

80 %



96 %

Deloitte.

9:54 AM

Monday 17th November 2014

|--|

Safety	
Lost Time Injury	6
RecordableInjury	8
Serious Bodily Injury	0

User Comments

Exceeded target despite Mine 2 Crusher Downtime

Mine | Posted by Paul Smith | 20:44

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Mine | Posted by Paul Smith | 18:34

Information Updates

\$	OPERATIONS	10 mins
Ŧ	ERP	2 mins
Ť	SAFETY	3 hours late



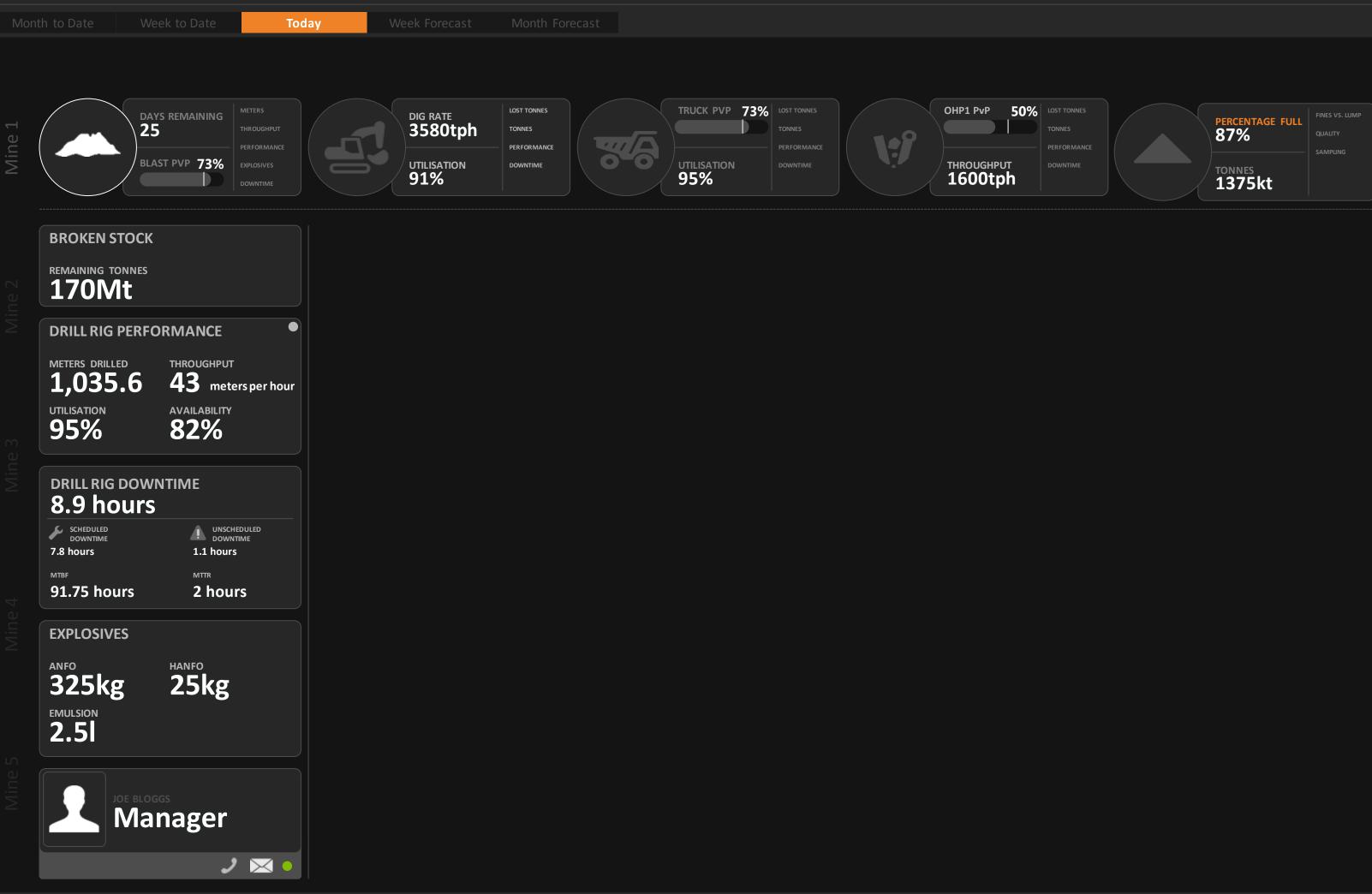
Our Design Principles



50%	LOST TONNES		FINES VS. LUMP
	TONNES	PERCENTAGE FULL 87%	QUALITY
	PERFORMANCE		SAMPLING
Л	DOWNTIME		
h		TONNES 1375kt	
81%			

		percentage full 50%	
uт bh		tonnes 750kt	

		percentage full 50%	
ut bh		tonnes 750kt	





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Our Experience



Manager

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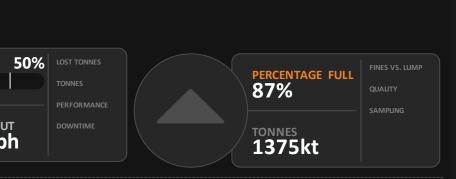
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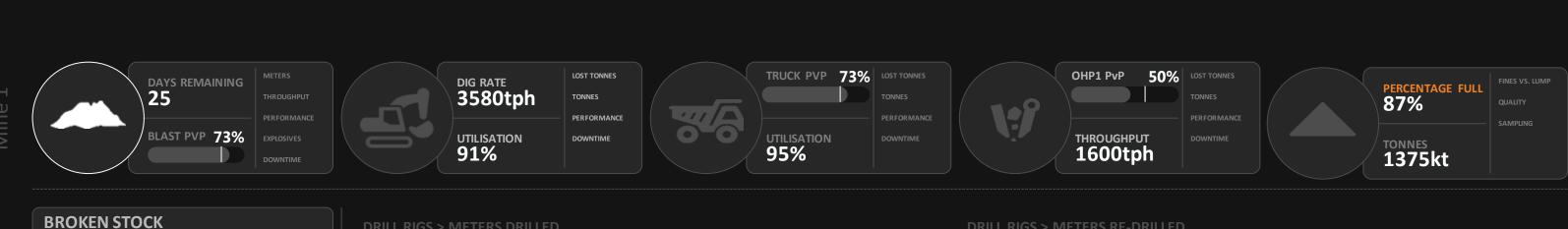


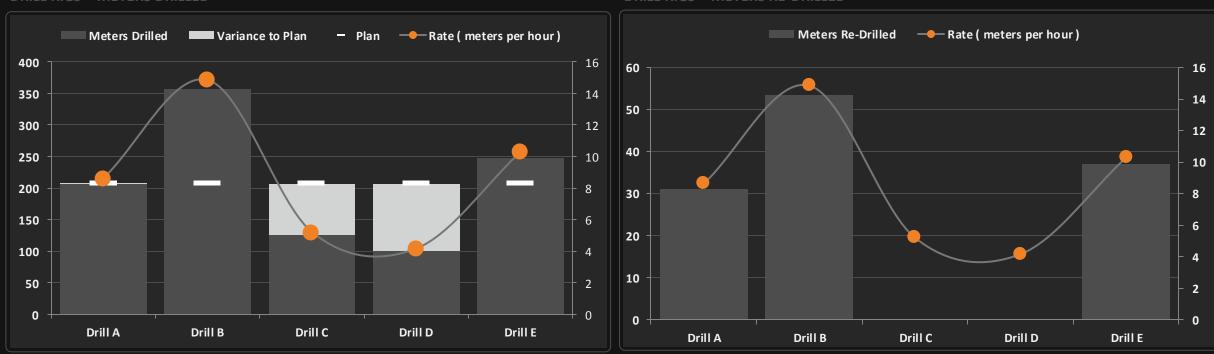
Our Experience



Today







170Mt DRILL RIG PERFORMANCE METERS DRILLED THROUGHPUT 1,035.6 43 meters per hour AVAILABILITY UTILISATION 95% 82%

REMAINING TONNES

7.8 hours 1.1 hours MTBF MTTR 91.75 hours 2 hours EXPLOSIVES ANFO HANFO 325kg 25kg



