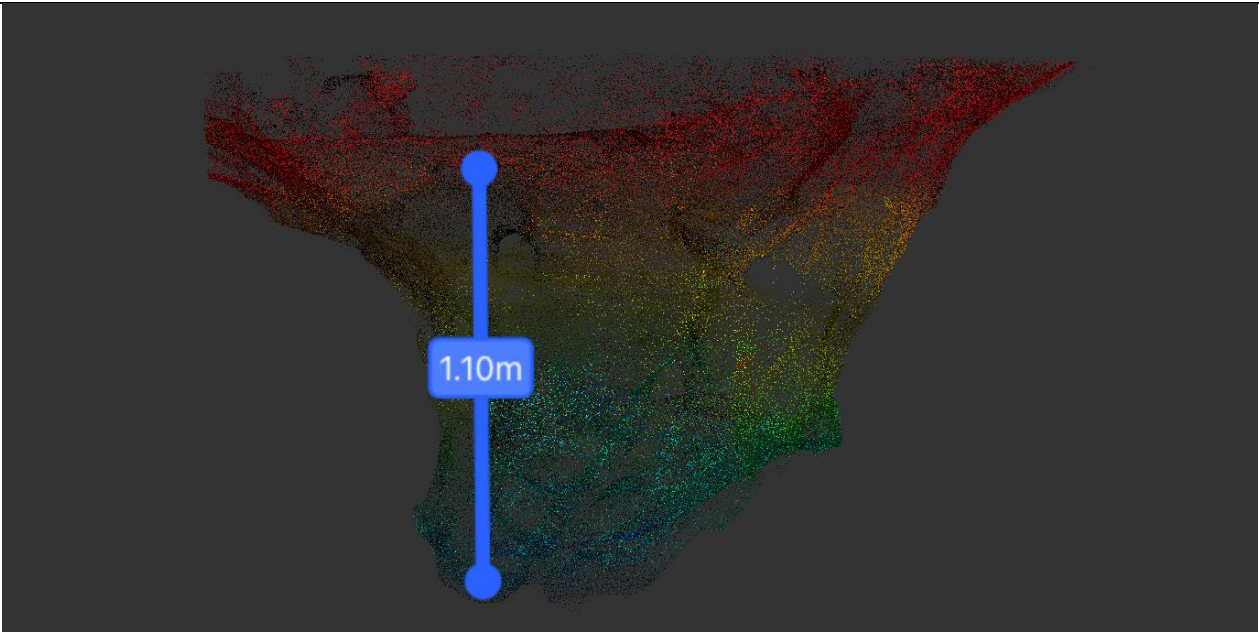



Figure 1

	Feature WML4	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24



CATEGORY 4

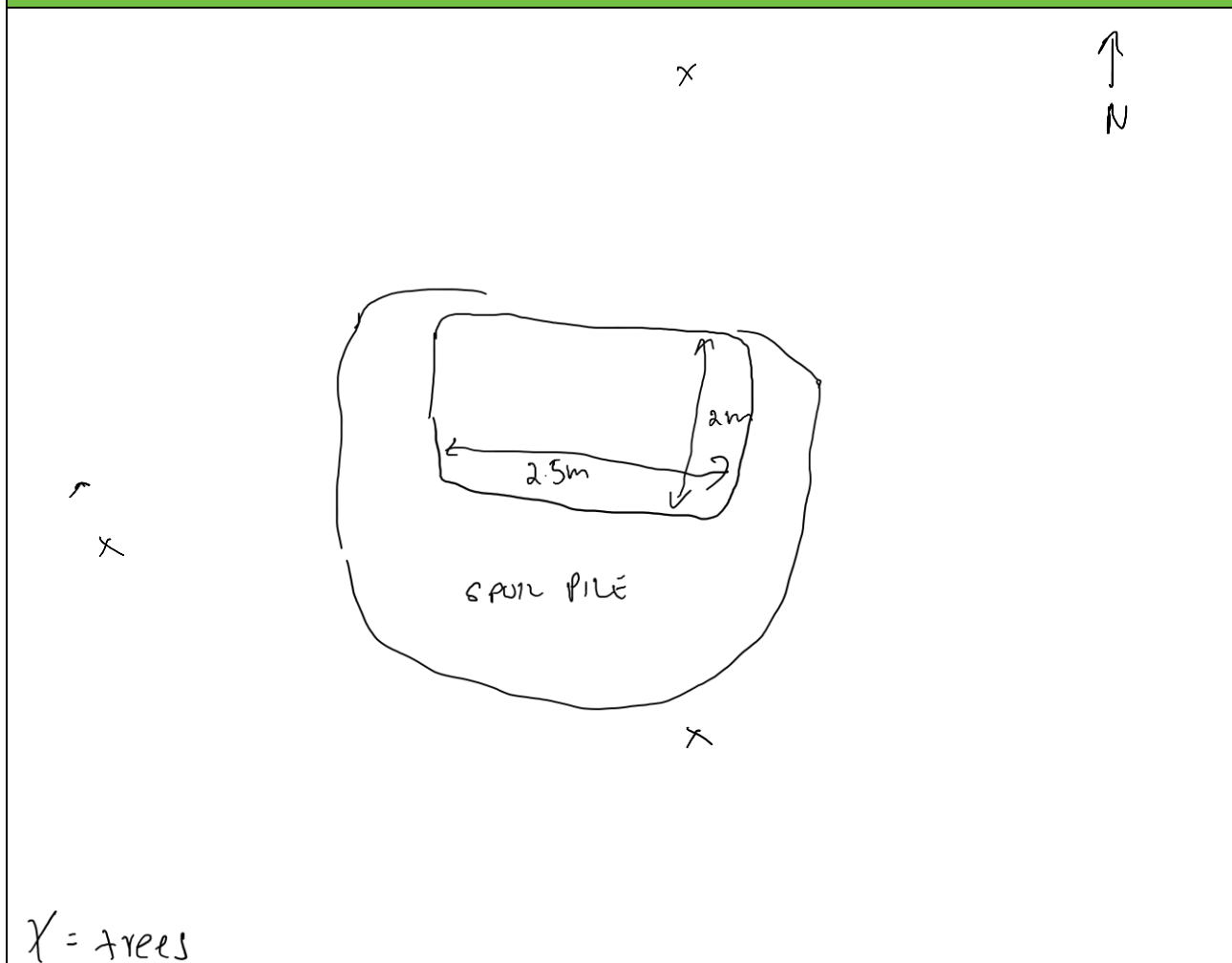


FEATURE S0227515

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.6602 Longitude: 116.3152	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.5 x 1.2 x 11.2 Approximate Volume (m³): 20 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, shrubbery and sparse small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular vertical shaft. There is a very small spoil pile surrounding the opening. Ground surface around the opening of the feature comprises highly weathered rock. Based on the LiDAR scans, there is a potential drive at approx. 6 m bgl and another at the base of the feature tending east. This should be rescanned.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.2% O₂: 20.9% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor quality rock mass. Lateritic highly weathered rock from the ground surface.	Concrete cone plug, or a mirafi cone plug backfill solution.


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature S0227515	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

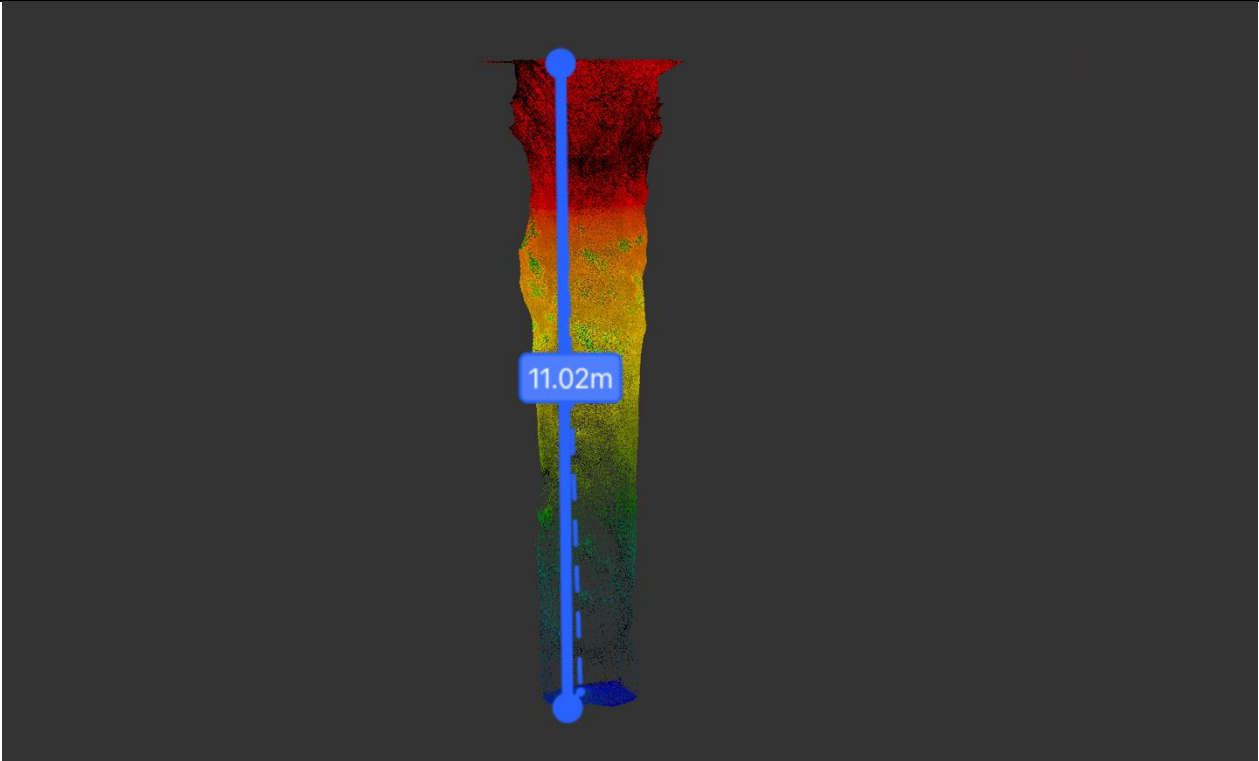



Figure 1

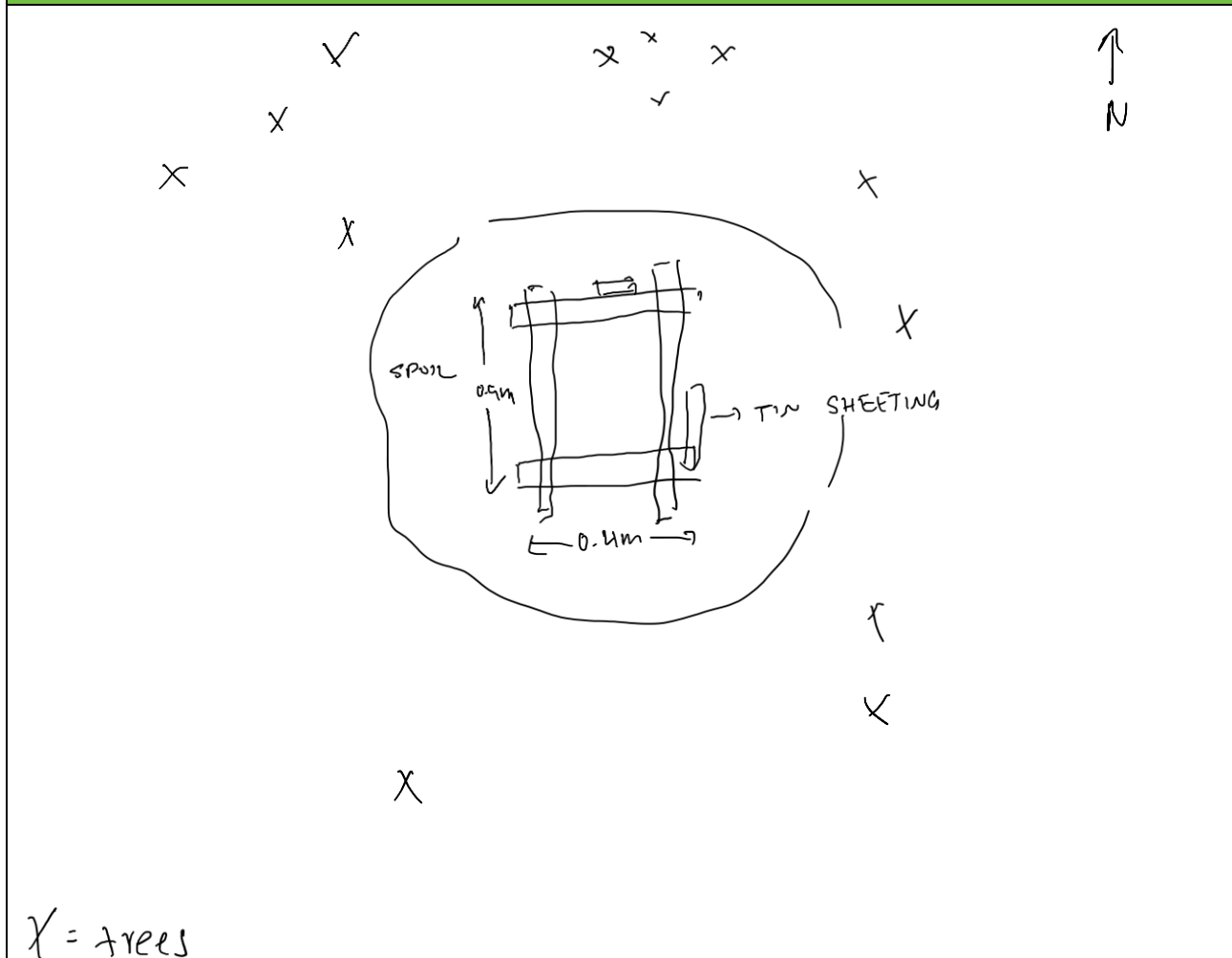
	Feature S0227515	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0227528

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662610 Longitude: 116.315190	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 0.9 x 0.4 x 9.9 Approximate Volume (m³): 3-5 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass and small shrubbery and sparse small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular vertical shaft. The collar is held open by tin sheeting propped against wooden pillar props. Soil is present in the base of the feature. A small spoil pile surrounds the opening of the feature. No lateral workings were identified within the 3D LiDAR scan.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.9% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Pizolithic gravels and sands from the ground surface.	Concrete cone plug ? If a planking solution is to be adopted, removal of the spoil pile and top 1 m if crumbly rock material will be required. Alternatively, use a mirafi cone plug backfill.


