CENTRAL EYRE IRON PROJECT – KEY PROCESSING METRICS AND BENCHMARKED ANALYSIS

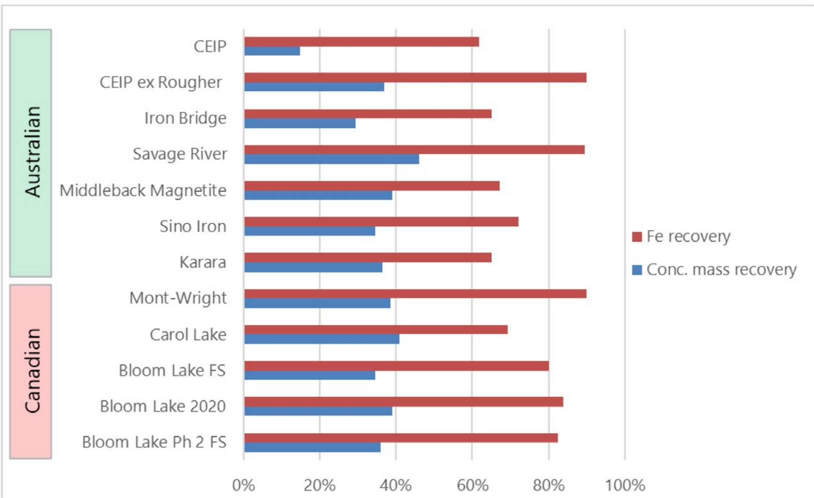
Iron Road Ltd (Iron Road or **Company, ASX: IRD)** is pleased to advise of key supplementary findings following the Company's recent announcement, *Independent Technical Review Verifies Ore Processing Flow Sheet* (19/05/21).

The technical review undertaken by Metalytics, a highly regarded specialist consulting firm to the iron ore and steel industries, has benchmarked projected iron and mass recoveries from the Company's Central Eyre Iron Project (CEIP) with comparable Australian and Canadian high-grade iron ore concentrate projects. It has also assessed key characteristics of CEIP concentrate in the context of high-grade iron ore products in international trade. The CEIP hosts Australia's largest magnetite Ore Reserve with a Definitive Feasibility Study (DFS) and post-DFS optimisation studies complete.

As outlined in the 19 May 2021 announcement, a key finding of the Metalytics report is that the coarse grain size and moderate hardness of the CEIP ore make it possible to reject 60% of the run-of-mine (ROM) mass early in the processing stage at the Rougher Magnetic Separation (RMS) step.

Consequently, only the remaining 40% mass flow is subject to further beneficiation. This 40% stream is estimated by Metalytics to have an average iron grade of around 27.5% Fe, which is well within the usual range for magnetite mining operations. The resultant material is then beneficiated to the finished concentrate product (66.63% Fe per Metalytics analysis and modelling) at a mass recovery of 37% and an iron recovery of 90%. In **Figure 1** below, Metalytics shows that these recoveries are favourable relative to appropriate comparative projects – the existing or under-construction magnetite producers in Australia and high-grade coarse hematite concentrate producers in Canada. The 12Mtpa (dry) CEIP processing flow sheet is included in this release.

Figure 1: Australian Magnetite vs Canadian Hematite Projects



Source: Metalytics analysis; indicative only, may not reflect current results, some data estimated

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Metalytics notes from the point that CEIP ore exits the RMS stage, its recovery parameters align with project peers shown in **Figure 1**. Further, because of the coarse-grained nature of the CEIP ore, its processing from that point is simpler, less energy-intensive and therefore potentially has lower operating cost than comparative projects from their respective ROM ore stages. Front end processing rejection of 60% material mass also has important and advantageous implications for unit capital intensity since this ore pre-concentration step substantially reduces the capacity that would otherwise be required for downstream processing. Bulk sample tests have shown that post RMS grades as high as 32.5% Fe are possible, depending on ROM ore quality and comminution specifics.