Manager 1 🖂 🔸

OTHER POTENTIAL METRICS

- **FRAGMENTATION QUALITY**
- OVERDRILL% ٠
- **DRILL HOLE ACCURACY** •

80 %

87 %

96 %

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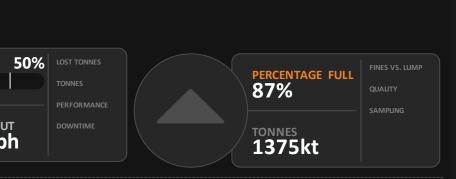
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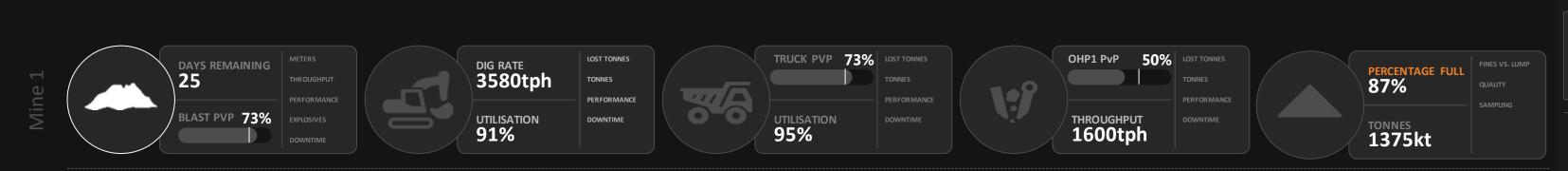


Our Experience



Today





BROKEN STOCK REMAINING TONNES **170Mt** DRILL RIG PERFORMANCE METERS DRILLED THROUGHPUT 1,035.6 **43** meters per hour UTILISATION AVAILABILITY 95% 82% DRILL RIG DOWNTIME

8.9 hours 7.8 hours

1.1 hours MTTR

2 hours

MTBF 91.75 hours

EXPLOSIVES

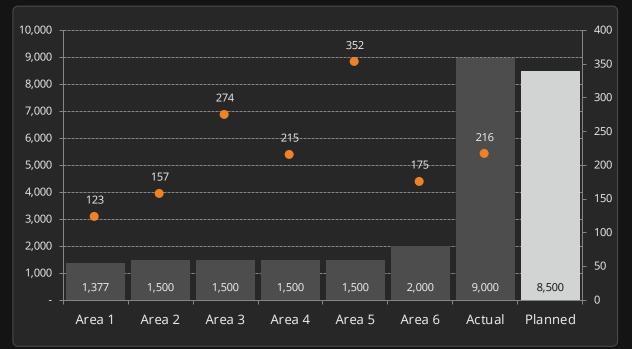
HANFO 325kg **25kg**



ANFO

Manager 1 🖂 🔸

EXPLOSIVES AND BCM TONNES BLASTED BY AREA LAST 7 DAYS



OTHER POTENTIAL METRICS

- FIRED vs. MISFIRED HOLES
- **POTENTIAL MISFIRE %**
- WET HOLES % •
- REDRILL %
- **DIPPED HOLES %** ٠
- ٠ **PIT FLOOR QUALITY**
- EXPLOSIVE LOAD RATE (HOLES / HOUR)



80 %



96 %

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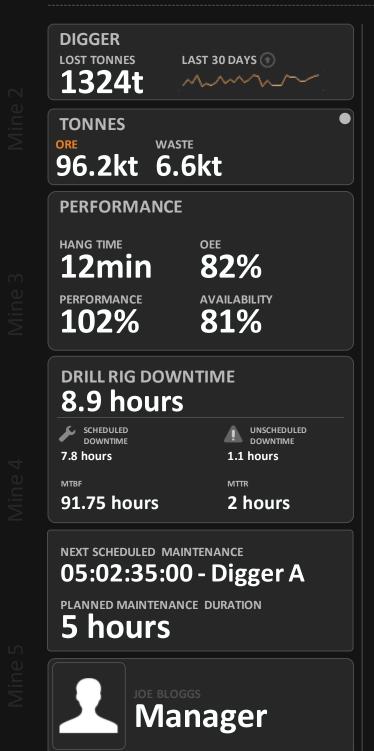


Our Design Principles



Our Experience

Mine Performance ♠ Today TRUCK PVP 73% LOST TONNES LOST TONNES OHP1 PvP DAYS REMAINING DIG RATE 25 3580tph TONNES \? 54 PERFORMANCE BLAST PVP **73%** UTILISATION UTILISATION DOWNTIME THROUGHPUT 95% 91% 1600tph



1 🖂 🔍



80 %



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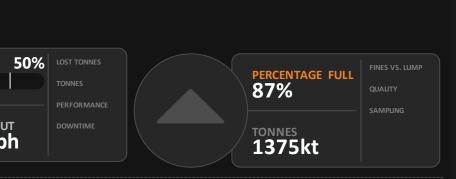
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Our Design Principles



Our Experience



Mine Performance Today TRUCK PVP 73% LOST TONNES LOST TONNES OHP1 PvP DAYS REMAINING DIG RATE 25 3580tph TONNES \? <u> ///</u>A PERFORMANCE 0 BLAST PVP 73% 0 UTILISATION UTILISATION DOWNTIME THROUGHPUT 95% 91% 1600tph DIGGER **POTENTIAL METRICS** LOST TONNES LAST 30 DAYS 🕥 1324t LOST TONNES DUE TO AVAILABILITY TONNES LOST TONNES DUE TO UTILISATION ٠ ORE WASTE LOST TONNES DUE TO RATE 96.2kt 6.6kt LOST TONNES BY INDIVIDUAL EQUIPMENT PERFORMANCE HANG TIME OEE 82% 12min PERFORMANCE AVAILABILITY 102% 81% **DRILL RIG DOWNTIME** 8.9 hours

