

CoRE LEARNING FOUNDATION GAMIFYING EARTH SCIENCE

Old as Dirt - 'Uncover'

CREATED BY
CoRE Learning Foundation



Uncover - Overview

CoRE's Old as Dirt is a compilation of games, which are aligned to the Year 8 ACARA Curriculum. Uncover is Game 4 of the compilation, but is not restricted to this year level.

Uncover, can be utilised as a digital textbook. The game addresses:

- The geological exploration for minerals, located deep undercover in the earth's crust. In this game, the focus is on green technology ores such as copper and nickel.
- The whole exploration process is described through twelve different conversations. Each of these conversations can be separately undertaken and they are decided by student vote.
- The twelve different conversations describe the exploration process from its onset, including the identification of prospective land through to community and environmental relations through the Environmental and Social Governance.
- The twelve conversations are led by an NPC (non-playing character) who describes the career(s) associated with the different stages of the exploration process.

The game was designed to highlight the diversity of careers required for the exploration process to locate ore. The exploration process is not just about geology; it also involves a lot of investment in community, environmental and contracting communications and capabilities.

The careers align strongly with the different sequential stages and demonstrate the interdisciplinary nature of STEAM Learning.



Uncover - Conversations

Uncover - Comprises Twelve Conversations and Twelve Careers along the Exploration Process to locate Green Technology minerals undercover.

Conversation	Description	Career
1	Identifying land for exploration	Chief Geologist
2	Lodging Exploration Licences	Tenement Officer
3	Collaboration with First Nations people	First Nations Liaison Officer
4	Plan for Community Liasion	Community Liaison Officer
5	Review environmental concerns	Environmental Scientist
6	Consult with Senior Geologist	Senior Geologist
7	Chat to Exploration Geologist	Exploration Geologist
8	Visit the Geophysicist	Geophysicist
9	Consult the Contracts Manager	Contracts Manager
10	Discussing Hydrogeology	Hydrogeologist
11	Visiting the Extractive Metallurgist	Metallurgist
12	Discuss community partnerships	Community Corporate Manager

Uncover - Game Structure and Operations

The students select the direction of the conversation (between conversations 1 - 12). Figure 1. For this conversation, the 'Talk to the Environmental Scientist - Kelsie has been selected.

Figure 1



The opening page will present (Figure 2)

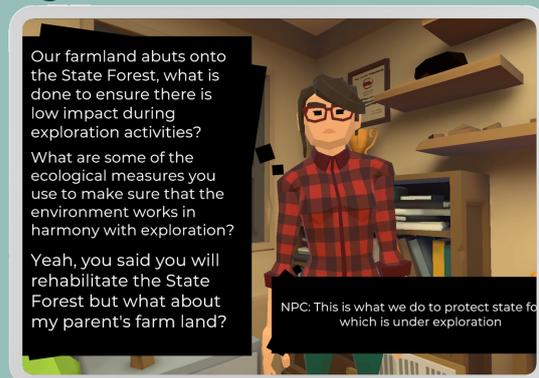
- A greeting presented by a character that defines the career for the specific conversation
- A description that identifies the purpose of the conversation
- A description that elaborates on the objective of the conversation.

Figure 2



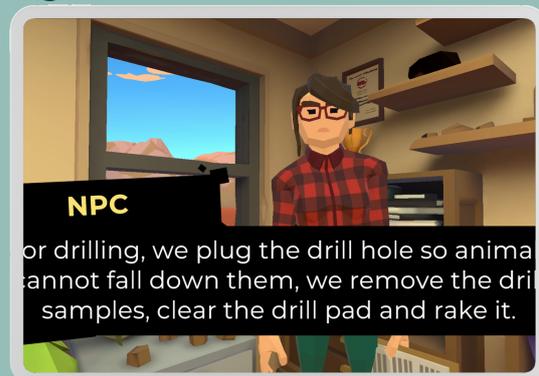
The next page will reveal three separate sub-conversations (topics A, B or C) that the students will vote on, (Figure 3) and follow through to obtain answers.

Figure 3



To continue with this conversation, the third conversation was selected and one of the answers (Figure 4) is presented. During this process, a series of questions related to the topic are asked and the NPC (the career person character) is responsible for the answer.

Figure 4



Uncover - Conversation Structure Tree

This section describes how to read the dialogue in the appendices. The Appendices are attached to demonstrate the content involved in each of the twelve conversations. The NPC is the career person who is answering the questions. As the students select the direction of the conversation, they choose the appropriate questions relevant to and extend the topic (A, B or C) of the conversation.

Greeting (Describes the career)	Hub A (Identifies the conversations purpose)	Hub B (Describes the conversations objective)	This is the opening and defines the conversation
Topic A	Topic B	Topic C	Students choose which topic/pathway to choose

For each topic (A, B, C), there are:

- Students (computer students) ask two preferred or favoured questions (the real students select these options) and two favour or favoured answers from the NPC (Career Character).
- One unfavoured or negative question asked by the students (computer students) (which the real students can select) is answered by the NPC in a positive tone, i.e. turning a negative into a positive. This section aims to dilute and refute misconceptions, particularly those associated with environmental and social governance.

For the above two dot points, this process is coded into the game, the students choose the options. Analysis of the appendices will highlight the content addressed and its sequential nature across Topics A, B and C and between conversations one to twelve.

Kelsie - The Environmental Scientist

Students have voted for the conversation with Kelsie the Environmental Scientist.

Greeting

Hey there! Let's chat. I'm an environmental scientist for the exploration company, so I'm keen to talk all about the natural environment.

Students have vote to decide the topic

Topic A

Right...well our farmland is going to be explored, and it's next to a state forest. How do we make sure the impact on the forest is minimal?

Kelsie A Response

Before we start exploration we have to complete a Conservation Management Plan which needs to be approved by the state Department for Mines. It details everything we'll be doing to protect local bushland.

AQ1

Favoured

So you look at plants and animals...flora and fauna...and waterways or just some of it?

AQ2

Favoured

OK, we have our Conservation Management Plan. What does it need to cover?

AQ3

I've read that parts of the environment are not necessarily included on the internet. If that's the case, what's the point of employing an environmental scientist?

Kelsie Ans-A1

Yep! We consider all plants and animals and waterways that form part of the bush's unique ecosystem. We identify what's there and count how many individuals of different species live there.

Kelsie Ans-A2

Well..lots of things...but water is very important! We measure the quality and quantity of both ground and surface water regularly across the seasons to monitor any changes.

Kelsie Ans-A3

That's not correct. In Australia, we have robust policies to protect the environment, including strict rules on land disturbance, emissions and rehabilitation for miners and explorers.

Hub 1

There's a lot of important things we need to do to protect local bushland when it's part of the sites we're exploring! What do you want to talk about?

Hub 2

This is how we ensure that after exploration any disturbance to local bushland or farm land is rehabilitated.