In respect of ore hardness, uniaxial compressive strength (UCS) is a key physical parameter relevant to rock geomechanics for iron ore mining and crusher design. CEIP ore reports an average UCS of 110 MPa compared with approximately 450-600 MPa for markedly finer grained, significantly harder and more abrasive banded iron formation (BIF) magnetite projects in Western Australia. For reference, Clout & Manuel (2015)[1] quote the following UCS ranges for Australian iron ores:

friable	20-35 MPa
medium hardness	110-200 MPa (CEIP ore = lower end of range)
hard	200-500 MPa

An additional notable feature of the CEIP ore according to Metalytics is its low annual chemical variability (aligned with the Thiess Mine Plan), which complements the consistency of its mineralogy and bulk physical properties. The relevance of this is the confidence it provides for efficient operation of the entire beneficiation line in producing high-grade iron concentrate of consistent quality. Crushing, grinding and mineral separation processes can all be optimised, which Metalytics observes is far preferable to a situation where continuous adjustments to operational settings and flow rates are necessary to accommodate changes in feed characteristics.

Based on a well-defined Thiess Mine Plan and the results of laboratory test work and process simulation studies, Metalytics' estimates of the average chemical composition of the ore feed and particle size distribution of the iron concentrate product during the 20-year steady state production period are listed in **Figure 2**. According to Metalytics, the product sizing distribution allows for a degree of flexibility in offtake agreements for CEIP concentrate given it could substitute in either sinter or pellet feed blends, subject to value-in-use assessments.

Figure 2: CEIP Ore and Iron Concentrate Characteristics

Average chemical composition of CEIP Ore to be processed during the 20-year 'steady-state' 12 Mtpa concentrate production period under the Thiess Mine Plan

	Weight % (dry)
Fe	**15.93**
SiO_2	53.37
Al_2O_3	12.62
$Fe_{(tot)}$ as Fe_2O_3	22.78
FeO	n.a.
MnO	1.54
MgO	2.43
CaO	1.29
Na_2O	n.a.
K_2O	1.02
TiO_2	0.56
Cr_2O_3	n.a.
P_2O_5	0.21
Total	**95.81**

Average chemical composition and particle size distribution of CEIP Concentrate produced during the 12 Mtpa 'steady state' production period under the Thiess Mine Plan

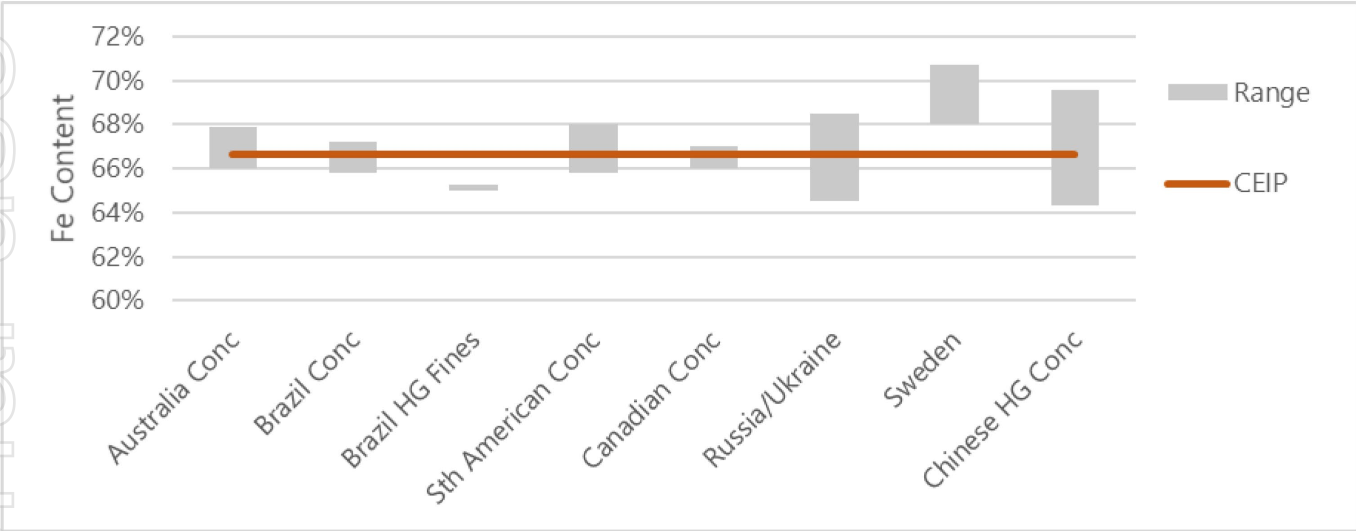
	Weight % (dry)	Appeture (microns)	Weight % passing
Fe	66.63	500	99.6
SiO_2	3.51	425	99.1
Al_2O_3	1.94	300	97.4
Mn	0.70	212	94.4
Cr	0.032	150	88.4
P	0.009	106	79.4
S	0.003	75	67.2
		53	49.9
		38	36.4
SiO_2	3.51	30	27.2
Al_2O_3	1.94	20	16.1
Fe_2O_3	64.76	15	10.5
FeO	27.45	10	6.1
MnO	0.90		
MgO	0.40		
CaO	0.11		
Na_2O	0.08		
K_2O	0.13		
TiO_2	0.29		
Cr_2O_3	0.05		
P_2O_5	0.02		
Total (dry)	99.64		

