



**FCON 24**

**Shark Tank Presentation**

# Planning and delivering Projects is difficult

**Billion-dollar infrastructure budget blowout highlights impact of labour, supplies shortages**

**Snowy Hydro expansion hits reset button as costs blow out to \$12 billion**

50 infrastructure projects cancelled after budget blowout

# Scope

Design

Existing conditions

Quality

Approvals

## Time

Resources

Productivity

Sequencing

## Costs

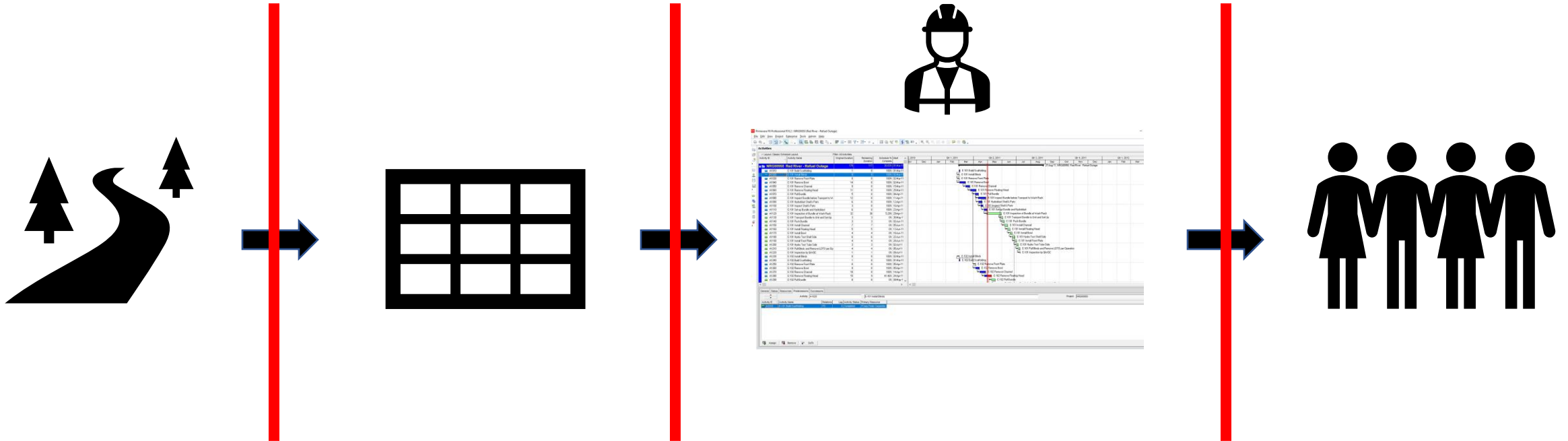
Time

Materials

Labour

Non labour

# Traditional Project Development Process





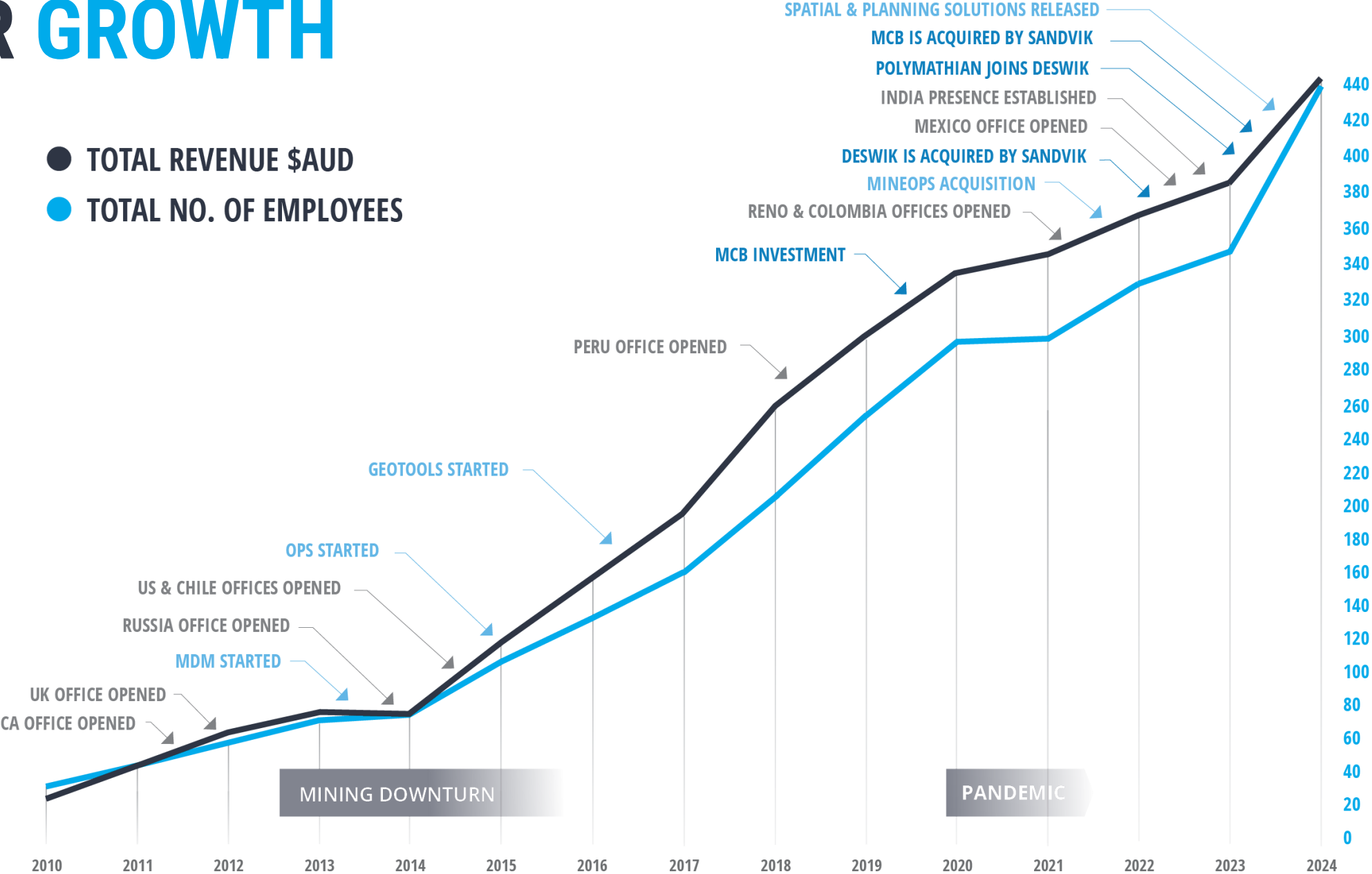
How do we solve it?