Topic B

What are some of the measures you use to protect the environment during mineral exploration?

Topic C

Yeah, you said you will rehabilitate the state forest, but what about my parent's farmland?

Kelsie B Response

We even look at the world of fungi, frogs, spiders, microorganisms and tree hollows, to ensure that diseases are not spread, that rare spiders, frogs and microorganisms are classified and that tree hollows are measured and maintained as habitat for marsupials or birds.

Kelsie C Response

We can protect both. During exploration, as part of being granted permission to drill on farmland we will ensure that we rehabilitate the land, restore fences and remove all waste and chemicals.

For Topics B & C

BQ1-3 and CQ1-3 together with Kelsie Ans-B1-3 and Kelsie Ans-C1-3 are repeated in the same format.

Appendix 1 - Uncover Conversation 1

Identifying Land for Exploration - Jill - Chief Geologist

Greeting

Morning, team!
I'm the Chief Geologist for the company. Today we're working to discover new resources. Reckon you can help? I hope so!

Hub 1

We need more mineralised land to explore and uncover to potentially find new nickel or copper orebodies. What factor do you want to discuss first?

Hub 2

Land which is close to road or rail lines, energy sources and water is preferable.

Topic A

Let's chat about accessing geological data and maps which show the appropriate rocks in outcrop. We need ultramafic rocks greenstone belts!

Jill A-Response

Great...so we need to find land which contains ultramafic rocks, either intrusive or extrusive.

AQ1

It's hard to find those...when we look at a map, we can see only a handful of locations coloured purple or green. We know those colours represent Archean ultramafic or mafic rocks...

Jill Ans-A1

This is a good sign. Even if there are only a handful of locations, if it's ultramafic on top, it's bound to be under the ground. It's like the iceberg rule: 9/10 of it is concealed.

AQ2

For some of the outcrops we're looking at, a mining symbol potentially indicates a mineralised prospect. This is a good sign, yeah?

Jill Ans-A2

This is brilliant! This indicates that the old-timers found something worthwhile. Even if it is chrysoprase, a semi-precious gemstone, it suggests that there must have been a nickel source close by to form this unique mineral. Overall, an excellent sign.

AQ3

Our geological map analysis shows a <1% ultramafic or mafic outcrop. We're ready to give up.

Jill Ans-A3

Hmm.. this is not a setback. Some of the best ore bodies ever found have been undercover, so we'll need to use other techniques that help us see below the surface to find them.

Appendix 1 - Uncover Conversation 1

Identifying Land for Exploration - Jill - Chief Geologist

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Hub 1

We need more mineralised land to explore and uncover to potentially find new nickel or copper orebodies. What factor do you want to discuss first?

Hub 2

Land which is close to road or rail lines, energy sources and water is preferable.

Topic B

The land we want to explore...how do we find out if we can get it at...licenses, permits and such?

Jill B-Response

We can access Landtracker and see the tenement activity in the area. That's the best starting point.

BQ1

Is that bad if there is a minimal activity because most of the rock we know of on the surface is unprospective granite?

Jill Ans-B1

Nope! That's excellent news; we may be the first to acknowledge this new greenstone terrain and explore it. Very exciting.

BQ2

As there is a farming town nearby, there is a good rail network, town water and energy supply, and a sound road system. Helpful?

Jill Ans-B2

Very helpful. Having this essential infrastructure in place will reduce our exploration costs and potentially our mine costs. We will also bring income to the town by employing locals and buying their products.

BQ3

There are some prospective licences, but their tenure is coming to an end, so we have to be ready to apply for them as soon as possible.

Jill Ans-B3

There is a lot of tenement activity centred around the greenstone outcrop; we have to be vigilant and wait for the tenement expiry dates.

Appendix 1 - Uncover Conversation 1

Identifying Land for Exploration - Jill - Chief Geologist

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I'm the Chief Geologist for the company. Today we're working to discover new resources. Reckon you can help? I hope so!

Hub 1

We need more mineralised land to explore and uncover to potentially find new nickel or copper orebodies. What factor do you want to discuss first?

Hub 2

Land which is close to road or rail lines, energy sources and water is preferable.

Topic C

What are the different types of geophysical techniques we can use to find undercover ultramafic rocks?

Jill C-Response

Hmm...many options. You need to understand the rocks! Then apply a range of geophysical technologies to it!

CQ1

Well, we know ultramafic rocks are heavy and dense, so we can use airborne gravity maps to locate gravity high signatures that could represent concealed ultramafic and mafic rocks...

Jill Ans-C1

Exactly! This is an excellent geological understanding of how the physical properties of rocks can be used effectively to identify them. Good call.

CQ2

Ultramafic rocks, particularly nickel-rich ones, may have a pyrrhotite tracer mineral, which provides a strong magnetic signature. Could we look for that?

Jill Ans-C2

Perfect. This complements the gravity high...so combined with a magnetic high, there is a good chance this represents ultramafic rocks!

CQ3

As this is a new metallogenic province, and the airborne data is old, its resolution is low, so it may be challenging to identify the deep gravity and magnetic highs...

Jill Ans-C3

If the airborne geophysical data is too old, we must find more recent versions from government sources or conduct our ground geophysical surveys.

Appendix 2 - Uncover Conversation 2

Lodging Exploration Licences - Jeremy - Tenement Officer

Greeting

Hi! I'm the company Tenement Officer! In order to explore on the land we have to get approvals from the Mines Department...

Hub 1

I'll need to get a list of the blocks, the number of land blocks for which you are applying, and an attached map outlining the boundary of the blocks for your exploration licenses.

Hub 2

This will be followed up with a statement which supports your license application.

Topic A

What's a 'block', and what does it mean?

Jeremy A-Response

A block is a measure of the amount of land on which you'll be exploring. Blocks need to be very spatially precise, and you must be sure that it covers your prospective land as you have to pay rent and spend a minimum amount of money on it!

AQ1

We're going to need a minimum of 70 blocks. We've got a map outlining the boundary, and the blocks we want are continuous and form a whole shape.

Jeremy Ans-A1

This looks good! It's helpful that your blocks and licence maps are continuous and that the boundary is relevant to the prospective area.

AQ2

We wish to apply for 200 blocks as it is prospective, and we've got a map attached outlining the boundary for the exploration licence.

Jeremy Ans-A2

The blocks are placed correctly to minimise the proposed lease expenditure. This looks fine.

AQ3

We've got a map, but the areas for which we want blocks are not continuous, and we haven't specified whether we are asking for mining permits or it's just prospective, and we would like to explore for orebodies...

Jeremy Ans-C3

This is messy. You'll need to repeat the process; consider making sure you're more specific about what you seek permits for and look for continuous blocks.

Appendix 2 - Uncover Conversation 2

Lodging Exploration Licences - Jeremy - Tenement Officer

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Hub 2

This will be followed up with a statement which supports your license application.

