

# Mine Blasting Data Analysis

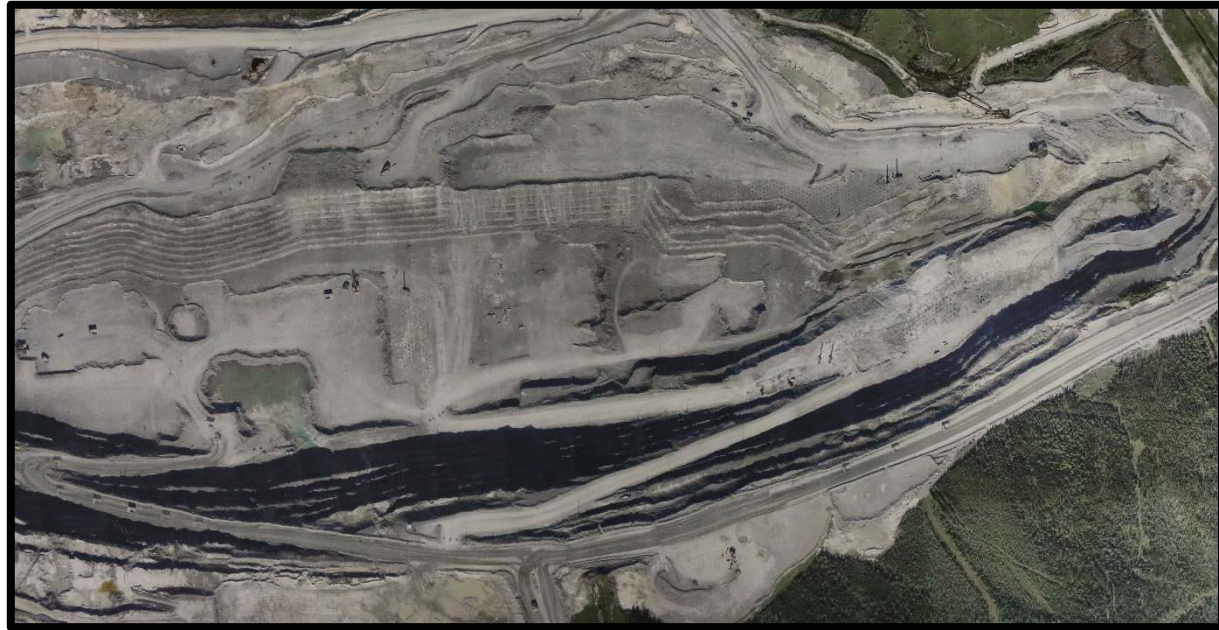
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Gold open pit mine located in Northeastern Ontario, dimensions are 1750m E-W, 450m N-S, and 96m depth.

Blasting is being used to extract the material from the mine.

The objective of the study is to find the relationship between **the blast outcomes** and **the rock mass parameters**.



