

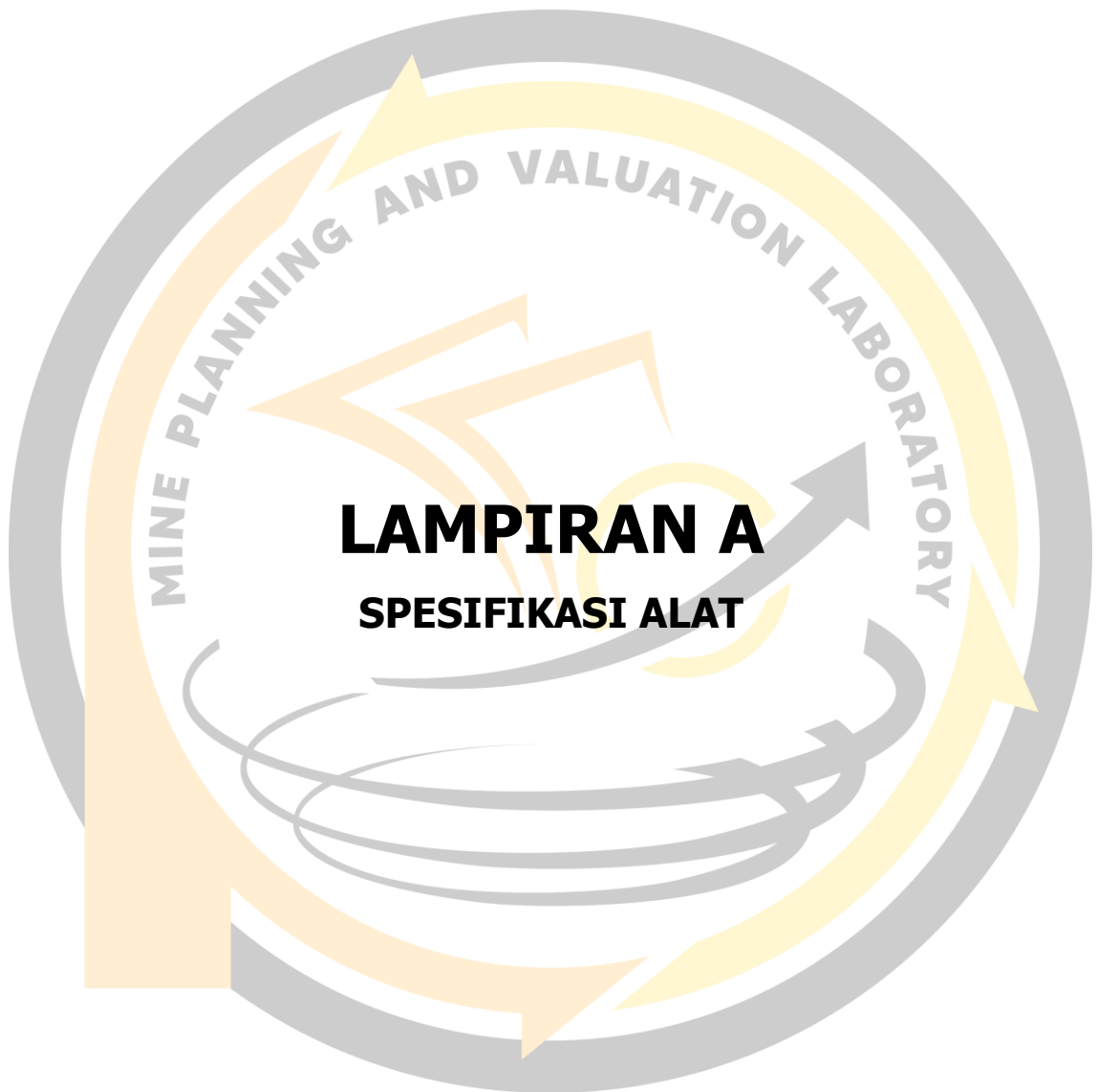
DAFTAR PUSTAKA

- Abdillah. 2013. *Program Linear*. Makassar: Dua Satu Press.
- Adriantantri, E., Indriani, S. 2021. Optimization of Production Planning Using Linear Programming. *International Journal of Software and Hardware Research in Engineering*, 41-46.
- Anisari, R. 2018. Perhitungan Produktivitas Bulldozer Pada Aktivitas Dozing di PT. Pamapersada Nusantara Tabaling Kalimantan Selatan. *Junal INTEKNA*, 8-12.
- Christian, S. 2013. Penerapan Linear Programming Untuk Mengoptimalkan Jumlah Produksi Dalam Memperoleh Keuntungan Maksimal Pada CV Cipta Unggul Pratama. *Journal The WINNERS*, 55-60.
- Hustrulid, W., Kuchta, M., Martin, R. 2013. *Open Pit Mine Planning & Design*. London: CRC Press.
- Kesuma. 2006. *Teori Produksi*. Bogor: Institut Pertanian Bogor.
- Khorami, M. T., Edraki, M., Corder, G., Golev, A. 2019. Re-Thinking Mining Waste through an Integrative Approach Led by Circular Economy Aspirations. *Minerals*, 1-13.
- Kim, R. H., Park, Y. J., Lee, D. E. 2019. Dozer Productivity Correction Method for Eco-Dozing Assessment. *KSCE Journal*, 2829-2838.
- Klanfar, M., Kujundžić, T., Vrkljan, D. 2014. Calculation Analysis of Bulldozer's Productivity In Gravitational Transport On Open Pits. *Tehnički Vjesnik*, 517-523.
- Komatsu. 2009. *Specifications & Application Handbook*. Jepang: Komatsu.
- Londong, C., Nurhakim, Dwiatmoko, M. U., Melati, S. 2016. Perencanaan Disposal Pada Tambang Terbuka. *Jurnal GEOSAPTA*, 49-55.
- Margaretta, J., Gondokusumo, O. 2017. Penerapan Metode Linear Programming Untuk Analisis Pemotongan Besi Tulangan Pada Proyek Bangunan Gedung di Jakarta. *Jurnal Muara Sains, Teknologi, Kedokteran dan Ilmu Kesehatan*, 51-61.
- Maswarni, Hermawan, H., Kartono. 2019. *Riset Operasi*. Banten: Universitas Pamulang.