7.8 hours MTBF 91.75 hours

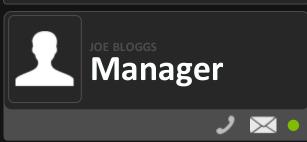
MTTR 2 hours

1.1 hours

NEXT SCHEDULED MAINTENANCE 05:02:35:00 - Digger A

PLANNED MAINTENANCE DURATION

5 hours





80 %



96 %

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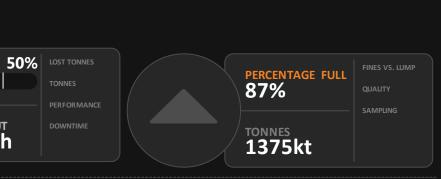
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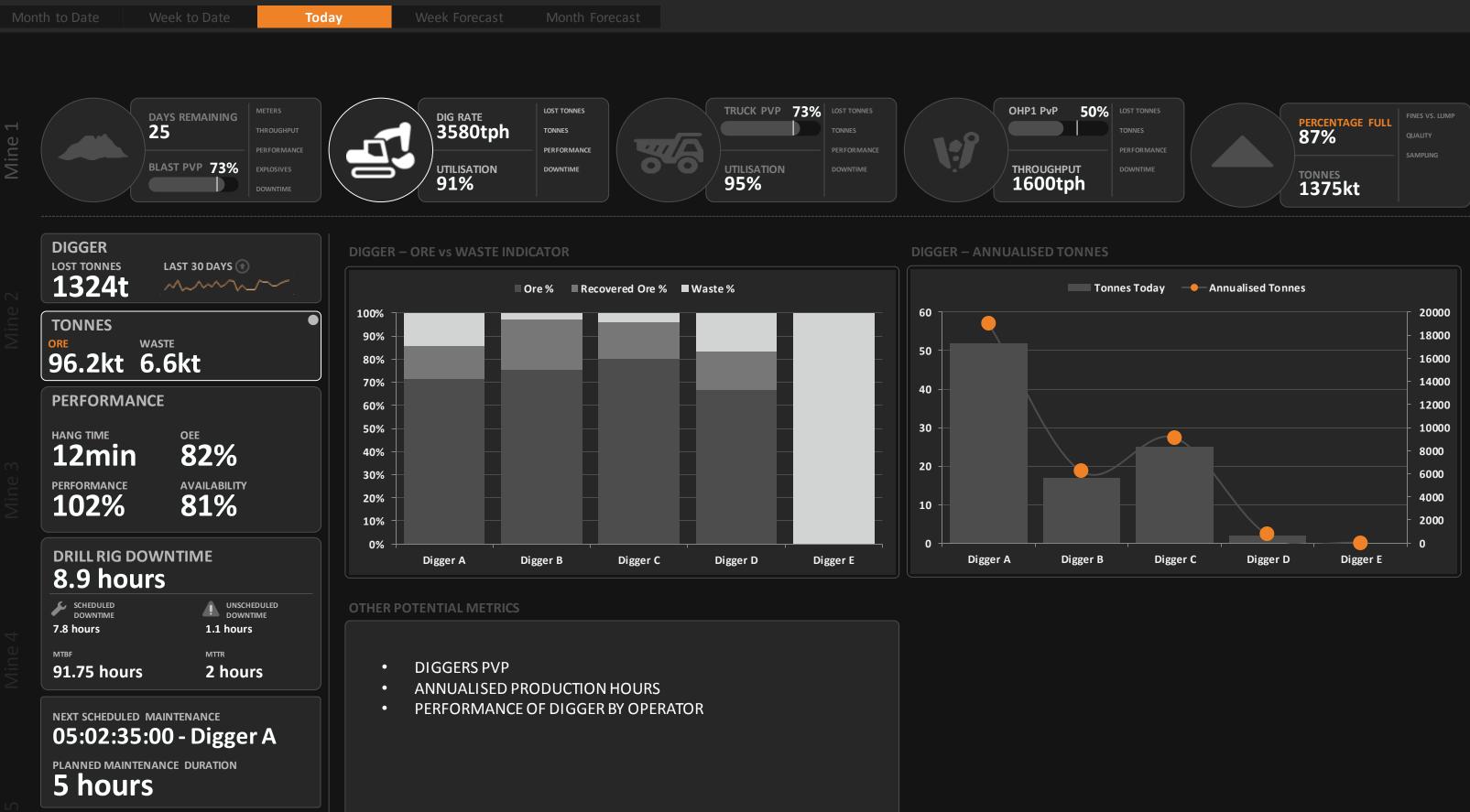


Our Design Principles



Our Experience





Manager 1 🖂 🔸 80 %

87 %

96 %

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Our Design Principles

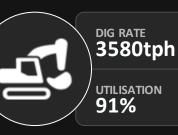


Our Experience

Today

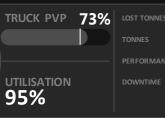


DAYS REMAINING 25 BLAST PVP 73%



LOST TONNES TONNES PERFORMANCE DOWNTIME





5

10

9

11

11 12

7

10

12

5

9

13

5

1

14

OHP1 PvP \? THROUGHPUT 1600tph

8

4

8

9

10

18

4

10

1

7

5

19

2

5

7

6

10

15

5

7

9

2

0

16

9

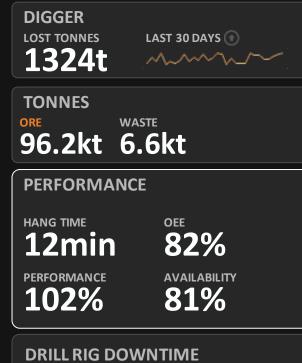
9

1

0

9

17



8.9 hours

1.1 hours
MTTR
2 hours

1 🖂 🗕

NEXT SCHEDULED MAINTENANCE



PLANNED MAINTENANCE DURATION



HANGTINE (BORATION > I MINOTE)									
Digger A	0	3	9	2	2	3	1	4	7
Digger B	2	9	8	5	10	0	4	2	0
Digger C	2	6	8	4	1	1	5	8	2

OTHER POTENTIAL METRICS

DIGGER HANGTIME

Digger D

Digger E

DIGGER TRAMMING (HOURS LOST DUE TO RELOCATION)

4

11

6

4

6

7

6

10

8

9

4

9

- AVERAGE SWING TIME
- LEVEL OF CLEANUP REQUIRED DUE TO SPILLAGE (DOZER HOURS)
- TRUCK FILL FACTOR %

80 %

87 %

96 %

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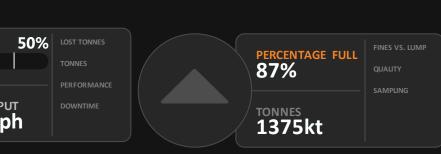
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Ŧ	ERP	2 mins
Ť	SAFETY	3 hours late



Our Design Principles

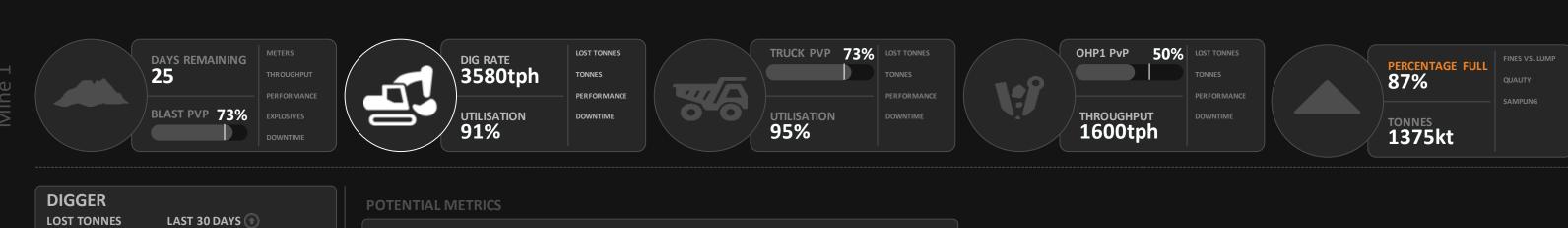


Our Experience



8	1	7	0	0	6	8	1	9	3
10	4	9	9	6	12	3	2	7	6
1	1	9	4	5	4	5	12	3	0
1	12	6	11	9	0	7	8	4	2
9	1	12	8	11	2	6	1	12	3
20	21	22	23	0	1	2	3	4	5

Mine Performance Today



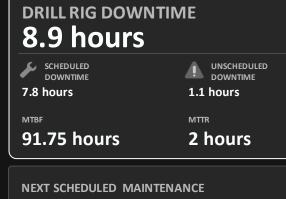
- PROCESS / EQUIPMENT DOWNTIME
- SCHEDULED / UNSCHEDULED DOWNTIME ٠
- MECHANICAL/ELECTRICAL DOWNTIME
- MEAN TIME BETWEEN FAILURE
- MEAN TIME TO REPAIR ٠
- MEAN TIME BETWEEN STOPPAGES
- TIME TO FIRST LOAD ٠

