



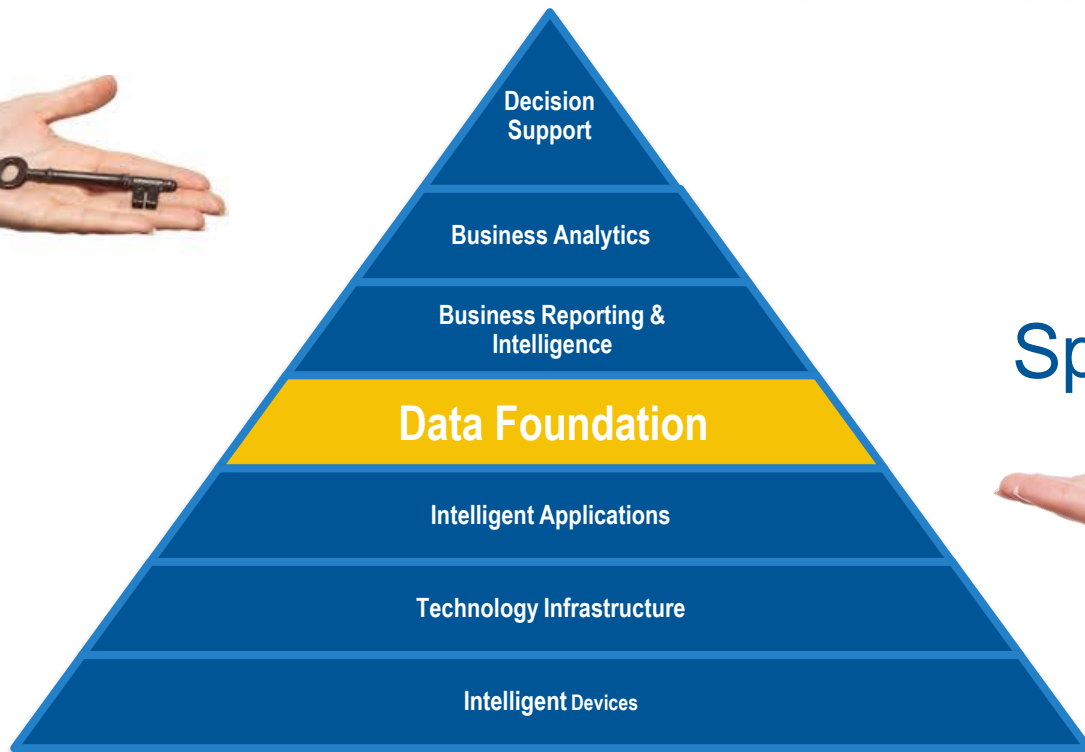
Ian du Toit – Optron, on behalf of
Alex Bals, Senior Director Professional Services

Cape Town, 10 February 2017

Connected Mine – A Data-driven Approach to Mining Optimisation



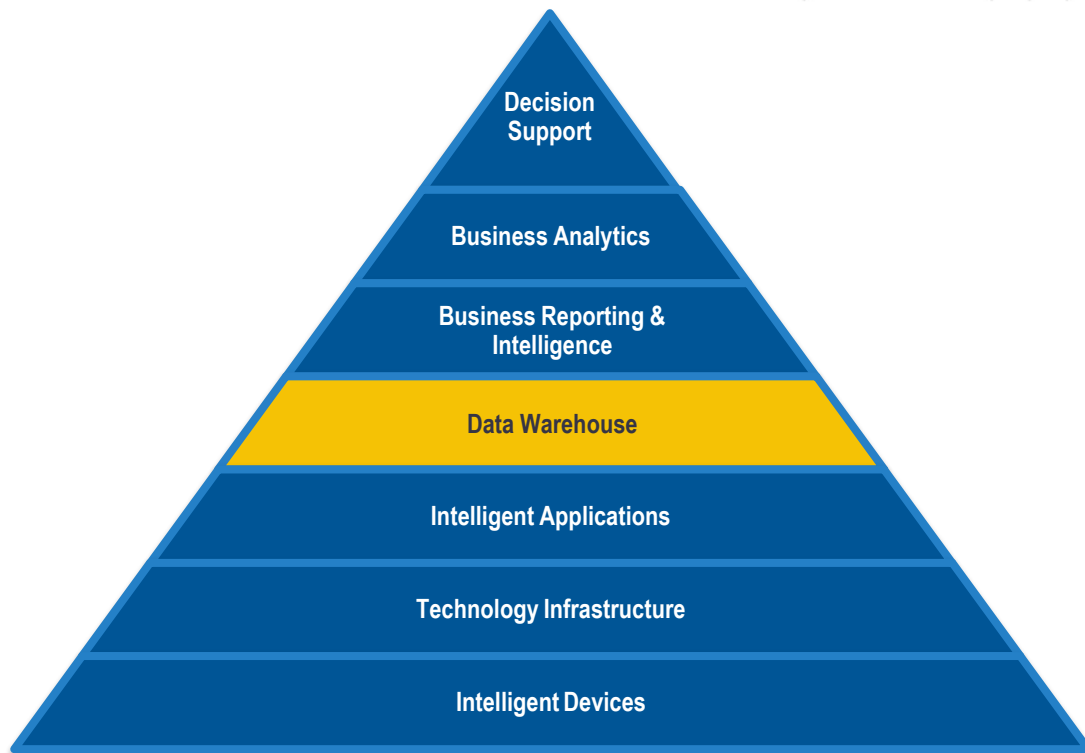
The Key to it all...



Spatial data



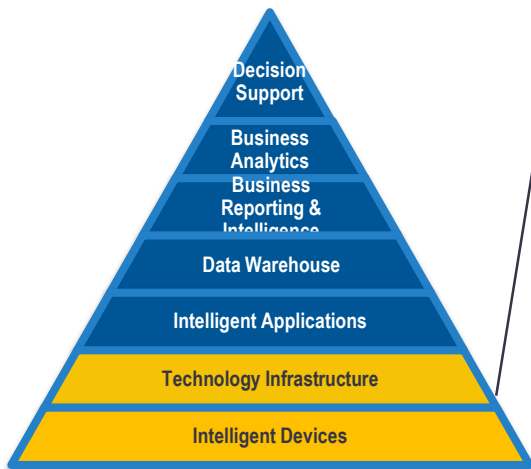
Typical Technology Stack – Mining



} Data
Opportunity

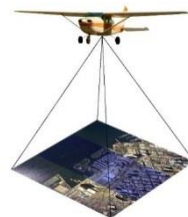
} Data
Collection

Trimble Sensors, Imagers & Intelligent Devices



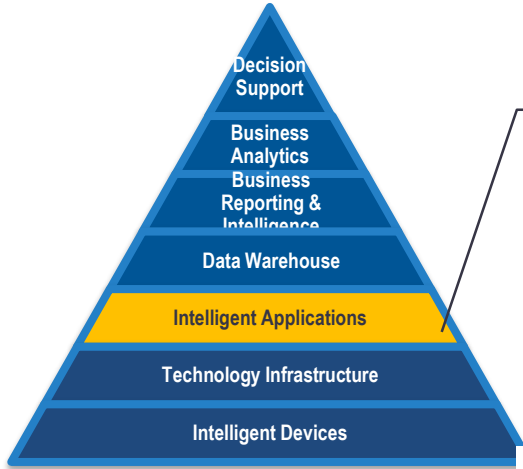
GPS
Optical
Radar
Lidar
Photogrammetry
Communications
Positioning

Historically many disparate, isolated data stores or silos with little correlation or collaboration



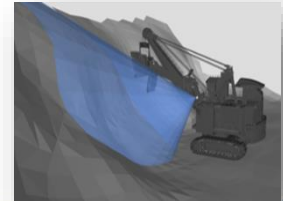
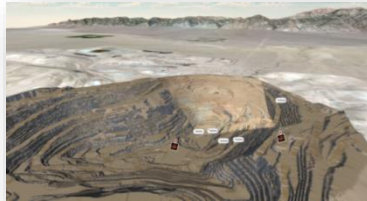
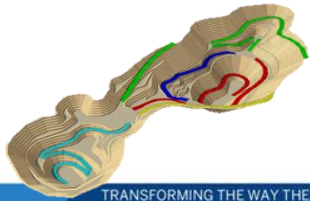


Intelligent Applications



Monitoring & Control
3D Spatial Modelling
Intelligent Applications

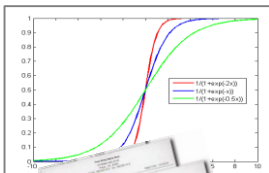
Extensive investment in numerous products to assist in capturing data that is not fully utilised



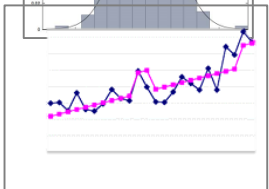
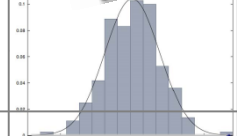
Store all your data in one trusted source

Statistics

Supply Chain, Production, Processing, Logistics

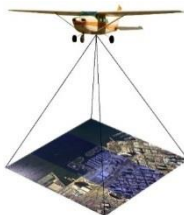


Trimble
Development



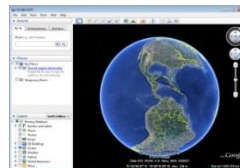
Production & Point Clouds

Fleet Monitoring, sensors, Radar, Lidar, Photogrammetry, Survey



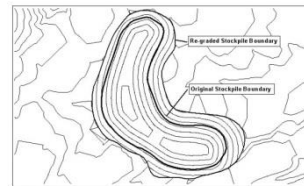
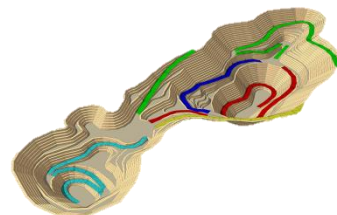
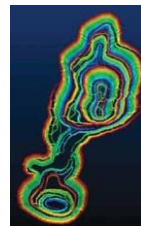
Imagery