There is no silver bullet



We've been helping customers solve similar problems in the mining industry for over a decade

# OUR GROWTH





# OUR CUSTOMERS

Deswik is the software of choice for both underground and open pit mines across varying commodities. Our customers are diverse and include the world's largest Tier 1 mining companies with multi-site operations, one mine companies, and small consultancies.

We also work with major contractors in the infrastructure and rail industries to accelerate digitalization of their project lifecycles.



**600+** COMPANIES



**900+** OPERATIONS



**25,000+** SOFTWARE LICENSES

RioTinto

GLENCORE

BHP

AngloAmerican

acciona

VALE

JOHN  
HOLLAND

AURIZON.

*pacificnational*

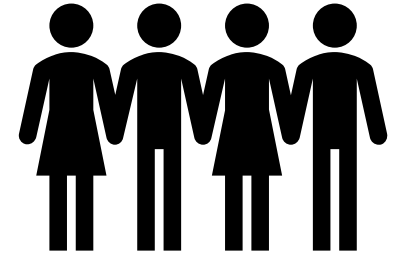
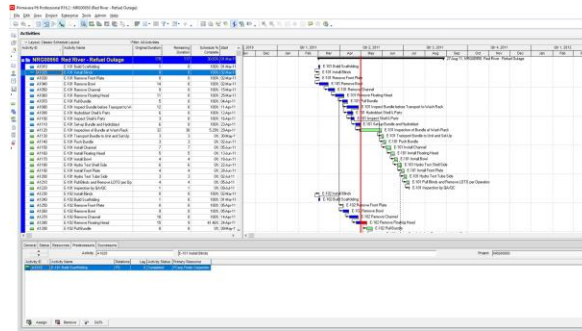
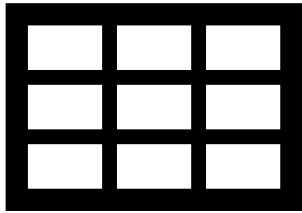
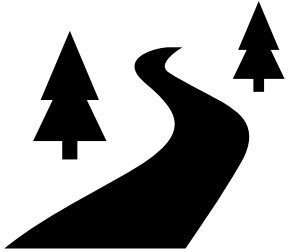
BARRICK

FMM FREEPORT-McMoRAN

NEWMONT®

CPB  
CONTRACTORS

# How are we bringing these processes and technology into infrastructure projects?



# We treat surface or linear projects like open cut mines

Windfarms, Roads, Rail, Dams



Open-cut



# We treat tunnels and pumped hydro project like underground mines

Tunnels and Pumped Hydro



Underground

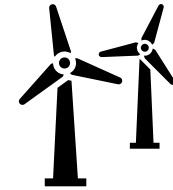
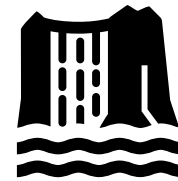


# Who is our solution for in the Construction industry?

Owners

Contractors

Consultants





# Case Studies

# Wired to optimise workflows

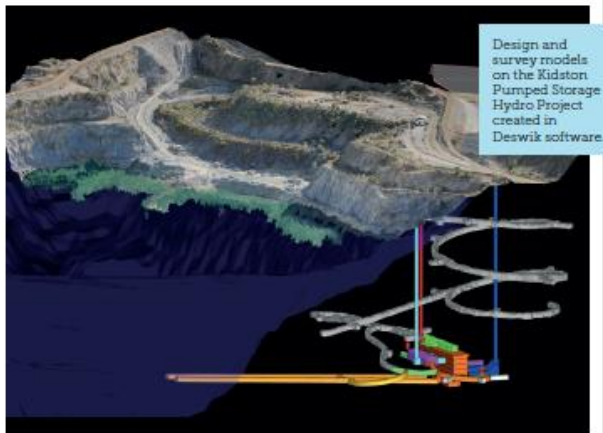
With the use of Deswik software, the McConnell Dowell John Holland Joint Venture has brought tangible benefits to the Kidston Pumped Storage Hydro Project, reportedly the first pumped storage hydro project in Australia for over 40 years.

Deswik is improving construction outcomes and site productivity through practical and cutting-edge digital workflows, as evidenced by its recent partnership for the Kidston Pumped Storage Hydro Project in Far North Queensland.

In early 2022, Deswik was engaged by the McConnell Dowell John Holland Joint Venture (MDJH JV) to visualise and review the existing P6 schedule for the project, said to be the first pumped storage hydro project developed by the private sector and the third largest electricity storage device in the country – and the results have been staggering.

John Holland deputy project director Peter Gaylard works directly with Deswik software on the Kidston Pumped Storage Hydro Project. His role is to oversee all design and construction activities associated with the powerhouse and the supporting infrastructure such as access tunnels, the upper reservoir and embankment dam.

McConnell Dowell project engineer – underground Jean-Luc Lejeune is also working directly with Deswik on the project, implementing the design in the underground phase, from the excavation of the powerhouse and the transformer hall to the construction of the access tunnels.



Design and survey models on the Kidston Pumped Storage Hydro Project created in Deswik software.

Both Gaylard and Lejeune concur that Deswik has been a crucial element to the project's ongoing success.

"We engaged Deswik in early 2022 to visualise and review the project P6 schedule as on a site level we got to a stage where we didn't have a firm grasp of our point in space in three-dimensions," says Lejeune. "Conceptually from design, we had our 2D drawings and alignment, but we didn't have a robust system that provided a visual of where we were in the project versus where we were going."

"Deswik brought the project to life in four-dimensions, the fourth dimension being time, and it was beneficial for the site team to see it play out in 3D."

It helps the entire team visualise where the project is going, says Lejeune, and identify any efficiencies or excess resources being over-deployed in certain areas.

The outcome of this initial review was the project team found opportunities and risks and were able to optimise resources to



Peter Gaylard, deputy project director, John Holland.



Underground development on the Kidston Pumped Storage Hydro Project.



Portal/underground access and lower reservoir.

improve the project plan.

Using Deswik's schedule generation technology the project team is able to generate 90 per cent of the detailed schedule with the click of a button, allowing it to run numerous scenarios and thus develop an optimised schedule.

With the project being delivered by a 24/7 onsite operation, Deswik's advanced 3D design/computer aided design (CAD) tools are also being used by the contractor to optimise the design based on unexpected site conditions found during construction. "For any changes, or updates to the project's design, we have to engage the design joint venture, which is a joint venture between GHD and Mott MacDonald," says Lejeune. "They work standard business hours (Monday to Friday), so for us to get any new design across the line it helps if we produce a tangible solution beforehand."

"The power of Deswik is that it provides the team onsite the tools to start that design of a robust alternative and get it somewhere tangible – we can work through the weekend and approach the design joint venture team on Monday morning with a tangible, workable solution."