Topic B

What do you mean by 'statement'?

Jeremy B-Response

A statement is a detailed report of at least four different techniques you propose to use to explore the land.

BQ1

Right. Well, nickel and copper are often found in greenstone belts, although there are many other rock types that they can exist in. In this case, I'll choose the blocks I need that cover these rocks, so I can then go out into the field to map the outcrop to see if I could find some mineralisation.

Jeremy Ans-B1

You are on the right track; you are starting at the beginning.

BQ2

In the field, I will take some rock chip samples to have them analysed for Ni and Cu and create thin sections of the samples to see what the rocks are made from. I could also use sensors that scan the rock samples to identify the minerals.

Jeremy Ans-B2

You are on the right track, you are starting at the beginning.

BQ3

So, we bring in a drill rig and start drilling on the small piece of outcrop and see what's there...?

Jeremy Ans-B3

No, this is the wrong decision, you have not done the prework or received approval to access the land, and this will lead to a refusal of your application...don't do this, please!

Appendix 2 - Uncover Conversation 2

Lodging Exploration Licences - Jeremy - Tenement Officer

Greeting

Hi! I'm the company Tenement Officer! In order to explore on the land we have to get approvals from the Mines Department...

Hub 1

I'll need to get a list of the blocks, the number of land blocks for which you are applying, and an attached map outlining the boundary of the blocks for your exploration licenses.

Hub 2

This will be followed up with a statement which supports your license application.

Topic C

We really need our exploration license. Any tips to make sure we get it approved?

Jeremy C-Response

Make sure your application is as detailed as possible, report on the technical and financial resources you have available, be factually correct and clear about what you are intending to do.

CQ1

I have done some reading, and for every block during the first three year period, we need to spend \$1,000.00 per block and report our results back to the government.

Jeremy Ans-C1

This is excellent budgeting, and from this, we can work out our expenditure to ensure we meet all the environmental, farming, community and First Nation cultural heritage requirements before we commence our program.

CQ2

Before we do any work, we need a technical team including a geologist, surveyor, heritage specialist, safety advisor and environmental scientist to outline the works program to ensure all mines department regulations are met.

Jeremy Ans-C2

Exactly, by having a collaborative team who specialises in their area, you can work out best practices and do them effectively and efficiently.

CQ3

If we spend our minimum budget just on drilling, we can be confident about getting good results and the best return on our investment.

Jeremy Ans-C3

This is an extreme approach. The community, environment, farmer, First Nations cultural heritage and the geological database could be compromised. You may wish to consider less invasive methods such as geophysical sensing beneath the surface before you plan to drill. If geophysics doesn't show prospective ground, you would be wasting your company's money. Poor work and governance endanger your ability to be granted another licence again.

Appendix 3 - Uncover Conversation 3

Collaboration with First Nation's People - Josephine - First Nation's Liaison Officer

Greeting

Hi I'm Josephine the First Nations Liaison Officer. Let's chat about how we can work together with the locals...

Hub 1

How do you think an exploration company works with traditional owners of the land to ensure that their cultural heritage is respected and preserved?

Hub 2

What do you think are the collaborative processes which are needed to maintain a positive partnership?

Topic A

Who are the people that develop and discuss a plan for collaboration between traditional owners and exploration companies?

Josephine A-Response

The senior project leader... basically the Exploration Manager, possibly assisted by a Heritage specialist, meets with the traditional owners of the land. It's important for someone very senior to be involved.

AQ1

What do they do in their initial meetings?

Josephine Ans-A1

They meet on the traditional lands to talk about local First Nations' history, culture and the importance of respecting the country. They need to understand the grounds on which they would like to be working as much as possible.

AQ2

What are some of the things they discuss?

Josephine Ans-A2

There are so many aspects! It ranges from discussing culturally significant sites to First Nations' interpretation of the land, sky, water, animals and plants. A deep and respectful discussion to build mutual understanding.

AQ3

Is this a quick process?

Josephine Ans-A3

These discussions need to be based on respect and a desire for meaningful and purposeful discussion about a positive collaboration. We should be prepared to take our time to get this right.

Appendix 3 - Uncover Conversation 3

Collaboration with First Nation's People - Josephine - First Nation's Liaison Officer

Greeting

Hi I'm Josephine the First Nations Liaison Officer. Let's chat about how we can work together with the locals...

Hub 1

How do you think an exploration company works with traditional owners of the land to ensure that their cultural heritage is respected and preserved?

Hub 2

What do you think are the collaborative processes which are needed to maintain a positive partnership?

Topic B

What is discussed about the exploration program?

Josephine B-Response

Conversation focuses on the purpose of the project, why it is important to all members of the local community and the company, as well as the project's risks and the approaches they will take to ensure there are shared values and shared outcomes for both parties.

BQ1

How will the exploration occur?

Josephine Ans-B1

The exploration will be based on a plan agreed by both parties, including surveys, regular updates, site visits, photographs and other activities. Agreement and regular discussions are crucial.

BQ2

How will the traditional owners work in partnership with the exploration company?

Josephine Ans-B2

The traditional owners will visit the site to create an agreed baseline report of what is there and then monitor it overtime to ensure the company's plan is being followed. Both parties will maintain robust, respectful and constant communication and ensure that the environment and First Nations cultural heritage is protected.

BQ3

Why can't communication between parties be done on a need to know basis?

Josephine Ans-B3

Both parties must have regular communications and site visits as part of the exploration plan. This is important. It's not a hassle; it's a privileged learning opportunity for company representatives and essential for doing this work respectfully and adequately. A partnership needs genuine respect to work.

Appendix 3 - Uncover Conversation 3

Collaboration with First Nation's People - Josephine - First Nation's Liaison Officer

Greeting

Hi I'm Josephine the First Nations Liaison Officer. Let's chat about how we can work together with the locals...

Hub 1

How do you think an exploration company works with traditional owners of the land to ensure that their cultural heritage is respected and preserved?

Hub 2

What do you think are the collaborative processes which are needed to maintain a positive partnership?

Topic C

How are the culturally significant sites identified and maintained?

Josephine C-Response

There is a baseline plan to ensure that the sites are evaluated, protected and monitored and there is ongoing engagement and cultural surveys to ensure that nothing is missed. Protecting and preserving important sites and artefacts is crucial to good exploration.

CQ1

Do the traditional owners report back to the exploration company to preserve culturally significant sites?

Josephine Ans-C1

Yes, there is constant, consistent and respectful engagement between the traditional owners and the exploration company.

CQ2

What if a new culturally significant site is found during exploration?

Josephine Ans-C2

This happens! When it does, the findings are shared, with both parties participating in the process to protect and preserve the culturally significant site and respect cultural heritage.

CQ3

What happens if a culturally significant site is damaged?