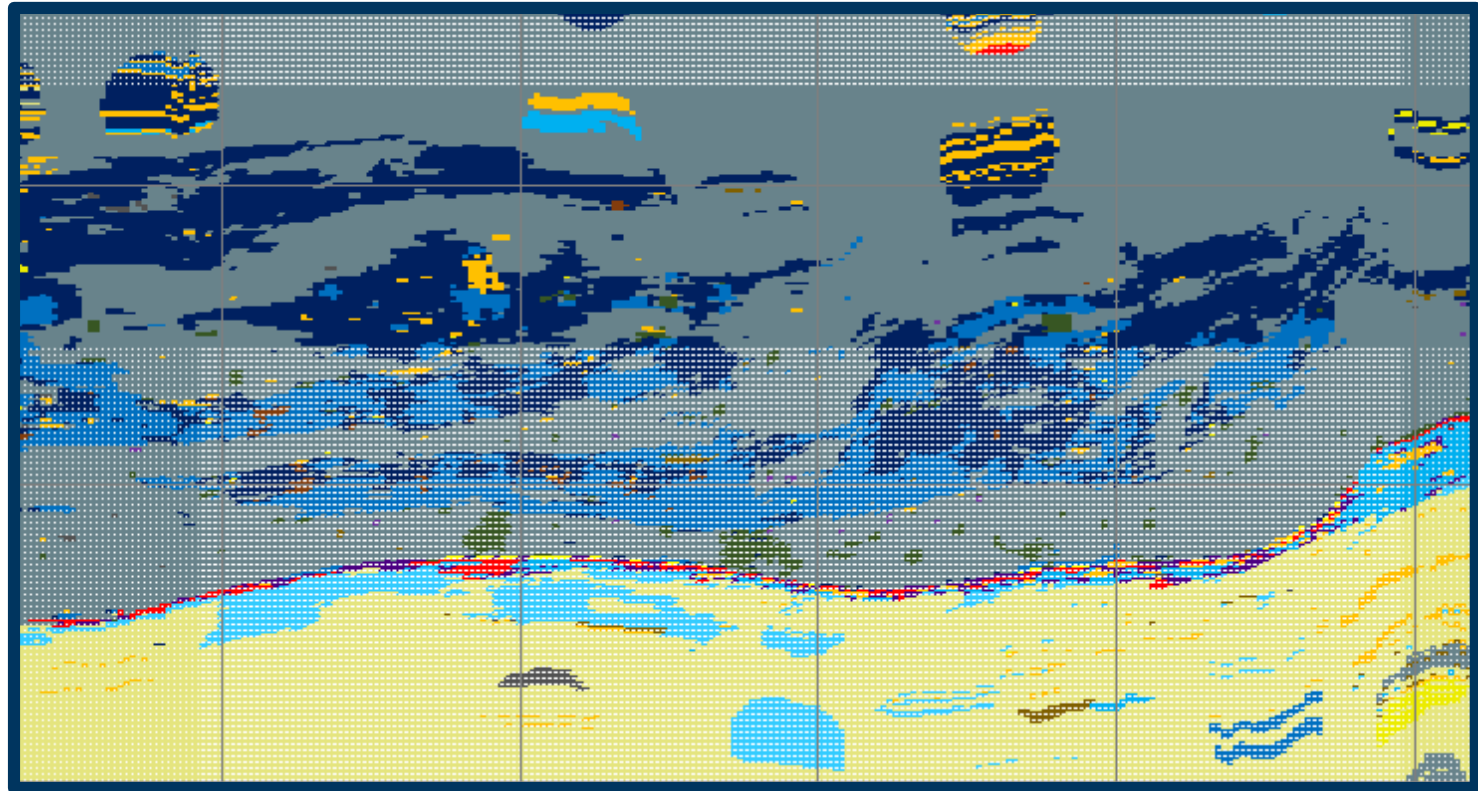
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# TYPE OF DATA (1)

