

The Hellyer Metals Project
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Hellyer Metals Project – Presentation Topics

Intec Group

- **Introduction to Intec Group**
- **Project Background**
- **Hellyer Metals Project**
- **Zinc Secondary Feed Material**
- **Indicative Project Economics**
- **Conclusion**

Intec Group Corporate History

Intec Group

- 1992: First significant private equity raised.
- 1992/94: International industry consortium formed to fund Intec Copper pilot plant.
- 1998/99: A\$14m Intec Copper demonstration plant (industry + Federal Government).
- 2002: Listed on ASX
- 2004: Acquisition of Hellyer Metals Project

Intec's Technology Portfolio

Intec Group

Halide-Based Leaching Technology

Inherent Advantages Over Conventional Pyrometallurgical and Sulfate-Based Systems

Applications

Copper
Concentrates

Zinc
Ores/Conc.

Polymetallic
Ores/Conc.

Nickel
Conc.

Nickel
Laterites

Environmental
EAF Dust
Zinc ferrites
Arsenic trioxide

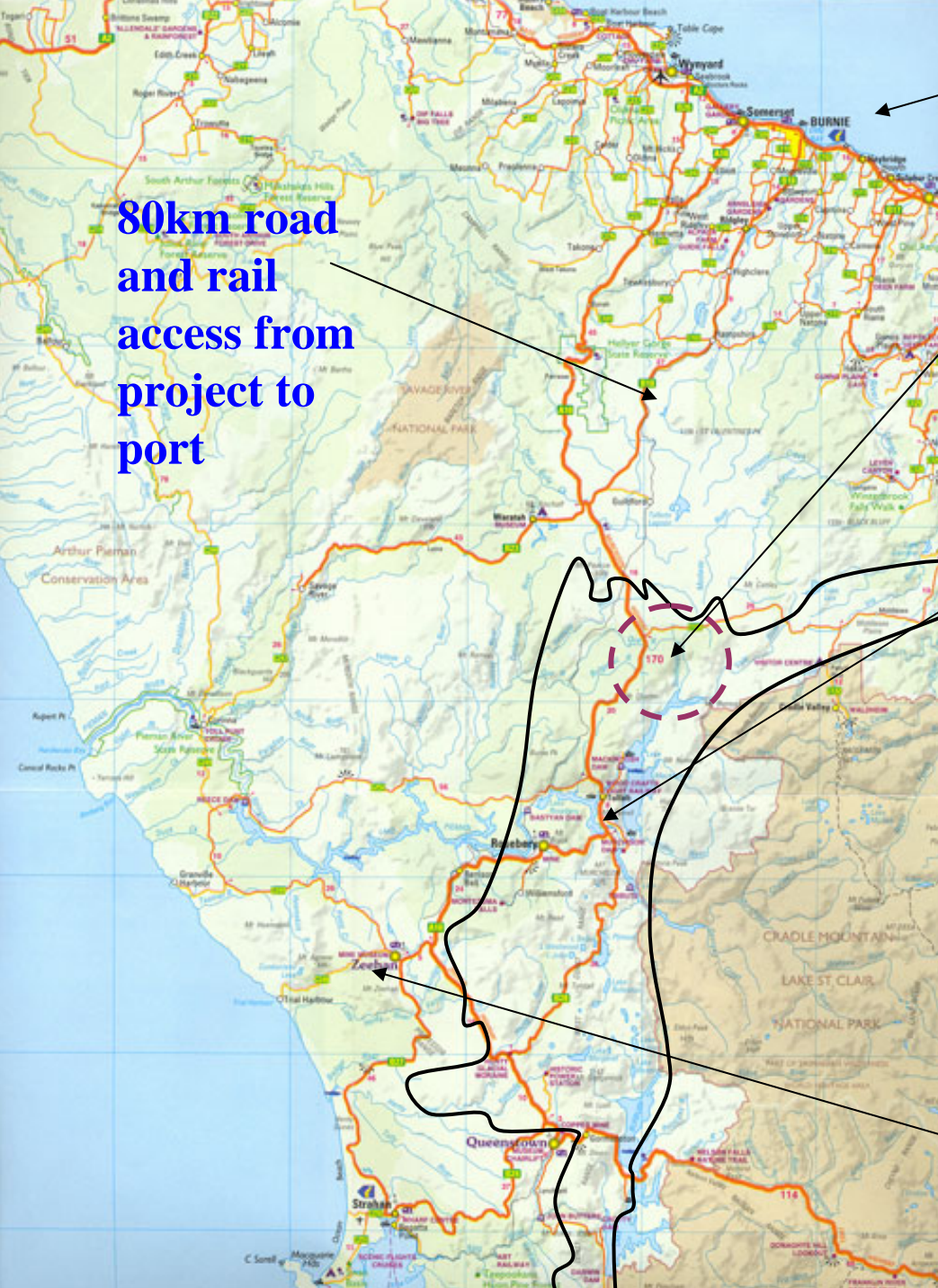
Refractory
Gold
Concentrates

Intec's Demonstration Copper Plant

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A\$14 million demonstration plant campaign 1998 - 1999