Josephine Ans-C3

Site remediation and ongoing monitoring would be required after consultation by the exploration company with traditional owners and other representatives such as government specialists and lawyers.

Appendix 4 - Uncover Conversation 4

Plan for Community Liasion - Ewelina - Community Liasion Officer

Greeting

Hey, gang! I'm the company's Community Liaison Officer, and I'm here to answer any questions you've got about our proposal to explore on nearby land.

Hub 1

Once you've got an exploration license... what do you think happens, and how does it affect the surrounding community?

Hub 2

What happens if an exploration license is lodged on my parent's farm?

Topic A

When you have been "granted an exploration license" what does this mean?

Ewelina A-Response

Easy! For a period between 2 and 5 years you can explore to find, for example, nickel and copper but only after you obtain all necessary approvals to access the land. Along the way, you will take steps to consider and respect environmental, cultural, and community requirements.

AQ1

When you are exploring, you have "works orders", which allow you to undertake your work sustainably and safely...right?

Ewelina Ans-A1

That is correct! We make sure we put together a works program that considers all areas, consults with all appropriate stakeholders, and is approved by the mines department of the Australian state in which we're working.

AQ2

Do you work with the farmers and traditional owners and consider environmental requirements during exploration?

Ewelina Ans-A2

We do! We make sure that we have permission to disturb the land... basically, we only do what's necessary for what we need to get out of it, nothing more. We may be required to pay a farmer compensation for disturbing the land if that means their farming tasks are interrupted. For example, if they cannot plant a crop because we are working on that part of their farm. We also describe how we will rehabilitate the land when we are finished. That's really critical.

AQ3

When exploring, can you also start mining?

Ewelina Ans-A3

No, it doesn't work like that. Here in Australia, we take it one step at a time and only do what our licence allows us to do, leading the world in community engagement and sustainability and ensuring that locals benefit from our investment in the community.

Appendix 4 - Uncover Conversation 4

Plan for Community Liasion - Ewelina - Community Liasion Officer

Greeting

Hey, gang! I'm the company's Community Liaison Officer, and I'm here to answer any questions you've got about our proposal to explore on nearby land.

Hub 1

Once you've got an exploration license... what do you think happens, and how does it affect the surrounding community?

Hub 2

What happens if an exploration license is lodged on my parent's farm?

Topic B

What does the exploration involve?

Ewelina B-Response

Exploration activities are activities that require no, or very minimal clearing or ground disturbance. We aim to have minimal impact as part of the commitment that we make to community, traditional owners and the regulators before we start.

BQ1

Do your exploration techniques include soil sampling?

Ewelina Ans-B1

Yes - soil sampling is a great way to start a low impact exploration program. It also provides us with a tremendous elemental analysis grid map. We can also create maps of the rocks that are visible on the surface

BQ2

Do your exploration techniques include ground-based and airborne geophysics?

Ewelina Ans-B2

Yes, the geophysical analysis lets us see if we can connect the information from above ground to below ground. It's like having X-Ray vision! It's also complementary to other techniques like soil sampling. Together, that gives us a great picture of geology.

BQ3

Can we dig some trenches and small pits without applying for a permit?

Ewelina Ans-B3

No, this action is illegal and would damage the relationship between the local community and traditional owners.

Appendix 4 - Uncover Conversation 4

Plan for Community Liaison - Ewelina - Community Liaison Officer

Greeting

Hey, gang! I'm the company's Community Liaison Officer, and I'm here to answer any questions you've got about our proposal to explore on nearby land.

Hub 1

Once you've got an exploration license... what do you think happens, and how does it affect the surrounding community?

Hub 2

What happens if an exploration license is lodged on my parent's farm?

Topic C

How does the exploration company access my parent's farm - our family land?

Ewelina C-Response

Before we commence our work, we must reach a land access agreement with the landholder. If we need to access your land with a new license application, we will contact the landowner. The license application will be advertised in the media and generally a community meeting is held which gives the landholder the opportunity to raise issues or concerns.

CQ1

The exploration company community liaison manager came to our farm last week to discuss what would happen...

Ewelina Ans-C1

Our local farmers are critical stakeholders...so yes, lots of discussions and conversations, formal and informal, will happen as part of the exploration process.

CQ2

What sort of information do companies give to landowners if they want to explore their land?

Ewelina Ans-C2

There will be a detailed explanation of the techniques and technology being used to explore for minerals, and any impact on fences, livestock or crops will be discussed and negotiated. Work will sometimes be delayed to ensure that the farmer is not disrupted; for example, the company could postpone work until after harvest. We try to give as much factual information as possible to the landowners involved before we start.

CQ3

We'd never let them on our property!

Ewelina Ans-C3

We would respect that. We don't force our way in. That's not how we operate, and we are committed to working with local landholders and traditional owners and respecting their wishes and land.

Appendix 5 - Uncover Conversation 5

Review of Environmental Concerns - Kelsie - Environmental Scientist

Greeting

Hey there! Let's chat. I'm an environmental scientist for the exploration company, so I'm keen to talk all about the natural environment.

Hub 1

There's a lot of important things we need to do to protect local bush land when it's part of the sites we're exploring! What do you want to talk about?

Hub 2

This is how we ensure that after exploration any disturbance to local bush land or farm land is rehabilitated.

Topic A

Right...well our farmland is going to be explored, and it's next to a state forest. How do we make sure the impact on the forest is minimal?

Kelsie A-Response

Before we start exploration we have to complete a Conservation Management Plan which needs to be approved by the state Department for Mines. It details everything we'll be doing to protect local bush land.

AQ1

So you look at plants and animals, flora and fauna, waterways, or just some?

Kelsie Ans-A1

Yep! We consider all plants, animals, and waterways that form part of the bush's unique ecosystem. We identify what's there and count how many individuals of different species live there.

AQ2

OK, we have our Conservation Management Plan. What does it need to cover?

Kelsie Ans-A2

Well..lots of things...but water is essential! We regularly measure the quality and quantity of ground and surface water across the seasons to monitor any changes.

AQ3

I've read that parts of the environment are not necessarily included on the internet. If that's the case, what's the point of employing an environmental scientist?

Kelsie Ans-A3

That's not correct. In Australia, we have robust policies to protect the environment, including strict rules on land disturbance, emissions and rehabilitation for miners and explorers.

Appendix 5 - Uncover Conversation 5

Review of Environmental Concerns - Kelsie - Environmental Scientist

Greeting

Hey there! Let's chat. I'm an environmental scientist for the exploration company, so I'm keen to talk all about the natural environment.

Hub 1

There's a lot of important things we need to do to protect local bush land when it's part of the sites we're exploring! What do you want to talk about?

Hub 2

This is how we ensure that after exploration any disturbance to local bush land or farm land is rehabilitated.

Topic B

What are some of the measures you use to protect the environment during mineral exploration?