Aerial, Terrestrial, Crowdsourced

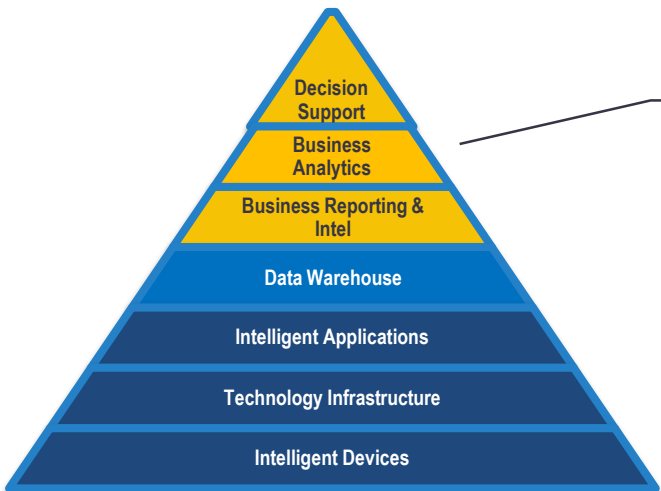


Design

Block Models, Surfaces, DXF



Connected Mine – Application Space



Statistical Analysis

Data Mining

Forecasting

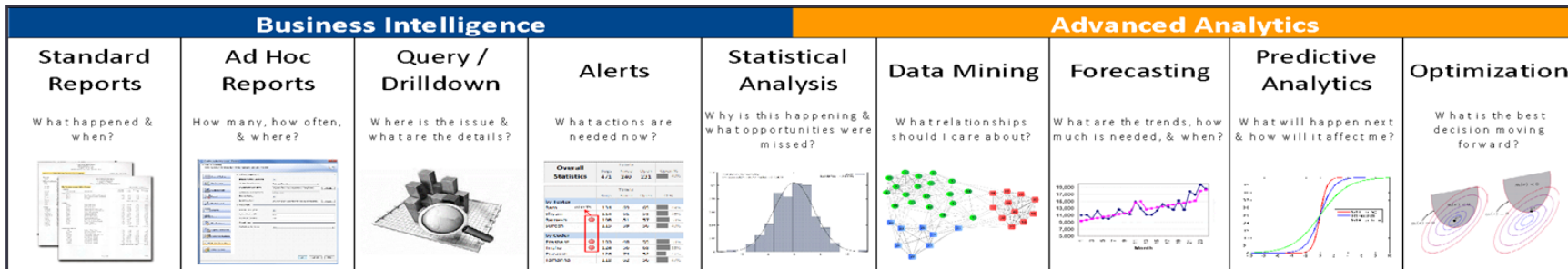
Predictive Analysis

Optimization

Allows for more **informed** decisions

Business improvement

Incremental productivity gains





Principal Concepts



- Acts as an **integrating layer**, bringing together data from many disparate sources into a consistent data model, according to a consistent set of business rules and definitions.
- Becomes the **single trusted source of all production related data** at a mining or aggregates operation, and to make that data accessible to all stake-holders.
- Provides **consistent production and performance reports** on an internal (or external) web, using standard definitions of quantities and metrics.
- Performs processing tasks in a documented, transparent and **auditable manner** (e.g. stockpile calculations, end of period survey adjustments and end of period ore grade and tonnage adjustments).



Effective and Efficient Operations

- Safe operation and good working conditions
- Low Cost operation
- Automatic deviation analysis from mining plan
- Accurate asset management and control
- Accurate Material Tracking for optimum blending and operating efficiency
- Optimum fragmentation for crusher and mill
- All meaningful data available for correlation
- Well designed and maintained road network
- Levelled floor with good lithological control and proper drainage
- Linking Mining/Quarrying to Mineral Processing

Connected Mine – all Devices



Connected Mine - Core Reports

Trimble
CONNECTED MINE

Search ...

Pages My Items

- Home
- TCM001 - Site Daily Report
- Mine Fragmentation
- Mine Performance
- Data Entry
- Production Reports
 - MGE002 - Daily Production Report
 - MGE002 - Movement Grade Summary [6 Grouping Levels]
 - MPR002 - Management Summary
 - MPR005 - Movements Summary
 - MPR006 - EOM Survey Validation
 - MPR007 - Cycle Details
 - MPR008 - Truck Production
 - MPR014 - Startup and TieDown
- Time Reports

SELECT PARAMETERS

Date Range
1/01/2016 Smart da
to
5/01/2016 Smart da

Operation
Demo Gold Operation 1

Group By
Date

Weight Type
Dry

Expand All
No

First Time Metric
Availability

Second Time Metric
Utilisation

Bookmark: New bookmark

New Open Save Save As Schedule QR

Run Report

Page 1 of 2

Management Summary

Operation: Demo Gold Start Date: 1/01/2016 End Date: 5/01/2016 Weight Type: Dry

Show/Hide All Graphs

Operation Production

Operation	Date	All Movement						Crusher Feed											
		Expit		Rehandle		Total		Expit		Rehandle		Total							
		Tonnes	bcm	Au Grade	Tonnes	bcm	Au Grade	Tonnes	bcm	Au Grade	Tonnes	bcm	Au Grade	Tonnes	bcm	Au Grade			
Demo Gold Operation 1		737,589	245,996	1.16	71,365	23,788	3.06	809,354	269,785	1.48	20,379	6,763		23,550	7,850	5.29	43,929	14,643	2.83
	1/01/2016	150,401	50,134	1.00	19,200	6,400	0.15	169,601	56,534	3.00	3,902	1,301		17,000	5,687	0.11	20,902	6,967	4.97
	2/01/2016	186,271	55,424	1.02	7,930	2,545	2.82	173,987	57,969	1.21	8,013	2,071		3,970	1,323	5.21	15,983	3,994	1.73
	3/01/2016	191,629	50,943	1.06	16,216	5,405		187,844	56,348	0.94	6,603	2,201		1,170	300		7,773	2,581	
	4/01/2016	118,327	39,442	1.22	25,295	8,765		144,622	48,207	0.87	1,851	620		1,110	370		2,971	990	
	5/01/2016	151,360	50,453	1.03	2,019	673		153,379	51,126	0.98				300	100		300	100	
Total		737,589	245,996	1.16	71,365	23,788	3.06	809,354	269,785	1.48	20,379	6,763	0.00	23,550	7,850	5.29	43,929	14,643	2.83

Production by Day

Crusher Feed by Day

Drilling

Operation	Shot	No. Holes		Total Depth	Penetration Rate	Down Time
		Count	Metres			

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Connected Mine – Dashboards

Trimble
CONNECTED MINE

Search ...

Pages **My Items**

- Home
- TCM001 - Site Daily Report
- Mine Fragmentation
- Broken Stock
- Data Entry
- Blasting Reports
- MDR006 - Explosives Supply Cost Report
- Drilling Reports
- MDR001 - Drilling Accuracy Dashboard**
- MDR003 - Drill Hole List
- MDR004 - Drilling Information
- MDR008 - Drill and Blast Summary
- Mine Performance
- Mine Product
- Process Performance
- Process Product
- Mining Spatial
- Mining Analytics
- Reference Data

SELECT PARAMETERS

Date Range: 1/01/2016 Smart da

TO: 11/01/2016 Smart da

Operation: All...

Depth Bucket Min: -2.5

Depth Bucket Max: 2.5

Depth Bucket Size: 0.25

XY Bucket Min: 0

XY Bucket Max: 1.5

XY Bucket Size: 0.1

Include Holes With Zero Depth:

Unit: All...

Bookmark: New bookmark

Drilling Accuracy Dashboard

Start Date: 1/01/2016
End Date: 11/01/2016
Operation: Demo Gold Operation 2, Demo Go...

Hole Depth Accuracy (Metres)

Number of Holes	1,898	Ave Depth Drilled	11.3
Design depth	21,224.2	Target Range (Under)	1.0
Drilled depth	21,079.9	Target Range (Over)	1.0
Excess Drilled Depth	-145.4	Within Depth Range	89.2 %
Excess Drilling	-0.7 %	Underdrilled	7.7 %
		Overdrilled	3.1 %

Hole XY Position Accuracy (Metres)

Target Range	1.00	Within Target Range	73.3 %
Average Hole Error	3,000.13	0.5 - 1.0m	1.4 %
Maximum Error	902,930.91	> 1.0m	25.3 %

Crew Performance (Target: 90 %)

OP	OP_A	OP_B	OP_C	OP_D
Performance	92 %	88 %	83 %	98 %

Crew Performance (Target: 90 %)

OP	OP_A	OP_B	OP_C	OP_D
Performance	74 %	72 %	89 %	43 %

Week-by-week tracking (Target: 90 %)

Week	27/12/2015	3/01/2016	10/01/2016	13/12/2015
Performance	87 %	73 %	91 %	85 %

Week-by-week tracking (Target: 90 %)