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature S0227528	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

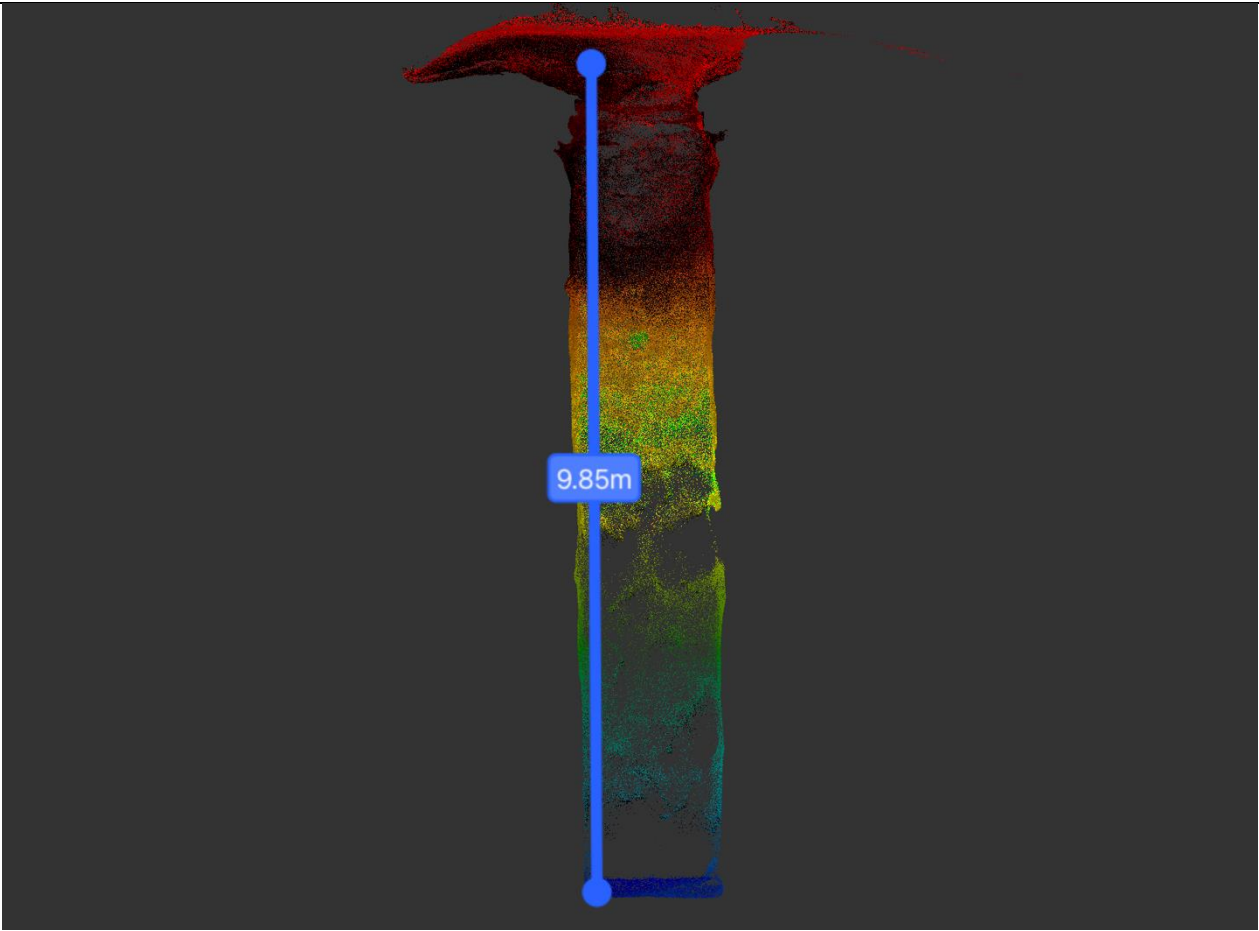



Figure 1

	Feature S0227528	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S01227531

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662610 Longitude: 116.315530	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.1 x 0.5 x 12.6 (to water) Approximate Volume (m³): 5-8 Depth to groundwater (m): 12.6 m Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular shaft feature, the collar is held open by tin sheeting propped against wooden pillar props. Water was present in the base of the feature at 12.6 m. A small spoil pile surrounds the opening. The shaft extends beyond the water level; however, the exact depth is unknown – the recordings taken with the dip meter were likely incorrect (suggested 50 m) and this will be validated during next phase of works. DCP testing indicates that the surrounding ground surface is relatively dense. No evidence of lateral workings was identified in the LiDAR scans.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Pizolitic gravels and sands from the ground surface.	Concrete cone plug ? If planking, remove spoil pile and top 1 m if crumbly rock material. Or backfill with large rocks over the groundwater and then spoil material and mine waste rock from gullewa mine?

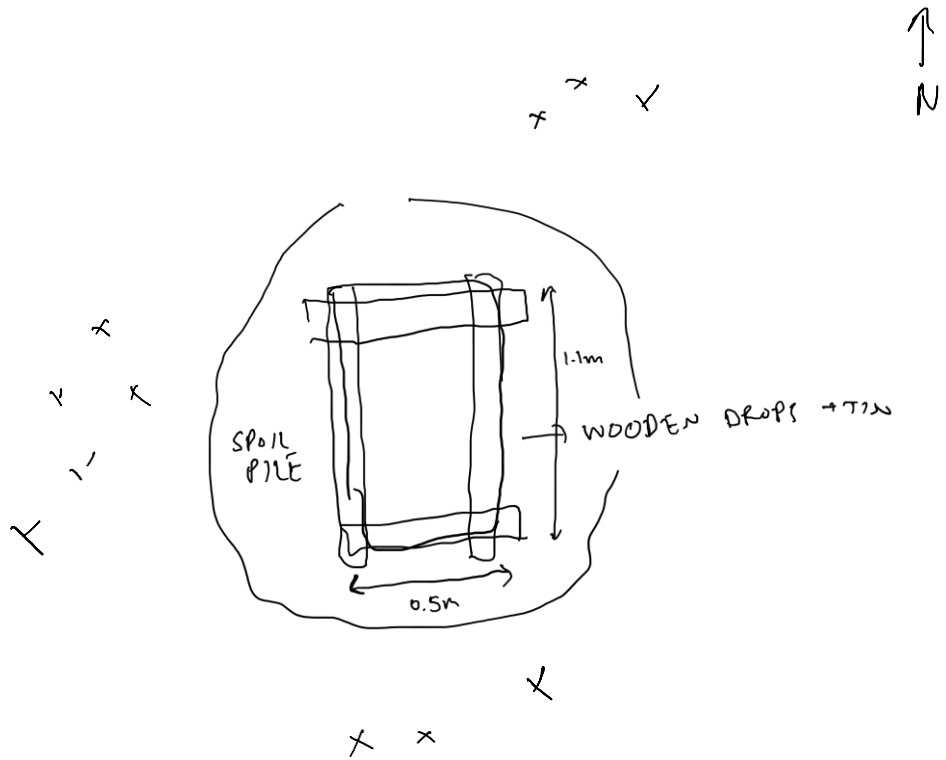
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	9			
0.15 – 0.30	28			
0.30 – 0.45	R			
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:




X = trees

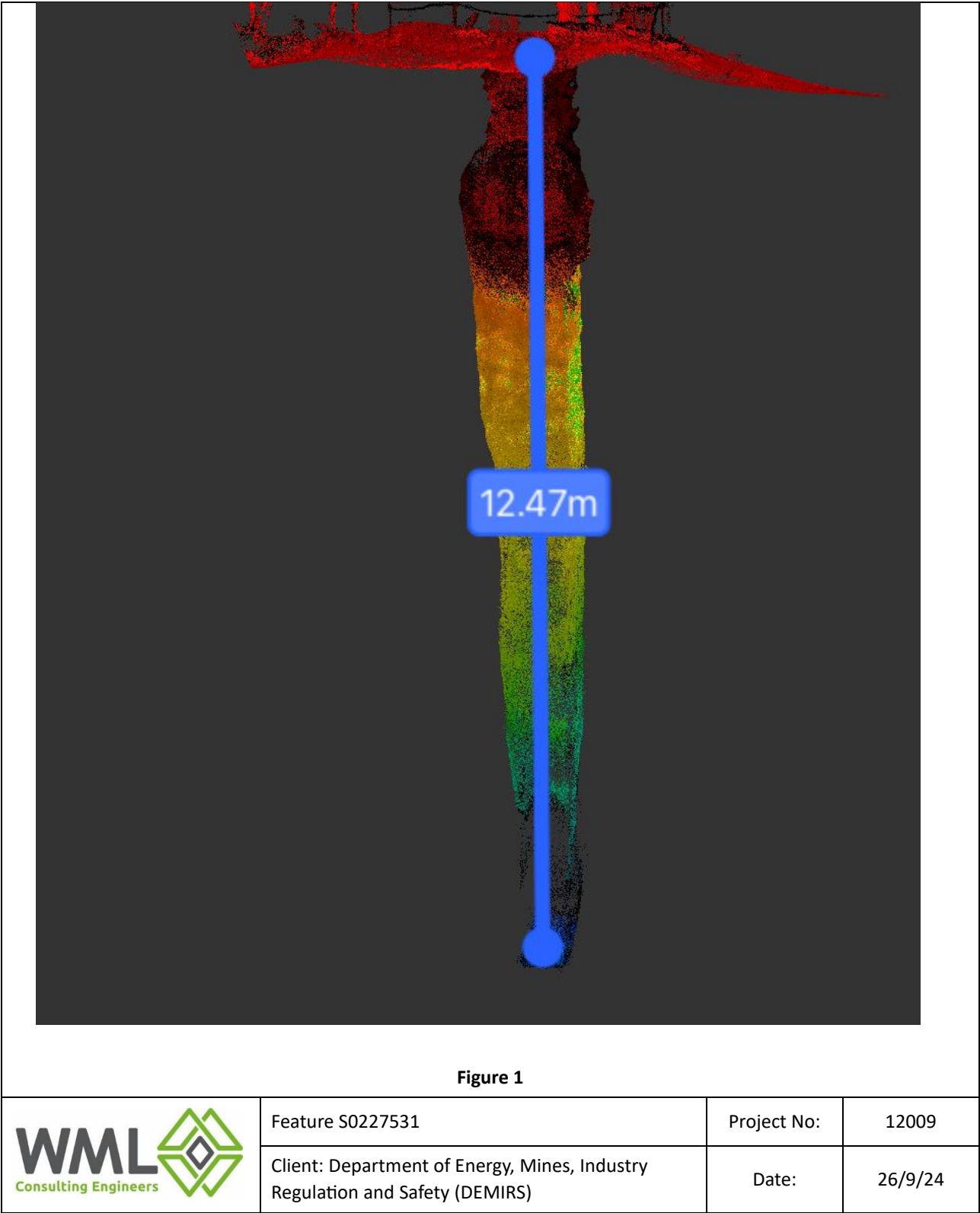
PHOTOGRAPHS



Figure 1

	Feature S0227531	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS



FEATURE S0227532

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662839 Longitude: 116.315410	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.6 x 0.4 x 12.5 Approximate Volume (m³): 8 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small trees surround the feature. The vegetation is denser to the south of the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular vertical shaft feature. Soil was present in base and a very small spoil pile surrounds the opening. The 3D LiDAR scans did not suggest the presence of any lateral workings in the shaft. DCP testing was undertaken on the ground surface adjacent to the shaft and indicated the surface is reasonably firm.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.2% O₂: 20.8.0% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Cemented pizolithic gravels from the ground surface. This material is more cemented and less crumbly at this location that features S0227532 % S0227531.	Mirafi soil cone backfill plug ? If planking, remove spoil pile and top 0.6 m.