## 1- Rock-Related Parameters

### 1-1- Rock type

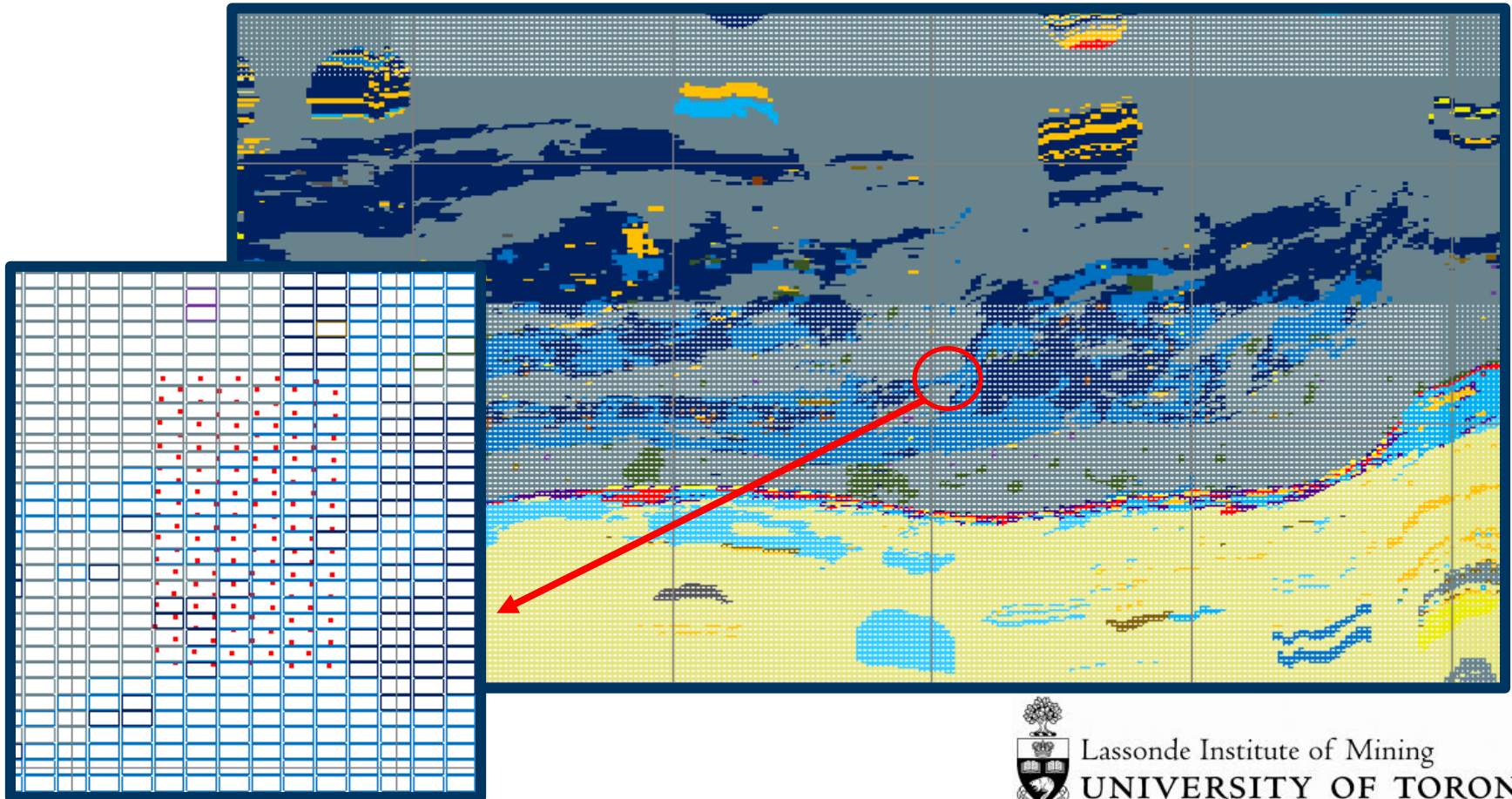
X	Y	Z	Rock type
560,000			



# TYPE OF DATA (2)

## 1-2- Penetration Rate

X	Y	Z	Penetration Rate
44,000			

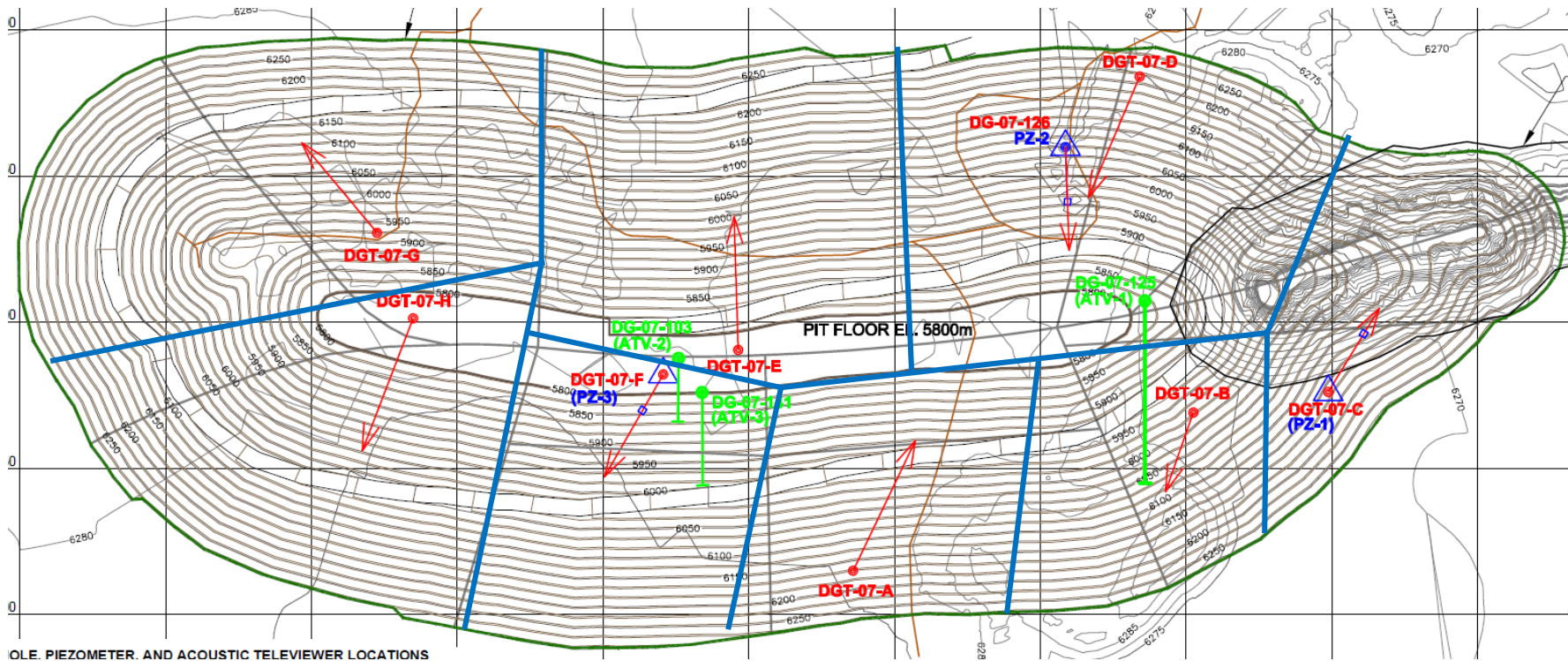




# TYPE OF DATA (3)

## 1-3- Geotechnical Parameters

Range X	Range Y	Range Z	Q	RQD	IS50	DC orientation
8 Geotech boreholes x 11 levels = 88						

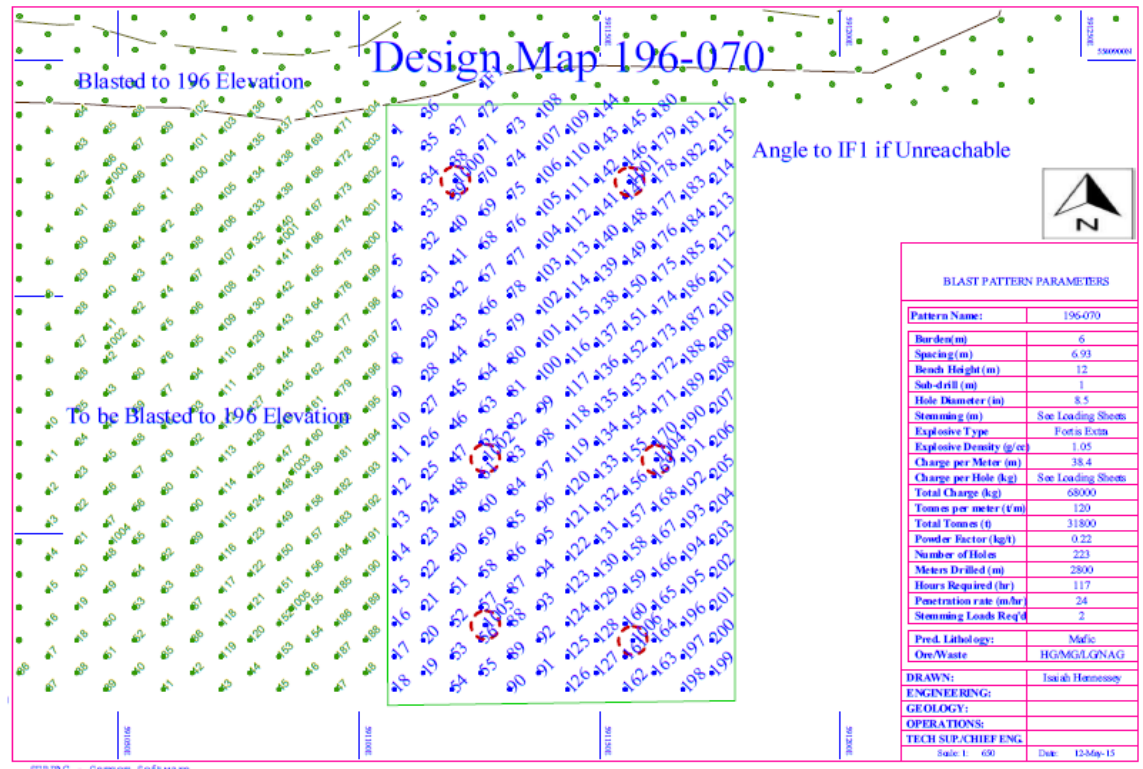


# TYPE OF DATA (4)

## 2- Blasting Parameters

Blast Location			Burden	Spacing	Stem.	Hole D.	Bench H.	Sub-drill	Explosive Type	Pattern	Initiate.	confinement
Range X	Range Y	Range *										
956												

No.	Level	# of blasting
1	148	37
2	160	45
3	172	58
4	184	72
5	196	126
6	208	135
7	220	111
8	232	92
9	244	145
10	256	102
11	268	33
Sum		956



\* Each coordinate range represents specific blast location that includes many blast-holes which have their own coordinates.

