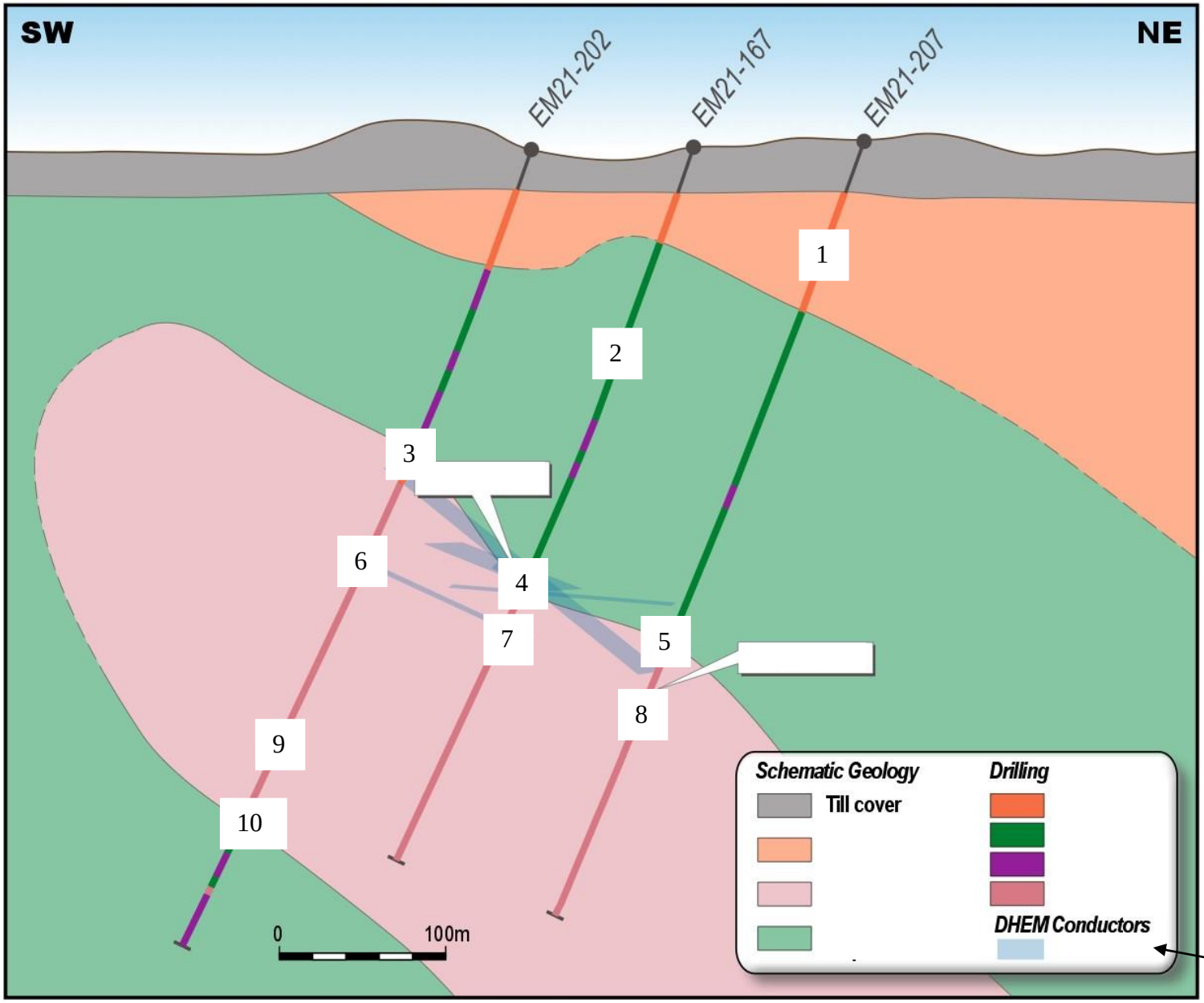
Geologist For a Day…or five (Fake it till you make it)



Map of where your cores came from

Once you have analyzed all your core samples complete the following four tasks:

1) Name the different colours of rocks in the legend.
2) Fill in the two boxes in the diagram indicating the type of ore mineral you think the DHEM Conductor is.
3) Geologists are always updating maps as they get more information. Update your map/legend if you believe there are details missing.
4) Your boss has given you a 650m drill budget. Use the Geophysics on the back page and the scale to the right to plan the next drill hole(s). Draw them on the image to the left.