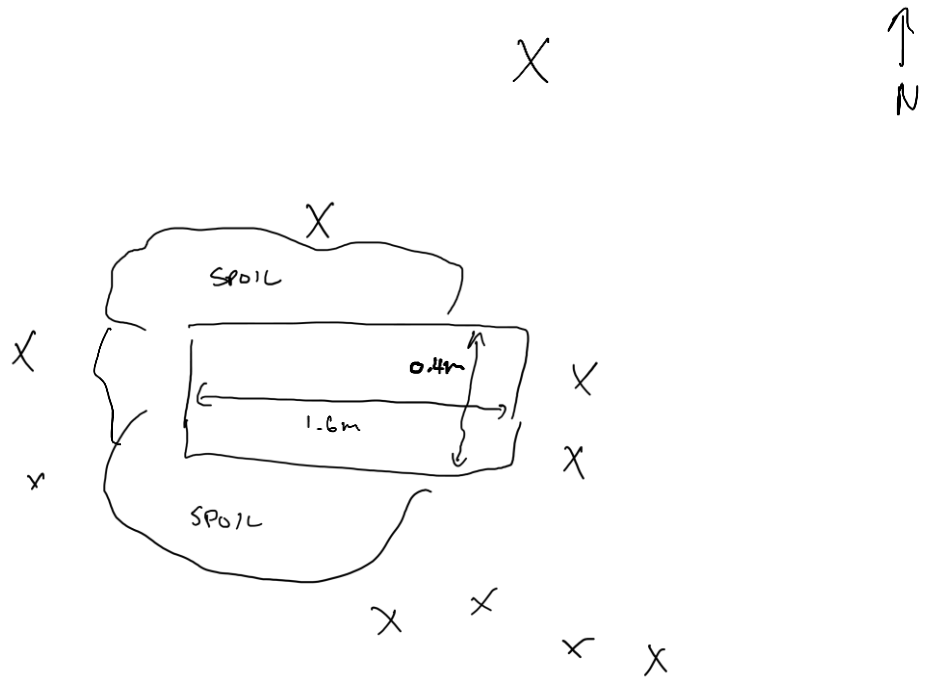
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	3			
0.15 – 0.30	12			
0.30 – 0.45	R			
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0227532	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

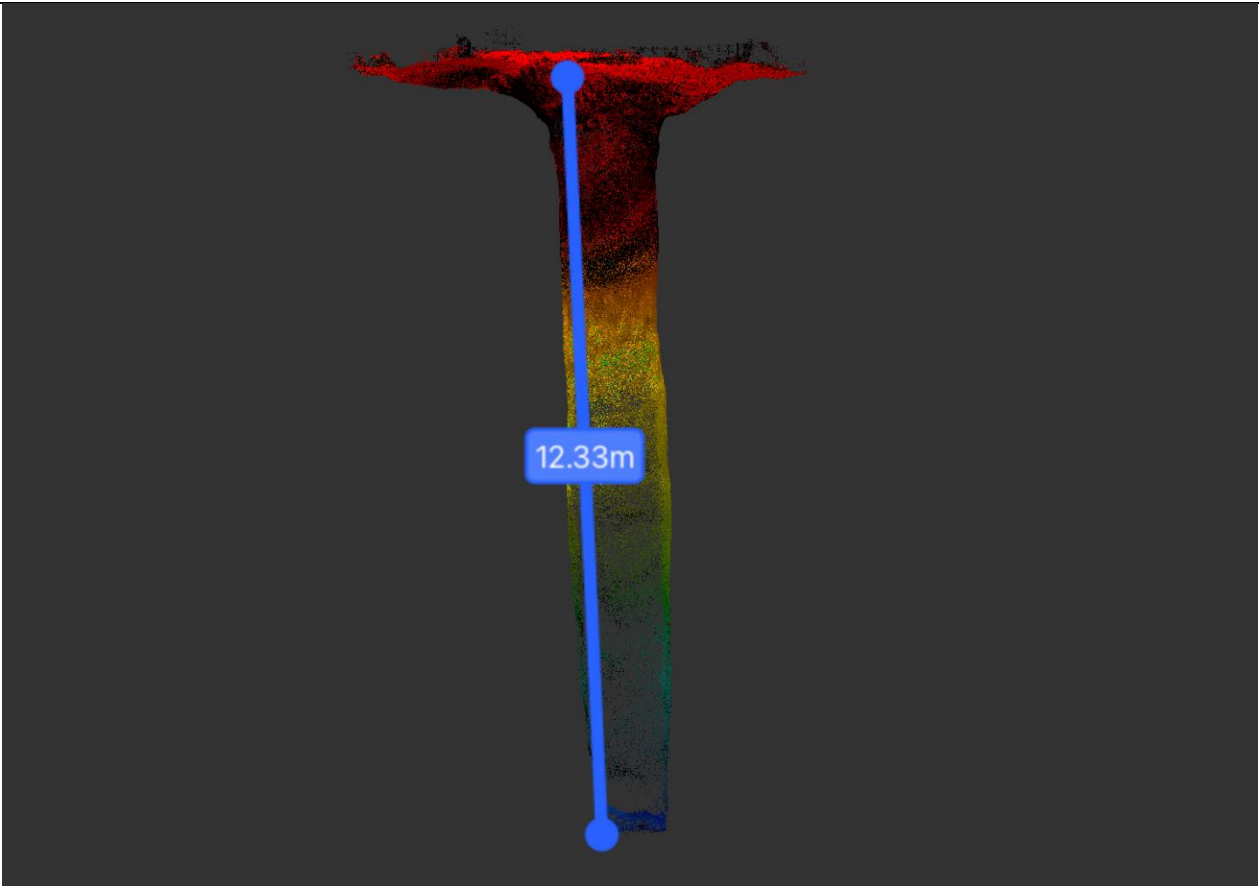



Figure 1

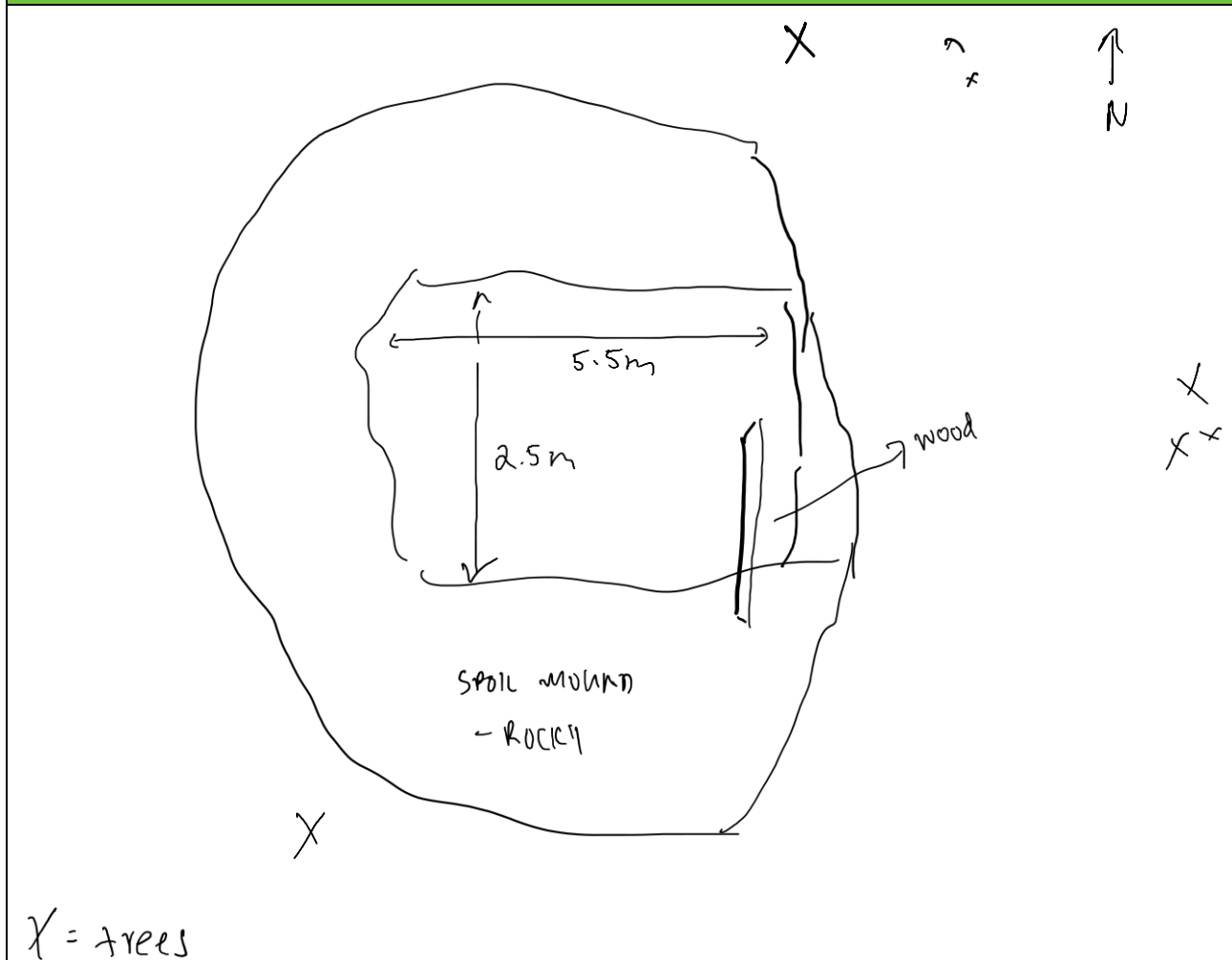
	Feature S0227532	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229117

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.657699 Longitude: 116.315470	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.6 x 1.07 x 8.9 Approximate Volume (m³): 25 Depth to groundwater (m): not encountered. Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by some grass the surroundings area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
Square vertical shaft feature. Soil and tin metal are present in the base of the feature. A reasonably large spoil pile surrounds the opening. The feature is situated to the west of the road. DCP testing was not undertaken around the feature due to presence of competent rock in the walls of the feature from the ground surface. The LiDAR scans did not indicate presence of lateral workings in the feature.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.1% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Reasonably good quality and competent rock mass. Moderately weathered. Near vertical rock walls that are jagged.	Concrete cone plug ?

Sketch of Feature:




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229117	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