- Mulyanti, W. R., Yuliadi, & Maryanto. 2017. Analisa Teknis dan Ekonomis Strategi Short Distance Disposal West Block (Anoa South). *Prosiding Teknik Pertambangan*, 270-281.
- Nehring, Topal, Little. 2010. A New Mathematical Programming Model For Production Schedule Optimization In Underground Mining Operations. *The Journal of The Sourhern African Institute of Mining and Metallurgy*, 437-446.
- Prasmoro, A., Hasibuan, S. 2018. Optimasi Kemampuan Produksi Alat Berat dalam Rangka Produktivitas dan Keberlanjutan Bisnis Pertambangan Batubara. *Operations Excellence*, 1-16.

- PT Vale Indonesia. 2020. *Journey to Excellence Amidst Challenge*. Sorowako: PT Vale Indonesia.
- PT Vale Indonesia. 2021. *SOP Management Disposal Terintegrasi*. Sorowako: PT Vale Indonesia.
- Rostiyanti. 1999. *Produktivitas Alat Berat Pada Proyek Konstruksi*. Jakarta: Rineka Cipta.
- Rostiyanti, S. F. 2008. *Alat Berat Untuk Proyek Konstruksi*. Jakarta: PT. Rineka Cipta.
- Sarkhel, S., Dey. 2015. A Critical Study on Availability and Capacity Utilization of Side Discharge Loaders For Performance Assessment. *International Journal of Research in Engineering and Technology*, 251-258.
- Schulze, M. 1998. *Linear Programming for Optimization*. Texas: Perceptive Scientific Instruments.
- Siringoringo. 2005. *Seri Teknik Riset Operasional: Pemograman Linear*. Yogyakarta: Graha Ilmu.
- Song, S., Marks, E., Pradhananga, N. 2017. Impact Variables of Dump Truck Cycle Time for Heavy Excavation Construction Projects . *Journal of Construction Engineering and Project Management*, 11-18.
- Taylor, B. 2013. *Introduction to Management Science*. Amerika: Pearson Education.
- Utama, R. E., Gani, A. N., Jaharudin, & Priharta, A. 2019. *Manajemen Operasi*. Jakarta: UM Jakarta Press.
- Zaenal. 2008. *Manajemen Produksi dan Operasi*. Bogor: Institut Pertanian Bogor.