Week	27/12/2015	3/01/2016	10/01/2016	13/12/2015
Performance	75 %	69 %	73 %	72 %

Drill Depth Histogram

Drill XY Position Histogram

Connected Mine - Geology Tools

Trimble of 811

Search ... Operation: Demo Gold Operation 1 Mine Block: MN3508002-05-PAG

Pages | My Items

- Home
- TCM001 - Site Daily Report
- Mine Fragmentation
- Mine Performance
- Data Entry
- Production Reports
- Time Reports
- Maintenance Reports
- Mine Product
- Mine Block Management
 - Mine Block Overview**
 - Product Tracking
 - Adjustment
 - Location List
 - Location Overview
 - Manual Balance
 - Merge
 - Product Reports
- Process Performance
- Process Product
- Mining Special
- Mining Analytics
- Reference Data

Mine Block Summary

Mine Block	MN3508002-05-PAG
Tenement	N/A
Date First Mined	2/12/2015
Date Last Mined	16/12/2015
Data Dug Off	
Opening Weight	52,311 t
Total Mined Weight	44,427 t
Remaining Weight	35,894 t
Current Grades	Ag: 4.17%, Au: 0.75 g/Tm, Cu: 37.40 PPM, mg: 0.00, S: 2.75%, Zn: 2,070.00 PPM
Bulk Density	N/A

Ore Destination Summary


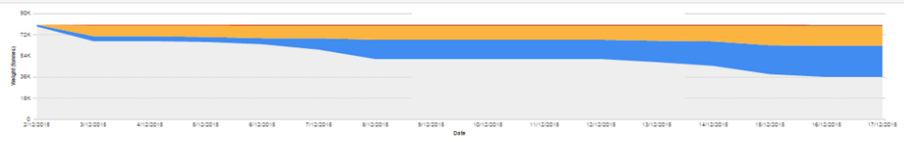

Destination	Weight (t)	Percent (%)	Ag	Au	Cu	S	Zn
D-PAGA-210	24,550	59.6 %	4.17	0.72	37.40	2.75	2,070.00
D-PAGA-220	16,815	37.8 %	4.17	0.72	37.40	2.75	2,070.00
M-MBO-260	708	1.6 %	4.17	0.72	37.40	2.75	2,070.00
M-MBO-350	177	0.4 %	4.17	0.72	37.40	2.75	2,070.00
D-PAGA-190	177	0.4 %	4.17	0.72	37.40	2.75	2,070.00

Mining by Loader

Date	FL301 (t)	FL302 (t)	FL303 (t)	Total (t)
2/12/2015	1,563			1,563
3/12/2015	12,990			12,990
5/12/2015	708			708
6/12/2015	1,947			1,947
7/12/2015	4,602			4,602
8/12/2015	7,965			7,965
15/12/2015		2,655		2,655

Cycle Log

Date	Shift	Destination	Type	Loader	Loader Oper.	Haul Truck	Haul Oper.	Weight (t)
2/12/2015	Night	D-PAGA-210	Waste dumps	FL301	Jeremie Morneau	Tru207	Deloris Pita	177
2/12/2015	Night	D-PAGA-210	Waste dumps	FL301	Jeremie Morneau	Tru207	Etisa Piliro	177
2/12/2015	Night	D-PAGA-210	Waste dumps	FL301	Jeremie Morneau	Tru119	Mary Prata	177

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Connected Mine – Product Tracking

☰ Trimble
👤 ⌵

Operation: Demo Gold Operation 1

Location: B-HG2A

🔍 Search

🔗 Edit

📊 Latest Material Composition

Material Type	Weight (tonnes)
High Grade-Hi Sulphur	~95,000,000
High Grade-Low Sulphur	~45,000,000
Unknown material type	~35,000,000

📊 Latest Origin Composition

Origin Label	Weight (tonnes)
2A/310	~65,000,000
B010-06-H02	~40,000,000
B005-07-H02	~30,000,000
B011-07-H01	~25,000,000
B005-04-H02	~20,000,000
B005-10-H02	~15,000,000
B009-02-H02	~10,000,000
B007-04-H02	~5,000,000

History

From: 1/10/2015 | Smart date... | To: 20/11/2015 | Smart date...

Grade: Au

Weight (tonnes)

1/10/2 2/10/2 3/10/2 4/10/2 5/10/2 6/10/2 7/10/2 8/10/2 9/10/2 10/10/ 11/10/ 12/10/ 13/10/ 14/10/ 15/10/ 16/10/ 17/10/ 18/10/ 19/10/ 20/10/ 21/10/ 22/10/ 23/10/ 24/10/ 25/10/ 26/10/ 27/10/ 28/10/ 29/10/ 30/10/ 31/10/ 1/11/2 2/11/2 3/11/2 4/11/2 5/11/2 6/11/2 7/11/2 8/11/2 9/11/2 10/11/ 11/11/ 12/11/ 13/11/ 14/11/ 15/11/ 16/11/ 17/11/ 18/11/ 19/11/ 20/11/ 2015

Movement History

Date	Shift	Origin	Destination	Loads	Weight (t)
Oct 31, 2015	N	S-HG2	B-HG2A/290-032	64	3,200

Connected Mine – Plant data

KPI Variance Scorecard

Period from 1/10/2014 to 31/10/2014

Region	Open Pit			Underground				Processing
	Ore Mined (t)	Ore Mined Grade (g/t)	Waste Mined (t)	Total Ore Mined (t)	Waste Tonnes (t)	Mined Grade - Au (g/t)	Recovered Gold (oz)	
Australia	389,464	3.18	1,424,797 (23 %)	106,708 (11 %)	23,983 (14 %)	6.88 (10 %)	300	
Demo Mine 1	389,464	3.18	1,424,797 (23 %)	106,708 (11 %)	23,983 (14 %)	6.88 (10 %)	300	
Africa	1,169,378 (24 %)	1.05 (-11 %)	825,334 (-11 %)				23,396	
Demo Mine 2	1,169,378 (24 %)	1.05 (-11 %)	825,334 (-11 %)				23,396	
South America	1,871,086 (100 %)	0.41 (7 %)	23,651,148 (0 %)	223,687 (23 %)	61,107 (2 %)	10.14 (-15 %)	131,711 (29 %)	
Demo Mine 3	1,325,656 (65 %)	0.34 (10 %)	12,460,549 (0 %)	45,976 (7 %)	20,437 (8 %)	11.58 (-44 %)	33,162	
Demo Mine 4	8,155 (07 %)	2.03 (37 %)	7,249,557 (1 %)	123,059 (22 %)	27,804 (9 %)	10.01 (27 %)	78,104 (14 %)	
Demo Mine 5	537,466 (28 %)	0.56 (78 %)	3,941,042 (2 %)	51,952 (45 %)	12,866 (-18 %)	10.01 (27 %)	19,364 (6 %)	
Demo Mine 6	2,926,691 (12%)	1.45 (12%)	4,090,777 (12%)				142,366 (12%)	
Demo Mine 7	2,319,581 (11%)	1.16 (3%)	1,862,736 (7%)				59,459 (8%)	
Demo Mine 8	607,110 (10%)	2.53 (10%)	223,041 (10%)				82,907 (10%)	
							342,721 (131 %)	

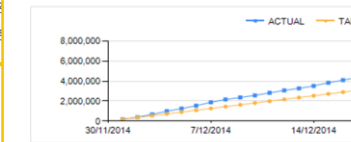
OP001 Ore Mined

Show/Hide Report Description

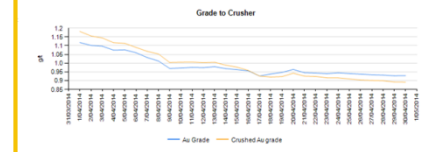
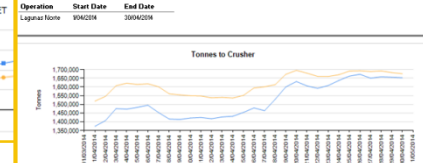


Performance

Operation	Units	Actual	Target	Var.	Difference
Demo Mine 1	t	1,021,447	1,234,873	-17%	-213,425
Demo Mine 2	t	1,669,106	1,570,712	2%	38,393
Demo Mine 3	t	876,759	968,089	-9%	-91,330
Demo Mine 4	t	49,276	0		49,276
Demo Mine 5	t	2,560,450	1,720,617	49%	839,833
Demo Mine 6	t	325,483	123,445	264%	325,483
Demo Mine 7	t	847,299	667,898	127%	847,299
Demo Mine 8	t	0	0		0
Demo Mine 9	t	0	0		0
Total		7,289,820	6,684,291	11%	1,795,629



Mine - Process Reconciliation



Date	Mine Feed		Processing Feed		Weight Factor	Grade Factor
	Total Ore to Crusher	Crushed Au grade g/t	Ore to Primary Crusher	Au Grade g/t		
10/04/2014	1578,762	1.16	1,374,464	1.12	0.90	0.95
20/04/2014	1,586,244	1.16	1,407,254	1.11	0.91	0.95
30/04/2014	1,627,073	1.14	1,476,021	1.11	0.92	0.96
4/04/2014	1,621,620	1.12	1,472,701	1.07	0.91	0.96

Plant Management

Home | Diagrams | Data Entry | Reports | Measurements

Yoyu Togo | Reports

Date: 7/29/2014 | Smart data | Operation: | Report: Demo 1

Refresh Data | Zoom: 100%

Concentrator Division

DEMONSTRATION ONLY

Date: 5/7/2014 | Report: Demo 1

Product | Tonnage | Power | Cu

Mine Site Daily Report

View Site Daily Report

View/Hide Report Description

Open Pit

Units	Period (1/12/2013 - 23/12/2013)			Month to Date (1/12/2013 - 23/12/2013)			Year to Date (1/01/2013 - 23/12/2013)		
	Actual	Annual Budget	Variance	Actual	Annual Budget	Variance	Actual	Annual Budget	Variance
Total Material Mined	1,245,811	3,789,121	-69,319	1,245,811	3,789,121	-69,319	47,602,498	49,068,110	-1,465,155
Ore Mined	1,790,480	1,384,627	396,853	1,790,480	1,384,627	396,853	25,824,337	23,824,397	1,792,560
Ore Mined Grade	0.91	1.24	-0.33	0.91	1.24	-0.33	1.14	1.24	-0.10
Ore Mined Oncies	00	70,062	70,062	00	70,062	70,062	802,428	802,428	136,311
Waste Mined	1,308,125	1,944,388	-188,263	1,308,125	1,944,388	-188,263	22,819,665	25,403,290	-613,520
Total Material Mined	1,464,449	3,426,362	-1,220,882	1,464,449	3,426,362	-1,220,882	70,758,424	71,246,018	-18,612,416
Reconcile	1,191,636	418,345	933,093	1,191,636	418,345	933,093	23,967,339	3,888,847	20,078,652