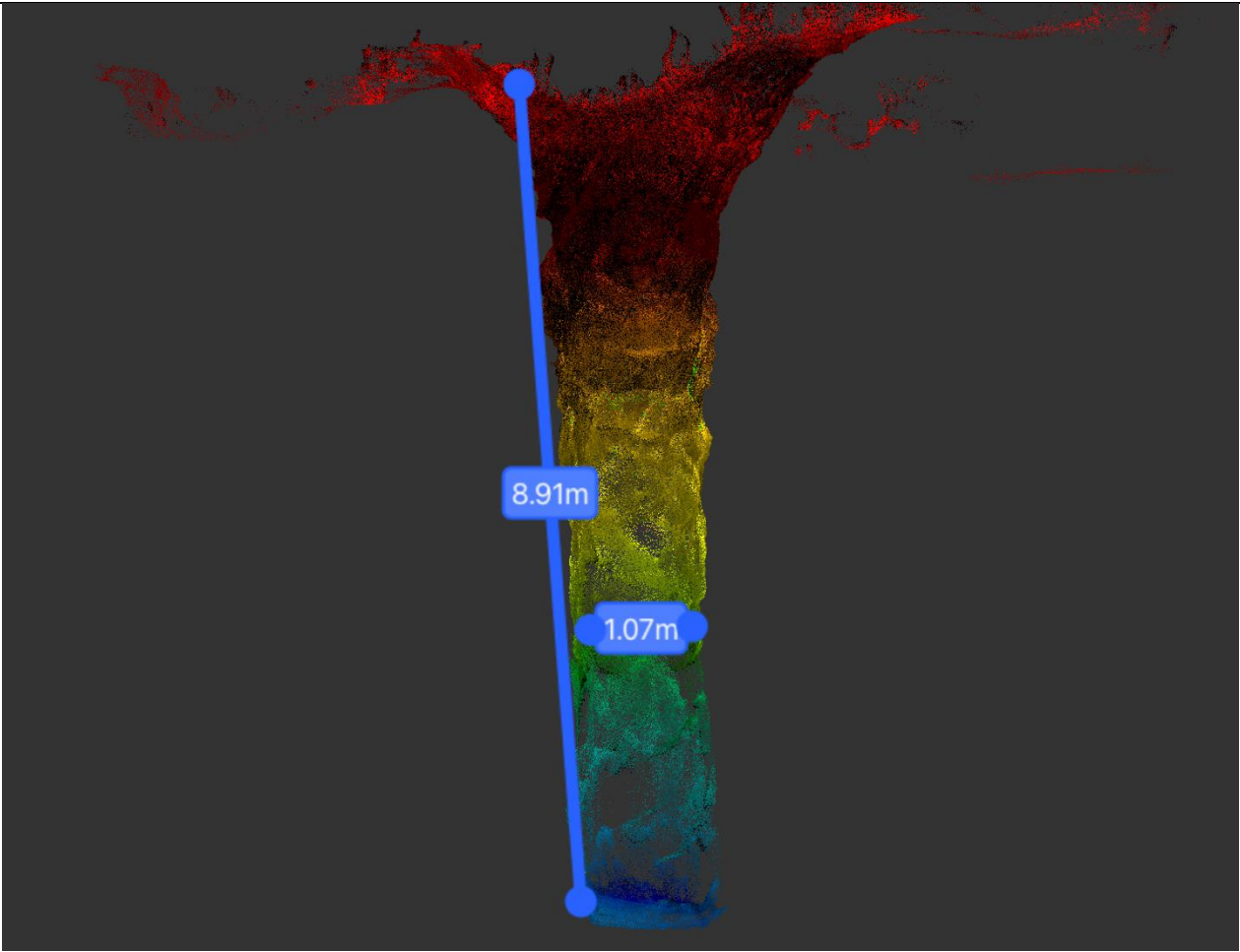



Figure 1

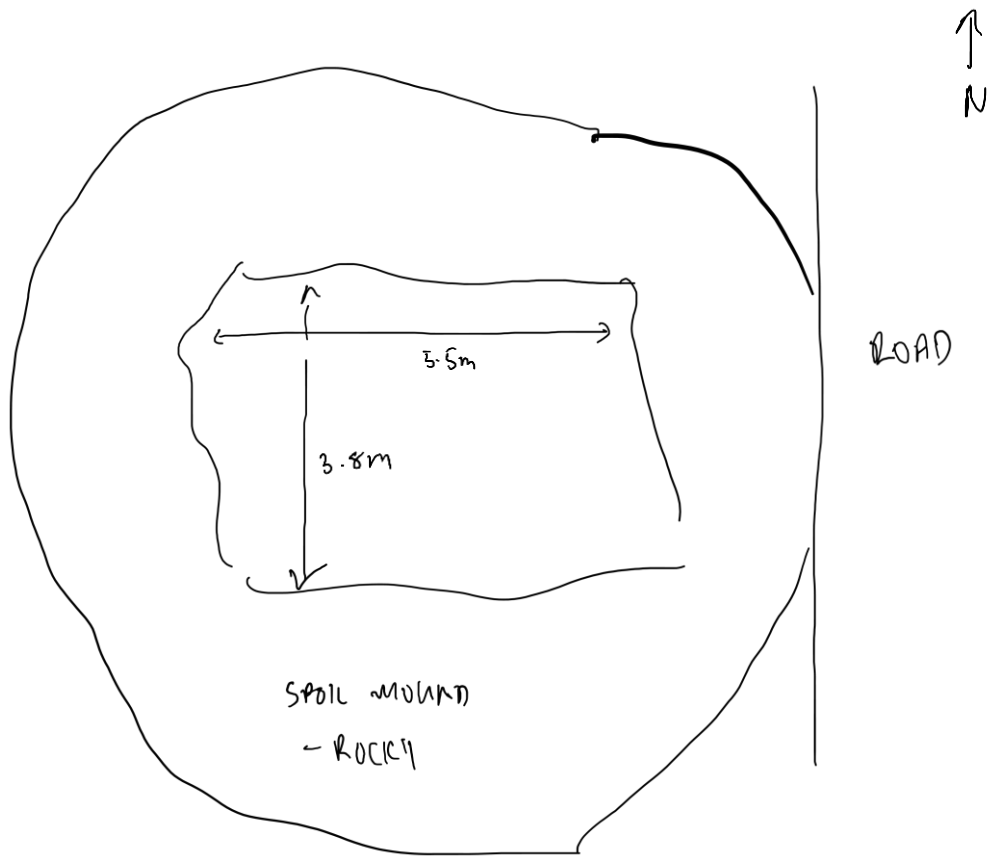
	Feature S0229117	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229118

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658919 Longitude: 116.315569	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.8 x 3.8 x 13 Volume (m³): 89 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by some grass, and the surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
Vertical shaft feature. There exists potential for a false floor at depth as it sounded like tin in the base. A large spoil pile surrounds the opening. The feature is situated to the west of the road. The 3D LiDAR scans did not indicate presence of lateral workings. DCP testing was not undertaken around the feature due to presence of highly weathered rock as evidenced by the walls of the feature from the ground surface.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.8% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass and reasonably competent. Highly weathered rock, that is jagged and near vertical rock walls.	Concrete cone plug.

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229118	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

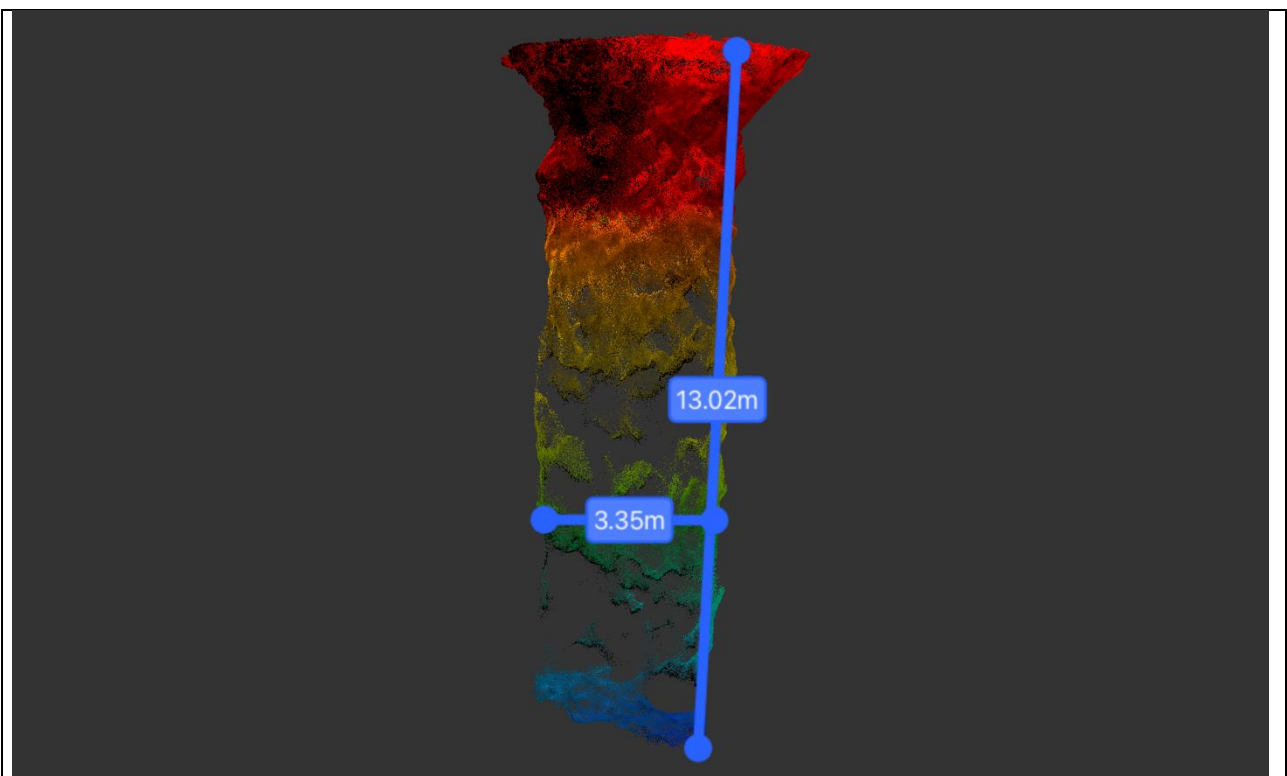


Figure 1

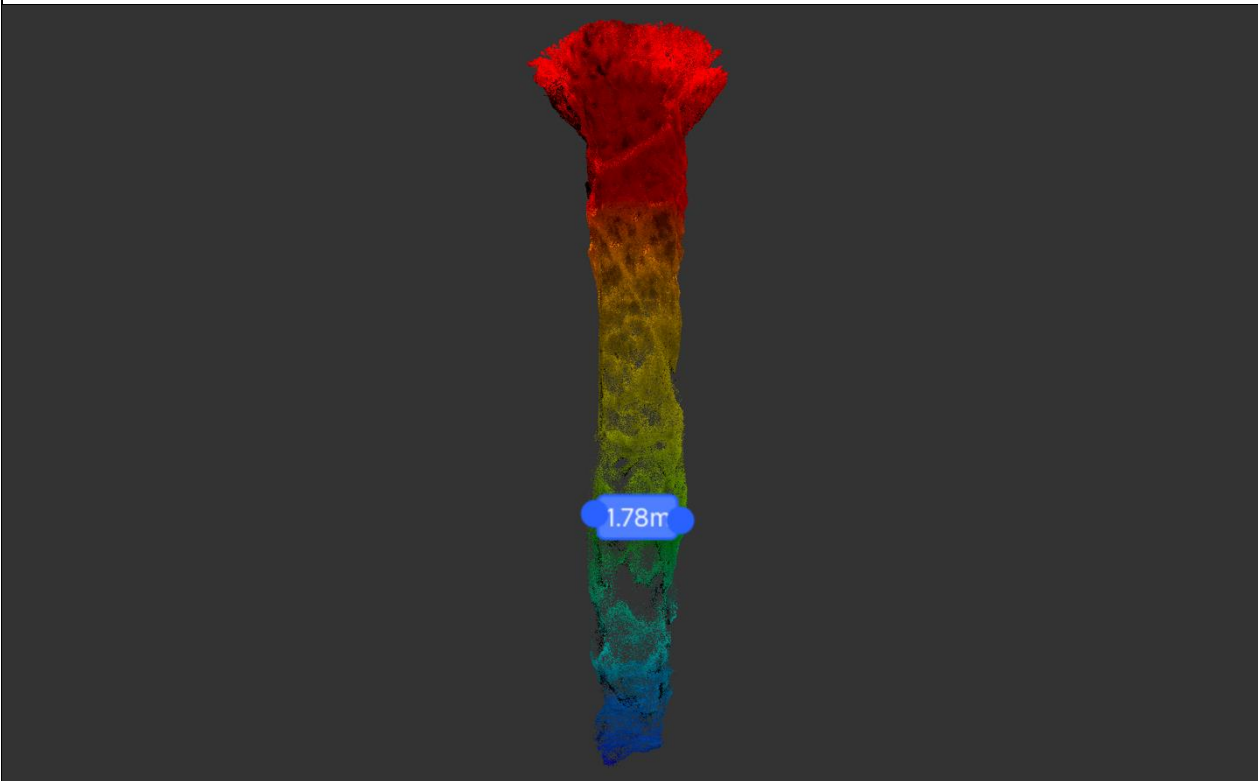



Figure 2

	Feature S0229118	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229157

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662700 Longitude: 116.316109	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.7 x 0.6 x 11 (to water level) likely deeper. Approximate Volume (m³): 10-15 Depth to groundwater (m): 11 m Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and dense vegetation in the form of small shrubs and small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular vertical shaft feature. Water was encountered in the base. A large spoil pile surrounds the opening. LiDAR scanned to 12 m deep however, likely much deeper. The depth of the feature below the groundwater will be measured during the next phase of works. No evidence of lateral workings was detected. DCP testing around the surface of the feature indicate the ground conditions are relatively firm.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.8% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor crumbly soil like rock mass for top 1 m overlying very poor quality rock mass. Highly weathered. Near vertical walls.	Concrete cone plug? If planking, remove spoil pile and top 1 m if crumbly rock material. Or backfill with large rocks over the groundwater and then spoil material and mine waste rock from gullewa mine?

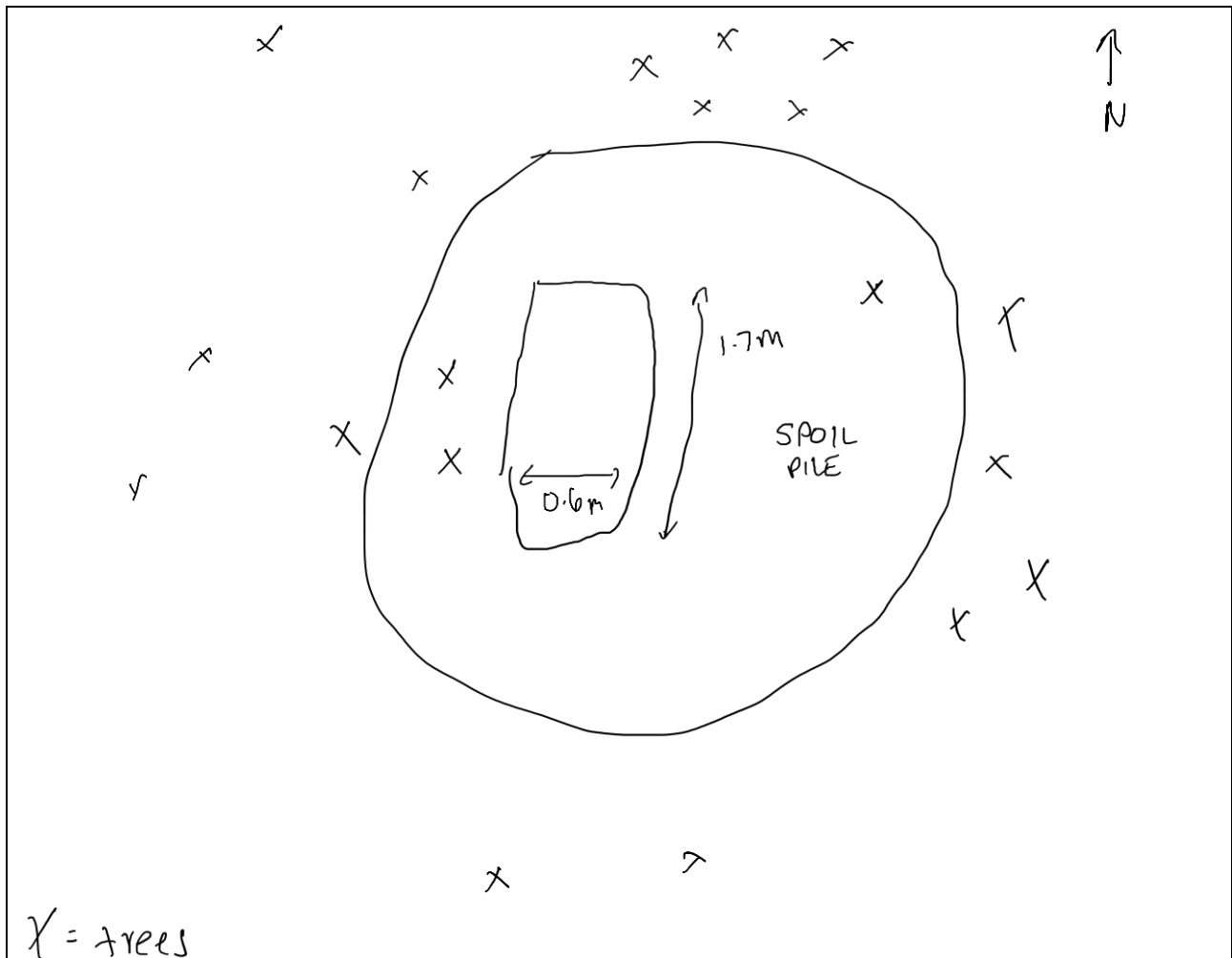
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	12			
0.15 – 0.30	28			
0.30 – 0.45	R			
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229157	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