This accelerates the request for information (RFI) and decision-making process significantly, leading to substantial savings. Using the onsite project team's optimised design solution, the joint venture design team built and issued for construction (IFC) designs in two to three days, a process that otherwise can take many weeks.

For Gaylard, he says Deswik allows the project team to better explain what they're doing. "It has enabled us to go to management and to both joint venture companies, as well as the client, with a 3D visualisation that they can comprehensively

understand," says Gaylard.

"Sketches and two-dimensional drawings just don't have that same effect and a 3D model through a traditional design process can take at least a month, if not longer to produce."

Deswik's survey tools are now also being adopted by the project team to automate progress updates and reschedule and reforecast the project on an ongoing basis. By using Deswik's integrated CAD and scheduling tools, Gaylard says this leads to a more efficient and robust process. "The software also handles solids very well," Gaylard adds. "Deswik is interchangeable with file format, so it speaks with our survey software."

"We're able to take survey data and import it straight into Deswik to create solids, which gives us our point in space – it's an extremely user-friendly and intuitive technology."

Further to the substantial benefits of the software, Gaylard and Lejeune say they are impressed with the support they continue to receive from the Deswik team. "Deswik has been very responsive, accommodating and has worked with us towards solutions," says Lejeune. "They helped me a lot when I was starting out, providing training sessions and would always be happy to dial into a quick video meeting to explain any processes."

Originally developed as a mining software, Deswik continues to modify its tools and workflow for the infrastructure industry. Deswik's infrastructure and construction manager Pieter Rautenbach and principal mining consultant Pat Banks are leading the charge to take the breakthroughs the company has had in the mining industry to the infrastructure and construction industries.

Rautenbach says the company's partnership with the MDJH JV Kidston Pumped Storage Hydro Project is a great example of how

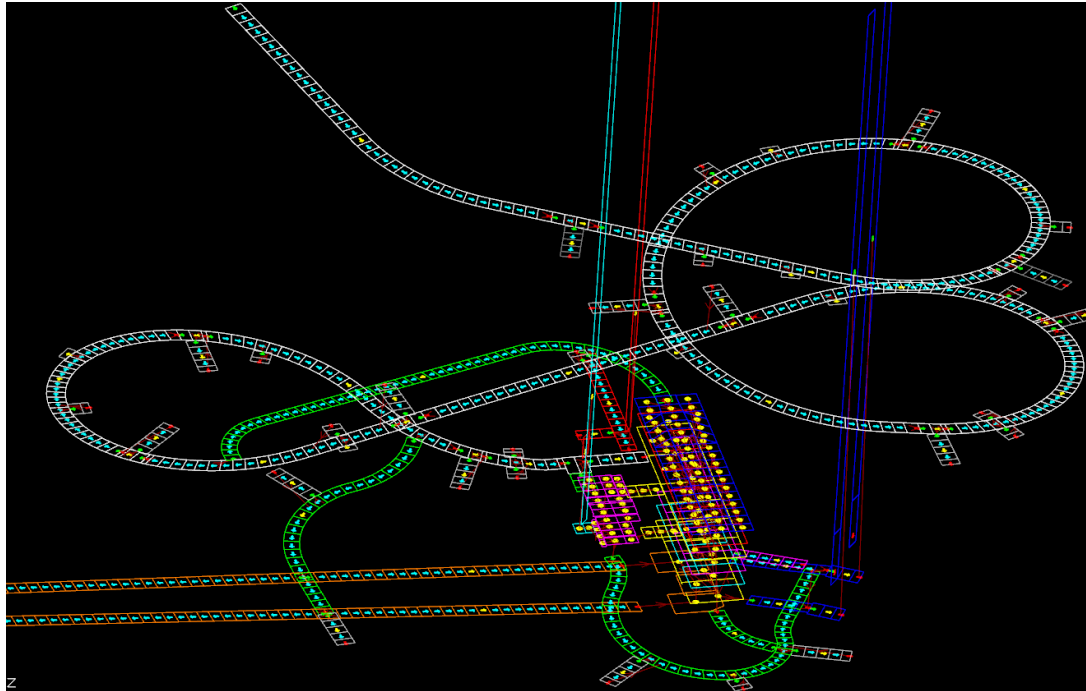


Jean-Luc Lejeune, project engineer – underground, McConnell Dowell.



Pieter Rautenbach, infrastructure and construction manager, Deswik.

# DESWIK.IS - Interactive Scheduler

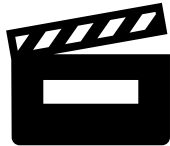


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Name	Description	Field
Mass Ex Development		Volume
Mass Ex (BC)		Volume

- Linked the 3D model to the schedule
- Created logic links based off rules
- 90% of the schedule generated at the click of a button