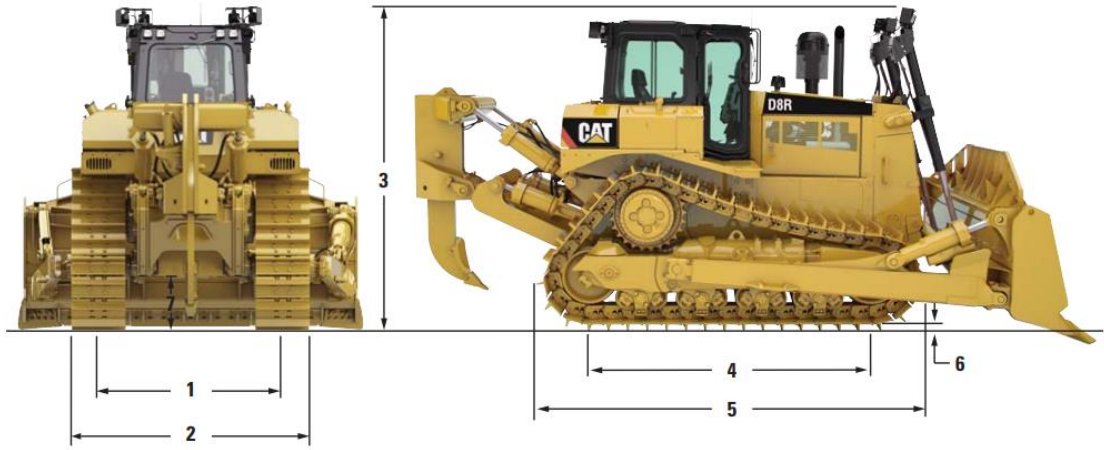
LAMPIRAN



LAMPIRAN A

SPESIFIKASI ALAT

DOZER D8R



1. Track Gauge
2. Width of Tractor
3. Machine Height, from Tip of Grouser
4. Length of Track on Ground
5. Length of Basic Tractor
6. Height of Grouser
7. Ground Clearance

Engine

Engine Model	Cat 3406C DITA*	
Engine Power (Maximum)		
SAE J1995	252 kw	338 hp
ISO 14396	247 kw	331 hp
ISO 14396 (DIN)		335 hp
Net Power (Rated**)		
ISO 9249/SAE J1349	226 kw	303 hp
ISO 9249/SAE J1349 (DIN)		307 hp
80/1269/EEC	226 kw	303 hp
Net Power (Maximum)		
ISO 9249/SAE J1349	239 kw	320 hp

Width of Shoe	610 mm	24 in
Shoes/Side	44	
Track Rollers per Side	8	
Grouser Height	78 mm	3.1 in
Pitch	216 mm	8.5 in
Ground Clearance	613 mm	24.1 in
Track Gauge	2083 mm	82 in
Length of Track on Ground	3206 mm	126 in
Ground Contact Area	3.91 m ²	6,060 in ²
Ground Pressure (ISO 16754)	95.1 kPa	13.8 psi
Standard – SU	84.7 kPa	12.3 psi
Standard – SU	86.2 kPa	12.5 psi
Standard – SU	86.6 kPa	12.6 psi

Blades

SU – Blade Capacity	8.70 m ³	11.38 yd ³
SU – Blade Capacity	3937 mm	155.0 in
U – Blade Capacity	11.70 m ³	15.30 yd ³
U – Blade Capacity	4262 mm	167.8 in
A – Blade Capacity	4.70 m ³	6.15 yd ³
A – Blade Capacity	4978 mm	196.0 in
SU LGP – Blade Capacity	8.50 m ³	11.12 yd ³
SU LGP – Blade Capacity	4400 mm	173.2 in