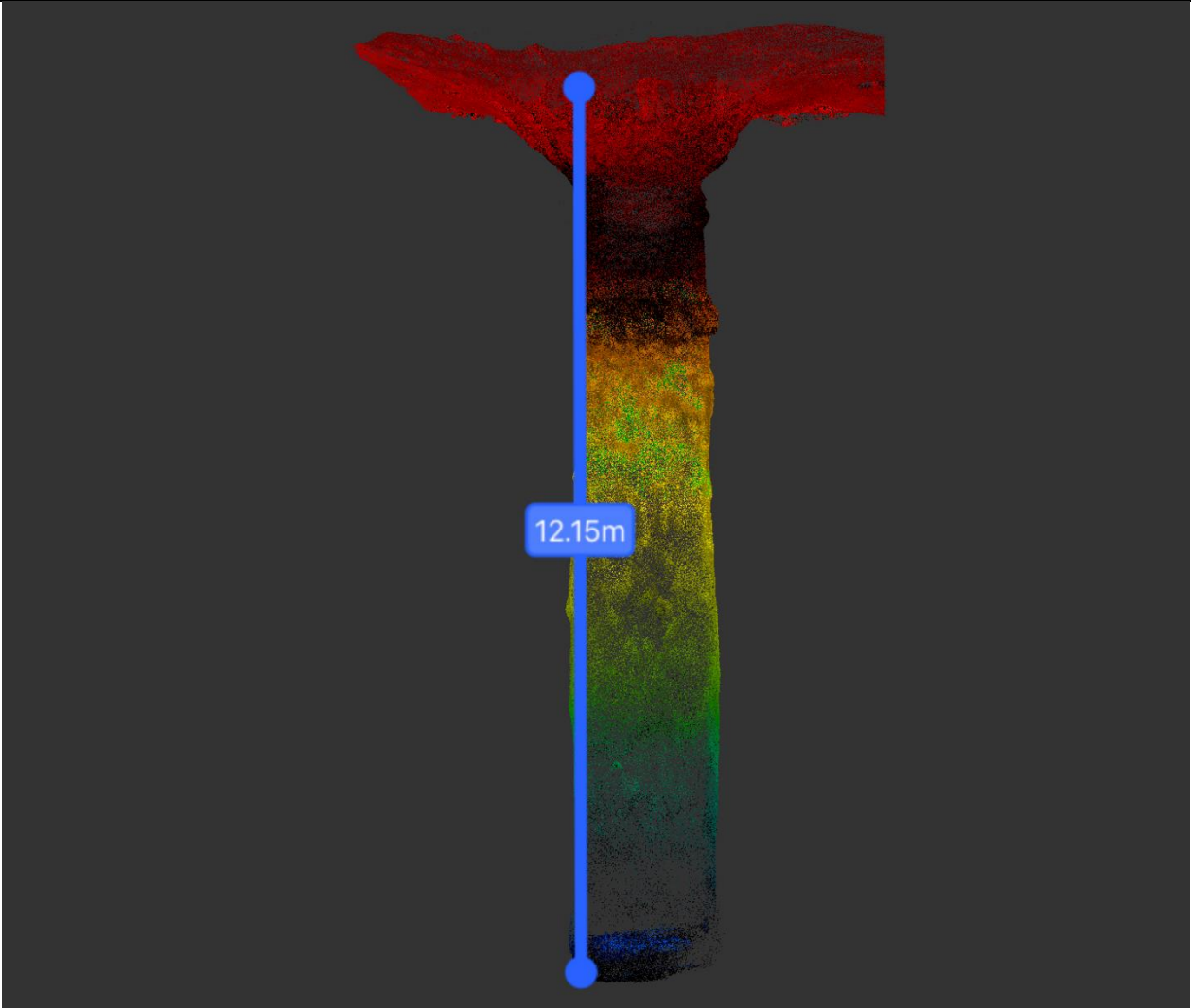



Figure 1

	Feature S0229157	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

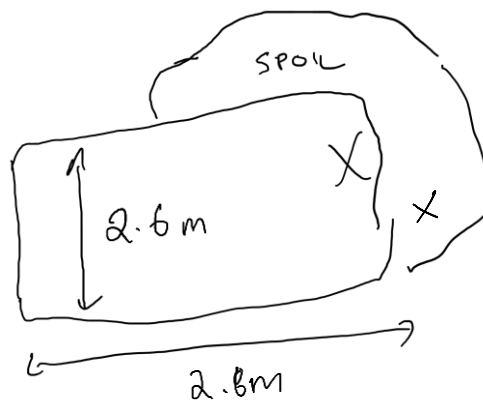
FEATURE S0229158

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.662790 Longitude: 116.315810	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.6 x 2.8 x 8.5 Approximate Volume (m³): 20-25 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on the middle of a slope; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and dense vegetation comprising small trees surround the feature.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular shaft which is near vertical. Soil was observed in the base of the feature. A small spoil pile surrounds the opening. Metal wire fencing was covering the opening. As a result the LiDAR scan undertaken from the top of the wire grating. It is recommended the wire be removed to facilitate a down hole scan to evaluate the feature for potential drives and rock mass quality. It is unknown whether drives exist as the LiDAR scan had some missing data gaps at the base which should be explored if possible. The feature is situated adjacent to the road (west).	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor crumbly soil like rock mass. Extremely weathered rock and cemented lateritic soils near the surface. Near vertical walls.	Mirafi cone plug? Ground unsuitable for founding planks or capping solutions.

Sketch of Feature:

ROAD




X = trees

PHOTOGRAPHS



Figure 1

	Feature S0229158	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

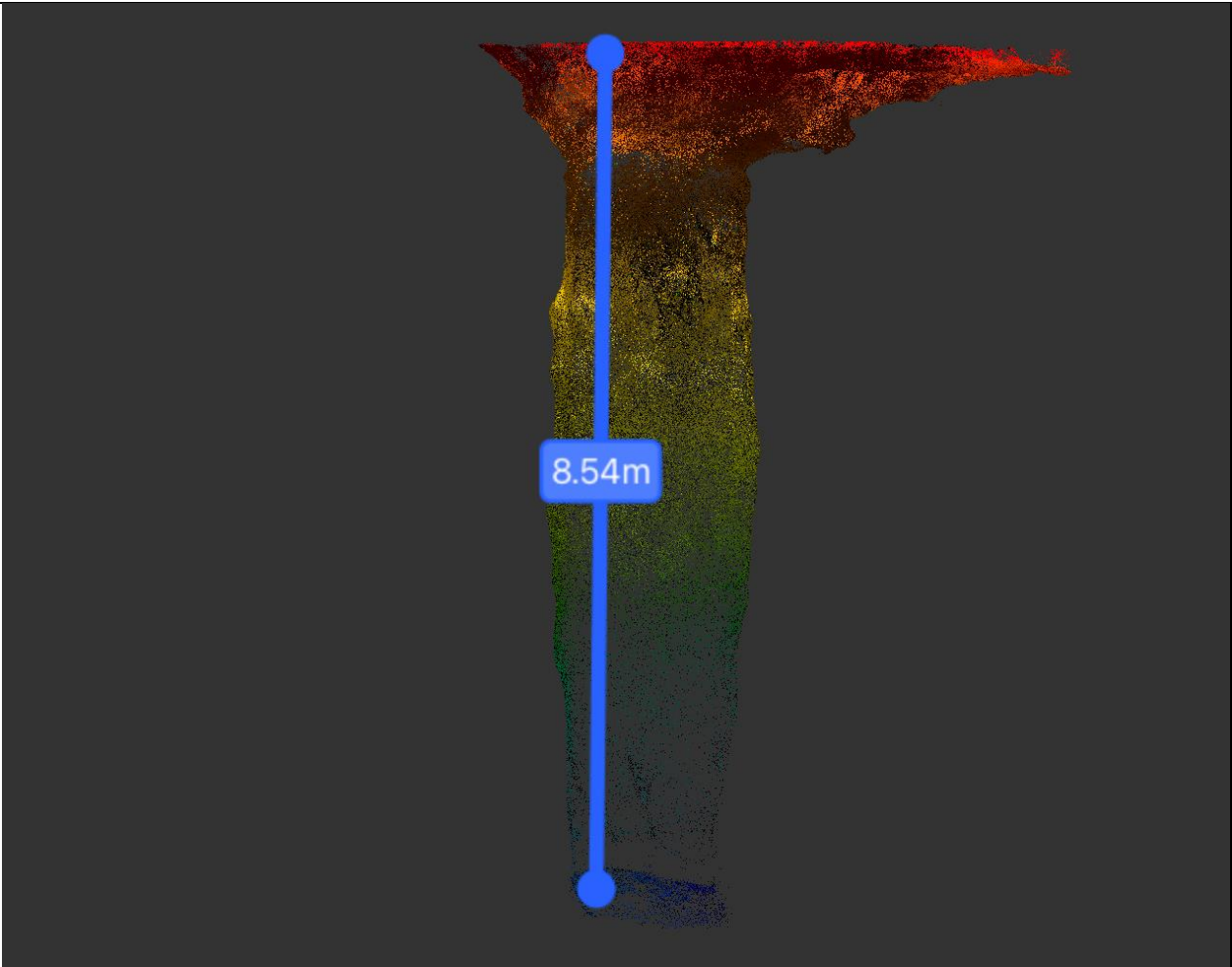



Figure 1

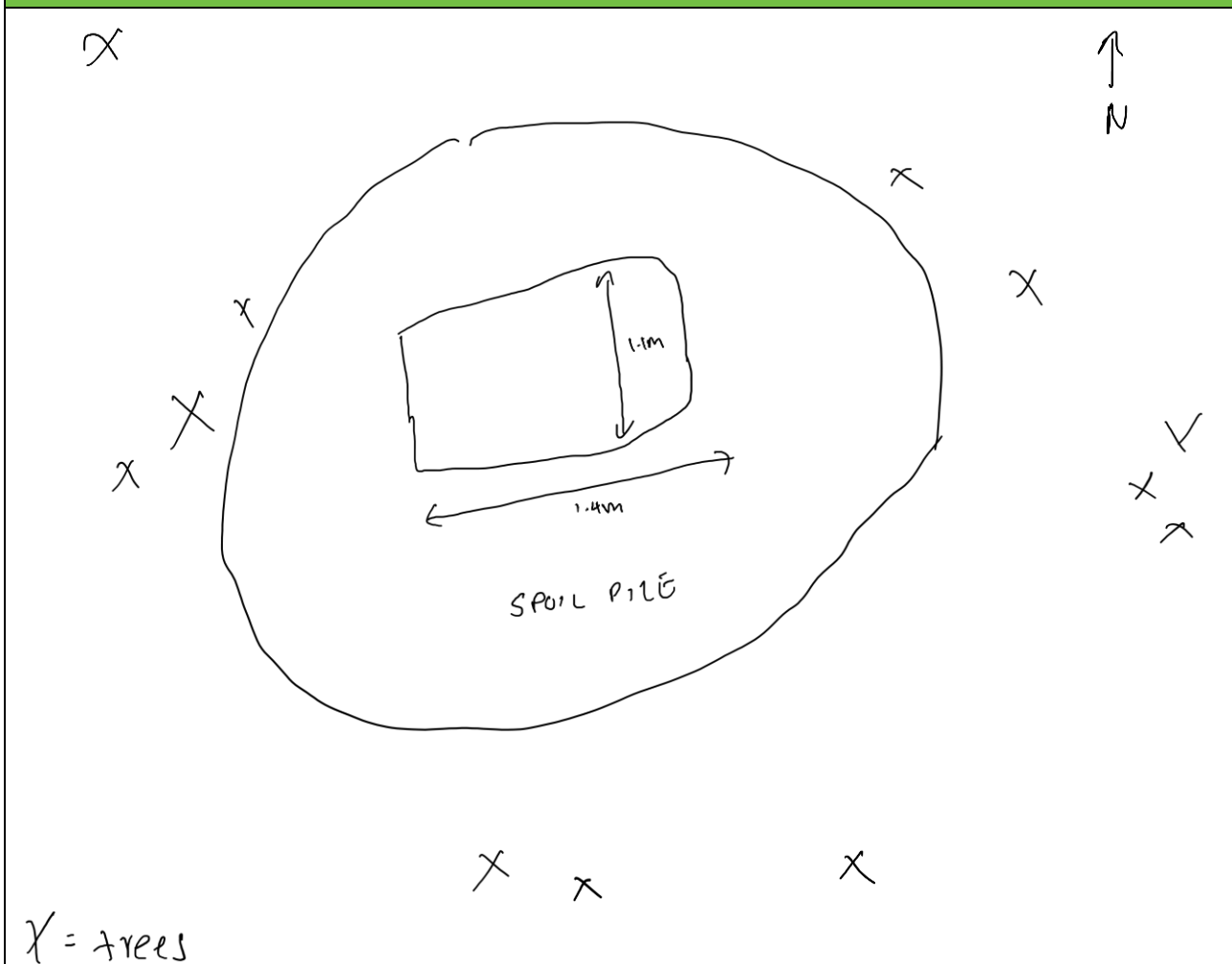
	Feature S0229158	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229159

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.663239 Longitude: 116.316050	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.4 x 1.1 x 10.5 Approximate Volume (m³): 15-18 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small trees surround the feature. The vegetation is denser in the southern portion of the site.
Description / comments / observations:	Noxious / flammable gas readings:
The feature is a vertical rectangular shaft. Soil was observed in base of the feature. A small spoil pile surrounds the opening. The 3D LiDAR scans showed blind spots at the base, tending to the west, which strongly indicate the presence of lateral workings. These working are tending south west and west and are 0.5 m x 0.5 m in size. However, their extents are currently unknown. This feature will be rescanned if further on site investigation is undertaken to determine the extent of the drives.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor crumbly soil like rock mass. Extremely weathered rock. Near vertical walls.	Mirafi cone plug? Ground is unsuitable for founding planks or capping solutions.