Burnie deep water port

**80km road
and rail
access from
project to
port**

Hellyer Metals Project

Mt Read Volcanics Zone

Que River – Ag/Pb/Zn

Rosebery – Ag/Pb/Zn

Henty - Gold

Mt Lyell – Copper/gold

Renison - Tin

Melba Flats - Nickel

Avebury - Nickel

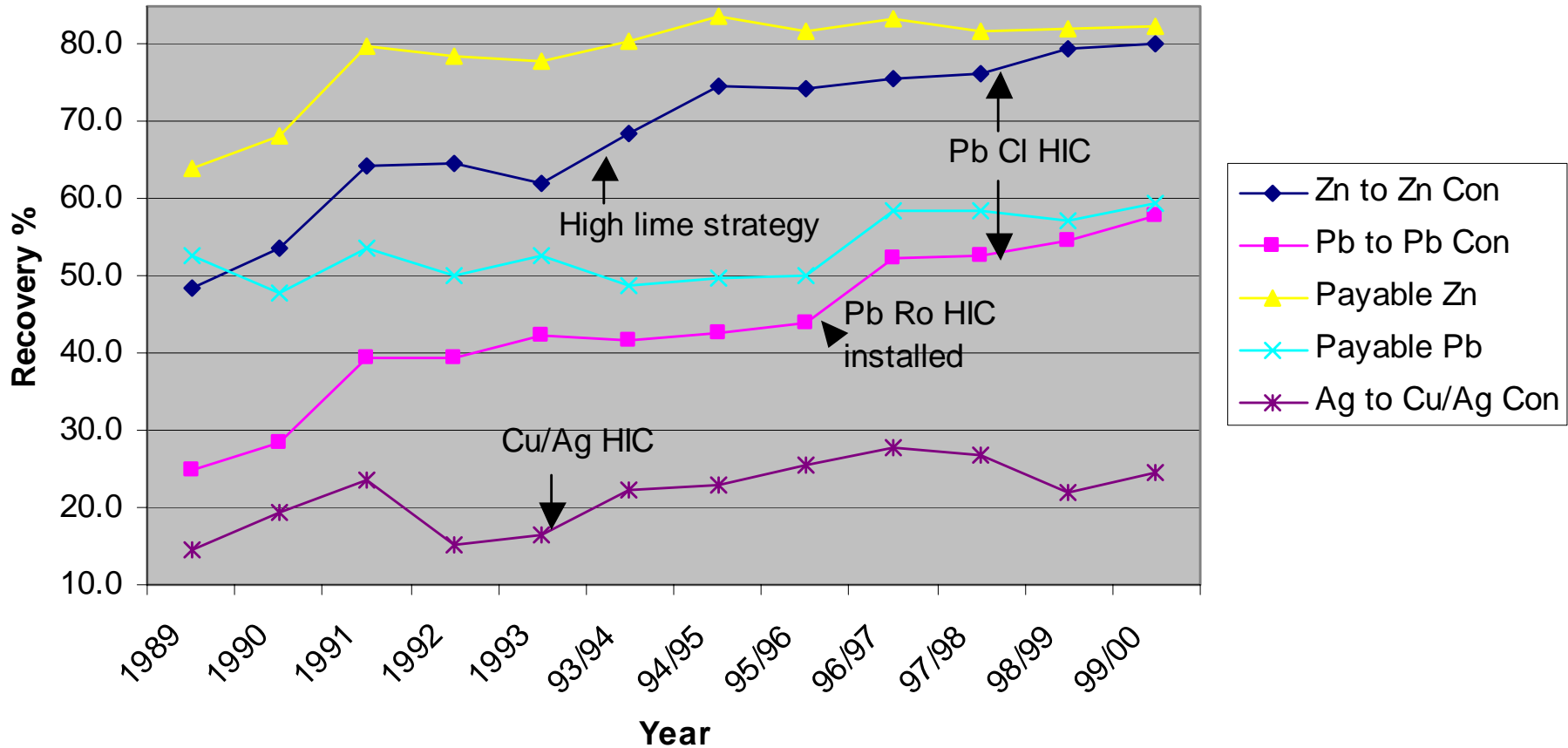
Hellyer Mine History

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- 1983: Que River commenced operation
 - 1988: Mining commences at Hellyer - reserves of 15 mt @ 13%Zn, 6.7%Pb, 158g/t Ag, 0.3%Cu, 2.4 g/t Au
 - 1989: Hellyer mill commenced operation
 - 1998: Western Metals takeover of Aberfoyle
 - 2000: Hellyer mill placed on care & maintenance
 - 2003: Western Metals placed in receivership
 - 2004: Intec acquires Hellyer Metals Project
-