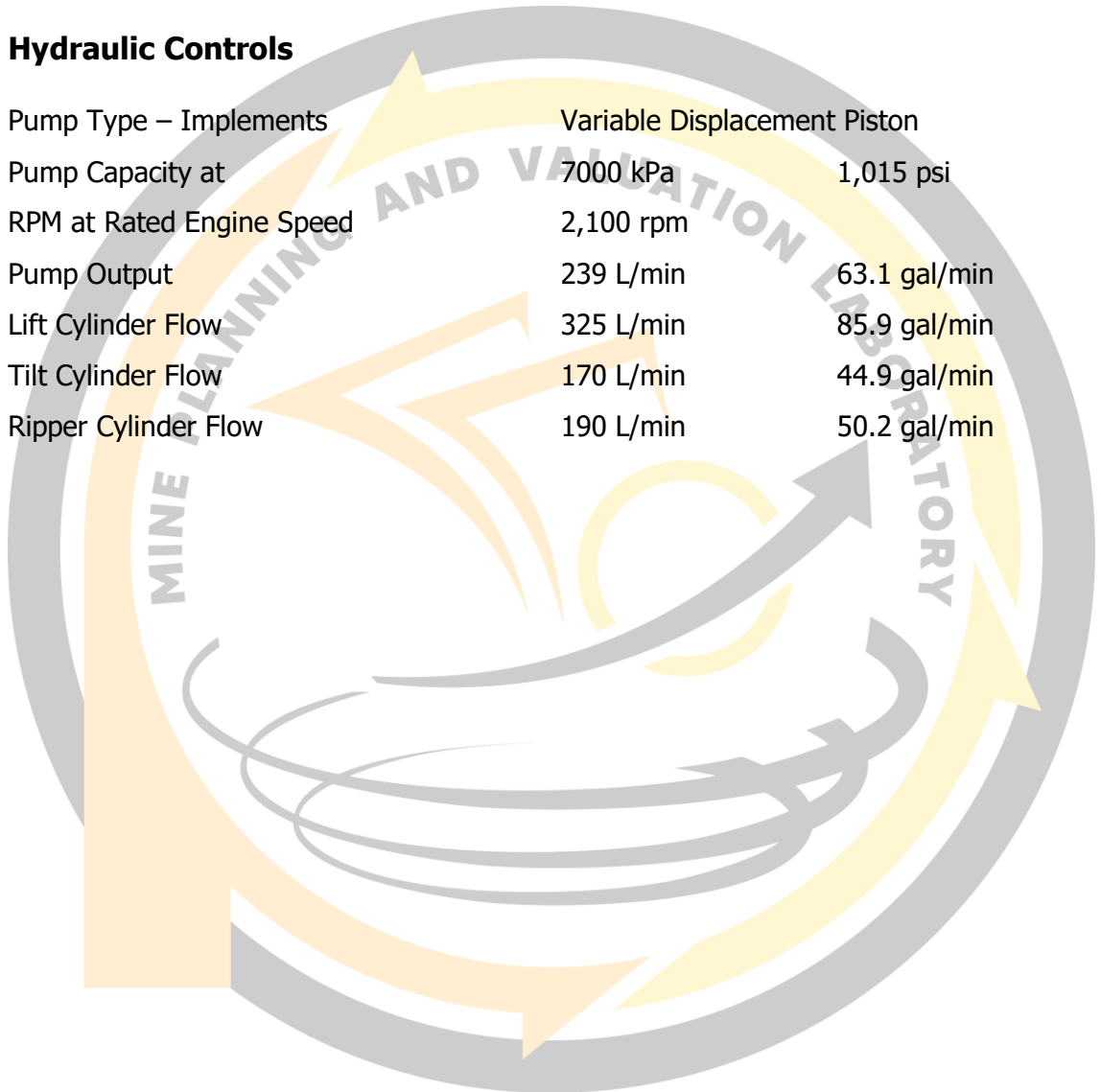
Ripper

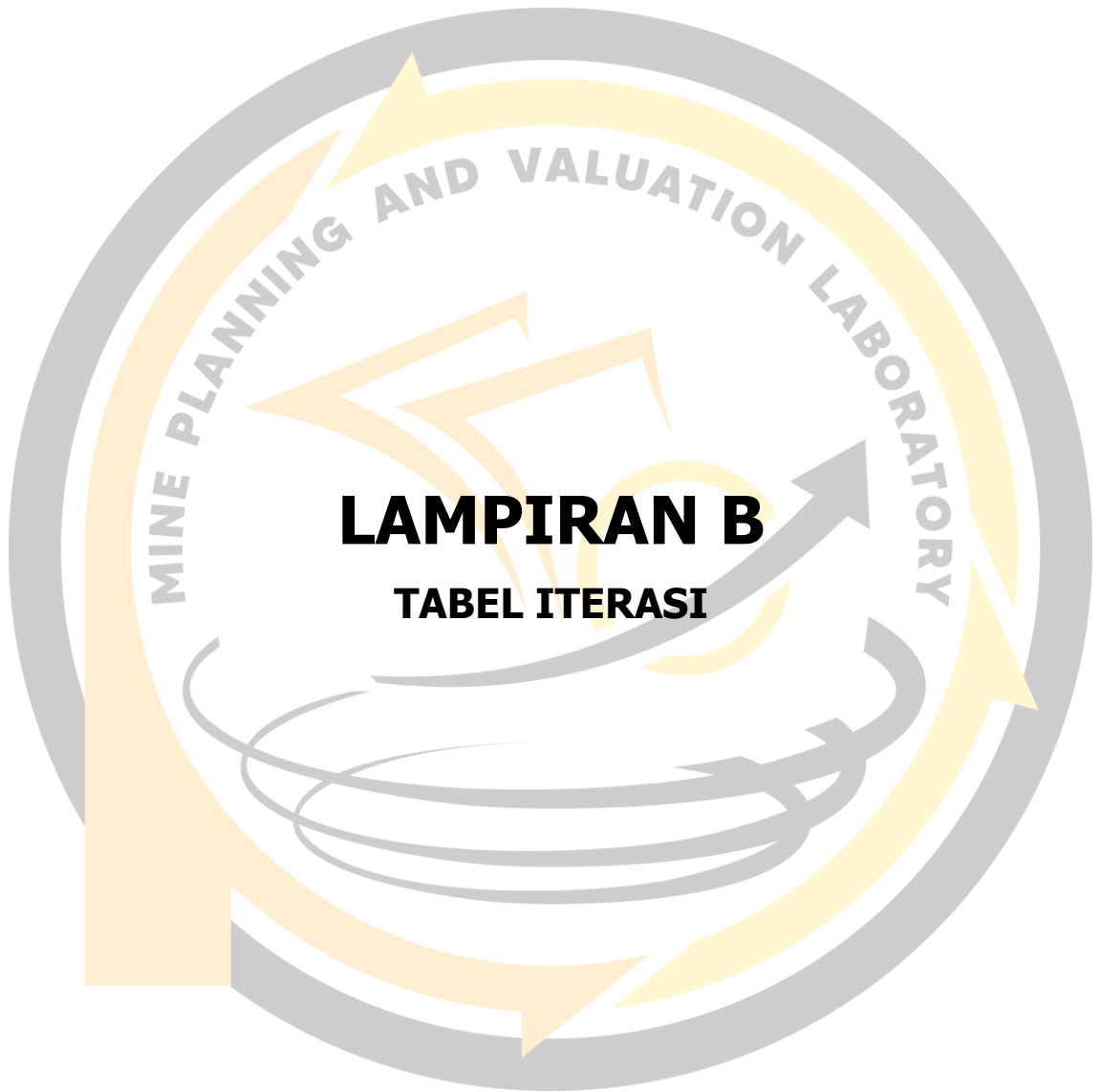
Type	Adjustable Parallelogram Single-Shank	
Number of Pockets	1	
Weight with Standard Single Shank	4085 kg	9,006 lb
Maximum Penetration	1135 mm	44.7 in
Maximum Penetration Force	127.4 kN	28,641 lbf
Pryout Force	222.8 kN	50,087 lbf
Type	Adjustable Parallelogram Multi-Shank	

Number of Pockets	3	
Weight with Three Shank	4877 kg	10,572 lb
Overall Beam Width	2464 mm	97 in
Maximum Penetration	780 mm	30.7 in
Maximum Penetration Force	124.2 kN	27,971 lbf
Pryout Force	227.9 kN	51,234 lbf

Hydraulic Controls

Pump Type – Implements	Variable Displacement Piston	
Pump Capacity at	7000 kPa	1,015 psi
RPM at Rated Engine Speed	2,100 rpm	
Pump Output	239 L/min	63.1 gal/min
Lift Cylinder Flow	325 L/min	85.9 gal/min
Tilt Cylinder Flow	170 L/min	44.9 gal/min
Ripper Cylinder Flow	190 L/min	50.2 gal/min