Processing

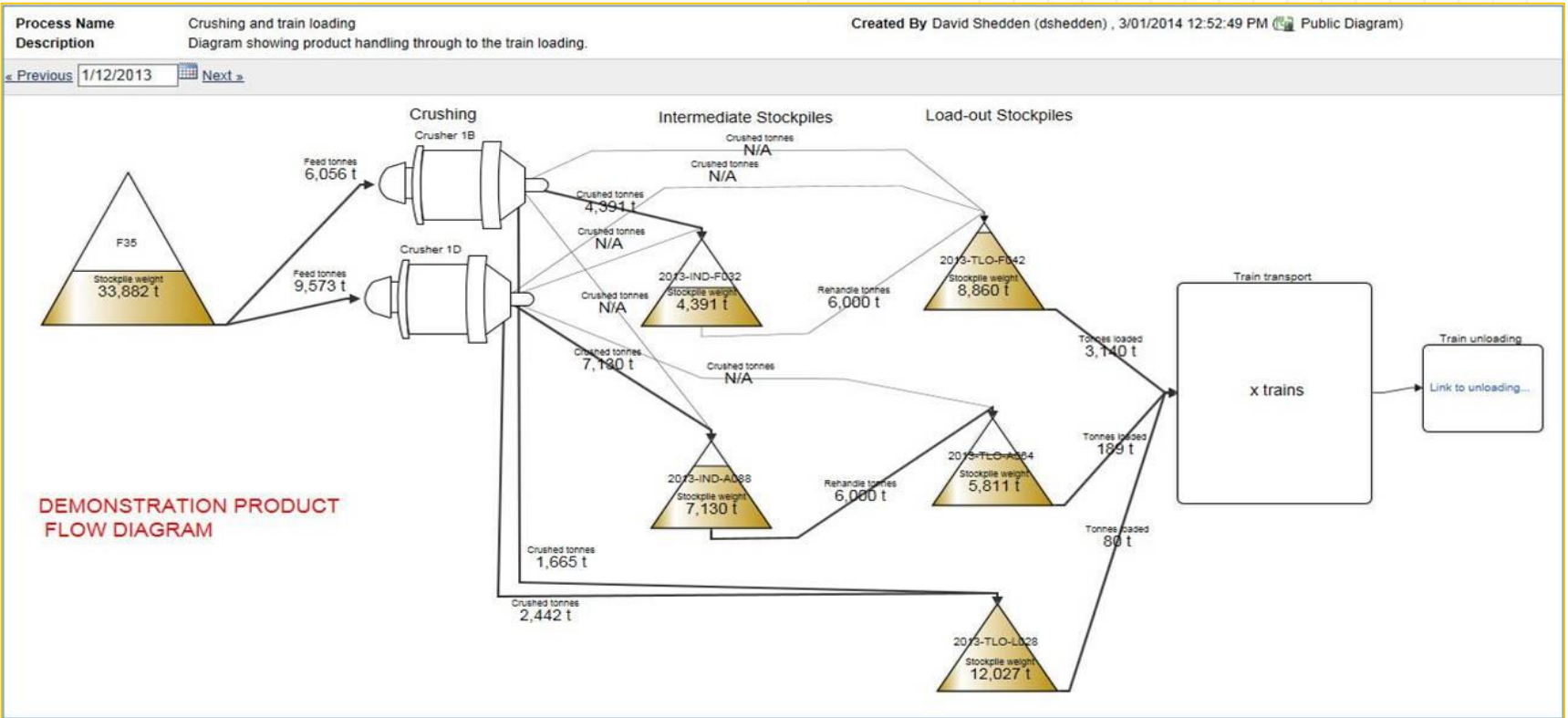
Units	Period (1/12/2013 - 23/12/2013)			Month to Date (1/12/2013 - 23/12/2013)			Year to Date (1/01/2013 - 23/12/2013)			
	Actual	Annual Budget	Variance	Actual	Annual Budget	Variance	Actual	Annual Budget	Variance	
Recovered Gold	49,130	56,868	-7,738	49,130	56,868	-7,738	586,371	586,371	66,374	
Material Picked	1,275,123	1,200,120	75,003	1,275,123	1,200,120	75,003	21,375,126	23,496,790	-1,881,594	
Gold Picked	48,252	49,000	-747	48,252	49,000	-747	584,100	603,400	-9,300	
Program Solution Picked	00	1,314,212	2,208,000	-893,788	1,314,212	2,208,000	-893,788	18,909,390	18,204,000	-13,946,420
Program Solution Grade	00	1.16	1.22	-0.05	1.16	1.22	1.09	1.12	-0.02	
Gold Production	00	48,252	49,000	-747	48,252	49,000	747	584,300	586,134	-5,834

Utilization

Units	Period (1/12/2013 - 23/12/2013)			Month to Date (1/12/2013 - 23/12/2013)			Year to Date (1/01/2013 - 23/12/2013)		
	Actual	Annual Budget	Variance	Actual	Annual Budget	Variance	Actual	Annual Budget	Variance
Shut Truck Utilization %	76.61%	81.20%	-4.59%	76.61%	81.20%	-4.59%	73.67%	81.07%	-7.40%
Equipment Utilization %	68.76%	82.74%	-14.00%	68.76%	82.74%	-14.00%	75.26%	83.10%	-8.80%



Connected Mine - Processing



Connected Mine – Process Accounting

PMRS Demonstration Home Diagrams Data Entry

Demonstration Reports **PMRS010 - Delay Log Summary** View Report

Operation: Demonstration Gold Mine
 Summary Group: Productive Unit

Delay Log Summary

Operation: Demonstration Mine
 Standard of Measure: ...
 Summary Group: Productive Unit

Show/Hide Report Description

Productive Unit	Equipment Type	Time Class	Stoppage Cause	Delay
Primary Crusher				
	Crusher			
		Process Scheduled		
			Ore delivery requirements	
			Process Unscheduled	
			Blockage	
			Service supply	
			Upstream/downstream constraints	
Secondary Crusher				
	Conveyor			
		Process Unscheduled		2.05 0.19 %
			Belt Drift	0.38 0.05 %
			Pullwire	1.67 0.46 %
	Feeder			2.25 0.63 %
		Process Unscheduled		2.25 0.63 %
			Blockage	2.25 0.63 %
HPGR				
	Bin			0.87 0.06 %
		Process Unscheduled		0.87 0.06 %
			Instrumentation fault	0.87 0.06 %

Plant Management

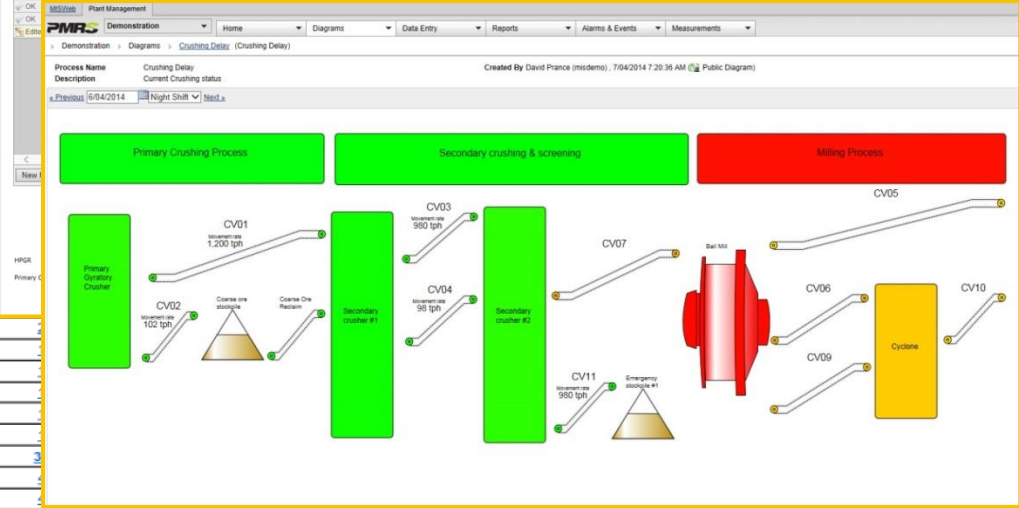
PMRS Demonstration Home Diagrams Data Entry Reports Alarms & Events Measurements

Filters

Plant: Mill Facility
 Delay Period: 11/11/2013 to 12/11/2013

Productive Units: All Productive Units

Options	Productive Unit	Equipment Type	Time Class	Stoppage Cause	Delay Start (GMT+0800)	Delay End (GMT+0800)	Comment
<input type="checkbox"/> OK	HPGR	Grinding Roll	Process Unscheduled	Upstream constraints	11/11/2013 01:08:00.000	11/11/2013 01:38:00.000	Wet screen bin full
<input type="checkbox"/> OK	HPGR	Grinding Roll	Maintenance Unscheduled	Lubrication System F4	11/11/2013 03:53:00.000	11/11/2013 05:45:00.000	Low grease level on HPGR
<input type="checkbox"/> OK	HPGR	Grinding Roll	Process Unscheduled	Upstream constraints	11/11/2013 07:03:00.000	11/11/2013 07:15:00.000	wet screen bins full running lower feed
<input type="checkbox"/> OK	HPGR	Grinding Roll	Process Unscheduled	Upstream constraints	11/11/2013 07:46:00.000	11/11/2013 08:05:00.000	wet screen bins full running lower feed
<input type="checkbox"/> OK	Primary Crusher	Crusher	Process Unscheduled	Service supply	11/11/2013 09:34:00.000	11/11/2013 10:20:00.000	No trucks
<input type="checkbox"/> OK	HPGR	Grinding Roll	Process Unscheduled	Upstream constraints	11/11/2013 09:37:00.000	11/11/2013 10:04:00.000	wet screen bins full running lower feed
<input type="checkbox"/> OK	HPGR	Grinding Roll	Process Unscheduled	Upstream constraints	11/11/2013 11:30:00.000	11/11/2013 12:07:00.000	wet screen bins full running lower feed



Connected Mine – Bring Your Own Device

Add/Remove Measurements

The 'My KPIs' component allows you to select or create your own measurement set.