OEE 82% 12min PERFORMANCE AVAILABILITY 102% 81%

WASTE

96.2kt 6.6kt

PERFORMANCE



05:02:35:00 - Digger A

PLANNED MAINTENANCE DURATION

5 hours

1324t

TONNES

HANG TIME

ORE



80 %



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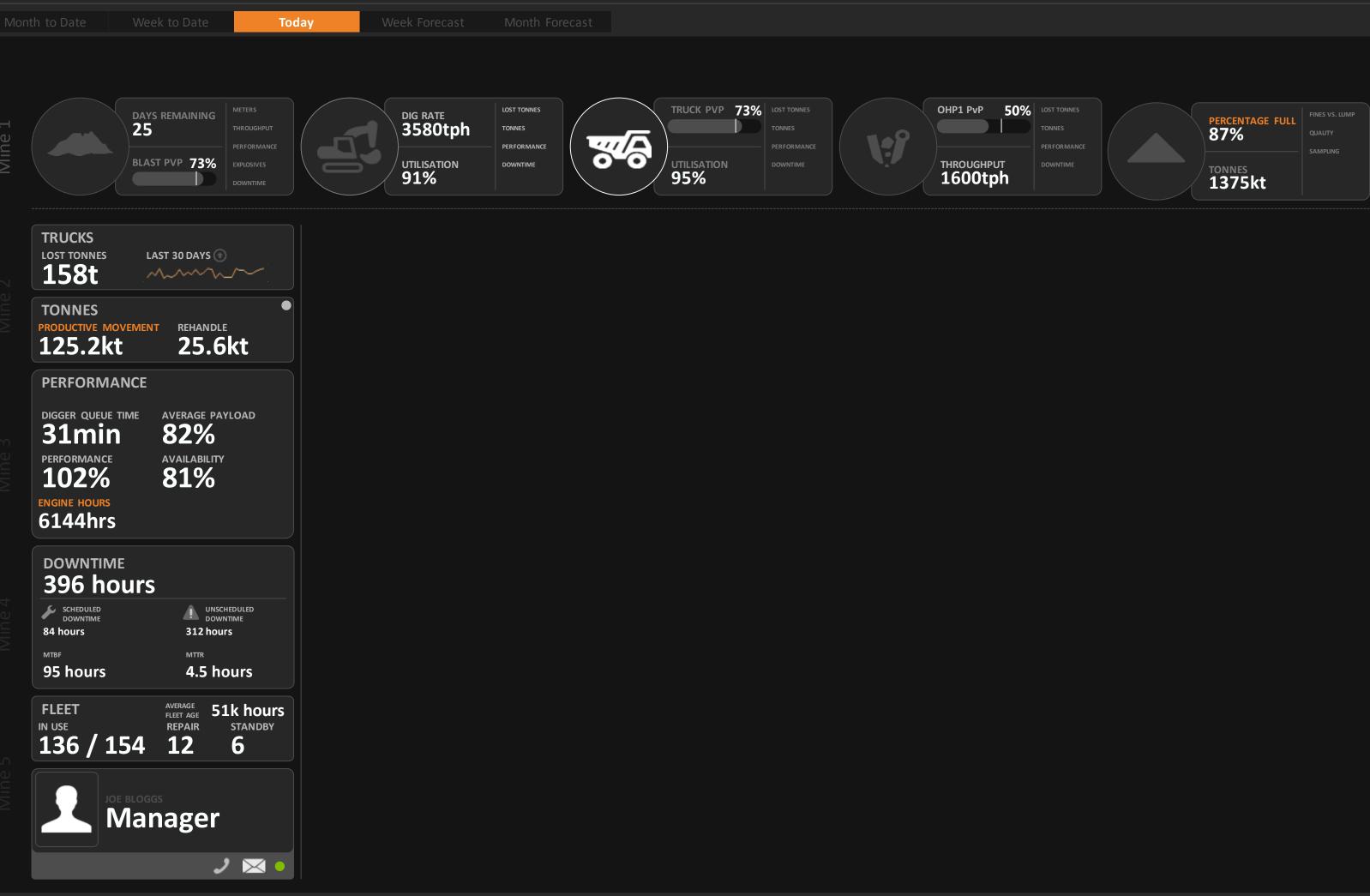
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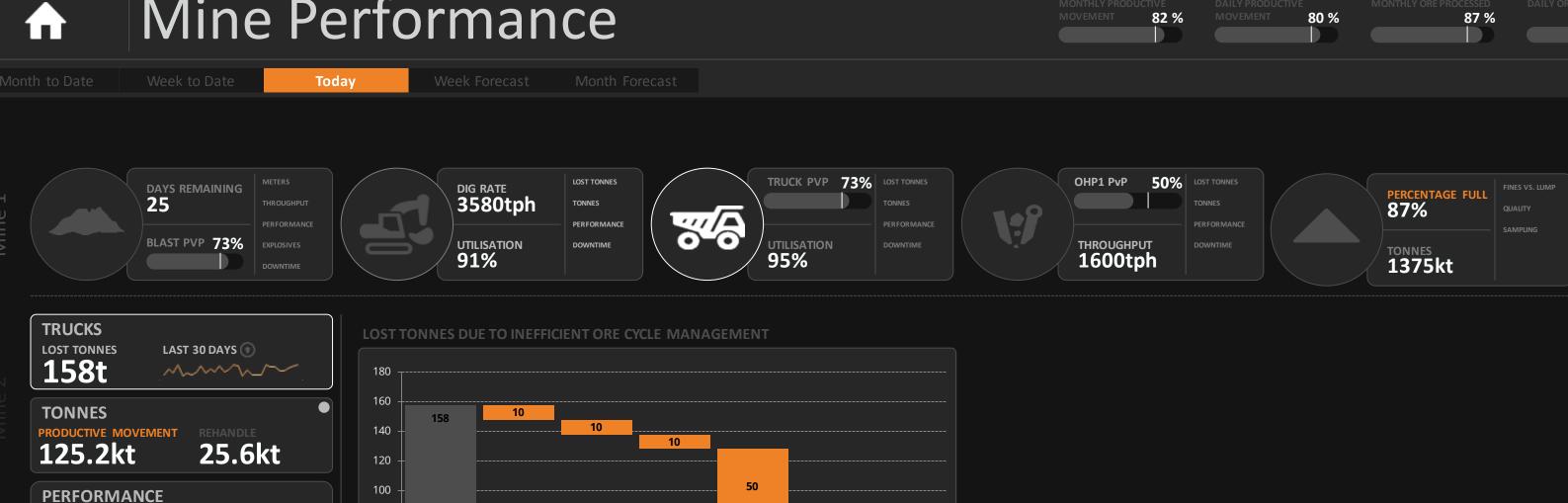
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Our Design Principles



Our Experience



38

Digger Queue Crusher Queue Early Parkup Other Factors

Time

Time

40

OTHER POTENTIAL METRICS

60

DIGGERS PVP

Variance

ANNUALISED PRODUCTION HOURS

Shift Change Refuelling

DOWNTIME 396 hours 312 hours 84 hours MTBF MTTR 4.5 hours 95 hours AVERAGE 51k hours FLEET FLEET AGE STANDBY TOTAL IN USE REPAIR 136 154 12 6 Manager 1 🖂 🔸