LAMPIRAN B

TABEL ITERASI

TABEL ITERASI

Cj	Basic Variables	1 X1	1 X2	0 slack 1	0 slack 2	0 artfcl 3	0 surplus 3	0 artfcl 4	0 surplus 4	0 slack 5	0 artfcl 6	0 surplus 6	0 artfcl 7	0 surplus 7	0 artfcl 8	0 surplus 8	0 artfcl 9	0 surplus 9	Quantity	
Phase 1 - Iteration 1																				
0	slack 1	0,0018	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
0	slack 2	0	0,0021	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
1	artfcl 3	1,444	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	16.752
1	artfcl 4	0	1,613	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	16.752
0	slack 5	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	707.706
1	artfcl 6	1	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	11.596
1	artfcl 7	0	1	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	10.385
1	artfcl 8	1	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0
1	artfcl 9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0
	zj	-3,444	-3,613	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	55.485
	cj-zj	3,444	3,613	0	0	0	-1	0	-1	0	0	-1	0	-1	0	-1	0	-1		

Iteration 2																				
0	slack 1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-0,0018	0,0018	0	0	24
0	slack 2	0	0,0021	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
1	artfcl 3	0	0	0	0	1	-1	0	0	0	0	0	0	0	-1,444	1,444	0	0	0	16.752
1	artfcl 4	0	1,613	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	16.752
0	slack 5	0	1	0	0	0	0	0	0	1	0	0	0	0	-1	1	0	0	0	707.706
1	artfcl 6	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	0	0	0	11.596

1	artfcl 7	0	1	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	10.385
0	X1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0
1	artfcl 9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0
	zj	0	-3,613	0	0	1	1	1	1	0	1	1	1	1	4,444	-2,444	1	1	55.485
	cj-zj	0	3,613	0	0	0	-1	0	-1	0	0	-1	0	-1	-3,444	2,444	0	-1	

Iteration 3																			
0	slack 1	0	0	1	0	0	0	0	0	0	0	0	0	0	-0,0018	0,0018	0	0	24
0	slack 2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	-0,0021	0,0021	24
1	artfcl 3	0	0	0	0	1	-1	0	0	0	0	0	0	0	-1,444	1,444	0	0	16.752
1	artfcl 4	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	-1,613	1,613	16.752
0	slack 5	0	0	0	0	0	0	0	0	1	0	0	0	0	-1	1	-1	1	707.706
1	artfcl 6	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	0	0	11.596
1	artfcl 7	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	10.385
0	X1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0
0	X2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0
	zj	0	0	0	0	1	1	1	1	0	1	1	1	1	4,444	-2,444	4,613	-2,613	55.485
	cj-zj	0	0	0	0	0	-1	0	-1	0	0	-1	0	-1	-3,444	2,444	-3,613	2,613	