Select a Measurement Set
New Measurement Set 2 Edit Set Add Set

Measurements

Edit Measurement Close Edit Delete

Label: Shovel Avail

Measurement: Demo Gold Operation 1 | AV003

Period: YearToDate

Aggregate: Time Avg

Class: AC - Actual

Compare to: B1 - Budget Save

- 1 Haul Truck Availability Edit Delete
- 3 Ave Payload Edit Delete
- 4 Ore Tonnes Edit Delete

+ Add Another Measurement Save Changes Cancel

Finish editing before saving!

Add/Remove Measurements

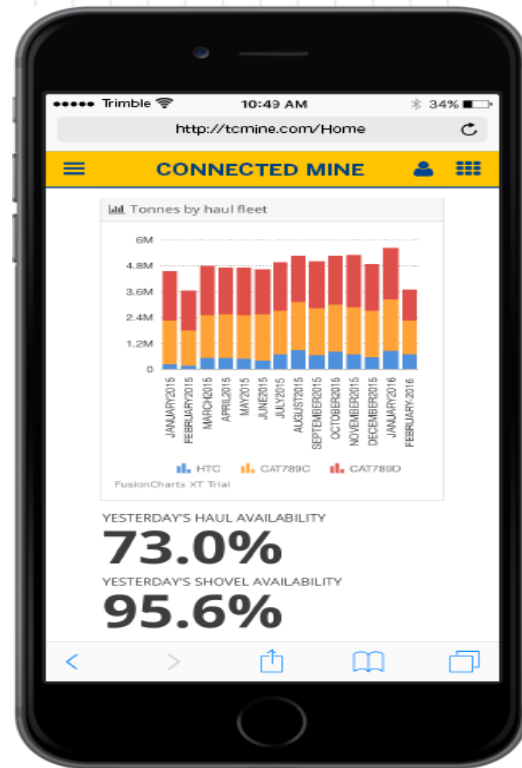
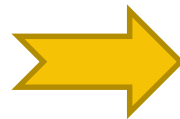
The 'My KPIs' component allows you to select or create your own measurement set.

Select a Measurement Set
New Measurement Set 2 Edit Set Add Set

Measurements

- 1 Shovel Avail Edit Delete
- 2 Haul Truck Availability Edit Delete
- 3 Ave Payload Edit Delete
- 4 Ore Tonnes Edit Delete

+ Add Another Measurement Save Changes Cancel



My KPI's – new function
User selected KPI's
Targeted for portable devices (phones and tablets)

Connected Mine – Corporate Benchmarking

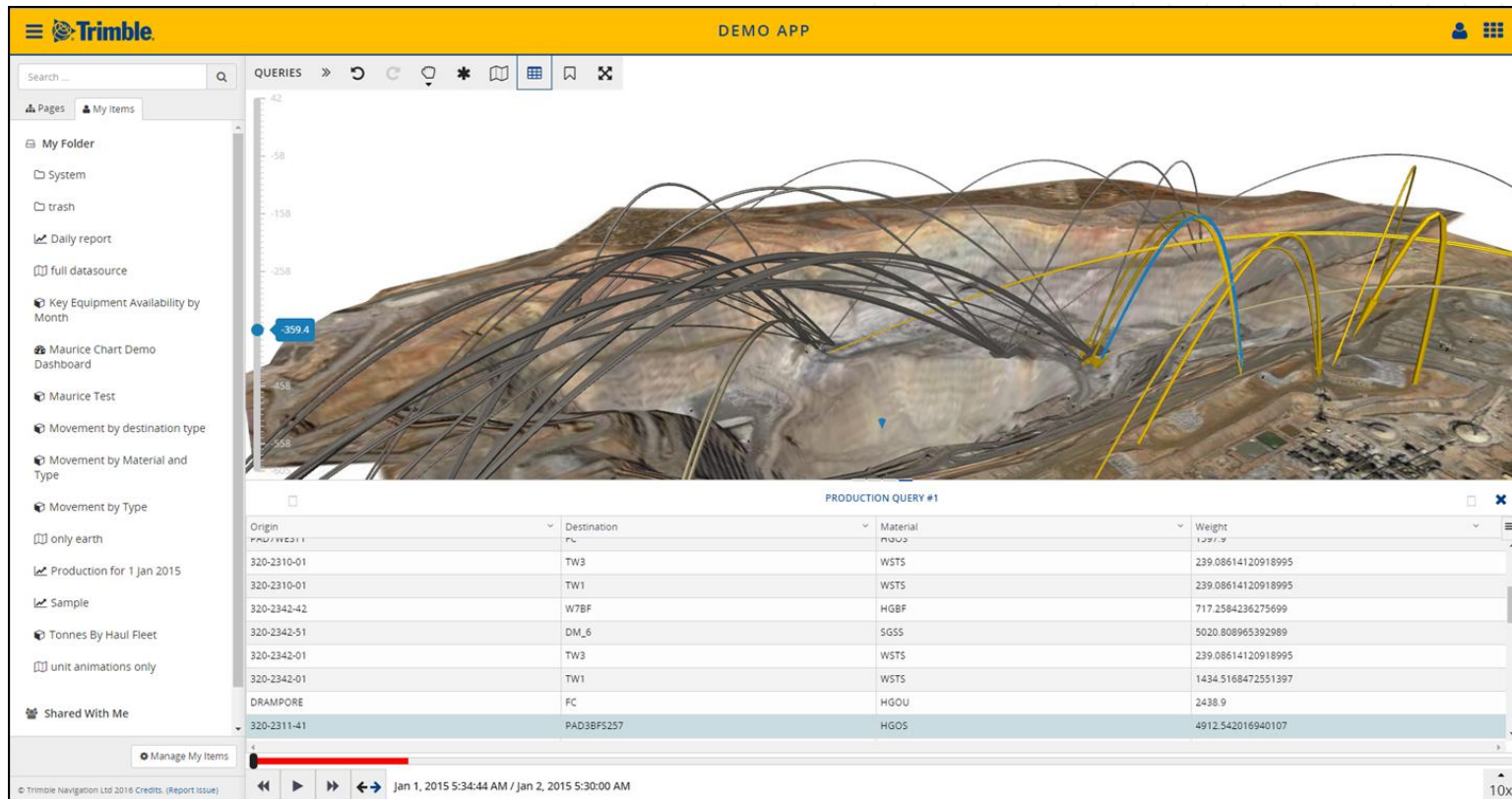
KPI Variance Scorecard



Period from 1/10/2014 to 31/10/2014

Region	Open Pit			Underground			Processing	
	Ore Mined (t)	Ore Mined Grade (g/t)	Waste Mined (t)	Total Ore Mined (t)	Waste Tonnes (t)	Mined Grade - Au (g/t)	Recovered Gold (oz)	Plant Recovery (%)
Australia	● 389,464	● 3.18	● 1,424,797 (23 %)	● 106,708 (11 %)	● 23,983 (-14 %)	● 6.88 (10 %)	● 300	● 83.4 % (2%)
Demo Mine 1	● 389,464	● 3.18	● 1,424,797 (23 %)	● 106,708 (11 %)	● 23,983 (-14 %)	● 6.88 (10 %)	● 300	● 83.4 % (2%)
Africa	● 1,169,378 (24 %)	● 1.05 (-11 %)	● 825,334 (-11 %)				● 23,396	● 83.4 % (2%)
Demo Mine 2	● 1,169,378 (24 %)	● 1.05 (-11 %)	● 825,334 (-11 %)				● 23,396	● 83.4 % (2%)
South America	● 1,871,086 (100 %)	● 0.41 (7 %)	● 23,651,148 (0 %)	● 223,687 (23 %)	● 61,107 (2 %)	● 10.14 (-15 %)	● 131,711 (29 %)	● 76.0 % (-9 %)
Demo Mine 3	● 1,325,465 (55 %)	● 0.34 (-10 %)	● 12,460,549 (0 %)	● 49,576 (7 %)	● 20,437 (8 %)	● 11.58 (-44 %)	● 33,162	● 72.2 % (-9%)
Demo Mine 4	● 8,155 (27 %)	● 2.03 (5 %)	● 7,249,557 (-1 %)	● 123,059 (22 %)	● 27,804 (9 %)	● 10.01 (27 %)	● 78,184 (-4 %)	● 79.7 % (-9 %)
Demo Mine 5	● 537,466 (614 %)	● 0.56 (78 %)	● 3,941,042 (2 %)				● 1,001	● 79.7 % (-9 %)
Demo Mine 6				● 51,052 (45 %)	● 12,866 (-18 %)	● 10.01 (27 %)	● 19,364 (-6 %)	● 83.4 % (2%)
Europe	● 2,926,691 (12%)	● 1.45 (12%)	● 4,098,777 (12%)				● 142,366 (12%)	● 91.2 % (12%)
Demo Mine 7	● 2,319,581 (11%)	● 1.16 (-3%)	● 1,862,736 (7%)				● 59,459 (8%)	● 91.2 % (12%)
Demo Mine 8	● 607110 (10%)	● 2.53 (10%)	● 2236041 (10%)				● 82,907 (10%)	● 91.2% (10%)
Total	● 6,356,619 (238 %)	● 1.14 (125 %)	● 30,000,056 (16 %)	● 330,395 (19 %)	● 85,090 (-3 %)	● 8.77 (-26 %)	● 342,721 (131 %)	● 81.6 % (-99 %)