AVERAGE PAYLOAD

82%

AVAILABILITY

81%

DIGGER QUEUE TIME

31min

PERFORMANCE

102%

ENGINE HOURS

6144hrs



80 %



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OTHER POTENTIAL METRICS

- **PRODUCTIVE MOVEMENT**
- ORE / WASTE / REHANDLE
- TOTAL MOVEMENT •
- TONNES KM / DAY



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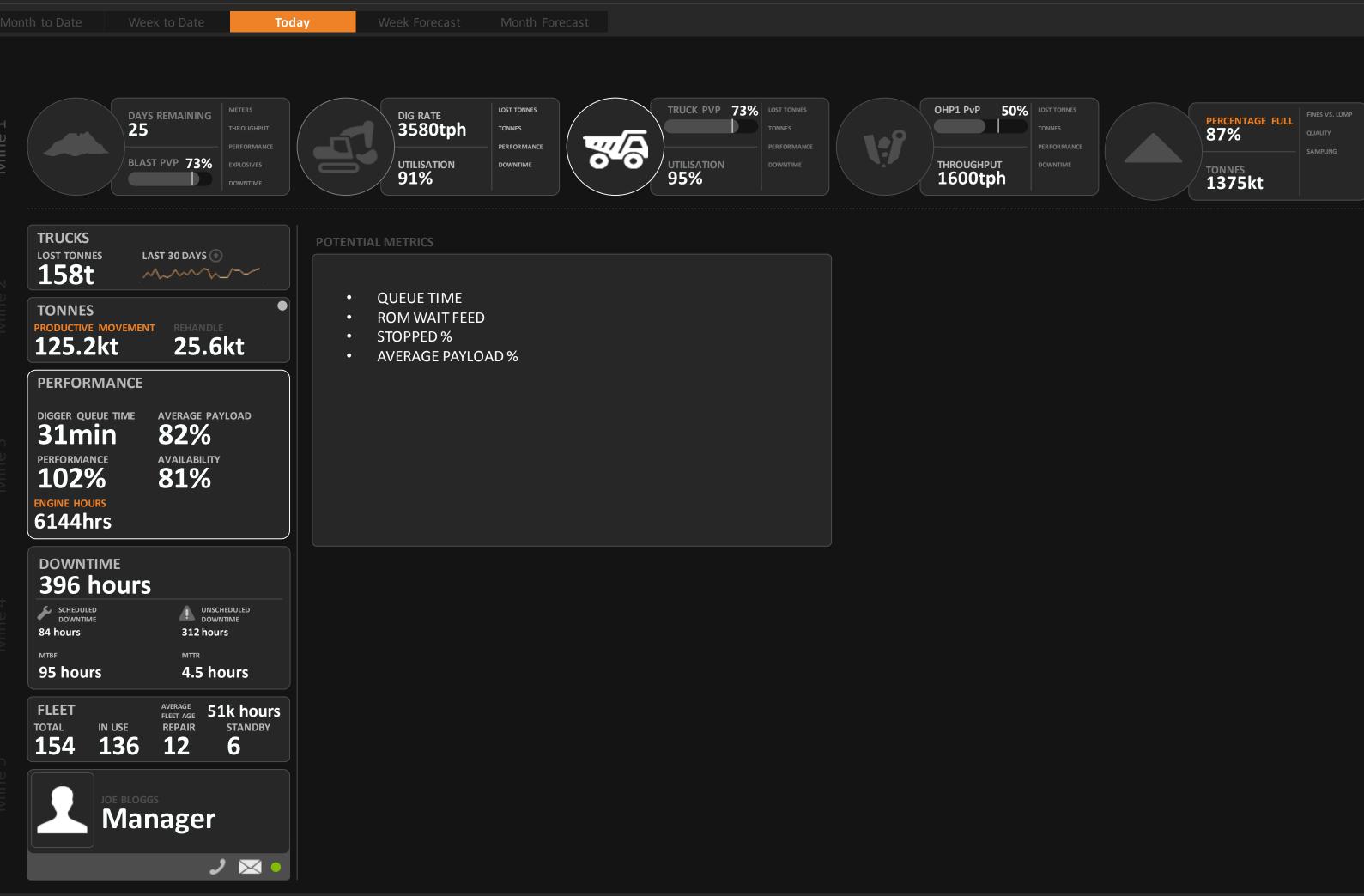
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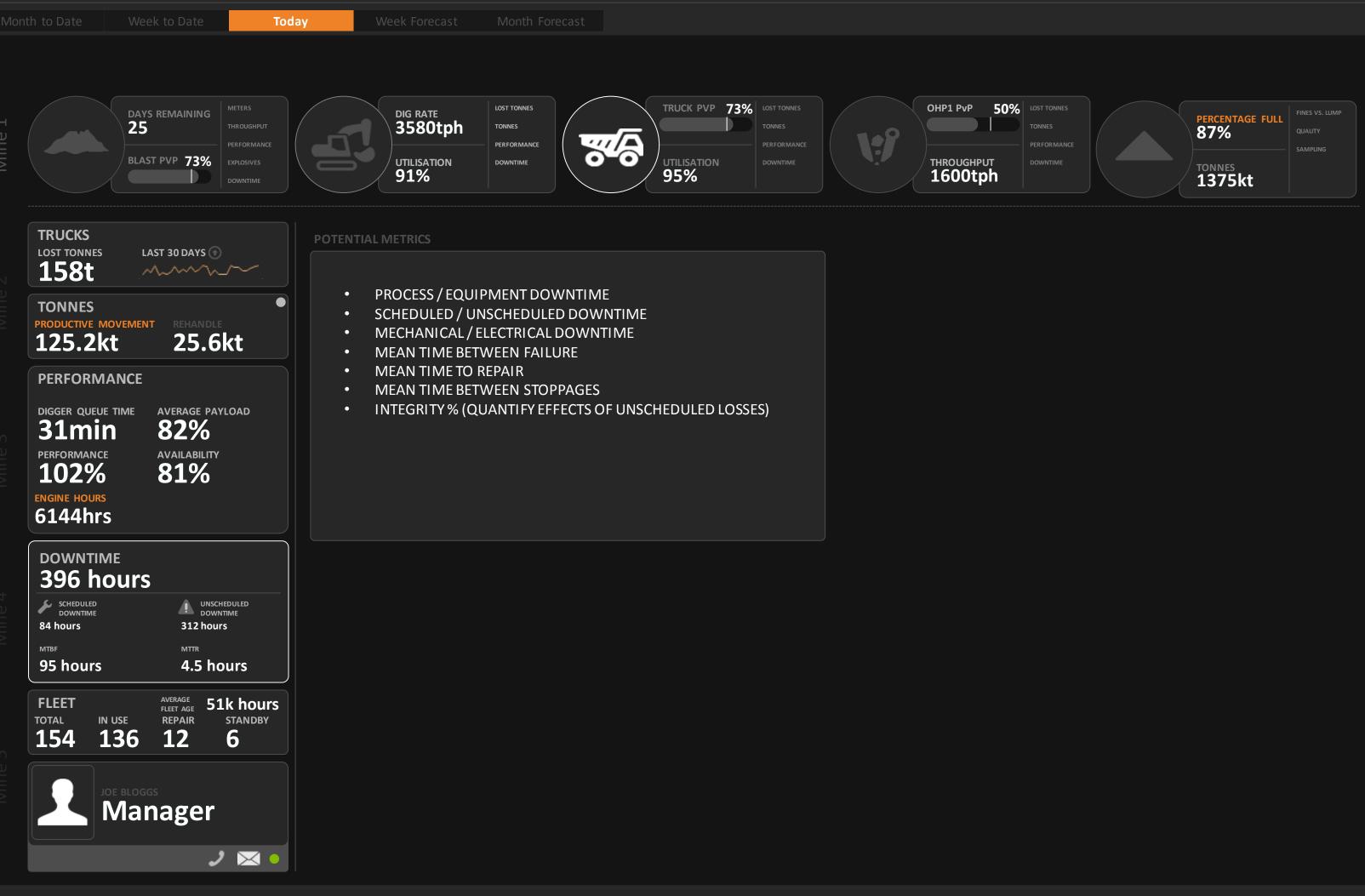
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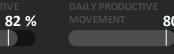