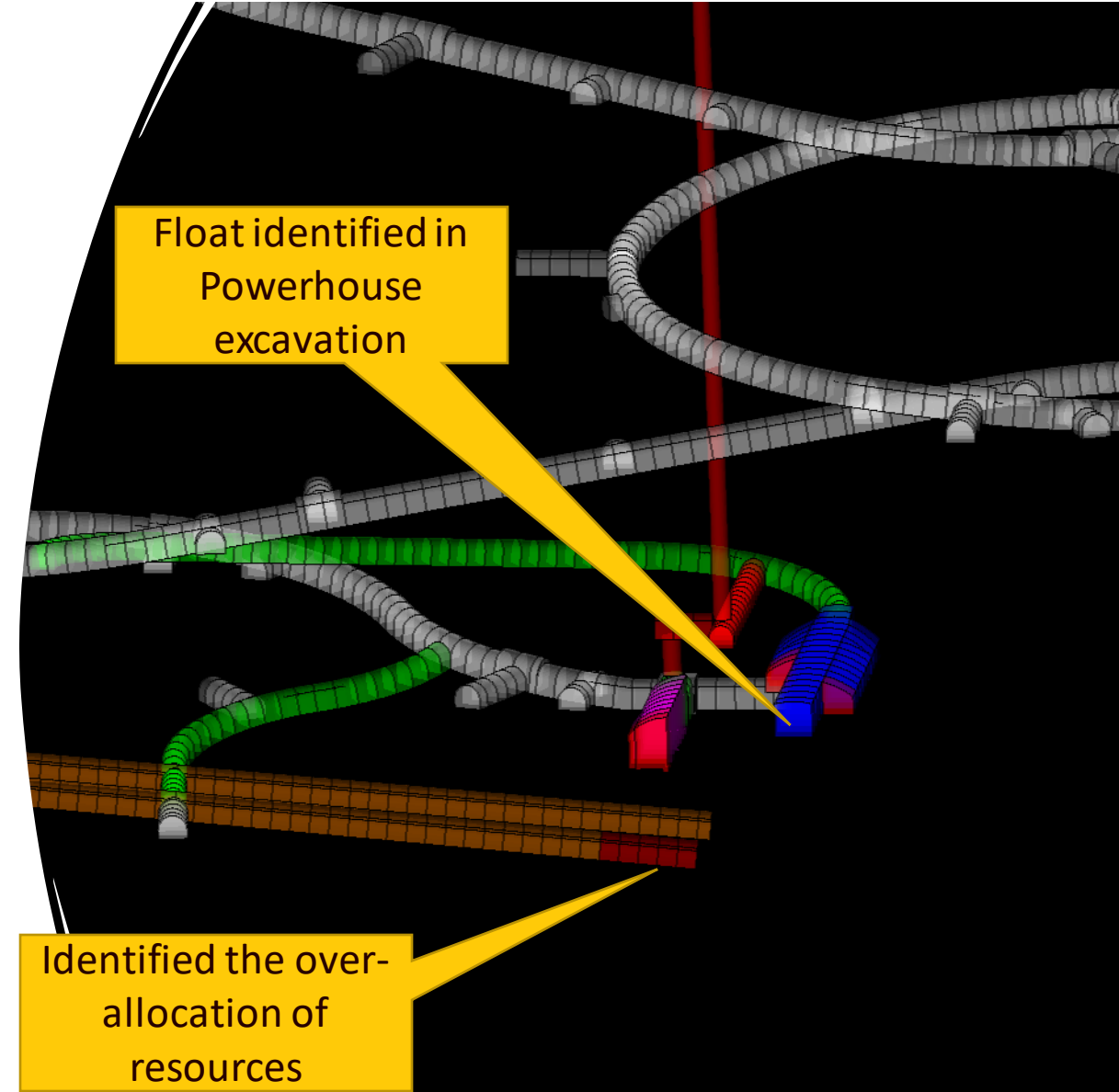


**Kidston**  
Pumped Storage Hydro Project



# KPSH ANIMATION – Adit 2

- Engaged Deswik to schedule based off our P6 program and logic
- Identified:
  - Logic errors
  - Resourcing over-allocation
- Allowed MDJH JV:
  - Re-focus resources to maintain and improve on critical path
- Construction team was able to create a new link in Deswik IS update the schedule

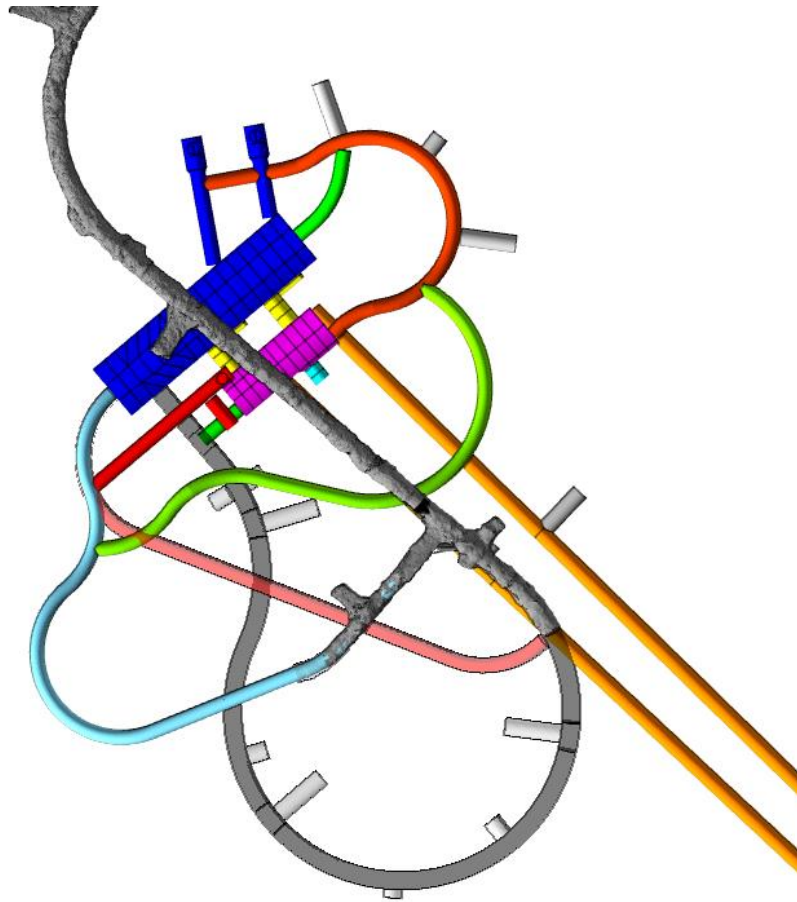


**Kidston**

Pumped Storage Hydro Project



# OPTIONEERING



- Introduction of new drives to optimise access to portions of the project [i.e shafts]
- Optioneering conducted to determine best path forward to maintain production and reduce overall downtime
- The following is a concept workshopped at KPSH