VI – Visualisation of Production Data



VI - Drill down to detail transaction level

CONNECTED MINE 0.9

RIES >> [Icons: Refresh, Undo, Redo, Erase, Location, Bookmarks, Grid, Bookmark, Close]



PRODUCTION QUERY #1

ORIGIN	DESTINATION	MATERIAL	WEIGHT
350-2335-42	PAD125UL1-2	HGOS	1739.475444290739
350-2333-41	PAD125UL1-2	HGOS	4969.929840830683
350-2333-41	FC	HGOS	2236.468428373807
350-2335-42	FC	HGOS	496.9929840830683
350-2333-41	PAD3BFN262	HGOS	5466.922824913751
350-2335-42	PAD3BFN262	HGOS	8945.87371349523
350-2331-41	P3STICKS	HGOS	2981.95790449841
350-2335-42	P3STICKS	HGOS	9442.866697578302
350-2333-41	P3STICKS	HGOS	248.4964920415341

First Previous 1 Next Last

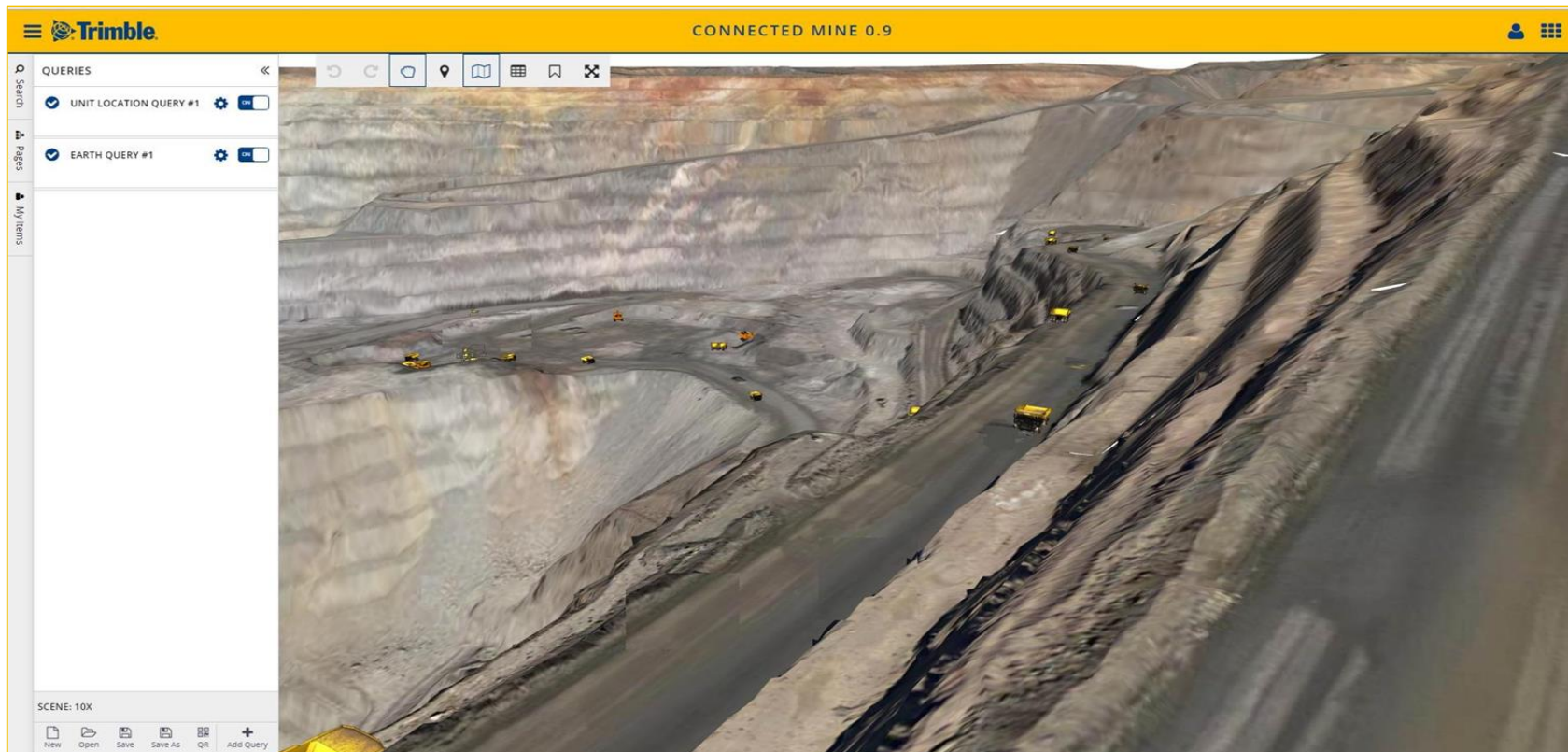
VI – Visualisation of Geological Data

The screenshot shows the Trimble DEMO APP interface. The main view is a 3D visualization of a quarry site with various equipment locations and material movement paths. The interface includes a search bar, a navigation menu on the left, and a table at the bottom displaying data for 'LOCATIONS QUERY #1'.

LOCATIONS QUERY #1

Location	Material	Volume	Weight
320-2312-41	HGOS	31135	88633
320-2339-41	HGOS	6654	18556
320-2342-42	HGOS	248	697
320-2312-27	MARS	1	1
320-2310-17	SGSS	1	1
320-2311-11	SGSS	3022	8584
320-2311-17	SGSS	1	1
320-2312-17	SGSS	1	1
320-2339-51	SGSS	4099	9566

VI - Overlay Fleet data



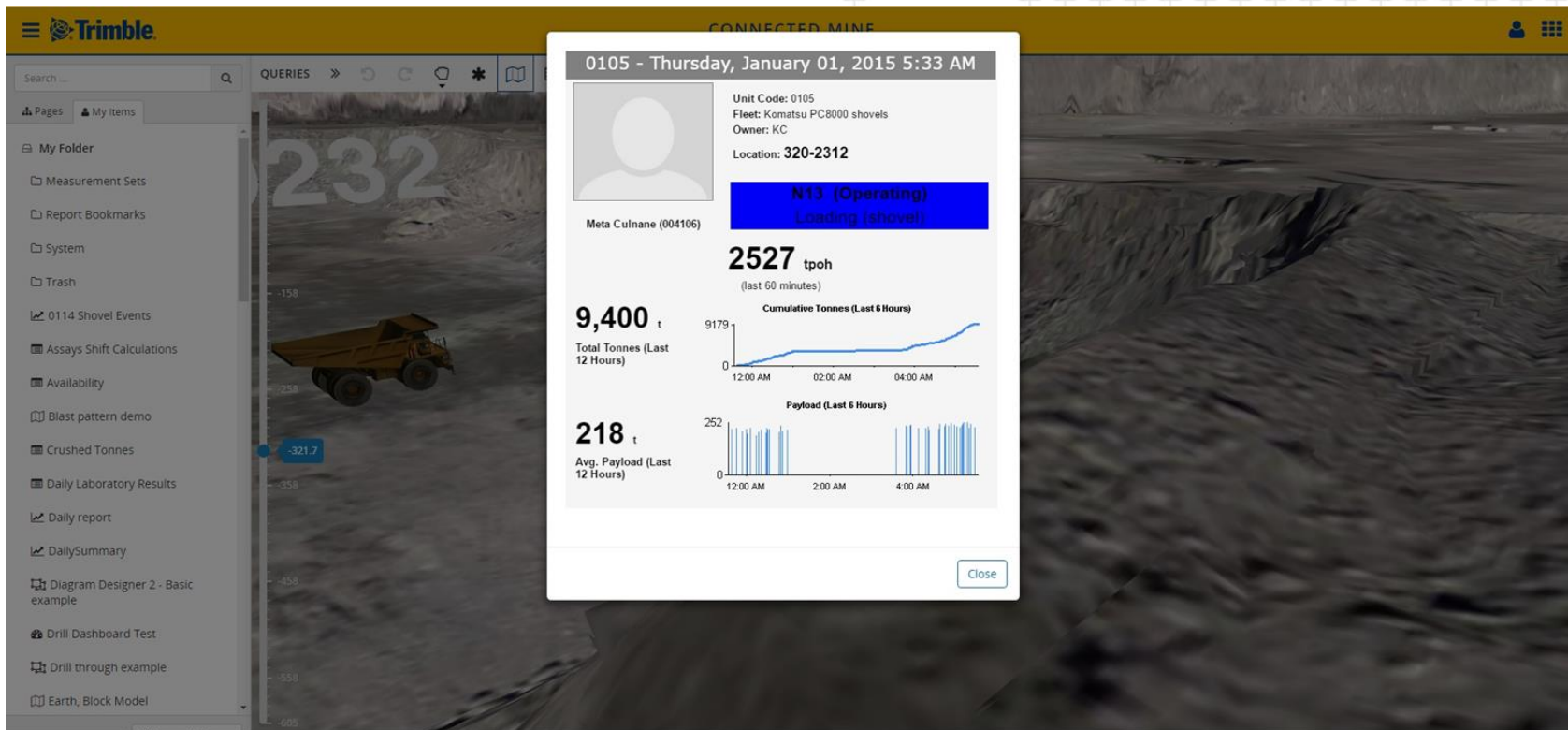
VI - Near Real Time Visualisation - BYOD