[1] *Clout, J.M.F., & Manuel, J.R., 2015: Mineralogical, chemical and physical characteristics of iron ore. In Iron Ore: Mineralogy, Processing and Environmental Sustainability. Woodhead Publishing, p. 71.*

The following charts compare CEIP concentrate with illustrative chemistry ranges of competing sources based on information drawn from Metalytics' database. These are not intended to be exhaustive or precisely cover all currently available or traded products as product specifications vary as operational and market circumstances change. They do however, collectively provide a reasonable reference gauge for assessing CEIP concentrate in the context of high-grade iron ore products in international trade.

Figure 3 shows that the iron content of CEIP concentrate is highly competitive against other concentrates available in the seaborne market and is well-placed relative to Chinese domestic concentrates. It sits higher than Brazilian high-grade sinter fines (principally Carajas Fines), which is the volume supply and trade benchmark in this market segment. Swedish concentrates stand out but play little role in Asian markets. It is Metalytics view that CEIP concentrate can play the same role as existing high-grade products in both sinter and pellet feed blends by enriching the iron grade and contributing to energy and emission reductions.

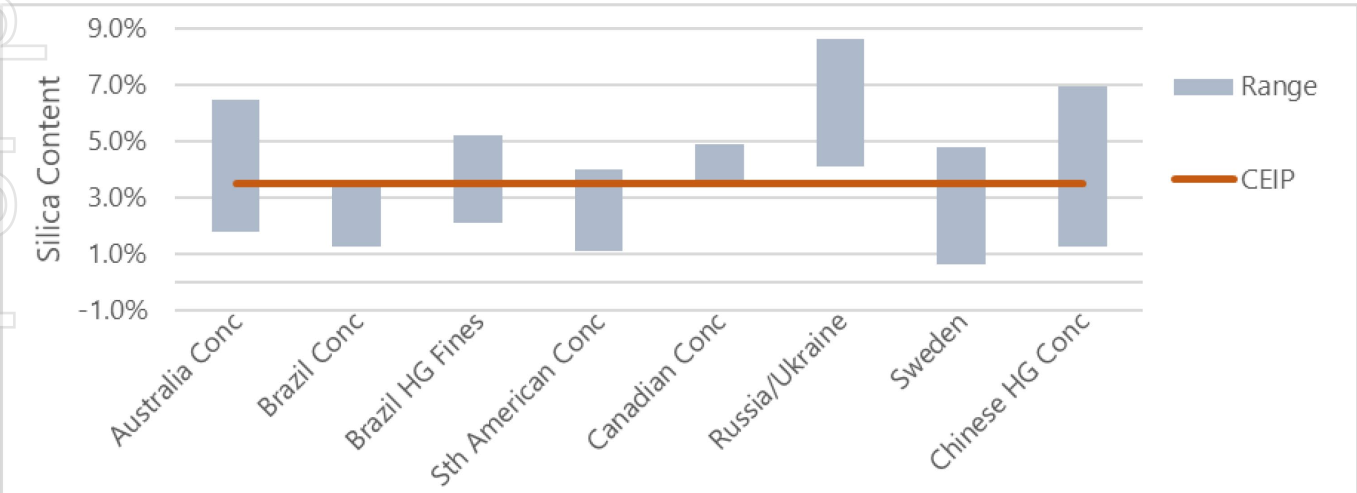
Figure 3: Iron Content



Source: Metalytics

Figure 4 illustrates that CEIP concentrate fits the expected band of silica content for high-grade fines and concentrates and is significantly better than some higher-silica concentrates and fines, particularly Chinese domestic concentrates. As the silica level is also lower than mainstream Australian and Brazilian medium-grade fines, CEIP product can contribute to controlling silica content in ore feed blends.