Sketch of Feature:



PHOTOGRAPHS



Figure 1

	Feature S0229159	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

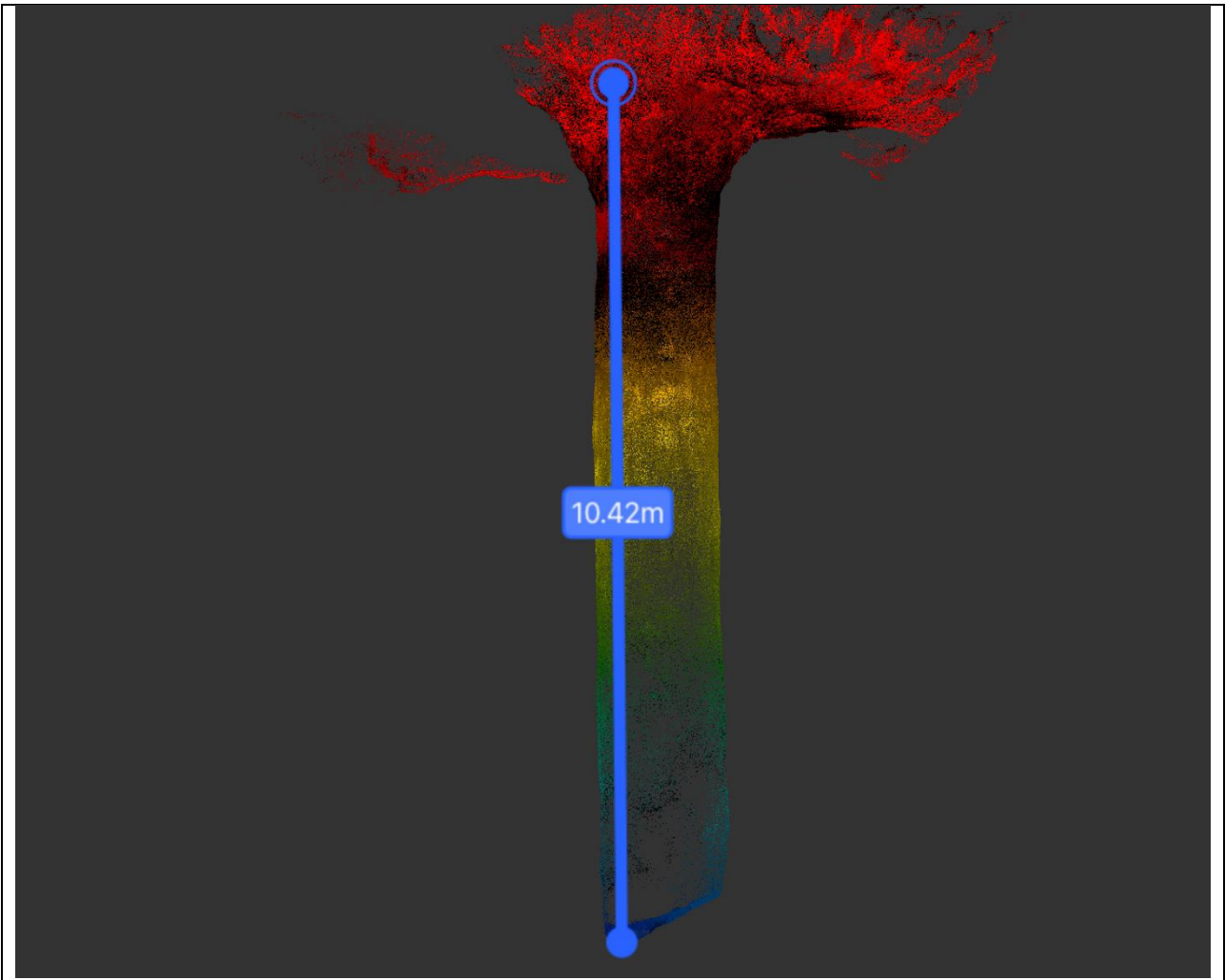



Figure 1

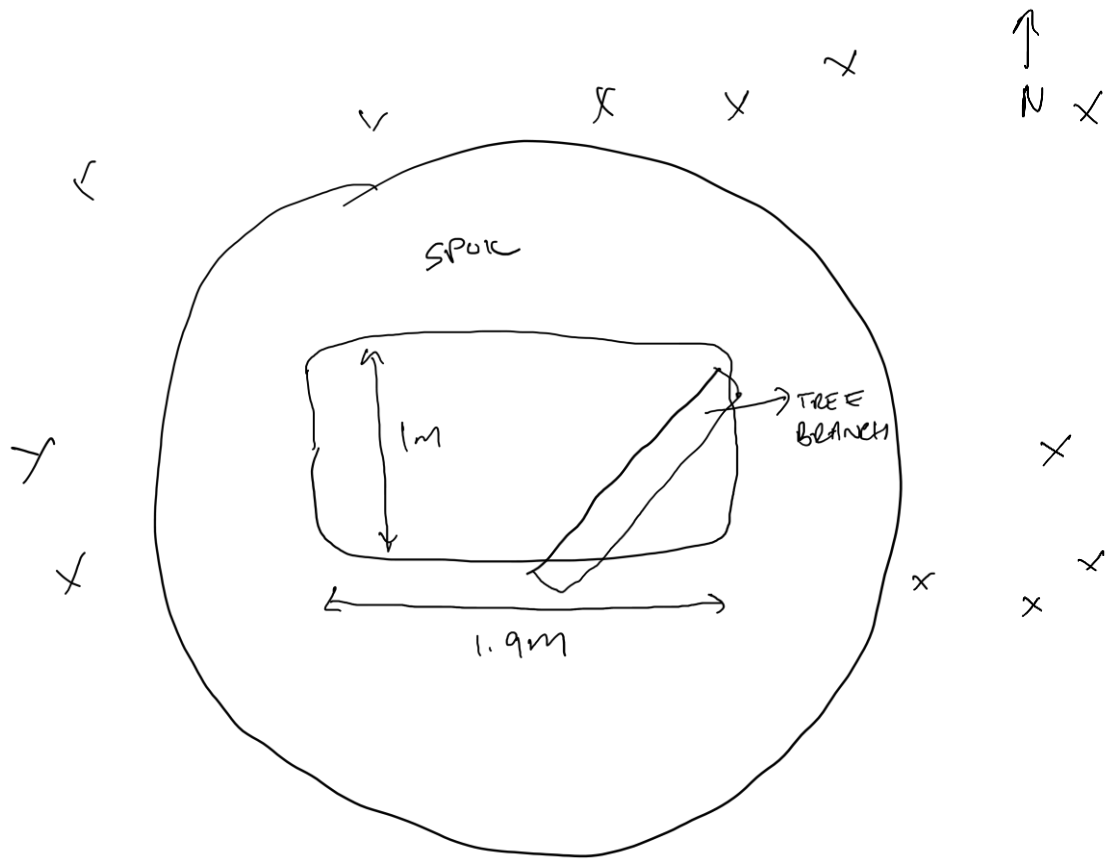
	Feature S0229159	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229160

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.663200 Longitude: 116.316239	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1 x 1.9 x 9.3 Volume (m³): 15-18 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned in a high and flat area; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small trees surround the feature. This portion of the site comprises denser vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
The feature is a vertical rectangular shaft. Soil was observed in base of the feature. A small spoil pile surrounds the opening. The 3D LiDAR scans showed blind spots at the base, tending to the west, which strongly indicate the presence of lateral workings and potential connectivity to S0229159. These working are approximately 0.5 m x 0.5 m in size. However, their extents are currently unknown. This feature will be rescanned if further on site investigation is undertaken to determine the extent of the drives.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor soil like rock mass. Extremely weathered. Near vertical walls. Approximately 2 m of gravelly lateritic soils overlying the rock.	Mirafi cone plug ?

Sketch of Feature:




x = trees

PHOTOGRAPHS



Figure 1

	Feature S0229160	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

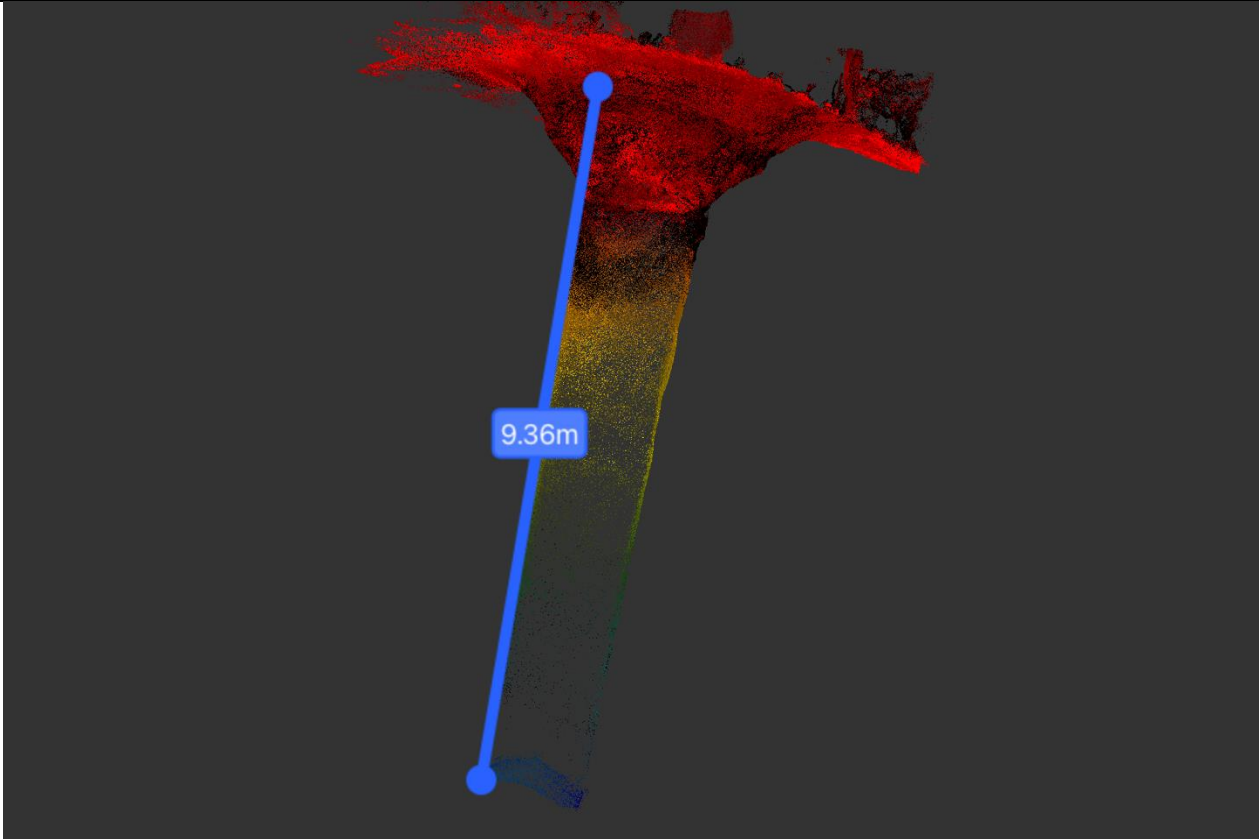



Figure 1

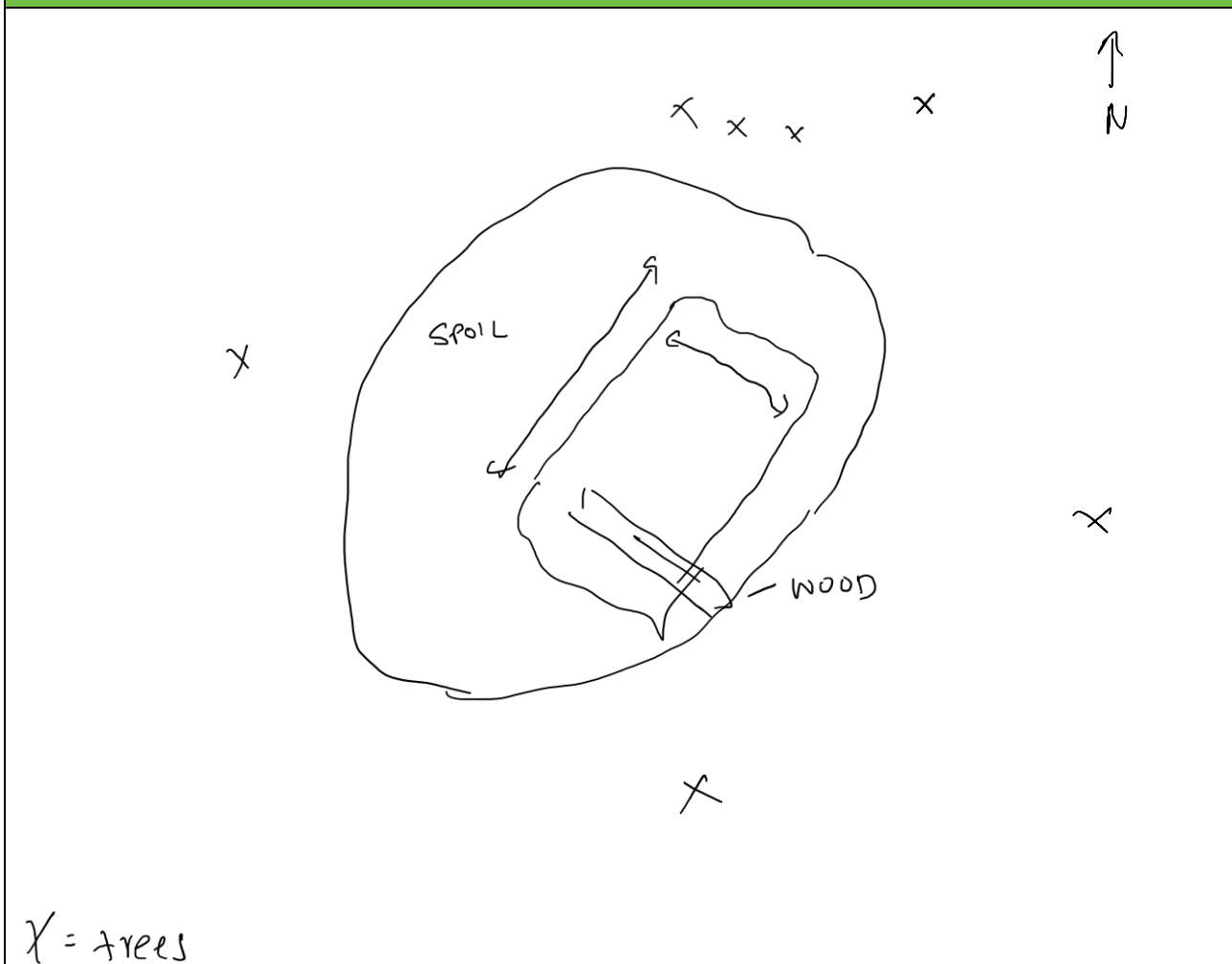
	Feature S0329160	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229161

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.663720 Longitude: 116.316030	Disturbance: no Geophysical: no
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 1.0 x 1.8 x 8.1 Approximate Volume (m³): 15 Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on the middle of a slope; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and small trees surround the feature. The vegetation is relatively sparse in the surrounding area.
Description / comments / observations:	Noxious / flammable gas readings:
Rectangular shaft feature which is vertical. Soil was noted in base of the feature. A small spoil pile surrounds the opening. LiDAR scan undertaken did not detect presence or any evidence of lateral workings in the base of the shaft.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.6% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Very poor soil like rock mass. Extremely weathered. Near vertical rock walls. There is approximately 1 m of crumbly lateritic soils overlying very poor quality rock mass.	Mirafi cone plug?

Sketch of Feature:




PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229161	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

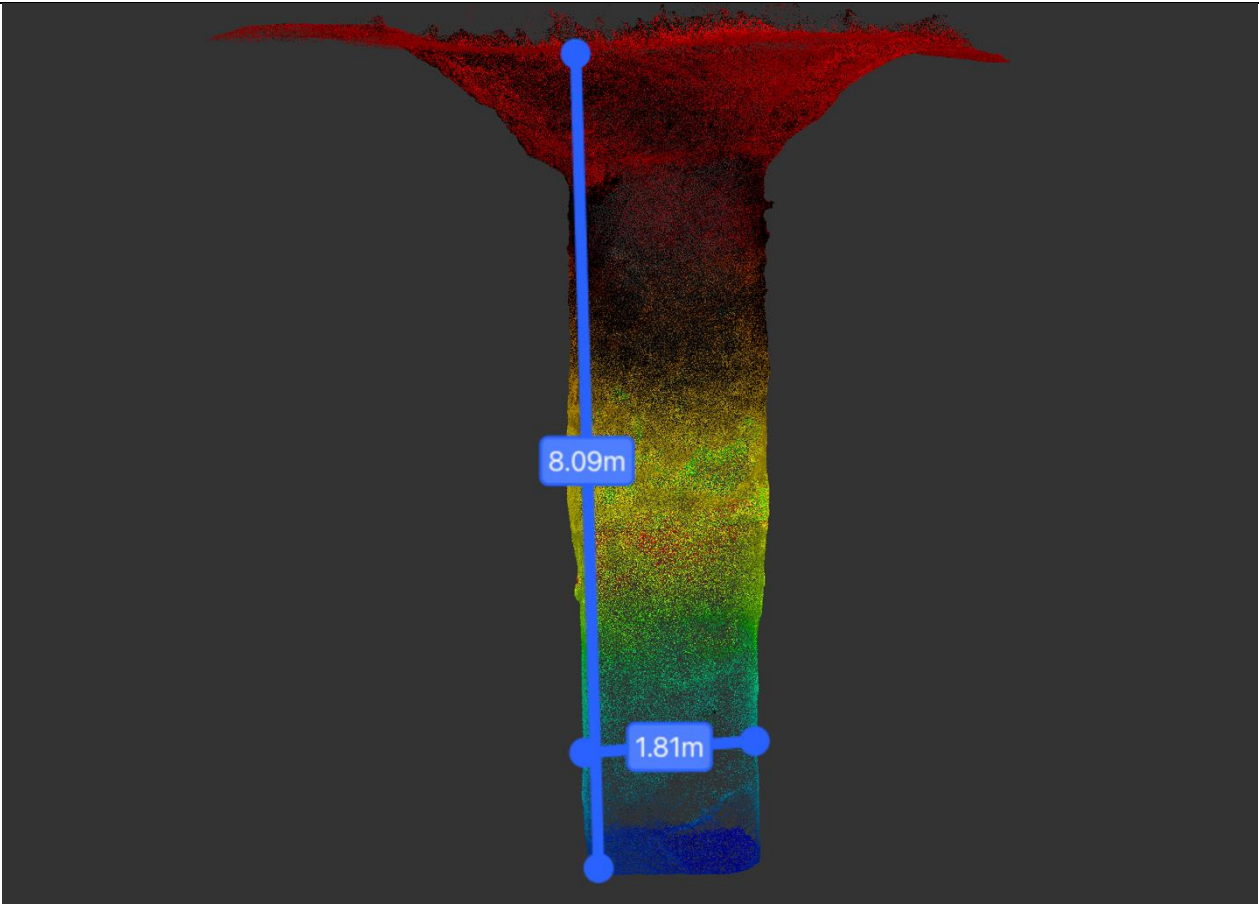



Figure 1

	Feature S0229161	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24



CATEGORY 5



FEATURE S0229133

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.6587 Longitude: 116.3165	Disturbance: no Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 2.1 x 1.4 x 13.5 Approximate Volume (m³): 35 Depth to groundwater (m): small puddle on western side encountered at 13.5 m. Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and the surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
Vertical square shaft. There was some standing water to the western side of the shaft in the base in the form of a small puddle, however, the remainder of the shaft base was dry. Rocky material fills the base on the eastern side of the feature. The LiDAR scans showed a drive tending south to link with the strike of features just south of S0229133 at 6 m bgl and is 1.2 m wide. Like to have been a crosscut T section ventilation shaft. DCP testing in the area suggests the surrounding ground surface is hard.	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Near vertical rock walls.	Concrete cone plug or planking solution.

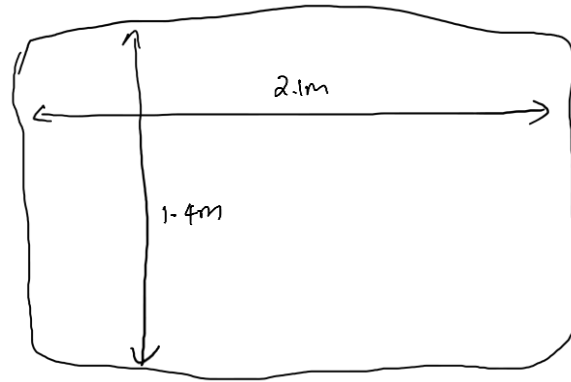
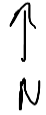
SUMMARY OF FIELDWORK

Dynamic Cone Penetrometer (DCP) Testing:

See approximate test locations noted on the sketch below.

Depth (m)	Blows / 150 mm			
	DCP-1	DCP-2	DCP-3	DCP-4
0.00 – 0.15	R			
0.15 – 0.30				
0.30 – 0.45				
0.45 – 0.60				
0.60 – 0.75				
0.75 – 0.90				
0.90 – 1.05				
1.05 – 1.20				
1.20 – 1.35				
1.35 – 1.50				
1.50 – 1.65				
1.65 – 1.80				
1.80 – 1.95				
1.95 – 2.10				

Sketch of Feature:



feature
132

feature
131

X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229133	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

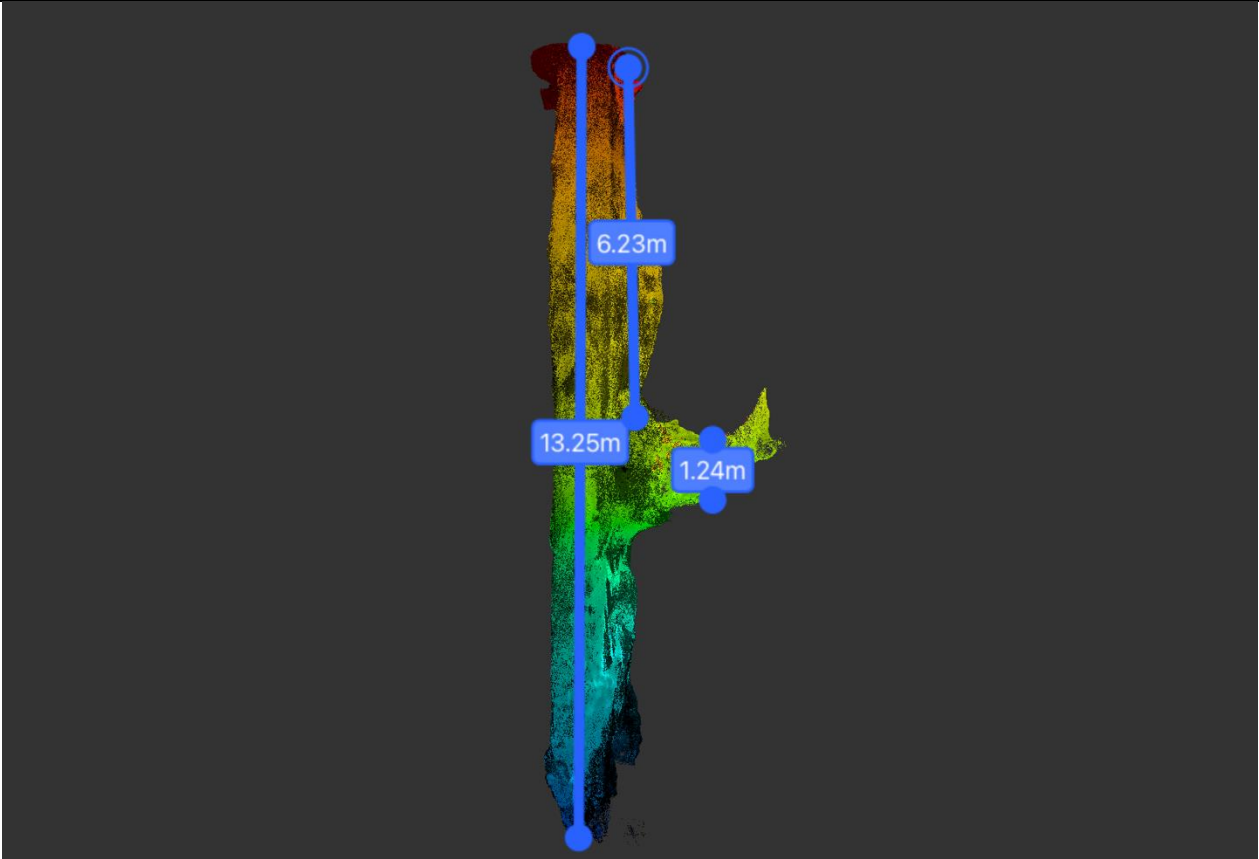



Figure 1

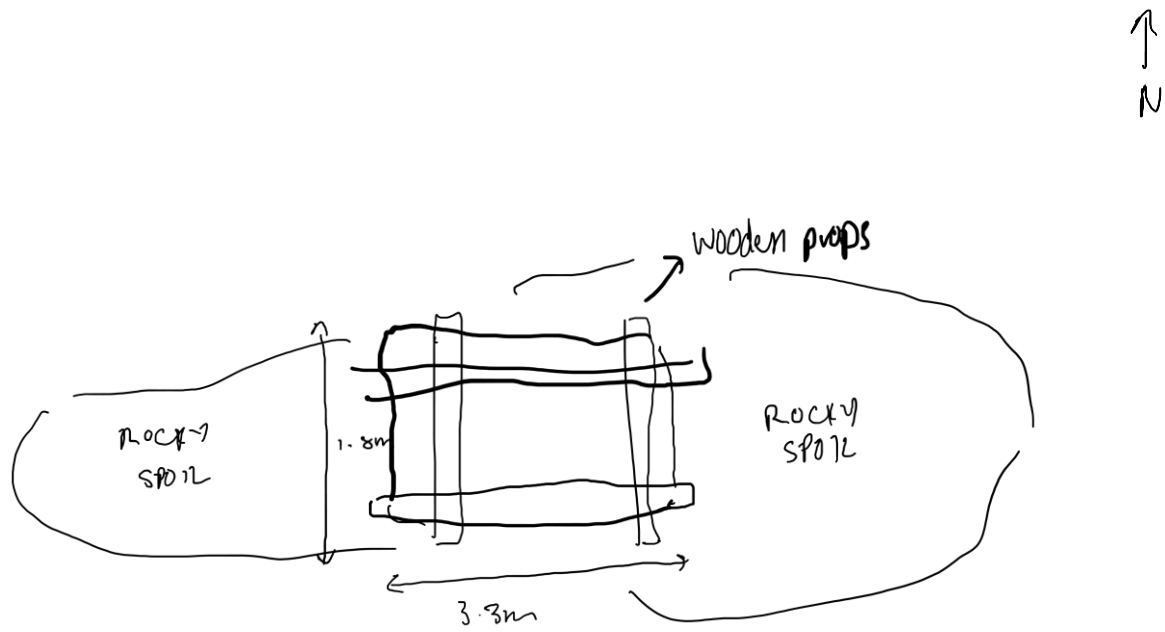
	Feature S0229133	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S0229136