Kelsie B-Response

We even look at the world of fungi, frogs, spiders, microorganisms and tree hollows, to ensure that diseases are not spread, that rare spiders, frogs and microorganisms are classified and that tree hollows are measured and maintained as habitat for marsupials or birds.

BQ1

During my walks through the bush, I see many trees with hollows and cockatoos using those hollows as their home for years.

Kelsie Ans-B1

That is correct; we conduct extensive ecological studies to protect the local habitat of native fauna.

BQ2

I have noticed that surface water runs swiftly through local bushland during spring. It's good to monitor it to see if any changes occur during exploration.

Kelsie Ans-B2

We don't want to affect the flow or chemistry of local water sources with our exploration. Our monitoring system can also help local farmers with their dryland salinity issues. We can work together to help protect the state forest and the farmland.

BQ3

Why is it important that we know about this?

Kelsie Ans-B3

This is why we need to learn through science to understand how everything is interrelated and dependent.

Appendix 5 - Uncover Conversation 5

Review of Environmental Concerns - Kelsie - Environmental Scientist

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Hey there! Let's chat. I'm an environmental scientist for the exploration company, so I'm keen to talk all about the natural environment.

Hub 1

There's a lot of important things we need to do to protect local bush land when it's part of the sites we're exploring! What do you want to talk about?

Hub 2

This is how we ensure that after exploration any disturbance to local bush land or farm land is rehabilitated.

Topic C

Yeah, you said you will rehabilitate the state forest, but what about my parent's farmland?

Kelsie C-Response

We can protect both. During exploration, as part of being granted permission to drill on farmland we will ensure that we rehabilitate the land, restore fences and remove all waste and chemicals.

CQ1

Would we be able to chat with drillers and geologists while working on learning more about what they are doing?

Kelsie Ans-C1

This is a great idea. Just let me know, and I will arrange a meeting for you that can be held safely. Drilling and geophysical equipment operators work with strict safety requirements.

CQ2

What are some of the rehabilitation techniques you use after exploration has ended on my parent's farm?

Kelsie Ans-C2

After drilling, we plug the drill hole to make it safe, remove the drill samples, clear the drill pad and rake it. We restore all impacts to fences, tracks and soil.

CQ3

Why is rehabilitation even necessary?

Kelsie Ans-C3

Rehabilitation is part of being a responsible minerals explorer and miner. We can restore the land to its original state or make it suitable for other uses. The government requires us to commit to doing this. Sometimes after mining, we can't restore the land to what it was initially; however, before we are approved, we agree to a rehabilitation plan. For example, in some cases, open-pit mines will be rehabilitated to create recreational lakes or provide renewable energy for use by the community.

Appendix 6 - Uncover Conversation 6

Consult with Senior Geologist - Denzyl - Senior Geologist

Greeting

Hi folks! I'm the Senior Geologist. I'm here to help get our primary exploration program underway.

AQ1

We found some green-white coloured rock with large green and black crystals. Good? Or not?

Denzyl Ans-A1

This is a great start.

Topic A

What are the types of rocks we are looking for?

AQ2

Inside the rock, when we pulverised it, there was a yellow, brassy coloured, metallic-looking mineral... that seems optimistic, right?

Denzyl Ans-A2

This is excellent! This sounds like a sulphide, which means there's likely Ni or Cu or both! Exciting!

Hub 1

Let's talk about rocks!

Denzyl A-Response

Well, initial observations should show the rocks to be heavy, green to black in colour, slightly magnetic...all good signs.

AQ3

We had a look around...and next to some black-green rocks, there was a cream, yellowy sandy type rock, and it broke when we picked it up....

Denzyl Ans-A3

This is not the rock we're looking for, but it may contain information that we need later down the track, so don't discard it.

Hub 2

What other surface evidence did you find that may help with identifying prospective ground?

Appendix 6 - Uncover Conversation 6

Consult with Senior Geologist - Denzyl - Senior Geologist

Greeting

Hi folks! I'm the Senior Geologist. I'm here to help get our primary exploration program underway.

Hub 1

Let's talk about rocks!

Hub 2

What other surface evidence did you find that may help with identifying prospective ground?

Topic B

How do we know if this is the correct rock we're looking for. What do we do?

Denzyl B-Response

Well, we need to start collecting our data... making sure we sample correctly to obtain its chemistry, slice it up and look at it under a microscope to see what's actually in it or use a scanner to identify the minerals..

BQ1

So, we could use a handheld X-ray fluorescent analyser and walk around the field...targeting the interesting rocks to get their chemistry, taking multiple readings.

Denzyl Ans-B1

Yes, data is so essential; multiple readings with matching GPS locations will provide us with some good geochemical maps we can work with to help us work out where the high nickel or copper readings are.

BQ2

Hopefully, we can find some excellent fresh samples which we can collect and send off to make into thin sections and look at with a microscope to see what we have. We could also send the samples off for hyperspectral scanning for mineral identification.

Denzyl Ans-B2

It is so important to look at a rock under the microscope to see what's in there and the patterns which the different minerals make. These combinations show how and where the mineralisation may be.

BQ3

We don't need a representative sample; only a couple of samples will be enough with today's technology.

Denzyl Ans-B3

You can never have enough data! Even the most obscure information is part of a story and might solve the puzzle of where to find more nickel. You are doing forensic investigations on this part of the earth to understand what has happened to the rocks over time.

Appendix 6 - Uncover Conversation 6

Consult with Senior Geologist - Denzyl - Senior Geologist

Greeting

Hi folks! I'm the Senior Geologist. I'm here to help get our primary exploration program underway.

Hub 1

Let's talk about rocks!

Hub 2

What other surface evidence did you find that may help with identifying prospective ground?

Topic C

Do we just keep walking over all the exploration licenses to see what is there?

Denzyl C-Response

Yes, we use our observations together with satellite imagery and our geophysics to see if what we see on the surface is validated by imagery. This includes the relationship and connections between things like the shape of the land and what the gravity, magnetic fields and geophysics.

CQ1

Looking at the satellite imagery and geophysics, I can see a pattern showing a long oval-shaped hill sitting on a magnetic high.

Denzyl Ans-C1

Using all the tools available to you is excellent geological detective work, and then you can create maps to record your observations.

CQ2

We need to investigate this hill! It also appears to have a different type of tree or shrub than the surrounding vegetation, which is another colour. We need to see if the ultramafic rock is there in the outcrop.

Denzyl Ans-C2

The key to success is looking for subtle differences. Observations are critical, based on recording your data and interpreting the relationships between the data and having a look in the field and immersing yourself in the environment.

CQ3

Why do you need to go and walk the field in the hot sun? All the data is in the computers, - surely that should be enough!