Figure 4: Silica Content



Source: Metalytics

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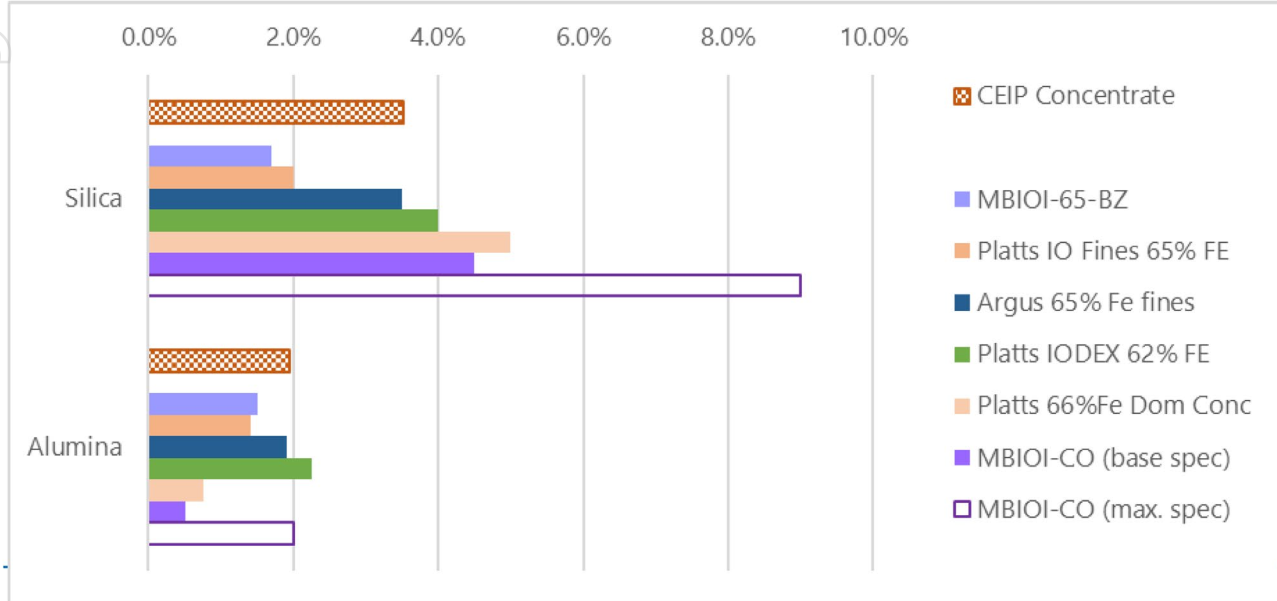
The alumina content of CEIP concentrate sits at the high end of the range of competing products but within the maximum specification for the Fastmarkets MB concentrate index (MBIOI-CO) as shown in **Figure 5**. Nonetheless, it is still below that of mainstream Australian fines and so would slightly lower the alumina content in a sinter feed blend if it substituted for such products, though it may increase the alumina level of a blended pellet feed.