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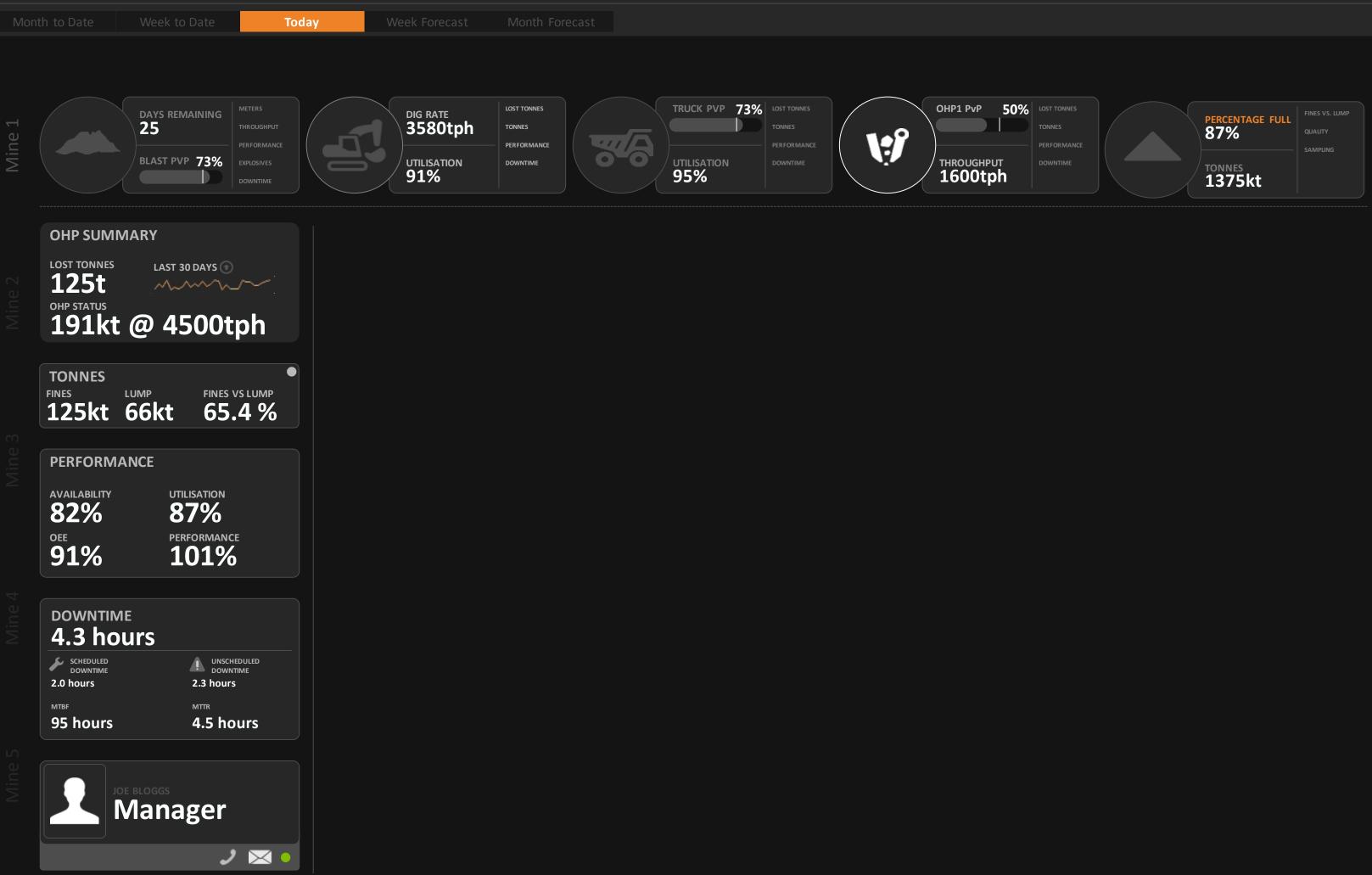
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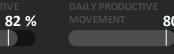


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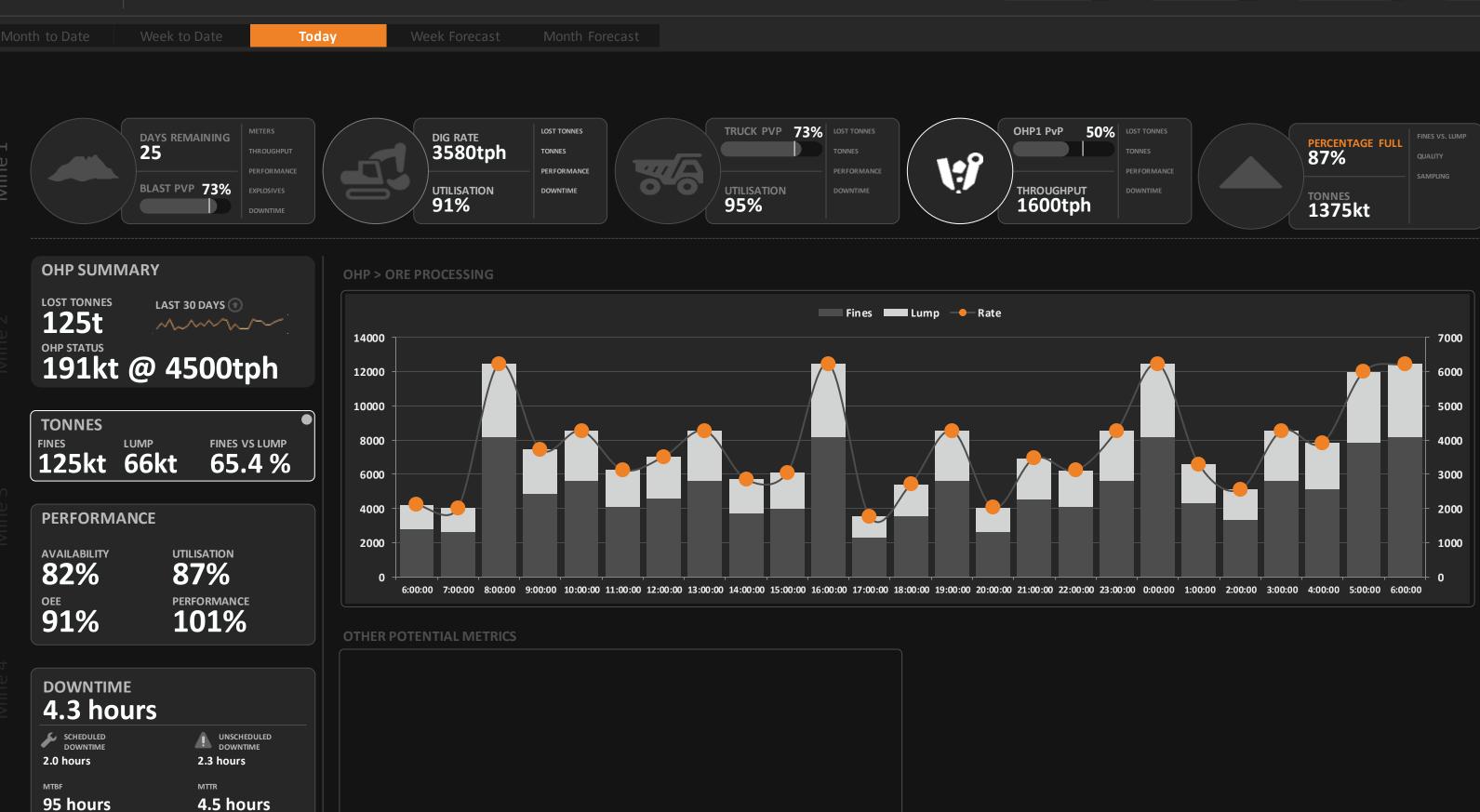
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Exceeded target despite Mine 2 Crusher Downtime