Denzyl Ans-C3

While we're in the digital age and can process the data we have with machine learning, artificial intelligence and virtual reality into models that will be right 95 per cent of the time, the difference between good and great can be based on small observations that you see in the field. It might be outside the algorithm but could help us make a significant discovery! Computer programs are only able to predict the future based upon prior knowledge that is given to them. They need humans to help them create models, and humans decide what to do next.

Appendix 7 - Uncover Conversation 7

Chat to Exploration Geologist - Le-Ann - Exploration Geologist

Greeting

Hi folks! I'm an exploration geologist. We've just received some exciting airborne electromagnetic 3D models showing three conductive bodies located about 300 metres below the ground. We need to do some surface sampling to see if there is a correlation between what we see at surface and what the deep sensing results are showing us!

Hub 1

What sort of techniques do you think we could use to back up the geophysical evidence?

Hub 2

Any other thoughts on techniques that are going to help us hone in on a prospective ore body?

Topic A

How about more airborne geophysical surveys? Would we be on the right track with that?

Le-Ann A-Response

Absolutely, but we could also consider other geophysical techniques! So much of Australia's mineral wealth is hidden deep underground and we just can't see it...so we have to use special technology like airborne electromagnetic surveys to help us work out what 's there!

AQ1

What is geophysics measuring?

Le-Ann Ans-A1

We use the physical properties of rocks, such as their density, magnetism and electrical conductivity, to see what lies beneath.

AQ2

How does it work?

Le-Ann Ans-A2

For this scenario, we use the electrical conductivity of the two minerals we are after - nickel and copper, occurring as sulphides. These minerals can conduct electricity better than the surrounding rock. So if they're present, we would see high conductivity and could use this as a potential area for further investigation.

AQ3

These rocks are boring! What information have they got that we can use?

Le-Ann Ans-A3

Rocks rock - they're never boring! They have so much helpful information that even if they're not the kind of rocks we're looking for, they can help us find what we're after.

Appendix 7 - Uncover Conversation 7

Chat to Exploration Geologist - Le-Ann - Exploration Geologist

Greeting

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Hub 1

What sort of techniques do you think we could use to back up the geophysical evidence?

Hub 2

Any other thoughts on techniques that are going to help us hone in on a prospective ore body?

Topic B
What's the surface process we're going to use to back this up?

Le-Ann B-Response
We'll be using the low-impact technique of soil sampling!

BQ1

How do we do this?

Le-Ann Ans-B1

We work off a grid and auger down a few metres, and take the sample. We will do a quick on-site X-ray fluorescent analysis before sending the sample off to the laboratory in the city for further analysis.

BQ2

What are we measuring?

Le-Ann Ans-B2

We are looking for nickel and copper and other elements such as cobalt, platinum and even gold to see if we have anomalies. Elevated levels of these elements would indicate that they came from deep underground, possibly represented by these deep conductive bodies.

BQ3

Is this going to be hot hard work?

Le-Ann Ans-B3

It's good to get out of the lab and outside into the fresh air to take samples, enjoy nature, and record any other features that may coincide with the sample, for example, a different tree species. We don't have to do fieldwork in the summer. It might be better to do fieldwork at a cooler time of the year

Appendix 7 - Uncover Conversation 7

Chat to Exploration Geologist - Le-Ann - Exploration Geologist

Greeting

Hi folks! I'm an exploration geologist. We've just received some exciting airborne electromagnetic 3D models showing three conductive bodies located about 300 metres below the ground. We need to do some surface sampling to see if there is a correlation between what we see at surface and what the deep sensing results are showing us!

Hub 1

What sort of techniques do you think we could use to back up the geophysical evidence?

Hub 2

Any other thoughts on techniques that are going to help us hone in on a prospective ore body?

Topic C

How do we know if the two are connected?

Le-Ann C-Response

Once the results for the elements come back, we can create maps and 3D images from the data and look to see if there is a pattern for and between the elements.

CQ1

So, if the soil chemistry element maps show that all these elements occur together in the exact locations...

Le-Ann Ans-C1

Then that would be very positive indeed! The pieces of the jigsaw are coming together!

CQ2

So if we look at soil chemistry combined with airborne electromagnetic data and find anomalies that coincide with this soil data....perhaps not precisely but proximate to each other?

Le-Ann Ans-C2

Then another jigsaw piece falls into place to put the story together! Geology is detective work.

CQ3

But there's too much distance between the geophysical and geochemical anomalies. This is not a good result!

Le-Ann Ans-C3

Every piece of information tells a story. The more information we have, the more complete the story!

Appendix 8 - Uncover Conversation 8

Visit the Geophysicist - Jayden - Geophysicist

Greeting

Hello there! I'm a geophysicist. And I'm here to tell you that our results show we need to undertake some ground geophysics work to better define our drilling targets. Let's chat!

Hub 1

Let's chat about how the geophysics team should design our programs! What do you want to talk about?

Hub 2

What would you like to talk about?

Topic A

How do we know which are the best targets for geophysics work?

Jayden A-Response

From the airborne surveys and soil sampling, we see that there's some overlap...but only for some locations. We need to work out what we can do here... thoughts?

AQ1

Well, we need to look for targets where the airborne electromagnetic overlaps with nickel, copper, platinum and gold anomalies...

Jayden Ans-A1

Very sensible. This is the most likely prospective scenario to pursue.

AQ2

I guess we could also look at where there are high-level soil anomalies...

Jayden Ans-A2

These things all work together...and we might be missing a geophysical anomaly.

AQ3

Why don't we just focus on the airborne electromagnetic targets? Seems easier to find...

Jayden Ans-A3

That wouldn't be the best option to pursue in terms of prospectivity and budget. It's expensive, and it's only a single data source.

Appendix 8 - Uncover Conversation 8

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Hub 1

Let's chat about how the geophysics team should design our programs! What do you want to talk about?

Hub 2

What would you like to talk about?

Topic B

What are the better and cheaper ground geophysical techniques to use?

Jayden

B-Response

Again we have to look at the rock chemistry and its structure as part of finding out what happens to these rocks closer to the surface. There are different responses when they are badly weathered.

BQ1

Can we do some gravity tests to see if the lateral surface extent of the orebody actually coincides with the elemental soil anomalies?

Jayden Ans-B1

This is an excellent idea and may explain an offset between the soil anomalies and the electromagnetic target.

BQ2

What about some electrical conductivity work to find out how close the orebody is to the surface?

Jayden Ans-B2

Good idea! It's always essential to determine how far down the orebody is situated.

BQ3

Would using gamma technology with a scintillometer work?

Jayden Ans-B3

Not such a good idea for the ultramafic greenstones that are not radioactive...but we do have granites on our tenements, and maybe we can identify contacts with other greenstones at depth.

Appendix 8 - Uncover Conversation 8

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Hub 1

Let's chat about how the geophysics team should design our programs! What do you want to talk about?

Hub 2

What would you like to talk about?