The screenshot displays the Trimble DEMO APP interface. At the top, the Trimble logo and 'DEMO APP' are visible. A search bar is located on the left. Below it is a sidebar menu with the following items:

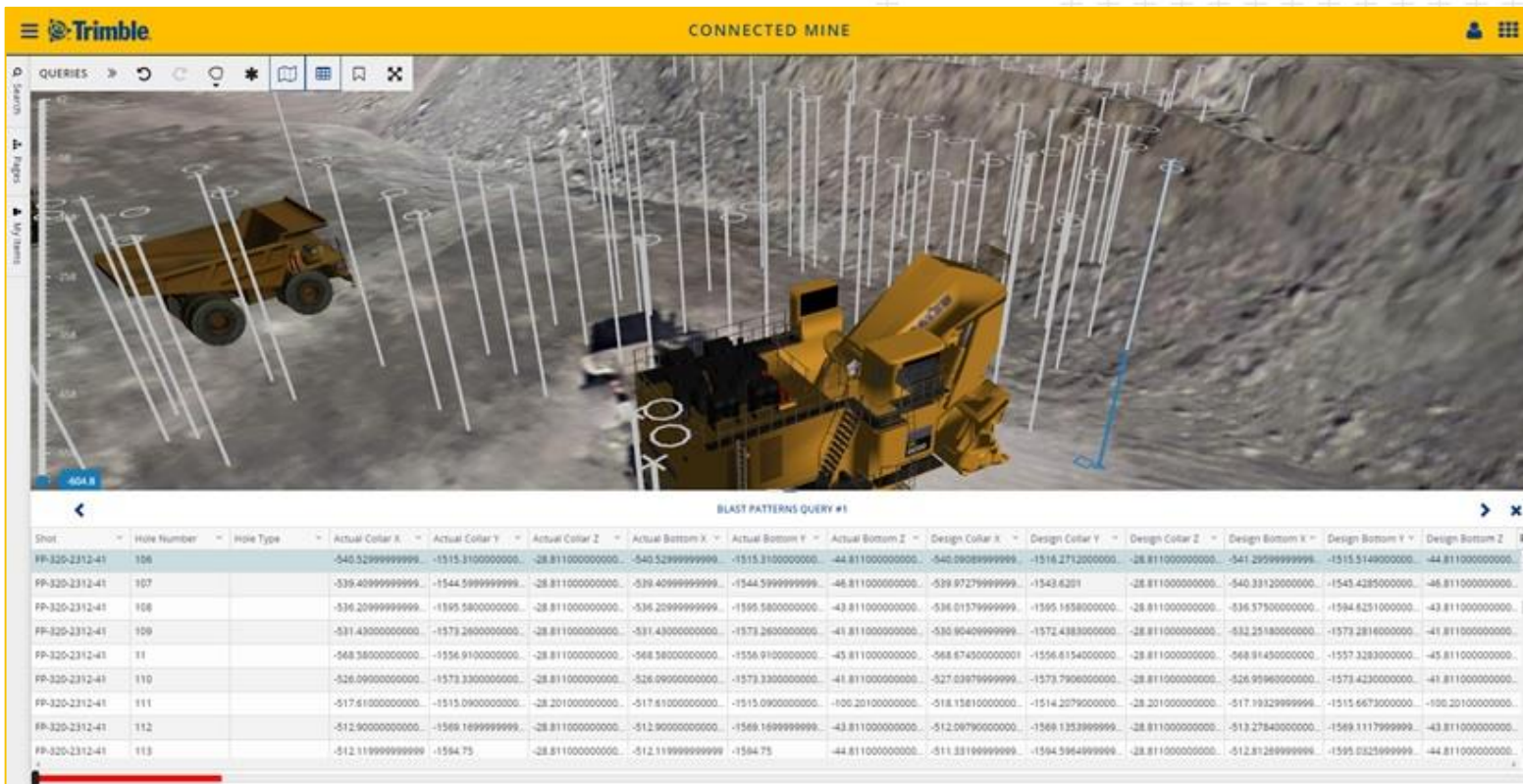
- Pages
- My Items
- My Folder
 - System
 - trash
 - 0114 Shovel Events
 - Blast pattern demo
 - Daily report
 - DailySummary
 - Fleet Time Line
 - full datasource
 - Haul Truck Down Time
 - Key Equipment Availability by Month
 - Maurice Chart Demo Dashboard
 - Maurice Test
 - Movement by destination type
 - Movement by Material and Type
 - Movement by Type
 - only earth
 - Sample
- Manage My Items

The main area shows a 3D visualization of a mining site with several pieces of equipment labeled with IDs: 0109, 0226, 0205, 0217, 0232, 0216, and 0105. The terrain is shown in shades of gray and brown, with some elevation markers like -58, -258, and -358. At the bottom, there is a timeline showing the date and time: Jan 1, 2015 5:31:13 AM / Jan 2, 2015 5:30:00 AM. A zoom level of 5x is indicated in the bottom right corner.

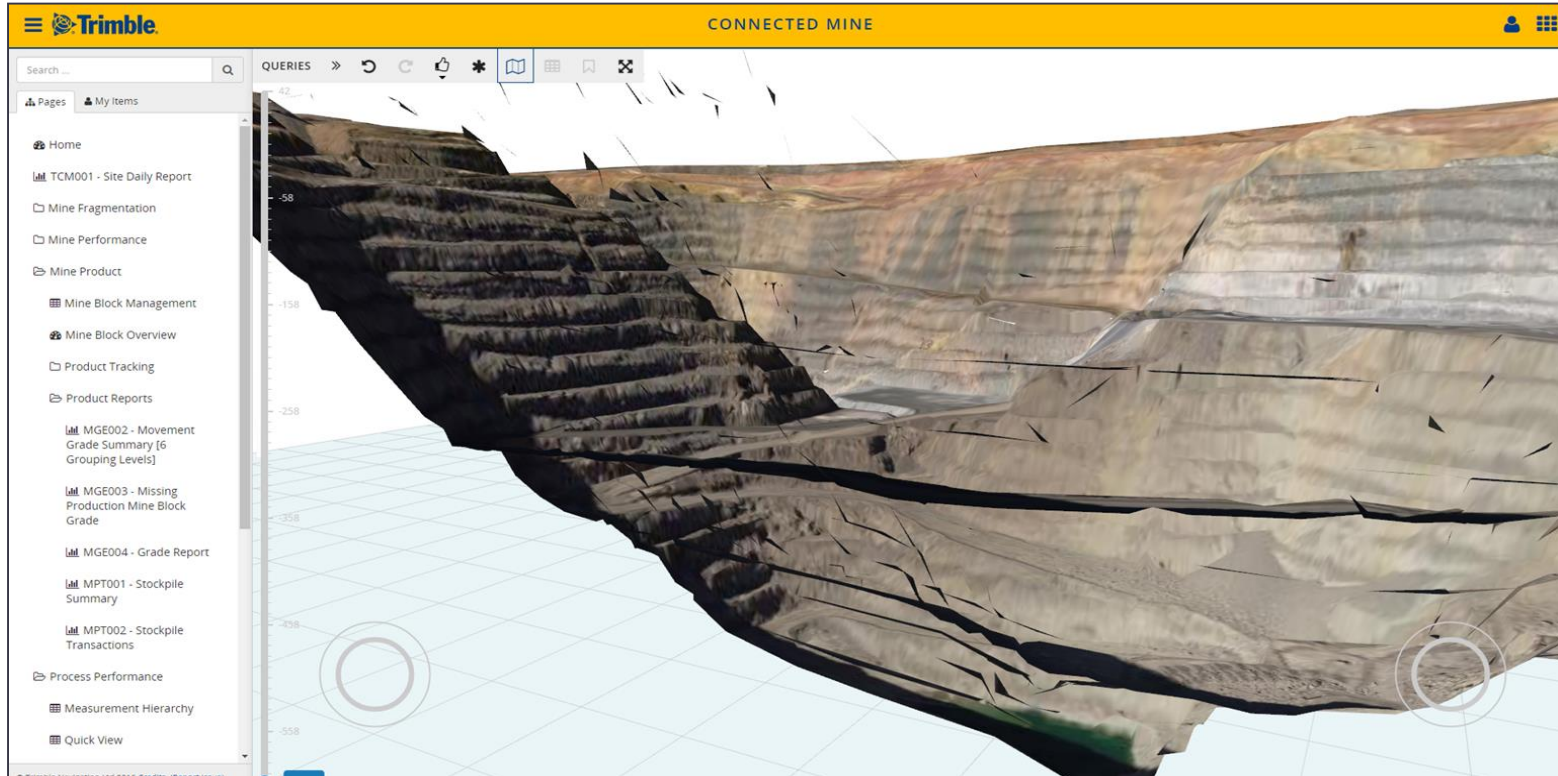
VI – Instant Pop-Up Equipment Statistics