**Kidston**

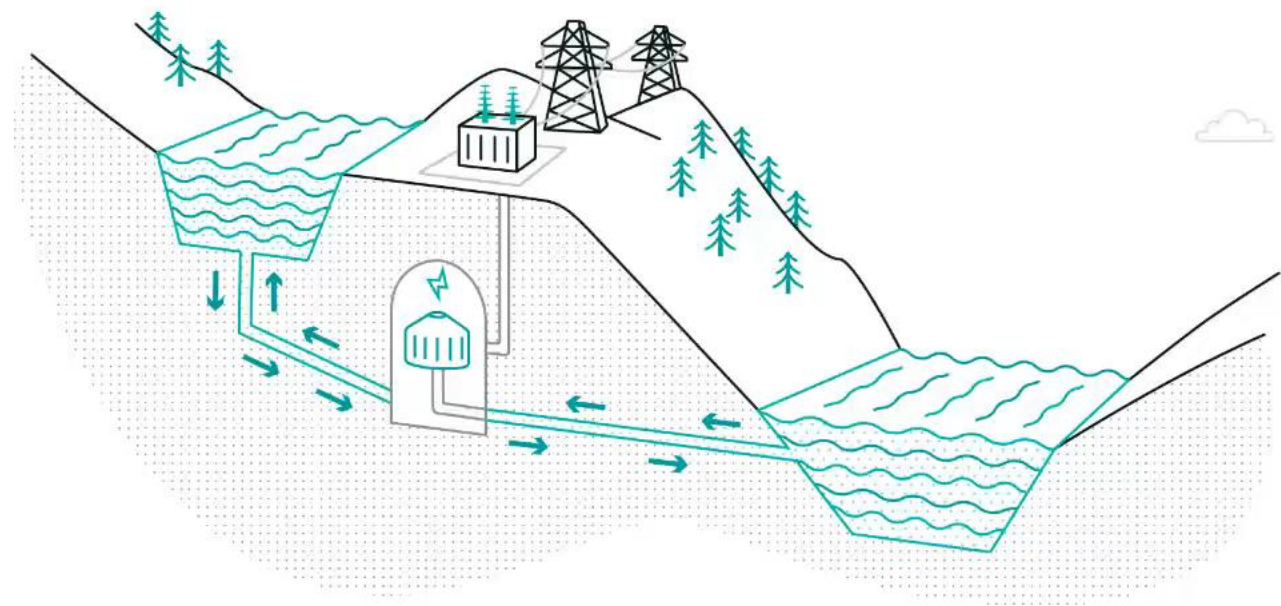
Pumped Storage Hydro Project



Outputs are easy to consume

- Pumped Hydro Demo
- Home
- 1.1 Surface Design
- 1.2 Underground Design
- 3.0 Schedule L2
- 3.1 Schedule L3
- 3.2 Animation
- 4.0 Resource Histogram
- 4.1 Concrete Volumes

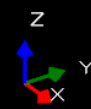
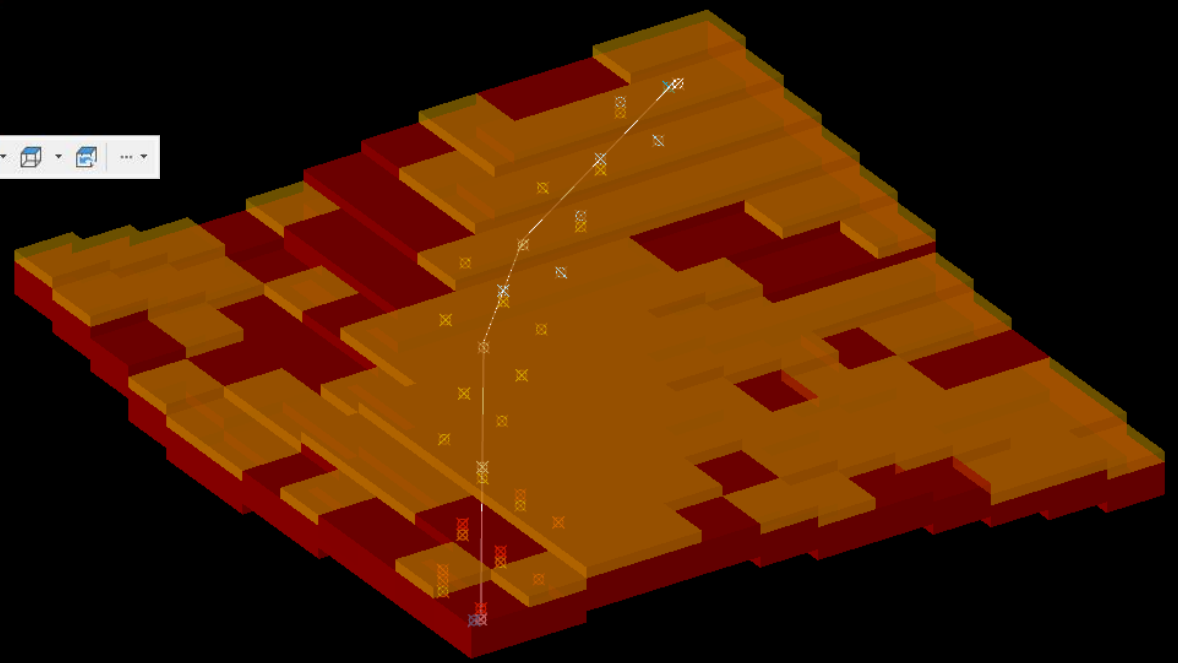
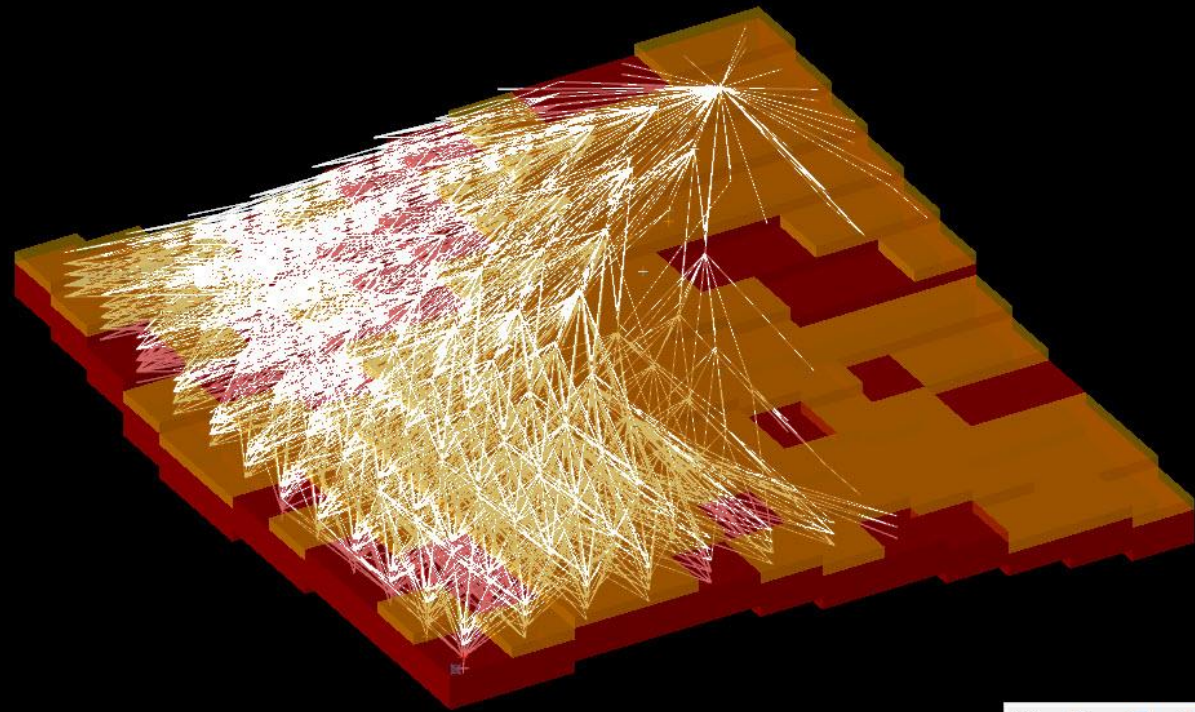
# Pumped Hydro Energy Storage Reporting Model