Hellyer Concentrator Performance

**Hellyer Concentrator Metal Recoveries
1989 - 2000**



Hellyer Metallurgical Performance

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Total metal recoveries to concentrates were relatively low over the life of the mine:

	Average (%)
Zinc	79
Lead	54
Silver	44
Gold	17

Hellyer Metals Project

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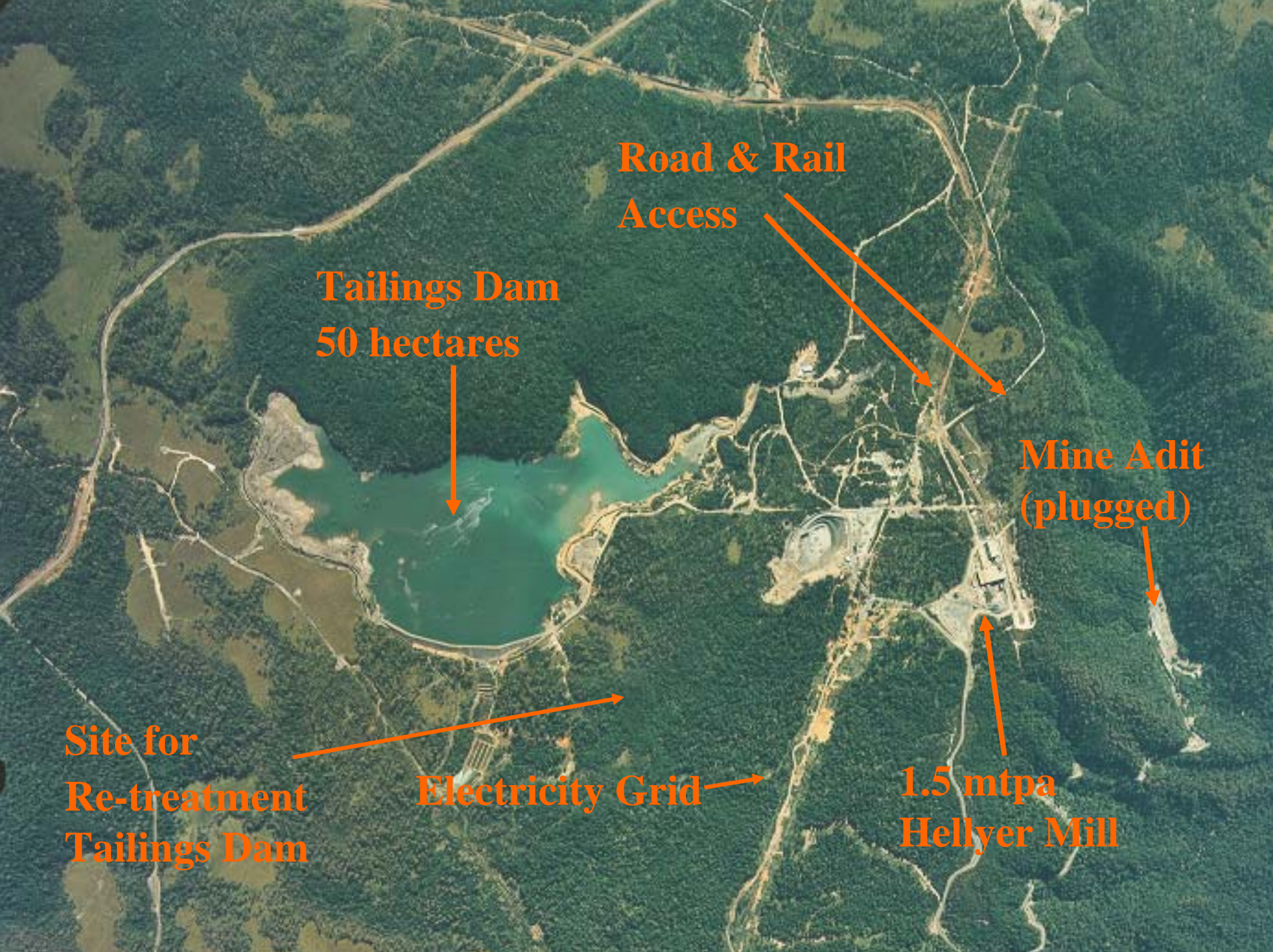
- Acquired by Intec from the Receivers to Western Metals – January 2004
- Acquisition cost: A\$1.34 million
- Assets acquired:
 - Mill – 1.5mtpa capacity, replacement cost A\$80 million
 - Tailings dam – A\$1.8 billion above-ground metal value
 - Mining & exploration tenements
 - Mt Gordon Copper Process
 - Burnie Research Laboratory (Ammtec)