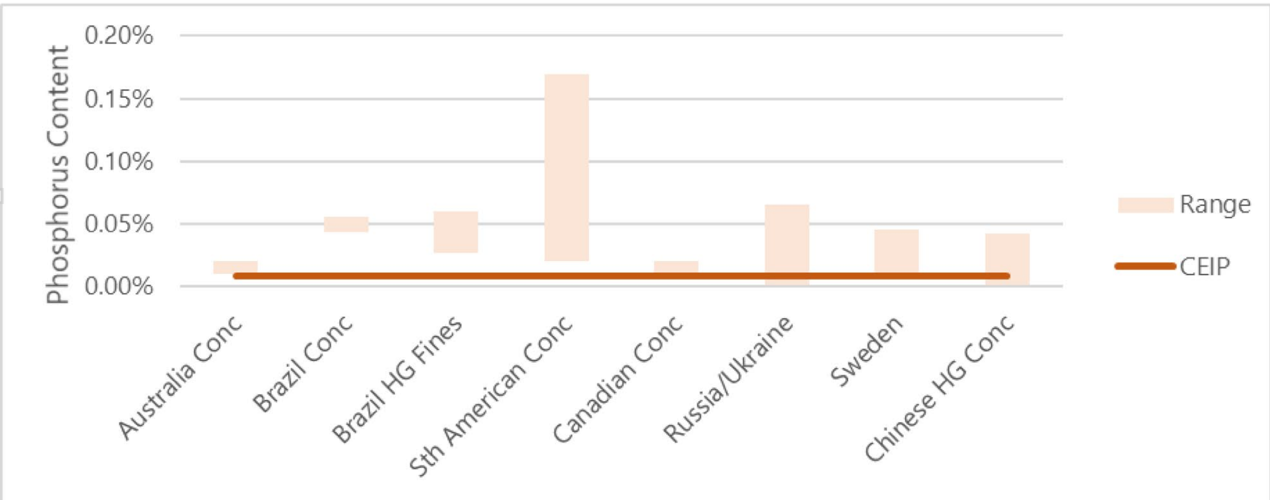
Figure 5: Silica and Alumina Specification Indices



Source: Fastmarkets MB, Platts, Argus Media, Iron Road

Phosphorus content in CEIP concentrate is extremely low as depicted in **Figure 6**. Sulphur content is also extremely low (not charted). Both phosphorus and sulphur are generally considered to be deleterious elements in steel and are not removed from iron by blast furnaces. Therefore, high levels of these elements in the hot metal (pig iron) need to be addressed by additional dephosphorisation or desulphurisation process steps between the blast furnace and steelmaking furnace. Metalytics views ultra-low phosphorus and sulphur contents as further advantageous characteristics of CEIP concentrate.

Figure 6: Phosphorus Content



Source: Metalytics

In Metalytics view, CEIP magnetite concentrate can deliver benefits generally provided by high-grade iron ore products in steel making – ie. reduced energy usage, emissions and slag generation and increased blast furnace productivity. Moreover, the exothermic oxidation of magnetite can reduce the heat energy required for pelletisation by 60% relative to hematite ores. These thematics align with tightening environmental regulations and policies that are being applied in China's steel sector, which include increased use of pellets.

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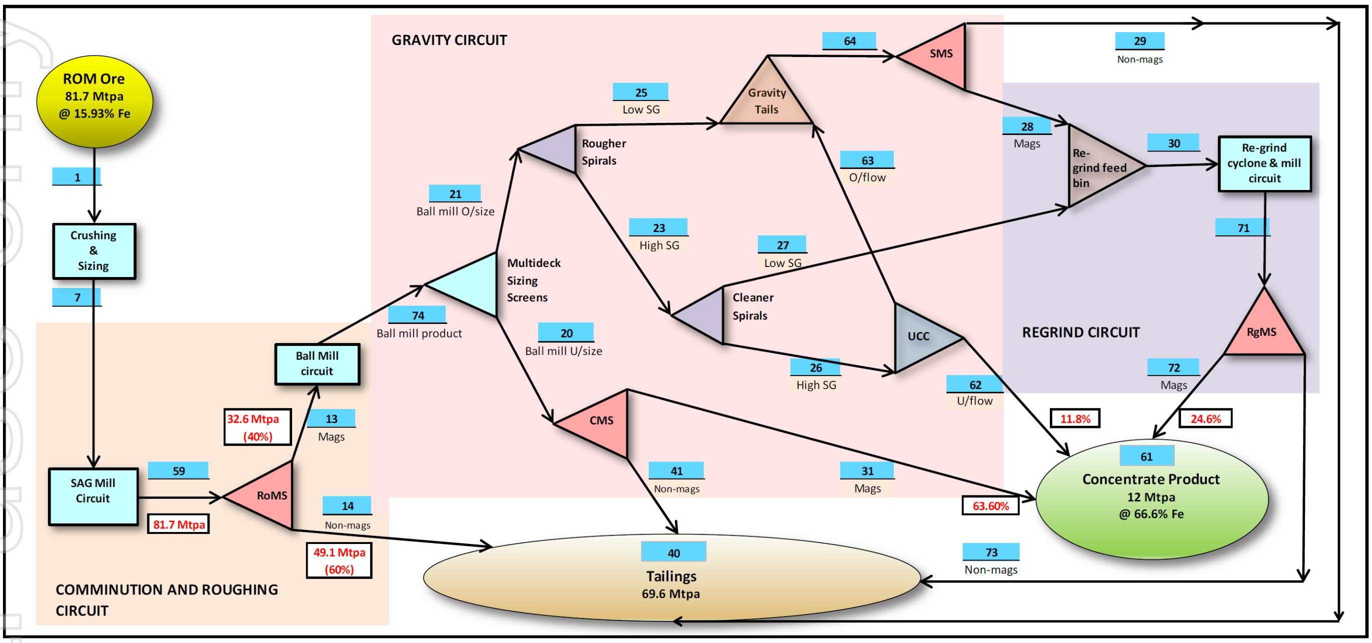
Figure 7 sets out the 12Mtpa (dry) CEIP processing flow sheet. The lower-risk, capital lighter 12Mtpa Thiess Mine Plan incorporates the processing of <50% of the CEIP Ore Reserve over an initial 22-year mine life (ie. 1.7Bt ore processed vs Ore Reserve of 3.7Bt). The CEIP will be an intergenerational asset producing consistent quality, high-grade iron concentrate over many decades.