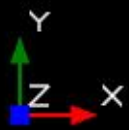
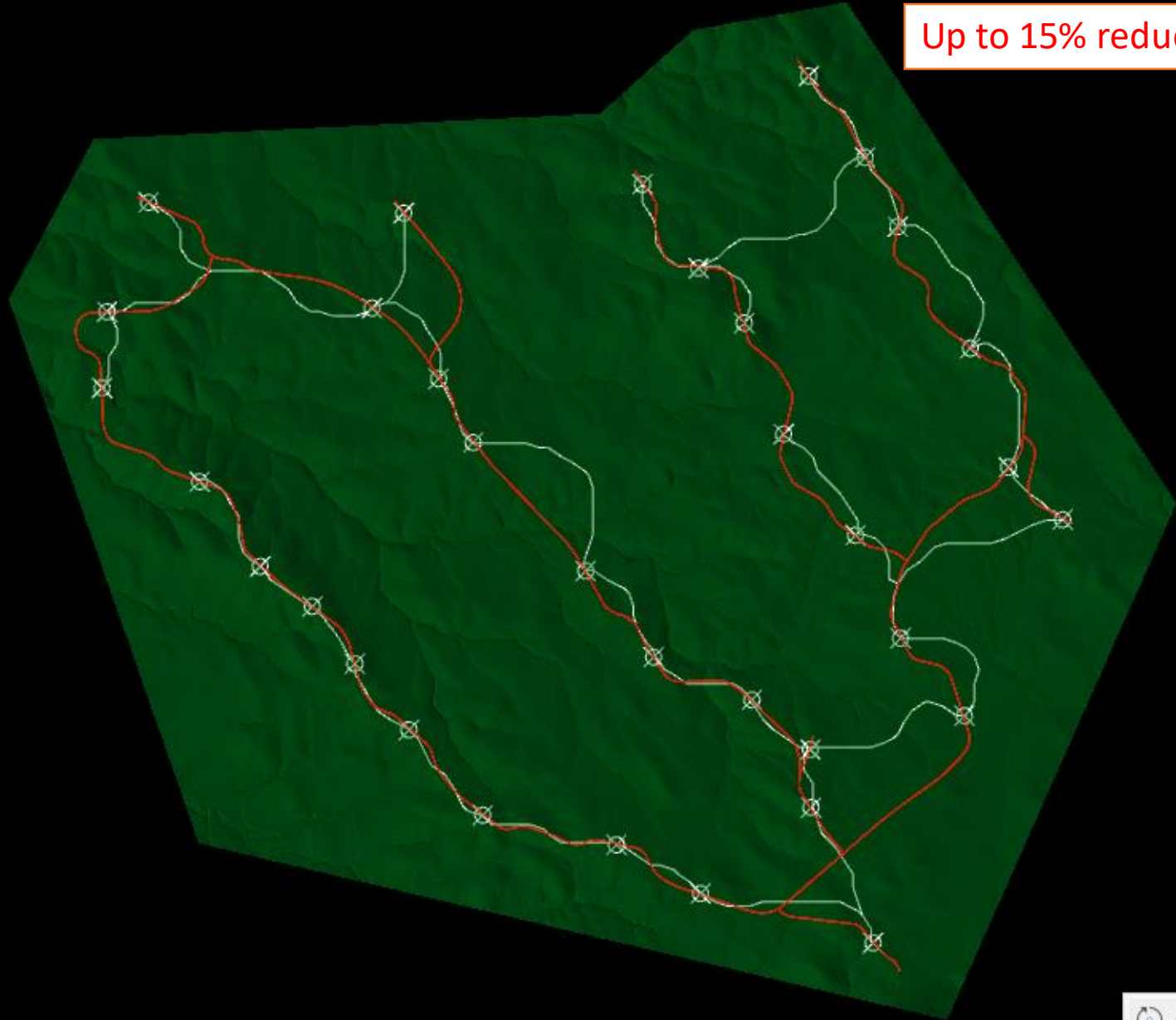
- Surface
- Underground
- Animation
- Volumes
- Schedule
- Resources

# Examples of use cases

Questions 1 - Where is the best place to build my roads for this windfarm?