Project Definition

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- Base Case: Treatment solely of high value Hellyer tailings
- Enhanced Case: Co-treatment of Hellyer tailings with other zinc-bearing residues, in particular Electric Arc Furnace (EAF) dust
Discussions well advanced with domestic & international EAF dust producers

Establishment of a long life 'residue' treatment facility
with robust economics



**Road & Rail
Access**

**Tailings Dam
50 hectares**

**Mine Adit
(plugged)**

**Site for
Re-treatment
Tailings Dam**

Electricity Grid

**1.5 mtpa
Hellyer Mill**

Aerial View of 1.5 mtpa Hellyer Mill



Hellyer Tailings Resource – 10.9mt

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Element	Grade	Quantity	In-situ A\$m value *	% of metal value
Gold	2.6 g/t	910,000 ozs	\$522	29%
Zinc	2.8 %	305,000t	\$464	26%
Lead	3.0 %	330,000t	\$441	25%
Silver	88 g/t	30,850,000 ozs	\$284	16%
Copper	0.16%	17,400t	\$76	4%
Total			\$1,786	100%

* Based US\$ metal prices and US\$/A\$ exchange rate.at 30 September 2004

Hellyer Tailings Dam



Tailings Mineralogy

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Size	p80	35-45 microns
Sphalerite	4.2%	70% in 7 to 38 micron size 50% free/50% binaries with pyrite
Galena	3.5%	Fine 50% < 7 micron. Liberated and moderately oxidised
Pyrite	51.0%	70% highly crystalline 15% primitive melnikovite
Arsenopyrite	2.7%	
Chalcopyrite	0.5%	
Tetrahedrite	0.1%	
Non-sulphide gangue	38.2%	(Silica, barite, calcite, siderite, etc)

Tailings Mineralogy (cont.)