Figure 7: The CEIP Processing Flow Sheet - average annual total mass and iron grade balances



Input Stream Number				59 →		13 →	74 →		20 →		21 →		23 →	
	ROM Ore		SAG mill	Rougher Mag Sep		Ball mill circuit	Multideck Screens		Cleaner Mag Sep		Rougher Spirals		Cleaner Spirals	
				Mags	Non-mags		O/size	U/size	Mags	Non-mags	High SG	Low SG	High SG	Low SG
Output Stream Number	1	7	59	13	14	74	21	20	31	41	23	25	26	27
Mass split at each step				*39.9%*	*60.1%*		*37.7%*	*62.3%*	*37.8%*	*62.2%*	*31.3%*	*68.7%*	*56.5%*	*43.5%*
Material Flow (Mtpa)	81.717	81.717	81.717	32.6	49.1	32.6	12.3	20.3	7.7	12.6	3.8	8.4	2.2	1.7
%Fe	15.93%	15.93%	15.93%	27.4%	8.3%	27.4%	26.5%	27.9%	66.5%	4.4%	52.5%	14.7%	59.0%	44.1%
P80 (mm)	470	160	3.0	3.0	3.0	0.18	0.30	0.10	0.10	0.10	0.30	0.30	0.30	0.30

Input Stream Number	26 →		25 + 63→	64 →		27 + 28 →	30 →	71 →		31 + 62 + 72 →	14 + 41 + 73 + 29→
	Up-current Classifier		Gravity Tails	Scavenger Mag Sep		Re-grind Feed	Re-grind mill circuit	Re-grind Mag Sep		Concentrate Product	Tailings
	U/flow	O/flow		Mags	Non-mags			Mag	Non-mags		
Output Stream Number	62	63	64	28	29	30	71	72	73	61	40
Mass split at each step	*65.3%*	*34.7%*		*49.0%*	*51.0%*			*48.1%*	*51.9%*		
Material Flow (Mtpa)	1.4	0.8	9.2	4.5	4.7	6.2	6.2	3.0	3.2	**12.071**	**69.646**
%Fe	66.4%	45.0%	17.2%	30.9%	4.0%	34.5%	34.5%	67.1%	4.2%	**66.63%**	**7.1%**
P80 (mm)	0.30	0.30	0.30	0.30	0.30	0.30	0.053	0.053	0.053	**0.112**	**2.2**

NB: dry basis throughout

Authorised for release by the board of Iron Road Ltd

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The information included in this announcement has been obtained from the "CEIP Study Confirms Compelling Commercial Case" announcement dated 26 February 2014, "Quarterly Activities and Cashflow Report" dated 2 May 2016 and as updated by "Revised CEIP Development Strategy" dated 25 February 2019 and Iron Road confirms that it is not aware of any new information or data that materially affects the information provided in this announcement.

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