Mine | Posted by Paul Smith | 20:44

Upcoming Planned Maintenance at Mine 3

Mine | Posted by Paul Smith | 19:32

Choke Feeding Mine 1 Digger 1 Mine | Posted by Paul Smith | 17:44

Stock build at Mine being choke fed

Mine | Posted by Paul Smith | 18:34

Mine 4 Crusher Record Day at 256kt Mine | Posted by Paul Smith | 18:34

Mine 1 Digger breakdown affective ability to load Ore

Mine | Posted by Paul Smith | 18:34

Information Updates

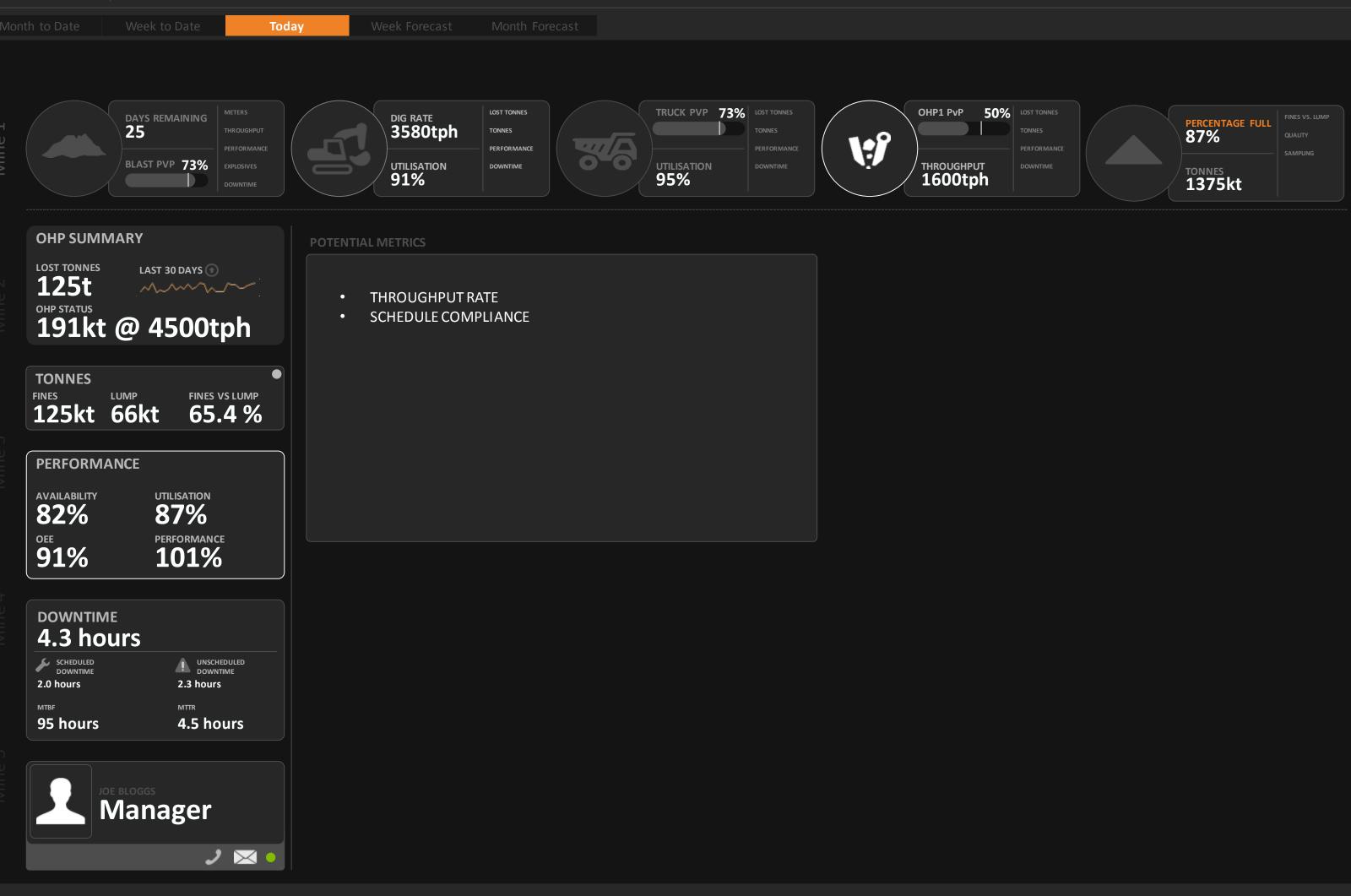
¢	OPERATIONS	10 mins
Ł	ERP	2 mins
Ť	SAFETY	3 hours late

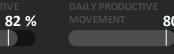


Our Design Principles



Our Experience





80 %



96 %

Deloitte.

9:55 AM

Monday 17th November 2014

Safety

Lost Time Injury	6
RecordableInjury	8
Serious Bodily Injury	0

User Comments

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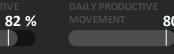


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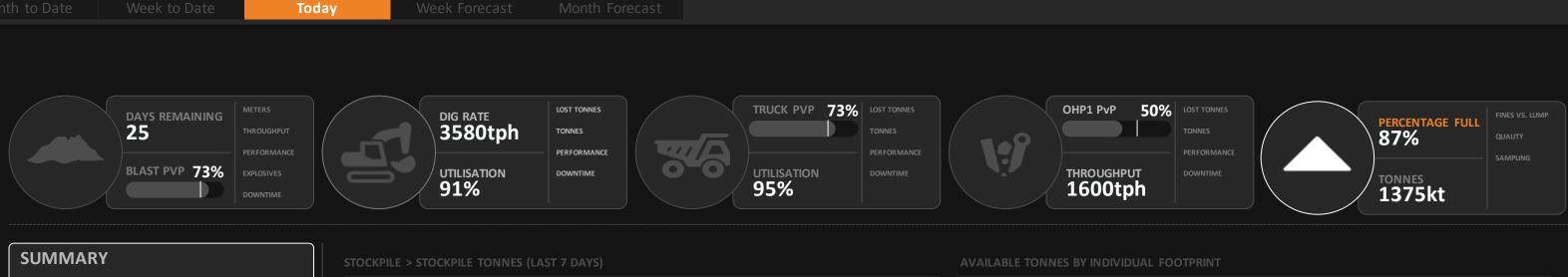
Our Design Principles

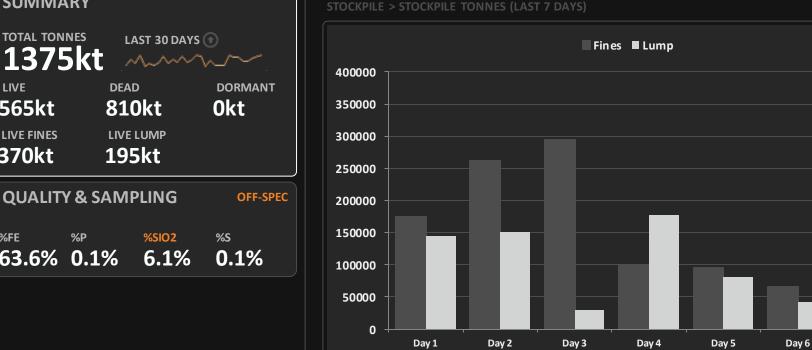


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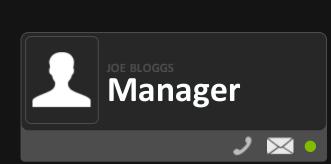
50% LOST TONNES PERCENTAGE FULL 87% TONNES 1375kt





A1 FINES PART RECLAIMED





%Р

63.6% 0.1%

DEAD

LIVE

%FE

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Day 7



80 %

87 %

96 %

Deloitte.