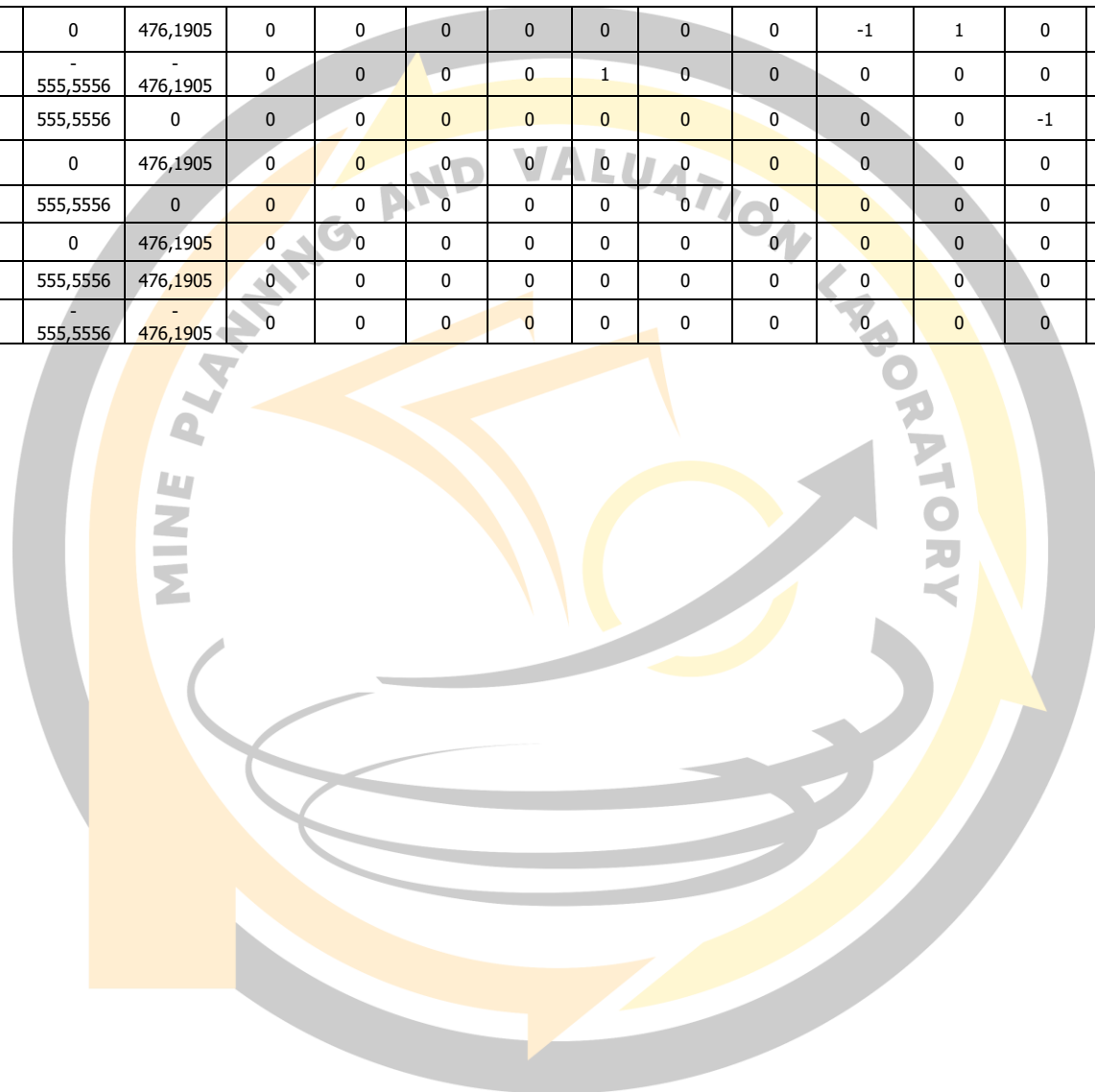
Iteration 4																			
0	slack 1	0	0	1	0	0	0	0	0	0	0	0	0	0	-0,0018	0,0018	0	0	24
0	slack 2	0	0	0	1	0	0	0	0	0	0	0	-0,0021	0,0021	0	0	0	0	2,1915
1	artfcl 3	0	0	0	0	1	-1	0	0	0	0	0	0	0	-1,444	1,444	0	0	16.752
1	artfcl 4	0	0	0	0	0	0	1	-1	0	0	0	-1,613	1,613	0	0	0	0	0,9946
0	slack 5	0	0	0	0	0	0	0	0	1	0	0	-1	1	-1	1	0	0	697.321
1	artfcl 6	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	0	0	11.596

0	surplus ₉	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	10.385
0	X1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0
0	X2	0	1	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	10.385
	zj	0	0	0	0	1	1	1	1	0	1	1	3,613	-1,613	4,444	-2,444	2	0	0	28.349,00
	cj-zj	0	0	0	0	0	-1	0	-1	0	0	-1	-2,613	1,613	-3,444	2,444	-1	0		

Iteration 5																				
0	slack 1	0	0	1	0	0	0	0	0	0	-0,0018	0,0018	0	0	0	0	0	0	0	3,1272
0	slack 2	0	0	0	1	0	0	0	0	0	0	0	-0,0021	0,0021	0	0	0	0	0	2,1915
1	artfcl 3	0	0	0	0	1	-1	0	0	0	-1,444	1,444	0	0	0	0	0	0	0	7,3759
1	artfcl 4	0	0	0	0	0	0	1	-1	0	0	0	-1,613	1,613	0	0	0	0	0	0,9946
0	slack 5	0	0	0	0	0	0	0	0	1	-1	1	-1	1	0	0	0	0	0	685.725
0	surplus ₈	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	0	0	0	11.596
0	surplus ₉	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	0	10.385
0	X1	1	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	11.596
0	X2	0	1	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	10.385
	zj	0	0	0	0	1	1	1	1	0	3,444	-1,444	3,613	-1,613	2	0	2	0	0	8,3718
	cj-zj	0	0	0	0	0	-1	0	-1	0	-2,444	1,444	-2,613	1,613	-1	0	-1	0	0	