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658410 Longitude: 116.316199	Disturbance: no Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 3.3 x 1.8 x 13.5 (to water level) Approximate Volume (m³): 80 (to the water level) Depth to groundwater (m): 13.5 m. Hydrological Features: The feature is positioned high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass, and the surrounding area is relatively free of vegetation.
Description / comments / observations:	Noxious / flammable gas readings:
<p>The feature exists as an almost shaft oriented at approximately 60 degrees east.</p> <p>The 3D LiDAR scans suggested the feature is 13.5 m deep, however, the base was partially plugged and obscured and the actual depth is likely far greater. The depth of the feature below the encountered water level is also unknown.</p> <p>The LiDAR scan reflected on the water surface. Lateral workings approximately 1-2 m wide at about 3.6 m bgl were identified heading both in both eastern and western directions. This may have been connected to feature S0229119 across the road to the west, however this western drive is now backfilled.</p> <p>The eastern drive may be backfilled, however, due to the orientation of the shaft, LiDAR scanning was unable to determine this with great accuracy.</p> <p>A large spoil pile is situated to the east.</p>	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 4.0% O₂: 20.8% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass, however, more competent than the features further south.	Mirafi plug backfill. No need to collapse the drive.

Sketch of Feature:



X = trees


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S01229136	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

3D LIDAR SCANS

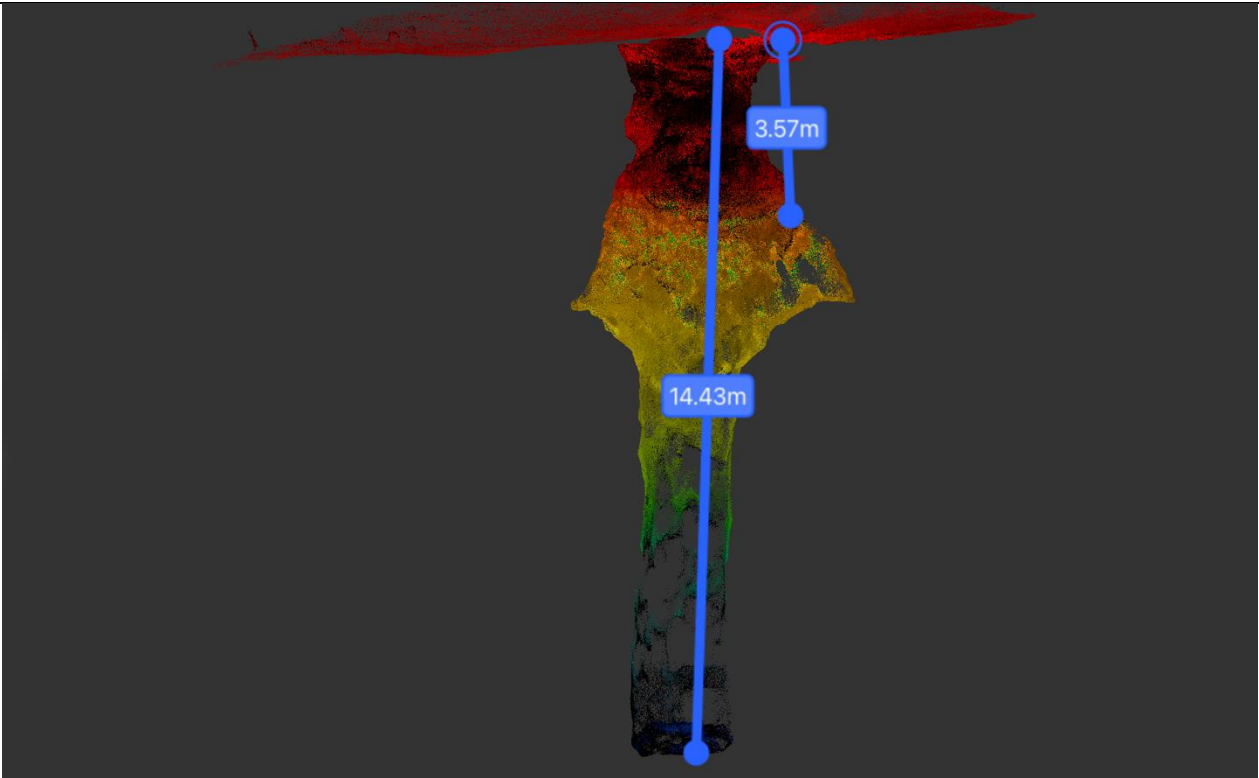



Figure 1

	Feature S01229136	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

FEATURE S01229138

Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SR, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.659050 Longitude: 116.316120	Disturbance: test pits to determine competency of ground for founding concrete planks. Geophysical: yes
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): 5.8 x 2 x 11 Volume (m³): 120-150 (to the visible floor) Depth to groundwater (m): n/a Hydrological Features: The feature is positioned on high and flat ground; surface run-off water is not considered risk for the remediation of this feature. No significant drainage issues were identified.	No evidence of fauna detected within or surrounding the feature. Ground surface covered by grass and weeds. There is very little vegetation surrounding the feature.
Description / comments / observations:	Noxious / flammable gas readings:
<p>The feature is a stope that is held propped open by wooden pillars. There are drives trending east at approximately 4 m bgl. The LiDAR scan showed the depth of the feature to be 11 m however the feature is significantly deeper.</p> <p>A drive may potentially be connected to S0122139 to the south west, however, it may be backfilled now. The eastern drive was likely connected to S0122137 at one stage. The LiDAR scans could not determine whether the drives are backfilled due to blind spots and dipping shape of the feature.</p>	CH₄: 0.0% CO₂: 0.0% H₂S: 0 ppm LEL: 3.6% O₂: 20.7% CO: 0 ppm
Rock mass / soil profile comments:	Preliminary remediation recommendations:
Poor quality rock mass. Near vertical rock walls.	Break out and collapse drive to the east – explosives? And backfill the main stope using mirafi?


PHOTOGRAPHS



Figure 1



Figure 2

	Feature S0229139	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24

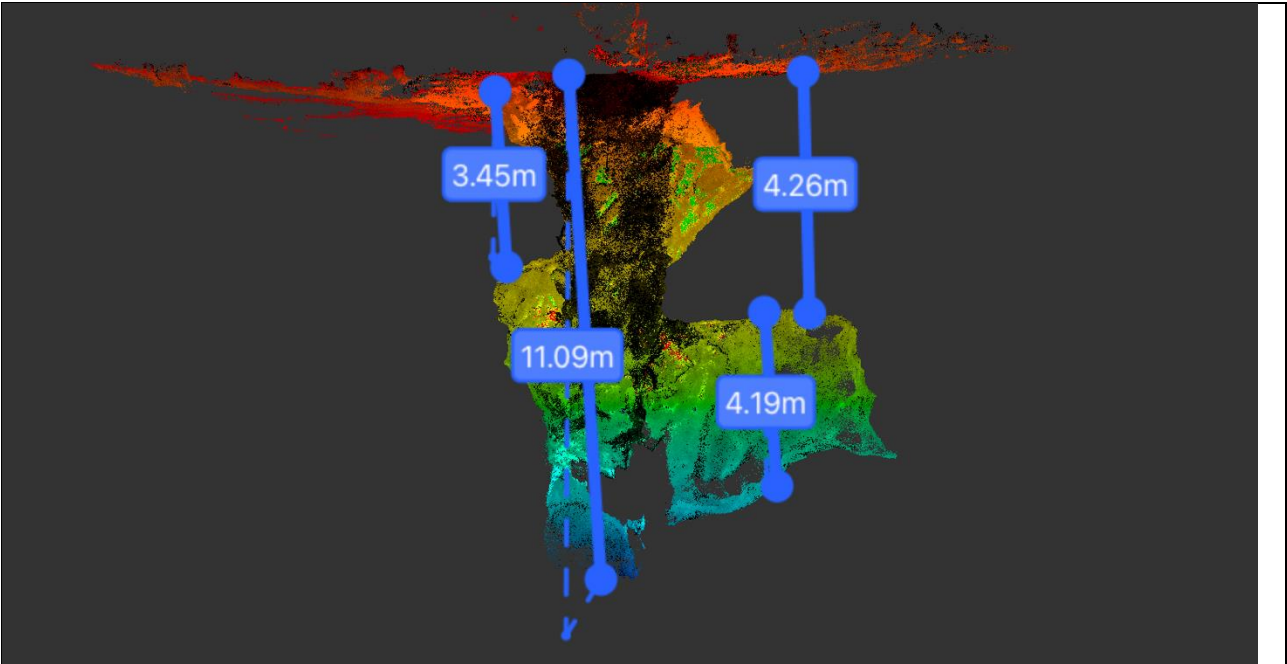


Figure 1

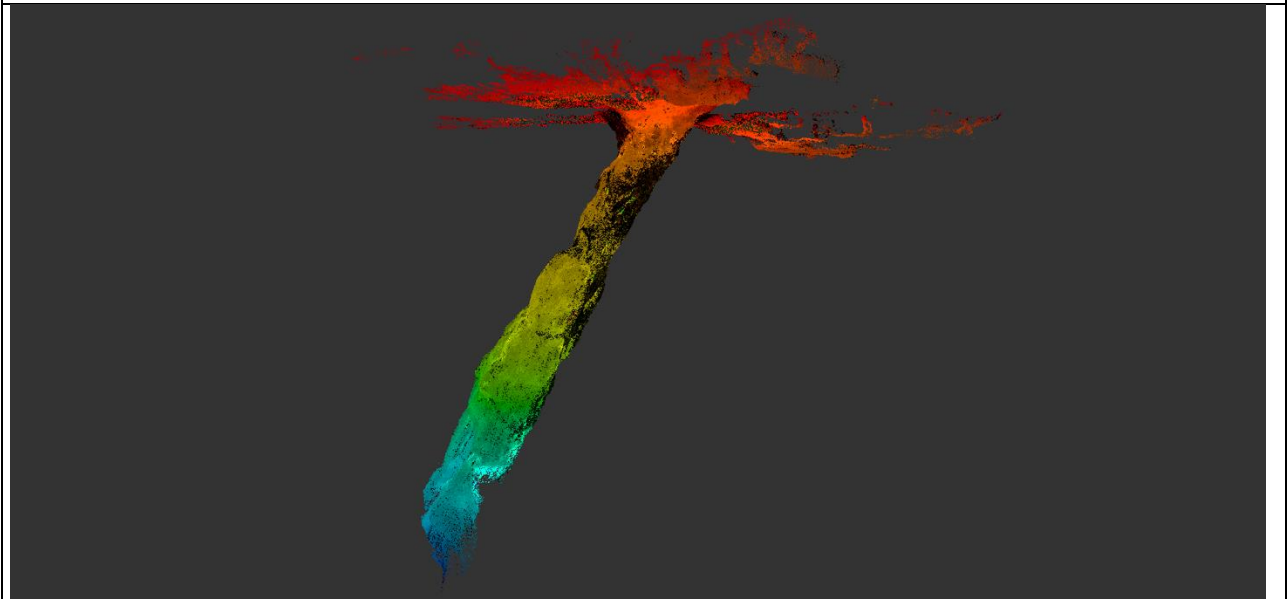



Figure 2

	Feature S0229138	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24



S0229137

FEATURE S0229127


Project Name:	DEMIRS Mine Rehabilitation Void Assessment
Location:	Morawa-Yalgoo Rd, Yalgoo WA
Client:	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)
Project Number:	12009
Date:	26/9/24
Site Personnel:	SM, IG
Weather:	L 11 H 30. Sunny and clear. Light winds.

Coordinates	Recommendations for future investigation:
Latitude: -28.658930 Longitude: 116.316260	N/A
Geometric characteristics:	Flora and fauna:
Approximate Dimensions (L x W x D): N/A Volume (m³): N/A Depth to groundwater (m): N/A Hydrological Features: N/A	N/A
Description / comments / observations:	Noxious / flammable gas readings:
Not a mining feature. Likely are RC pad sumps. Graded flat area. BH ID: 23KSRC006.	N/A
Rock mass / soil profile comments:	Preliminary remediation recommendations:
N/A	Do not rehabilitate.

PHOTOGRAPHS



Figure 1

	Feature S0229137	Project No:	12009
	Client: Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Date:	26/9/24