Topic C

Can we make sure these techniques have minimal impact on the environment?

Jayden

C-Response

Yes, we can use low-impact technologies and work closely with environmental scientists so that everything we do has the least possible environmental impact.

CQ1

Will we need to bulldoze tracks through the state forest?

Jayden Ans-C1

Hopefully not! A lot of this work can be done on foot and in the cooler months - so if you like camping, it's the way to go!

CQ2

Is it possible to conduct multiple tests at once?

Jayden Ans-C2

Yes - although machine hire is expensive, we will have to do it efficiently and use multiple test units.

CQ3

It's too hot to do all this work!

Jayden Ans-C3

Getting out in the field helps us better understand how the ore body is situated in the ground and what's undercover.

Appendix 9 - Uncover Conversation 9

Consult the Contracts Manager - Tara - Contracts Manager

Greeting

Hey there! I'm the Contracts Manager. That means I send out tenders to suitable contractors to get work such as geophysical surveys and drilling done!

Hub 1

What would you like to talk about? Is it drilling?

Hub 2

How does the company manage project environmental impacts, safety and good sample recovery?

Topic A

How many different types of drilling are needed for this project?

Tara

A-Response

There are two main types and each has a different purpose...

AQ1

Can you drill several holes above the water table to a depth of 100 metres effectively and safely?

Tara Ans-A1

This can be achieved through Reverse Circulation Drilling, where pneumatic hammers push the drill bit into the ground. The air is forced through its outer tube, and crushed rock is blown up the inner tube to a cyclone (a collection container), where the sample is collected in one-metre intervals.

AQ2

What type of drilling is best used to get really deep - say, deeper than 1 km?

Tara Ans-A2

This is known as diamond drilling. It is pretty slow but it produces whole-rock cylinders that are cut (like a rotating cookie cutter) by diamonds so you can see what the rock is and if there are other exciting features.

AQ3

Fast drilling gets the job done, so why can't we use it?

Tara Ans-A3

Reverse Circulation drilling is unsuitable because we would not get complete, uncontaminated samples extracted.

Appendix 9 - Uncover Conversation 9

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Hub 1

What would you like to talk about? Is it drilling?

Hub 2

How does the company manage project environmental impacts, safety and good sample recovery?

Topic B

What do contractors have to do to minimise environmental impact and meet safety requirements?

Tara B-Response

For the tender, the contractors need to outline how they would minimise environmental impact and operate safely. It's a very thorough process, and we check everything, before, during and after the drilling program.

BQ1

Are drill rigs mounted on trucks?

Tara Ans-B1

Yes, this is important because the truck's width spreads the rig weight, which minimises the impact of drilling.

BQ2

How do they dispose of waste?

Tara Ans-B2

The drilling contractor takes away any wastewater or rock from the drill sites.

BQ3

Is the exploration company responsible for cleaning up after drilling is finished?

Tara Ans-B3

Yes. The drilling contractor is responsible for ensuring that all holes are filled back up and capped at the surface (to manage the risk of marsupials falling into them or people injuring themselves if they walk on them). The site is clean at the end of the job.

Appendix 9 - Uncover Conversation 9

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Hub 1

What would you like to talk about? Is it drilling?

Hub 2

How does the company manage project environmental impacts, safety and good sample recovery?

Topic C

What happens if trees have to be removed?

Tara C-Response

A special works order needs to be submitted by the exploration company.

CQ1

What happens if a drilling contractor damages the site?

Tara Ans-C1

Under their contract, they would not be allowed to proceed further and would have to remediate any damage caused.

CQ2

How does the drilling contractor get onto the site to drill? Do they have to make their access roads or tracks?

Tara Ans-C2

The drilling contractor has to use the access tracks made by the exploration company to access the site.

CQ3

So, if something is found and a new site has to be drilled, can the drilling company expand beyond the cleared site and remove more trees?

Tara Ans-C3

No, contractors can only work within the area defined by the exploration licence. If the new anomaly is close to an existing drill site, the drillers may be able to drill an angled hole to test the new target. A geologist will use trigonometry to calculate what angle and length a hole would need to reach the new target.

Appendix 10 - Uncover Conversation 10

Discussing Hydrogeology - Amy - Hydrogeologist

Greeting

Hey there! I'm a hydrogeologist. I love water and rocks!

Hub 1

What would you like to chat about?

Hub 2

Anything else you want to talk about today?

Topic A

Can you explain what hydrogeology is?

Amy

A-Response

Hydrogeology is the scientific study of the movement of water through rock and soil or storage of water in rock - the impact water and rocks have on each other and the surrounding environment!

AQ1

Why is this important?

Amy Ans-A1

We need to know where and how much water is underground so that we don't disturb or contaminate it and choose the correct drilling method. We also might want to apply to extract some of the water to operate a future mine if we discover an orebody.

AQ2

How does water get underground?

Amy Ans-A2

Rock is porous and can be permeable, so the rainwater gets absorbed and stored.

AQ3

I thought rock is hard - that explanation makes no sense!

Amy Ans-A3

Rock may be hard, but it can also have pores that allow the passage and storage of water over long periods.

Appendix 10 - Uncover Conversation 10

Discussing Hydrogeology - Amy - Hydrogeologist

Greeting

Hey there! I'm a hydrogeologist. I love water and rocks!

Topic B

Why does this matter to an exploration company?

Amy B-Response

Water is a valuable resource which we must protect and manage. We need to know where it flows, what chemistry or organisms it contains, how deep it is and where to find it.

Hub 1

What would you like to chat about?

Hub 2

Anything else you want to talk about today?

BQ1

How do you find it?

Amy Ans-B1

We drill to find the water table level, and electromagnetic geophysical techniques can also help us to map it.

BQ2

How do you work out how it flows?

Amy Ans-B2

We can take measurements down the drill hole and pump from nearby drill holes to work out how much water there is, how the holes are connected, the pressure at which water is being released and the direction it flows.

BQ3

I don't get it - it's underground; how can we work this out?

Amy Ans-B3

We use many scientific tools to look undercover to see what is happening with this essential resource.

Appendix 10 - Uncover Conversation 10

Discussing Hydrogeology - Amy - Hydrogeologist

Greeting

Hey there! I'm a hydrogeologist. I love water and rocks!

Topic C

Who are the other scientists a hydrogeologist works with?

Amy

C-Response

We work with a lot of different scientists from geologists to environmental scientists to engineers - anywhere that there's water and rocks!

Hub 1

What would you like to chat about?

Hub 2

Anything else you want to talk about today?

CQ1

So you do work with environmental scientists?

Amy Ans-C1

Mining employs many environmental scientists to help with testing and measurement against the natural baseline, amongst other things.

CQ2

And the geologists?

Amy Ans-C2

Yes, the drilling patterns and the water data from the holes are helpful information for geologists and engineers.