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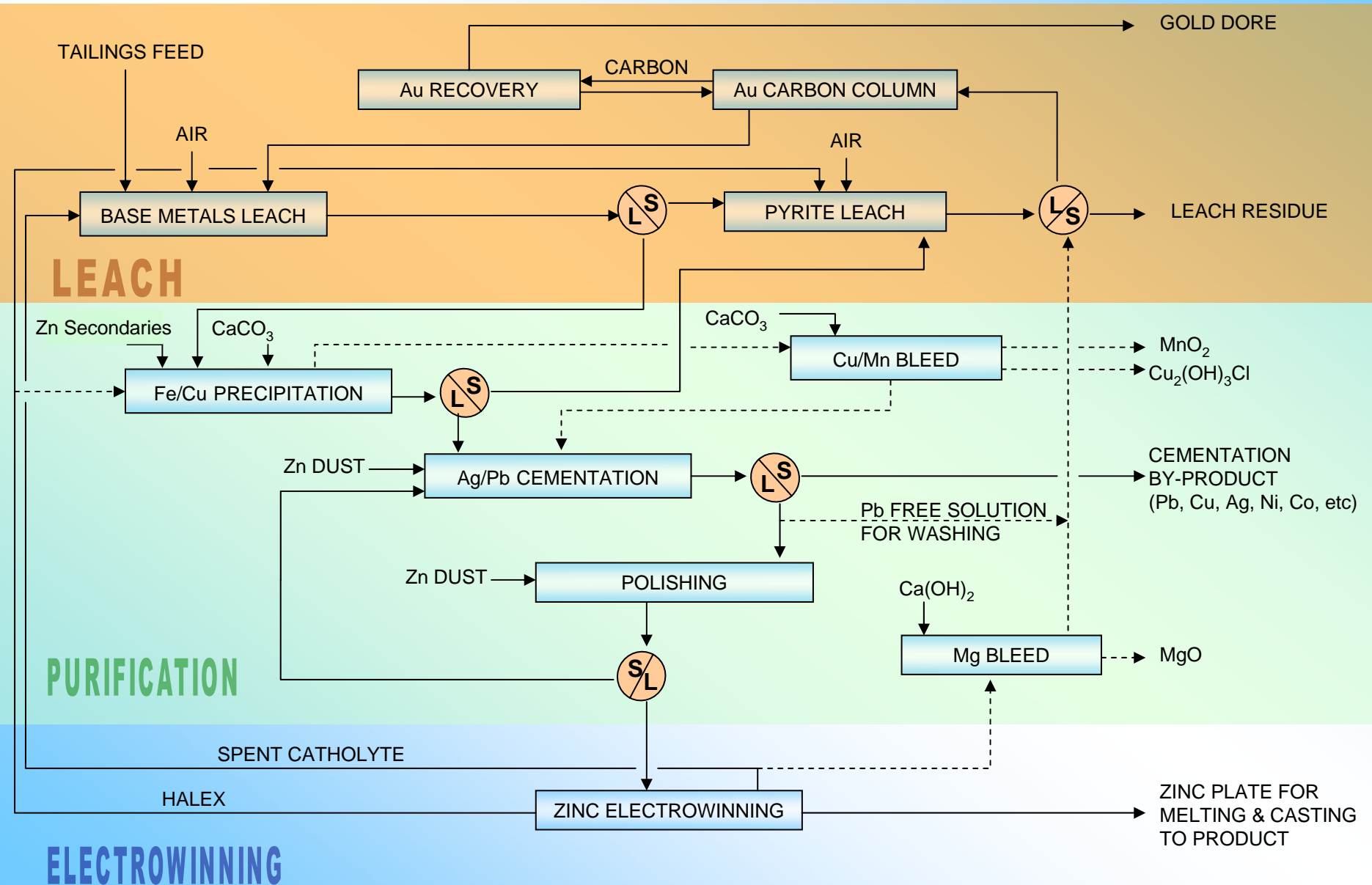
- Gold: 10% free (cyanidable)
20-30% with arsenopyrite
60-70% with pyrite (<0.25 micron)
- Silver: 75% with tetrahedrite
25% with galena
- Implications for tails leaching

Intec Mixed Halide Leach Process for Hellyer

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- Cl⁻ & Br⁻ form complexes with metals
 - AuBr₄⁻, AgCl₃²⁻, PbCl₄²⁻, CuCl₄²⁻, CuCl₄³⁻
 - Increased solubility
- Benefits
 - Increased leach kinetics (milder leach conditions)
 - Simultaneous zinc, lead, copper, silver and gold extraction
 - More stable residue products (haematite, scorodite, anhydride)

Hellyer Process Flow Diagram



Leach

- $MS + 2Cu^{2+}/Fe^{3+} \rightarrow M^{2+} + 2Cu^{+}/Fe^{2+} + S$ (M= Zn, Pb, Cu)
- $4FeS_2 + 15O_2 + 2H_2O \rightarrow 8SO_4^{2-} + 4Fe^{3+} + 4H^+$
- $FeS_2 + 7.5BrCl_2^- \rightarrow FeCl_3 + 7.5Br^- + 2H_2SO_4 + 12HCl$

Purification

- $2Fe^{3+} + 3CaCO_3 \rightarrow 2Fe_2O_3 + 3Ca^{2+} + 3CO_2$
- $4Cu^{2+} + 3CaCO_3 + 2Cl^- \rightarrow 2Cu_2(OH)_3Cl + 3Ca^{2+} + 3CO_2$
- $Pb^{2+} + Ag^+ + Cu^{2+} + Zn \rightarrow Pb^0/Ag^0/Cu^0 + Zn^{2+}$