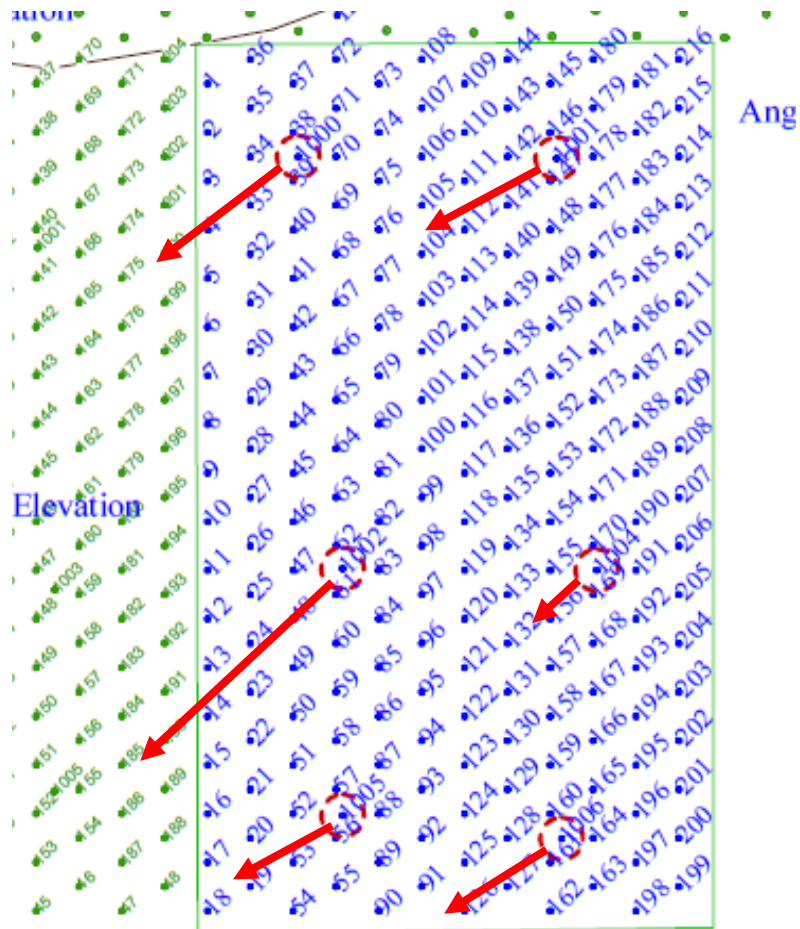


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# TYPE OF DATA (5)

## 3- Blast-induced movement

X	Y	Z	Movement Magnitude	Movement deviation
2,110				



# TYPE OF DATA (6)


## 4- Blast-induced Fragmentation

### 4-1- Direct


Blast Location			D80	D50	D100
Range X	Range Y	Range Z			
6+5 blast location					

### 4-2- Indirect

- Filling Factor

Blast Location			Truck	Capacity
Range X	Range Y	Range Z		
900,000				
				
950 sets (Blast Locations) x 2 (Truck type) = 1900				

- Digability

Blast Location			Shovel	Loading time
Range X	Range Y	Range Z		
900,000				
				
954 sets (Blast Locations) x 2 (Shovel type) = 1900				



# COMBINING DATASETS

Finally, the information in different data-sets should be combined as below table.

Blast Location			Rock Type	Penetration rate	Geotechnical Parameters			Blasting Parameters										Move ment	Fragmentation						
																			Digability	Filling Factor	Image analysi s				
	Range Z	Range Y			DC	IS50	RQD	Q	Burden	Spacing	Stemming	Hole Diameter	Bench Height	Sub-drill	Explosive Type	Pattern	Initiation	confinement	Magnitude	Deviation		D 8 0	D 5 0		

Accordingly, the blasting results (green parameters) should be related to two other types of parameters (blue and red columns).

The results can be used:

- 1- to predict the results of blasting (movement and fragmentation) knowing the rock-related (red column) and blast-related (blue column) parameters.
- 2- to optimize the blasting parameters (blue column) of a particular rock mass for a desired blast outcomes.