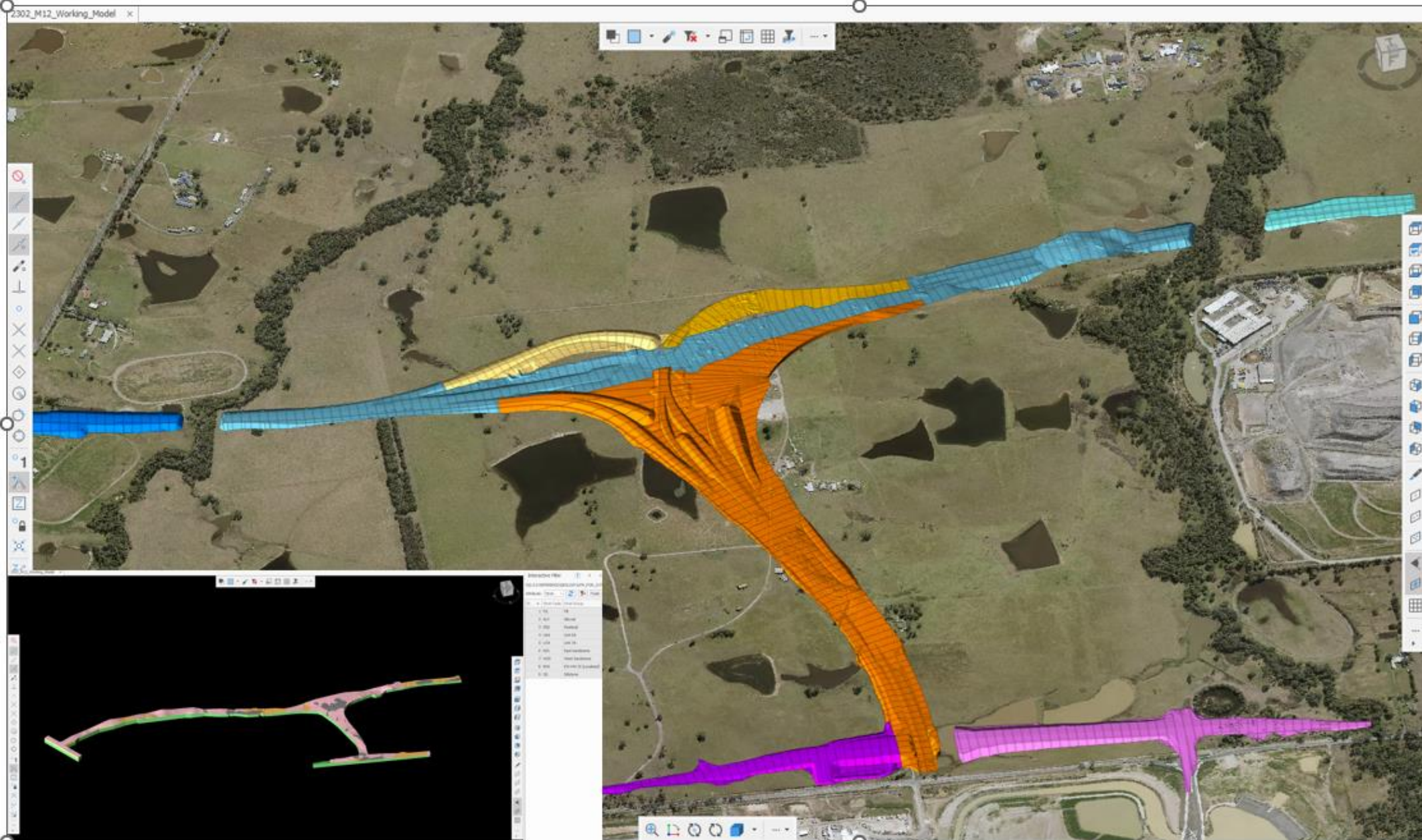


Up to 15% reduction in costs





Question 2 – What is the quantity of hard rock that we have in Separable Portion 1?



Process Map

\*MASS HAUL

**Deswik** Delivering more efficiency Mass Haul Process v37

Mass Haul Tools

Split surveyed remaining volumes: ?

<b>Cut:</b>	<b>Fill:</b>
<input type="button" value="Split Solids"/>	<input type="button" value="Identify LSEU"/>
	<input type="button" value="Split Solids"/>

Cut Scheduling >

?

Fill Scheduling >

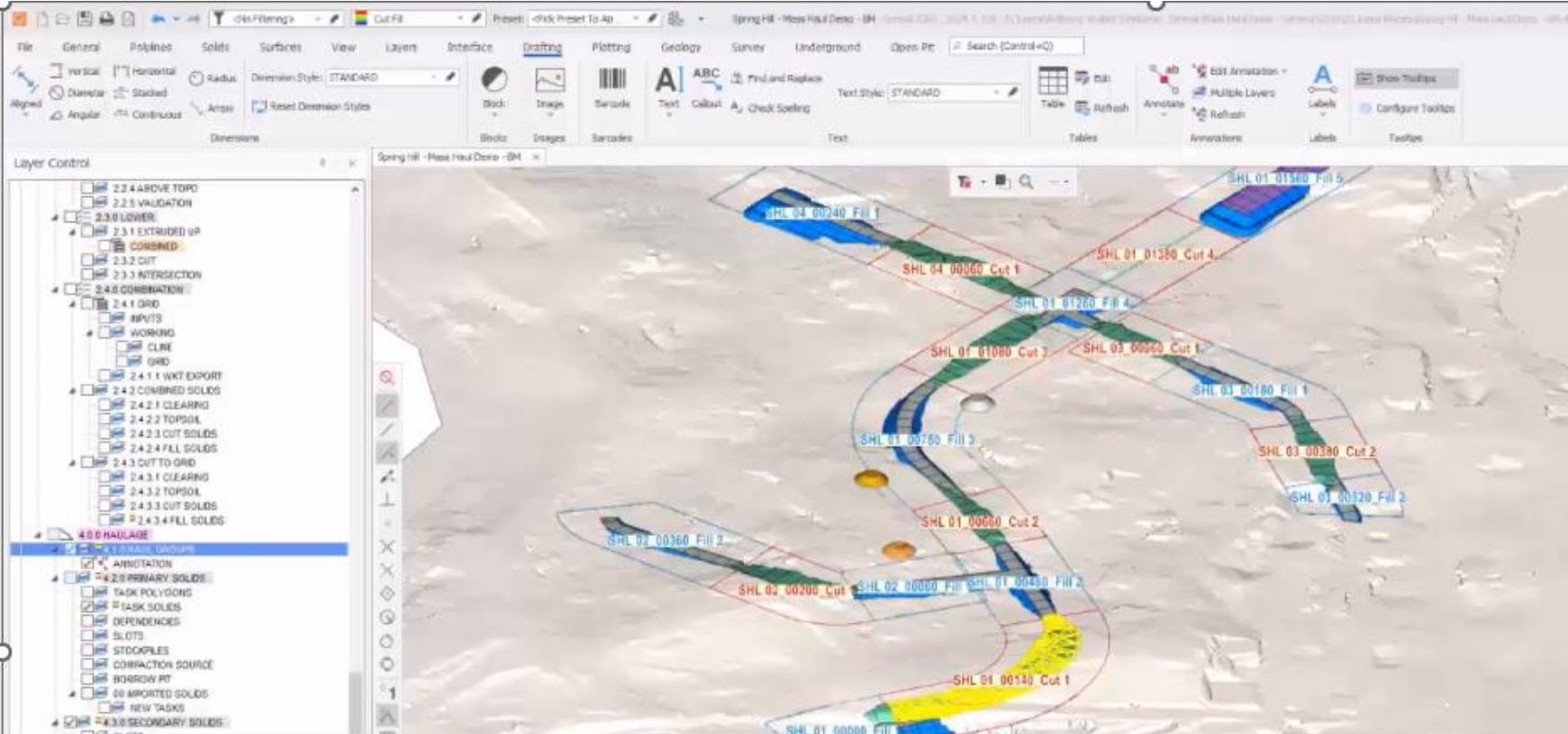
Question 3 – What is the most efficient way to build this road?