9:54 AM Monday 17th November 2014

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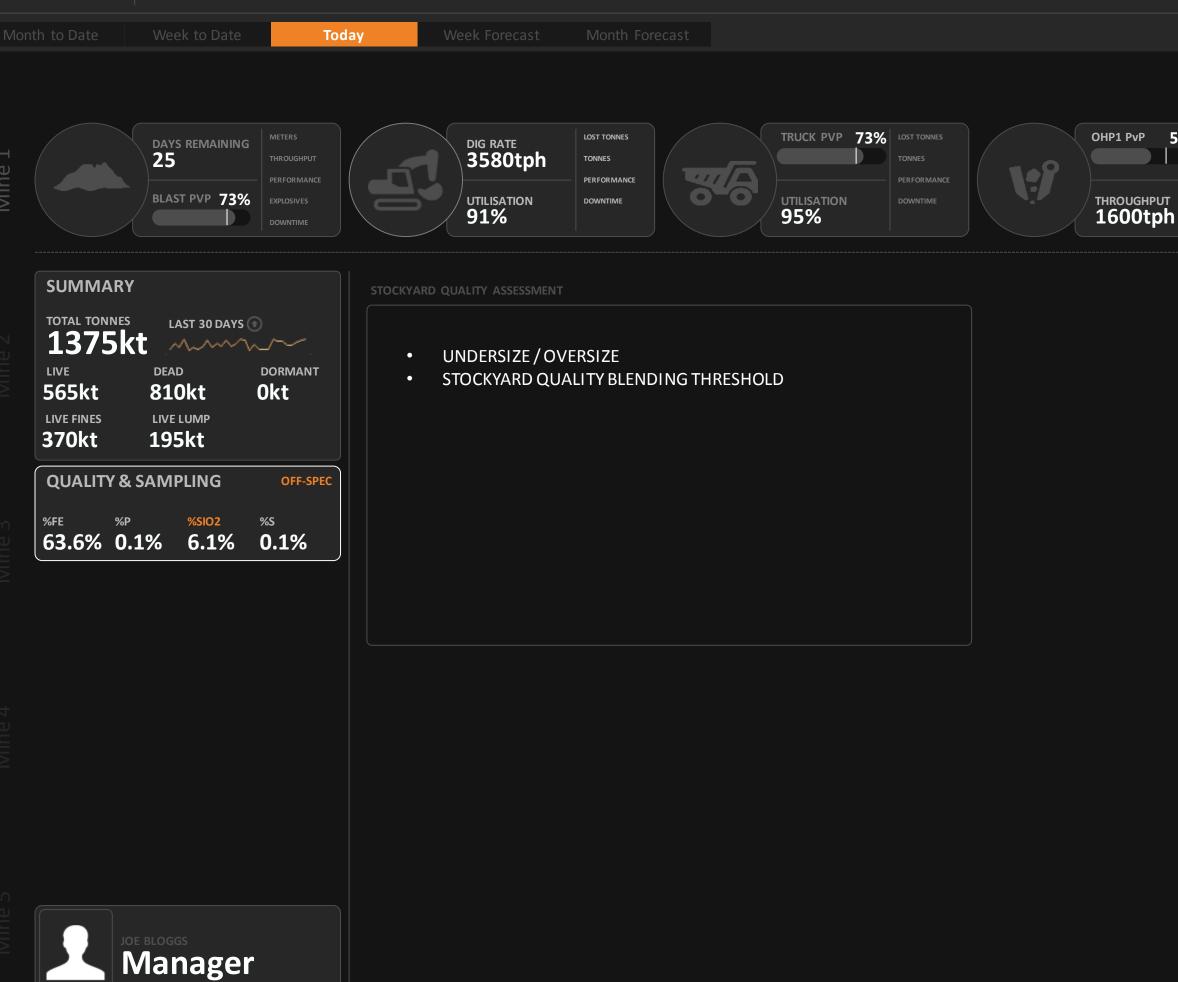
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50% LOST TONNES PERCENTAGE FULL 87% TONNES 1375kt

Our Design Principles íΠÌ

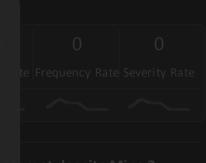
Information will be displayed on the dashboard using a ۲ standard Left – Right approach

- Utilise management-by- exception philosophy so people are ۲ disturbed only when a condition arises that requires human intervention.
- To create a sense of *urgency to act,* though not deviate from ۲ disciplined and methodical decision making means.
- To visually analyse *production trends* of inventory and plant ۲ (mobile and fixed) performance over time
- Not intended as a tool to perform scheduling. Users already • have scheduling systems in place and the system should not duplicate these.
- Not intended to replace control systems. Users already have ۲ control systems in place and the system should not duplicate these.
- Avoid clutter on the dashboard and build for simplicity. Avoid • excessive colour, animation and other visual features that cause the user to expend more mental effort acquiring essential information. This dashboard's purpose is to convey information.

۲

Minimise alerts and set any thresholds at sensible limits. Do not design the dashboard to provide an oversupply of warnings that distract users, including management, from what is important both strategic and tactically.

Will not be customised to hide poor data – poor data must be corrected at the source system



Contact Us

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If you would like further information about this solution, please contact us on the details below.



Alan Marshall Partner | Enterprise Information Management

Perth



Steven Walsh Partner | Technology Advisory

Perth



Ilario Dichiera Director | Operational Performance Solutions

Perth



Marc Pearce Director | Business Intelligence & Data Warehouse

Perth mpearce@deloitte.com.au



Rutu Ayachit Manager | Solution Architecture & Delivery

Perth



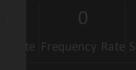
Lovesh Patni Manager | Data Transformation Design & Development

Perth



Phil Kirby Director | Mining Operations

Perth







Premdas Kanaran Senior Consultant | Visualisation Design & Development

Perth

Our Experience íΠÌ

Hub ____: Rai ___

715 2J 2015 759 2015 197 2019 20 3 3 5 30 5

Operational Performance Dashboard

Our global mining client moved its regional site-based short term production, planning and control activities to a city-based new integrated remote operations centre. They saw this as an opportunity to enhance visibility of production information across the supply chain.

Deloitte designed and delivered a supply chain visualisation solution showing key operational metrics in near-real-time, permanently displayed on large screens, built on a leading business intelligence and data warehouse toolset.

"For the first time we can see our total supply chain, in real time and in one place, enabling us to proactively make the right decisions for the whole business." **Global Mining CEO**

Operational Performance Reporting

Our global mining client needed a standard suite of operational reports that display key operational metrics to support informed decisions on the operations of its many mines.

Deloitte designed and delivered a dashboard-style standard operational reporting solution covering mobile fleet, fixed plant and maintenance operations, built on a leading business intelligence and data warehouse toolset.