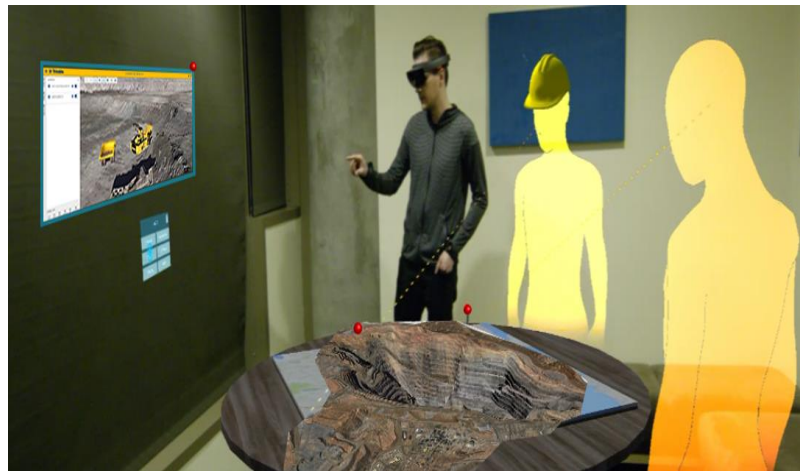
VI – Visualisation of Drilling Data



VI – Transparency

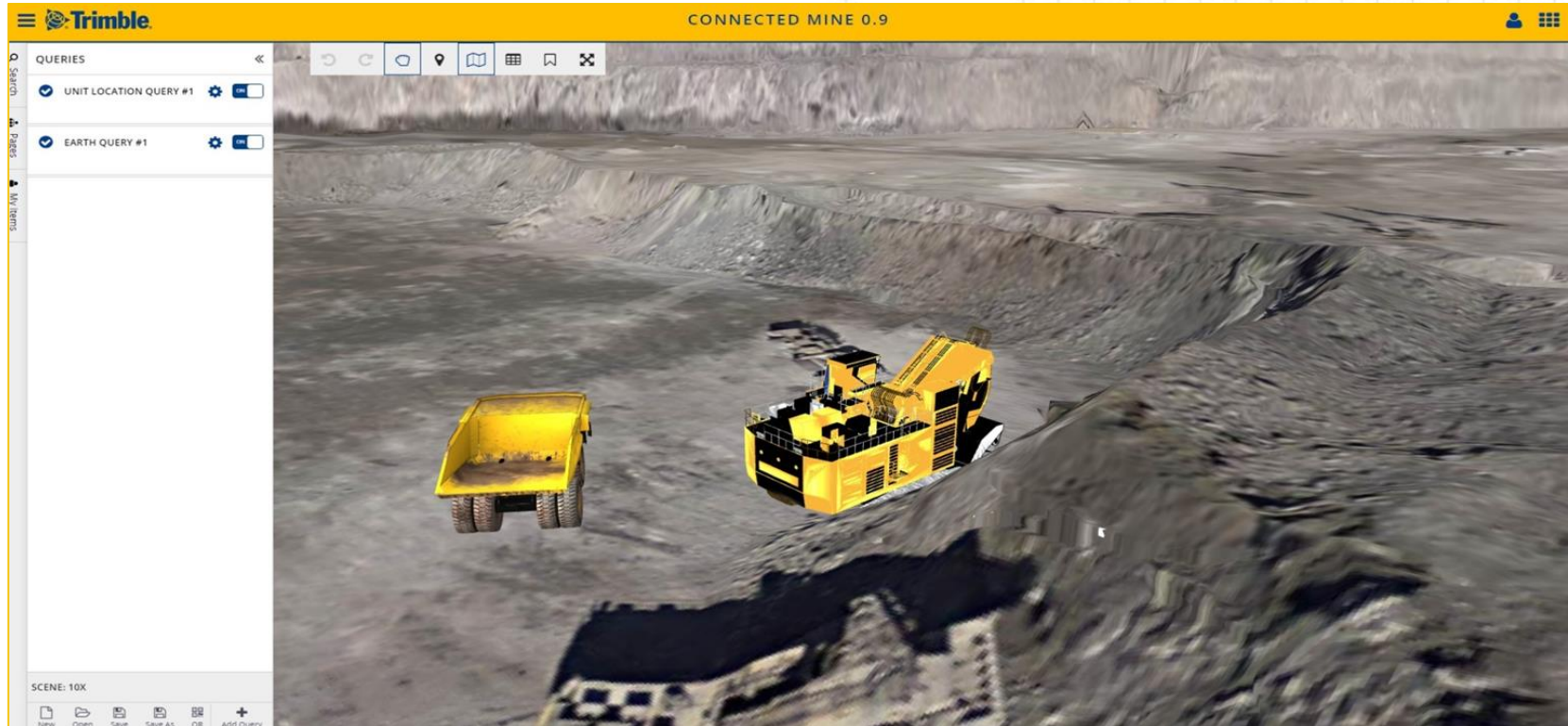


VI – Augmented Reality

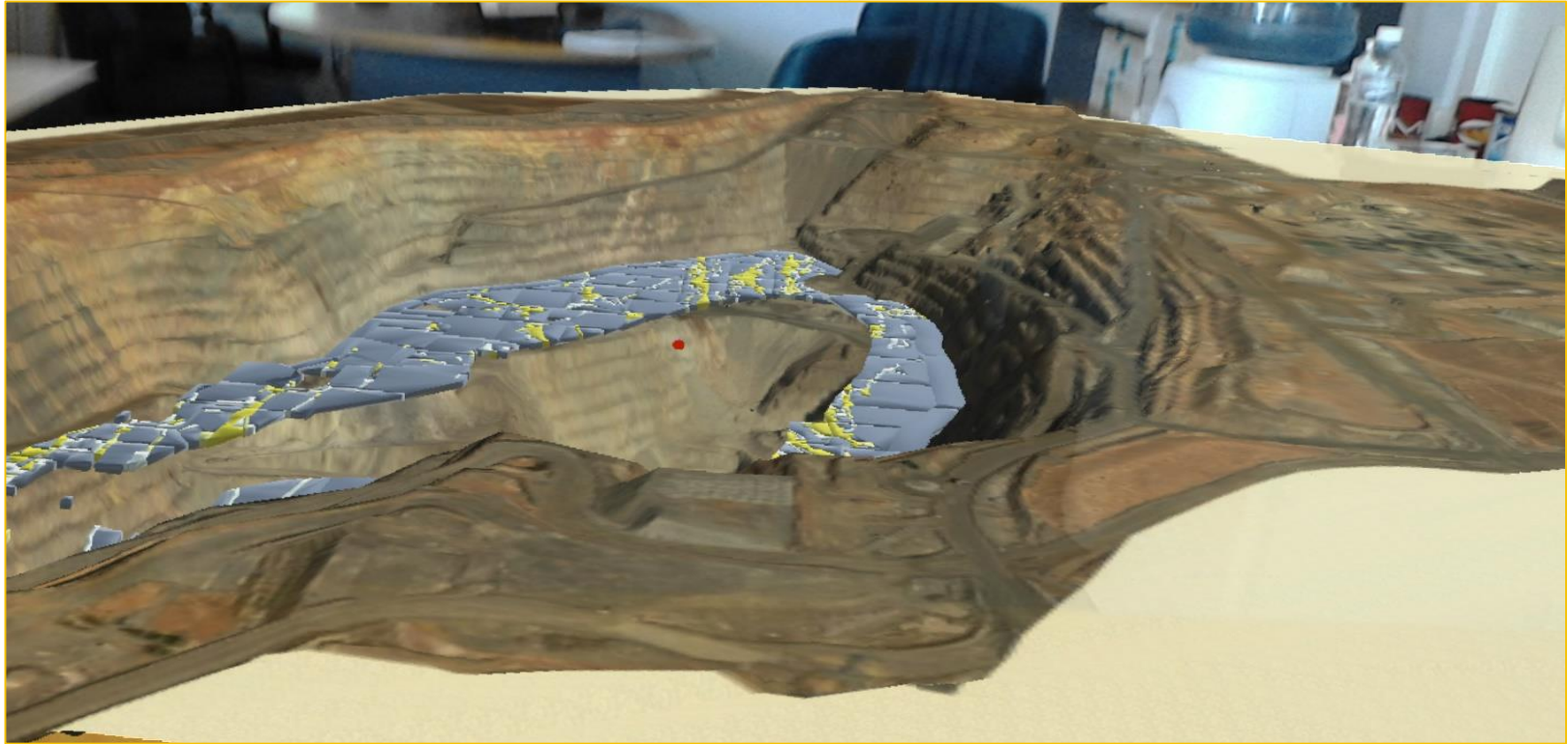


Immerse Yourself

VI – Take the boardroom into the mine

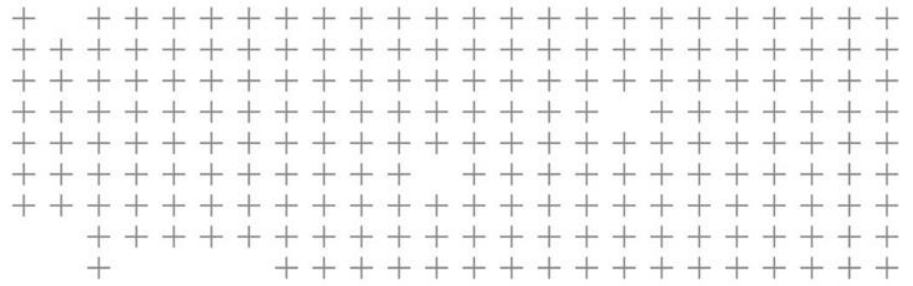


VI – Bring the Mine to the Boardroom



VI – Visualise data inside the view





 Thank you