19 6654.793

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1			Fill																										
			Material	SHL 01_00000_Fill 1	SHL 01_00000_Fill 1	SHL 01_00140_Cut 1		SHL 01_00140_Cut 1	SHL 01_00480_Fill 2	SHL 01_00480_Fill 2	SHL 01_00660_Cut 2	SHL 01_00800_Fill 3	SHL 01_00800_Fill 3	SHL 01_01080_Cut 3	SHL 01_01260_Fill 4	SHL 02_00060_Fill 1	SHL 02_00060_Fill 1	SHL 02_00200_Cut 1	SHL 02_00380_Fill 2	SHL 02_00380_Fill 2	SHL 03_00060_Cut 1	SHL 03_00180_Fill 1	SHL 03_00180_Fill 1	SHL 03_00360_Cut 2	SHL 03_00520_Fill 2	SHL 04_00240_Fill 1	SHL 04_00240_Fill 1		
			Area	Type A Fill	Type B Fill	Type A Fill		Type A Fill	Type A Fill	Type B Fill	Type A Fill	Type A Fill	Type A Fill	Type A Fill	Type A Fill	Type B Fill	Type A Fill	Type A Fill	Type A Fill	Type A Fill	Type A Fill	Type A Fill	Type B Fill	Type A Fill	Type A Fill	Type A Fill	Type B Fill		
2	Cut																												
3	Area	Material		5098.191	2840.221	528.144							18.118	19265.001							8875.853	5602.767	85.274	2948.71	55070.914	42831.027	Balance		
4	SHL 01_00000_Fill 1	Cut_OTR	1778.013		1778.013																								0
5	SHL 01_00000_Fill 1	Cut_Rock	36.463	36.463																									0
6	SHL 01_00140_Cut 1	Cut_OTR	48338.536				3606.836																						-44731.7
7	SHL 01_00140_Cut 1	Cut_Rock	13312		528.144																								-12783.9
8	SHL 01_00480_Fill 2	Cut_OTR	25.012					25.012																					0
9	SHL 01_00660_Cut 2	Cut_OTR	6654.793					6654.793																					-6654.79
10	SHL 01_00660_Cut 2	Cut_Rock	22.497																										-22.497
11	SHL 01_00800_Fill 3	Cut_OTR	193.481																										-193.481
12	SHL 01_01080_Cut 3	Cut_OTR	23612.77																										-23612.8
13	SHL 01_01080_Cut 3	Cut_Rock	3486.281																										-3486.28
14	SHL 01_01260_Fill 4	Cut_OTR	1164.102																										-1164.1
15	SHL 02_00060_Fill 1	Cut_OTR	122.93																										-122.93
16	SHL 02_00200_Cut 1	Cut_OTR	10410.464																										-10410.5
17	SHL 02_00200_Cut 1	Cut_Rock	3406.887																										-3406.89
18	SHL 02_00380_Fill 2	Cut_OTR	2.281																										-2.281
19	SHL 03_00060_Cut 1	Cut_OTR	8186.995																										-8187
20	SHL 03_00060_Cut 1	Cut_Rock	129.611																										-129.611
21	SHL 03_00180_Fill 1	Cut_OTR	1.63																										-1.63
22	SHL 03_00360_Cut 2	Cut_OTR	7257.214																										-7257.21
23	SHL 03_00360_Cut 2	Cut_Rock	1151.766																										-1151.77
24	SHL 03_00520_Fill 2	Cut_OTR	35.6																										-35.6
25	SHL 04_00060_Cut 1	Cut_OTR	18670.995																										-18671
26	SHL 04_00060_Cut 1	Cut_Rock	6933.352																										-6933.35
27	SHL 04_00240_Fill 1	Cut_OTR	561.865																										-561.865
28				-5061.728	-1062.21	0	0	-21034.27	-7036.2	-101.6	-19081.15	-12565.54	-18.12	-19265	-6294.5	-6537.41	-109.07	-6762	-5111.72	-40.52	-8875.85	-5602.77	-85.27	-2948.7	-55070.91	-42831.03			
29																													
30																													
31																													
32																													
33																													



SHL 04\_00240\_Fill 1



5 - 40% reduction in distance by volume moved

**Destination Mapping:**

1. Material based rules
- ➔ 2. Manual allocations
3. Automated allocations

Sources: 0 allocated of 362,147.76 total material

Area	Borrow alloc	Borrow remain	Crusher Outp...	Crusher Outp...	Out_DTM alloc	Out_DTM rem	Out_Road_Bk	Out_Road_Bk	Out_Road_RL	Out_Road_RL	Topsoil alloc	Topsoil remaining
BP1_0000_0		161,992										
Crusher_00000_0				8,540								
SHL 01 00000_Fill 1					1,624.32		36.24		317.03			1,626.87
SHL 01 00180_Cut 1					23,664.23		15,311.69		26,982.07			2,952.56
SHL 01 00480_Fill 2					17.34							1,460.69
SHL 01 00960_Cut 2					2,819.02		36.53		3,964.12			676.35
SHL 01 00780_Fill 3					274.07				49.82			1,913.97
SHL 01 01380_Cut 3					12,601		4,305.39		12,658			1,326.35
SHL 01 01260_Fill 4					903.42				961.46			1,214.06
SHL 01 01580_Fill 5					46.72				3,009.37			3,009.37
SHL 02 00060_Fill 1					138.63				831.59			224.93
SHL 02 00200_Cut 1					6,309.25		3,462.33		4,793			311.53
SHL 02 00360_Fill 2					355.19				32.44			1,110.61
SHL 03 00380_Cut 1					5,815.67		177.41		2,818.75			707.65
SHL 03 00180_Fill 1					49.13				37.73			1,331.51
SHL 03 00260_Cut 2					2,816.15		1,428.33		4,616.33			811.58
SHL 03 00520_Fill 2					25.77				9.29			405.63
SHL 04 00000_Cut 1					8,970.69		8,087.04		10,842.73			1,336.15
SHL 04 00240_Fill 1					491.01				103.7			2,396.44

Destinations: 0 allocated of 363,721.37 total material

Area	General alloc	General remaining	Pavement alloc	Pavement remaining	Subgrade alloc	Subgrade remaining	Topsoil alloc	Topsoil remaining
SHL 01 00000_Fill 1		5,368.89		564.2		341.89		
SHL 01 00180_Cut 1		4,296.28		976.2		915.89		
SHL 01 00480_Fill 2		26,826.14		536.1		623.21		
SHL 01 00560_Cut 2		28.34		345.49		523.98		
SHL 01 00780_Fill 3		32,636.17		863.46		899.49		
SHL 01 01080_Cut 3		152.43		34.52		486		
SHL 01 01260_Fill 4		19,766.9		765.58		630.24		
SHL 01 01380_Cut 3		625.37		101,748.18		3,503.81		
SHL 02 00060_Fill 1		765.98		13,334.15		178		
SHL 02 00200_Cut 1		1,196.82		101.39		428.61		
SHL 02 00360_Fill 2		224.93		12,407.52		585.55		
SHL 02 00520_Cut 1		311.53		38.07		348.32		
SHL 02 00780_Fill 3		470.2		13,040.81		375.99		
SHL 03 00380_Cut 1		851.29		98.55		376		
SHL 03 00520_Fill 2		1,109.93		3,147.32		231.62		
SHL 04 00000_Cut 1		1,196.82		15.87		485.99		
SHL 04 00240_Fill 1		1,265.13		99,678.97		566.82		
SP1_00000		303.24						25,000
		995.1						

SHL-left dck: auto allocate, SHL-right dck: clear allocation, CTL-left dck: select entities in model space, CTL-right-left dck: auto allocate by distance.

Question 4 – What equipment should we use and what is the best sequence of work

# **Traditional Mass Haul Plan -** Excel Approach

# Silver Bullet?

Although there is no single silver bullet,

- **Scope**
- **Time**
- **Costs**

When we use integrated processes with the right technology and people to plan and manage our projects – **productivity** goes up



What are you waiting for? Find out how you can apply this to your projects