Electrowinning

- $ZnCl_2 + Br^- \rightarrow Zn$ (cathode) + $BrCl_2^-$ (anode)

Hellyer Project Description

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- Tailings reclaimed by dredging
- Tails pumped 3 kms to Intec plant
- Base metal leach reactors – FRP
- Pyrite leach reactors – FRP
- Belt filters for leach and iron residues
- Gold recovery onto carbon in columns
- Secondary zinc leach reactors – FRP
- Zinc dust cementation of lead and silver
- Zinc electrowinning: 1.5m by 1.0m cathodes, 600 A/m², 3.2 V & 95% current efficiency
- Leach and iron residue pumped to new tailings dam

Intec Pilot Plant at Ammtec, Sydney

Intec Group



Results of 'steady state' pilot plant campaigns on Hellyer tailings

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Element	Average % extraction over three campaigns	Highest % extraction in single campaign
Lead	99.0	99.6
Zinc	98.8	99.0
Copper	93.5	97.0
Silver	91.2	94.8
Gold	32.8	49.3
Weighted average % extraction of metal value	78.1%	83.9%

Zinc Secondary Feed Material For Enhanced Case

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- Zeehan slag dump (photo) and Zeehan Zinc pre-concentrate



- Electric Arc Furnace Dust from Australian mainland and Asia
Smorgon EAF dust co-treated in pilot plant: 95%-Zn extraction
Similar pilot plant results achieved with another EAF dust
- Australian and overseas EAF dust producers considering dust supply contracts

Benefits of Zinc Secondary Feed Material

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- Increased project life
- Higher grade feed – EAF dust grades up to 35% zinc
- Potential for receipt of EAF dust treatment fees
- Assists in oxidation of gold-bearing pyrite at Hellyer
- Forms basis of ‘Enhanced Case’ economic model

Hellyer Metals Project: Pre-Feasibility Study

Engineering design, capital and operating cost for an Intec Plant at the Hellyer minesite adjacent to the existing mill

Two Cases Evaluated:

Base Case

1.0 mtpa tails

Enhanced Case

0.5 mtpa tails

0.1 mtpa Zn secondaries

Production:

25,500tpa Zn ingots

32,200tpa Zn

3,000tpa Cu oxychloride

3,400tpa Cu

29,400tpa Pb in cement

16,660tpa Pb

2.60mozpa Ag in cement

1.45mozpa Ag

23,000ozpa Au in bullion

17,400ozpa Au

Hellyer Metals Project - Indicative Economics *

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	BASE CASE	ENHANCED CASE
Production	1 mtpa of tailings	0.5mtpa tailings 0.1 mtpa Zn secondaries @ 20% Zn
Project Life	11 years	22 years
Capital Cost	A\$153 million	A\$136 million
Operating Cost	A\$35 million pa	A\$28 million pa
Net Sales Revenue	A\$105 million pa	A\$90million pa
Margin	67%	69%
Cash flow	A\$69 million pa	A\$61 million pa
IRR (all equity/post tax)	31%	32%
NPV @ 10%	A\$172 million	A\$234 million