CQ3

I am not making the connections - water is very different to rock...

Amy Ans-C3

Water in rock is one of the Earth's largest freshwater resources - they're always together.

Appendix 11 - Uncover Conversation 11

Visiting the Extractive Metallurgist - Lachie - Metallurgist

Greeting

Hey! I'm an extractive metallurgist! I love ore, metals, chemistry, physics, rocks, and everything around them!

Hub 1

Let's chat about metals, and ores!

Hub 2

Anything else?

Topic A

What is your role?

Lachie A-Response

An extractive metallurgist plays a critical role in determining the ability for the valuable metals or minerals to be extracted from the rock.

AQ1

What is the "mineral ore"?

Lachie Ans-A1

This is the important orebody and the metal or mineral we're looking for! It's processed to become a product to use in things we need in our daily life.

AQ2

Why is this so important?

Lachie Ans-A2

If we've found it, we have to find an efficient, safe and sustainable way to get the mineral ore out of the rock.

AQ3

There are so many different scientists needed here. This is so complex...

Lachie Ans-A3

Yes, it's a team effort by different people with a variety of skills which are needed to find a solution.

Appendix 11 - Uncover Conversation 11

Visiting the Extractive Metallurgist - Lachie - Metallurgist

Greeting

Hey! I'm an extractive metallurgist! I love ore, metals, chemistry, physics, rocks, and everything around them!

Topic B

How does this connect with exploration?

Lachie B-Response

Exploration helps the company figure out what metal or mineral ore is in the rock.

Hub 1

Let's chat about metals, and ores!

Hub 2

Anything else?

BQ1

What happens during extractive metallurgy?

Lachie Ans-B1

The rock needs to be crushed and processed, and the valuable components recovered as ore. According to environmental and licence agreements, the leftover waste material needs to be safely treated and stored or disposed of.

BQ2

Where is the geologist in all of this? After all, it does involve rocks...

Lachie Ans-B2

The geologist will provide the ore samples to the metallurgist for testwork and processing - they know where the best samples are located.

BQ3

There is so much to learn here...who does what and why?

Lachie Ans-B3

It all fits together as part of a value chain, with each expert applying their skills and experience to work with other team members to achieve the best outcome for all stakeholders.

Appendix 11 - Uncover Conversation 11

Visiting the Extractive Metallurgist - Lachie - Metallurgist

Greeting

Hey! I'm an extractive metallurgist! I love ore, metals, chemistry, physics, rocks, and everything around them!

Topic C

What safety risks need to be taken into account?

Lachie C-Response

Safety is the first priority in mining and exploration, so plans to reduce risk are mapped out before work starts.

Hub 1

Let's chat about metals, and ores!

Hub 2

Anything else?

CQ1

Are harmful chemicals involved?

Lachie Ans-C1

Breaking down rock requires chemicals, physical force or both for separation. The use of chemicals is carefully planned and managed to protect the local environment.

CQ2

What precautions are taken?

Lachie Ans-C2

We make sure that there is a clear plan, including briefings and signage and the use and disposal or recycling of chemicals based on hazard mitigation guidelines.

CQ3

There's so much to consider! My head is spinning...

Lachie Ans-C3

Yes, but it's all about ensuring safe, efficient and more sustainable mining to provide products used by all of us in our daily lives.

Appendix 12 - Uncover Conversation 12

Discussing Community Partnerships - Jett - Community Corporate Manager

Greeting

Hello! I'm the Community Relations Manager, and I'm responsible for community engagement and local communication.

Hub 1

Let's talk about what companies do to keep the community informed about a future nickel and or copper mine!

Hub 2

What else would you like to talk about? I love my job!

Topic A

If there's going to be a mine, how does the company work in partnership with the community?

Jett A-Response

The company will have a number of local meetings to be open and transparent about their plans with everyone.

AQ1

So if my family live in a community where a mine is coming, could they get a job?

Jett Ans-A1

Yes, companies employ many locals in great jobs as part of new mine development.

AQ2

Will other local businesses that aren't involved in mining benefit?

Jett Ans-A2

Yes! There is more demand for housing, transport, engineering services and many other businesses as part of mine development.

AQ3

I'm not sure about the benefits...

Jett Ans-A3

Our company works closely with the local community to spend money locally, and community groups like sporting clubs, environmental groups, and First Nations health services are supported.

Appendix 12 - Uncover Conversation 12

Discussing Community Partnerships - Jett - Community Corporate Manager

Greeting

Hello! I'm the Community Relations Manager, and I'm responsible for community engagement and local communication.

Hub 1

Let's talk about what companies do to keep the community informed about a future nickel and or copper mine!

Hub 2

What else would you like to talk about? I love my job!

Topic B

When there's a mine, will we be able to visit it? It sounds exciting.

Jett B-Response

Yes, the mine will hold regular open days for the local community so everyone can see what goes on there and how the mine uses new technology to extract and process minerals in a safe and more sustainable way.

BQ1

Would your company be able to give us some of the rock specimens?

Jett Ans-B1

Yes, definitely! The rocks from the mine tell us a story about their history, from being formed billions of years ago to how they will be used to generate and store renewable energy and in electric vehicles today.

BQ2

So the rocks you are mining contain metals used in renewable energy and other sustainable technologies? I thought mining just had a negative impact on the environment...

Jett Ans-B2

These rocks contain platinum used for green hydrogen production and fuel cells, copper for renewables and energy storage and nickel which goes into batteries for electric cars! Mining that is respectful of the environment, heritage and community requirements helps us to begin to reverse the impact of global warming.

BQ3

I don't like rocks.

Jett Ans-B3

Well, you live on a big rock called Earth, and your modern life depends on what we get from rocks in the ground. Maybe have another think about what life could be like without the metals and minerals that we extract from rocks...

Appendix 12 - Uncover Conversation 12

Discussing Community Partnerships - Jett - Community Corporate Manager

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Hub 1

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Hub 2

What else would you like to talk about? I love my job!

Topic C

Will the company help to improve our town?

Jett C-Response

Yes, mining companies are a big part of the local community because they will be here for several decades and the benefits will continue long after the mine has finished. That includes encouraging young people to find out more about STEM careers because many mining jobs require STEM and in the future they will apply even more technology.

CQ1

Will you build us a new skatepark?

Jett Ans-C1

We want your ideas on how we can support good local projects that the community wants because engaged and active young people make for a healthier and happier town!

CQ2

Do you get involved in school events?

Jett Ans-C2

Yes indeed! Mine site visits show and tell at local schools, and sponsorship of school events are possibilities.

CQ3

Lots of people say you won't improve the town...

Jett Ans-C3

Mining companies bring highly skilled, highly paid jobs into local areas and do a lot to support local health, childcare, education and sporting groups. We even have traineeship programs to help young people launch into an exciting and diverse career in the mining industry!