This section of rock is a conductor. This means electricity can pass through it. This means more ore!

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 1										

Rough Sketch of Core including:

1) Various Minerals & respective sizes
2) Locations and size of Ore Minerals
3) Colours
4) Unique Features

Core 1

Core 2

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 2										

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 3										

Rough Sketch of Core including:

1) Various Minerals & respective sizes
2) Locations and size of Ore Minerals
3) Colours
4) Unique Features

Core 3

Core 4

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 4										

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 5										

Rough Sketch of Core including:

1) Various Minerals & respective sizes
2) Locations and size of Ore Minerals
3) Colours
4) Unique Features

Core 5

Core 6

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 6										

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 7										

Rough Sketch of Core including:

1) Various Minerals & respective sizes
2) Locations and size of Ore Minerals
3) Colours
4) Unique Features

Core 7

Core 8

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 8										

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 9										

Rough Sketch of Core including:

1) Various Minerals & respective sizes
2) Locations and size of Ore Minerals
3) Colours
4) Unique Features

Core 9

Core 10

Sample Number	Grain Size Fine Course Mix	Description in your own words	Ore Minerals			Composition (Non Ore Minerals)			Rock Name	How did the rock form? (rate & where)
			Ore (Yes/ No)	Colour of Ore(s)	Best Guess at Type of Ore	Visible Minerals	Colours Of Minerals	% Of Each		
Core 10										

Questions:

1) What changes did you make to the geologic map (Question 3). Why did you make these changes? What do you think your core is telling you?

You have now completed a comprehensive analysis of the Geology. Your boss has spent another $250 000 + on some geophysics.

The Geophysics: Induced polarization (IP) is a geophysical imaging technique used to identify the electrical chargeability of subsurface materials, such as ore. In IP an electric current is transmitted into the subsurface through two electrodes, and voltage is monitored through two other electrodes. {Rough translation → Put electricity into the ground and if there are conductors (metals) the electricity will flow through it (like wires) and the better (more ore) the conductor, the longer the electricity will flow around underground.

Resistivity: How hard it is to transmit electricity into the subsurface (Quartz has high resistivity. Ore minerals have low resistivity)

Chargeability: The subsurface ability to "hold electricity" (Quartz has low chargeability. Ore minerals have high chargeability)

Metal Factor: A proprietary service offered by Schaub that calculates the probability of subsurface metals according to an algorithm that considers various factors in the inversion (Fancy thing Schaub does that takes geophysics and geology data to make a subsurface model). Works great for most metals except gold. People pay a lot for it. Some consider it akin to witchcraft.

Gold Index: A proprietary service offered by Schaub that calculates the probability of subsurface GOLD according to an algorithm that considers various factors in the inversion (Fancy thing Schaub does that takes geophysics and geology data to make a subsurface model). Gold (High chargeability) is unique in that it often sits in quartz (high resistivity) so this algorithm takes this into consideration. People pay a lot for it. Some consider it akin to witchcraft.

Using this information answer the two questions on the back.

2) Why did you put your drill hole where you put it on the geologic map (Question 4). Justify your decision to you boss referencing the geology you discovered and the geophysics you were provided with.

3) Your boss has told you that if your above drill hole is successful, you may drill another 400 m. This will be a new drill hole in the area where you have no geology data. The core from this hole will be the first core for analysis for a new project. Draw where you would like this drill hole on the geophysics data (use the scale on the side of the data). Justify to your boss using your knowledge of the area (the geology and geophysics analyzed previously) and the geophysics provided to place this new hole.

4) Your boss is wondering if you should complete a "Geophysics Magnetic survey" or a "Geophysics Seismic Survey" next.
   a) What is a geophysics magnetic survey?

   b) What is a geophysics seismic survey?

   c) What is a geophysics magnetic survey good at locating (Structure, ore, gold, oil, etc)

   d) What is a geophysics seismic survey good at locating (Structure, ore, gold, oil, etc)

   e) Which survey would you tell your boss to complete and why? (There is only one right answer)