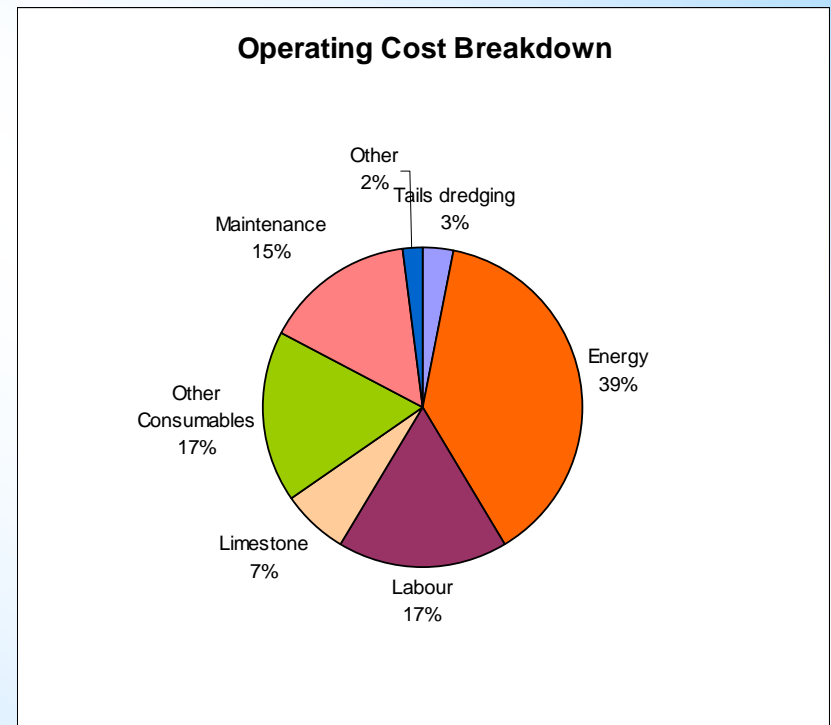
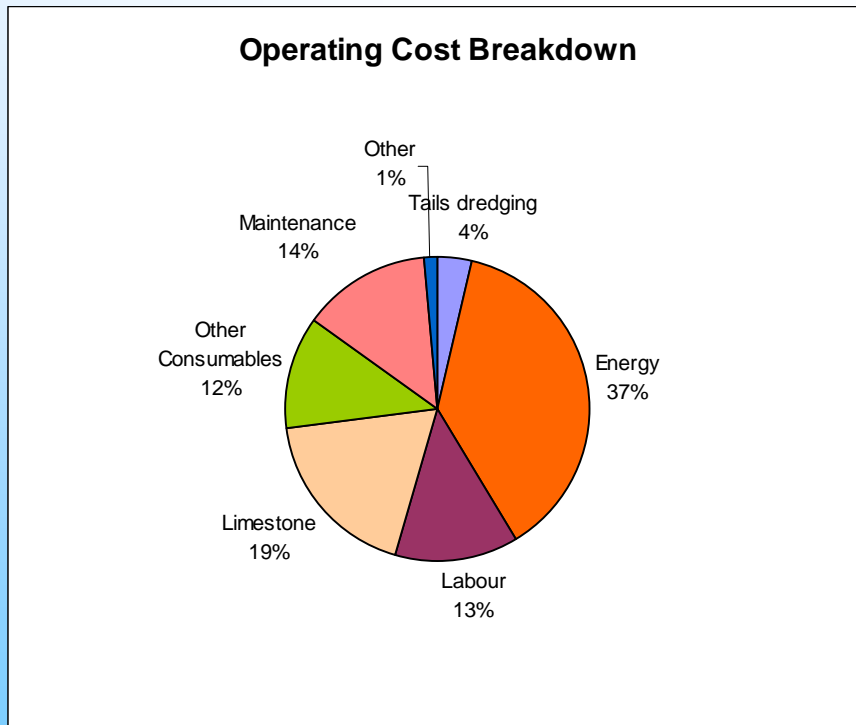
* Metal prices & US\$/A\$ exchange rate @ 30 September 2004

Operating Cost Breakdown

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Base Case

Enhanced Case



Hellyer Metals Project – Development Schedule

- Jan-Sep 2004: Pilot leach plant campaign (Brookvale, Sydney)
(successfully completed) Zinc purification & electrowinning (Sydney University)
Gold recovery (AJ Parker Centre, Perth)
Pre-feasibility study by H.G. Engineering (Toronto, Canada)
- Dec Qtr 2004: A\$15 million capital raising
Commence full scale zinc electrowinning cell (Burnie)
Commence demonstration plant construction (Burnie)
- 2005: Operation of demonstration plant (Burnie)
Bankable feasibility study
Project Financing
- 2006: Construction and commissioning of commercial plant (Hellyer)
- 2007: First commercial production (Hellyer)

Ammtec - Burnie Research Laboratory (BRL)

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- Intec and Ammtec have developed a close working relationship
- Ammtec is Australia's leading minerals processing consultancy
- Ammtec acquired BRL from Receivers & Managers for Western Metals in January 2004
- Internationally respected metallurgical team reassembled under the leadership of Geoff Richmond
- Intec's A\$8m demonstration plant program will be conducted at BRL facilities

Hellyer Metals Project – Conclusion

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- Intec Process maximises value from the Hellyer tailings resource
- Advantages over sulphate system include:
 - improved leach kinetics and oxygen transfer
 - ability to extract lead into solution
 - ability to extract gold directly without cyanide
- Low cost supplementary zinc rich feedstocks considerably improve project economics
- Environmental “cleanup” of base metals from tailings dam

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