Iteration 6																				
0	slack 1	0	0	1	0	0	0	0	0	0	-0,0018	0,0018	0	0	0	0	0	0	0	3,1272
0	slack 2	0	0	0	1	0	0	0,0013	0,0013	0	0	0	0	0	0	0	0	0	0	2,1902
1	artfcl 3	0	0	0	0	1	-1	0	0	0	-1,444	1,444	0	0	0	0	0	0	0	7,3759
0	surplus ₇	0	0	0	0	0	0	0,62	-0,62	0	0	0	-1	1	0	0	0	0	0	0,6166
0	slack 5	0	0	0	0	0	0	-0,62	0,62	1	-1	1	0	0	0	0	0	0	0	685.724,38
0	surplus ₈	0	0	0	0	0	0	0	0	0	1	-1	0	0	-1	1	0	0	0	11.596

0	surplus 7	0	0	0	476,1905	0	0	0	0	0	0	0	0	-1	1	0	0	0	0	1.043,57
0	slack 5	0	0	-	-	0	0	0	0	1	0	0	0	0	0	0	0	0	0	682.944,09
0	surplus 8	0	0	555,5556	476,1905	0	0	0	0	0	0	0	0	0	0	-1	1	0	0	13.333,33
0	surplus 9	0	0	0	476,1905	0	0	0	0	0	0	0	0	0	0	0	0	-1	1	11.428,57
1	X1	1	0	555,5556	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.333,33
1	X2	0	1	0	476,1905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.428,57
	zj	1	1	555,5556	476,1905	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24.761,91
	cj-zj	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				555,5556	476,1905															











LAMPIRAN C
KARTU KONSULTASI

Lampiran B 10

Kartu Konsultasi Tugas Akhir

JUDUL: Optimalisasi Produksi Dozer D8R di Disposal Hasan PT Vale Indonesia Tbk Menggunakan Metode Linear Programming

(Konsultasi minimal 8 kali)

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
2 Juni 2022	<ul style="list-style-type: none">- Perbaiki abstrak- Perbaiki bab I- Tambahkan penjelasan disposal di bab II- Penghilangan tahapan forecasting- Tambahkan formulasi model sistematis di bab III- Perbaiki kesimpulan	
27 Juni 2022	<ul style="list-style-type: none">- Perbaiki abstrak- Perbaiki bagan alir- Tambahkan pembahasan di bab IV- Perbaiki bab I- Perbaiki formulasi matematika di bab III dan IV	
13 Juli 2022	<ul style="list-style-type: none">- Konsistensi penggunaan kata- Perbaiki pembahasan di bab IV- Perbaiki bab I- Perbaiki lampiran	
22 Juli 2022	<ul style="list-style-type: none">- Perbaiki bab I- Perbaiki typo /kesalahan penulisan- Perbaiki bab III- Penggunaan kata berulang	
26 Juli 2022	<ul style="list-style-type: none">- Perbaiki bab IV- Perbaiki perhitungan	
29 Juli 2022	<ul style="list-style-type: none">- Perbaiki formulasi fungsi batasan	

TANGGAL	MATERI KONSULTASI	PARAF DOSEN
1 Agustus 2022	Perbaiki pembahasan di bab IV	Puf
9 Agustus 2022	Perbaiki bab IV	Puf
12 Agustus 2022	ACC	Puf
2 September 2022	<ul style="list-style-type: none"> - Perbaiki grafik - Tambahkan tujuan - Tambahkan kesimpulan - Perbaiki pembahasan 	Puf
13 September 2022	<ul style="list-style-type: none"> - kata hubung di awal kalimat - Perbaiki abstrak - Perbaiki kesimpulan 	Puf
10 Oktober 2022	<ul style="list-style-type: none"> - Perbaiki hasil grafik - Perbaiki kata pengantar - Perbaiki daftar isi, tabel - keterangan tabel 	Puf
10 Oktober 2022	ACC	Puf