# **GALENA** MINING LIMITED

## INVESTOR PRESENTATION February 2019



#### **Cautionary statement – Reference to PFS**

This report refers to the Abra Base Metals Project ("Abra" or the "Project") Pre-Feasibility Study ("PFS"). A summary of the PFS and material assumptions was published by Galena Mining Ltd ("Galena") on 25 September 2018 (see ASX announcements platform).

Environmental approvals, mining tenements and approvals, other governmental factors and infrastructure requirements for selected mining methods and for transportation to market were not included as modifying factors for the Ore Reserve estimate contained in this report as they were all analysed in detail for the PFS and determined not to pose any practical or economic restriction to the selected mining and processing model. Furthermore, all other material assumptions (eg, with respect to financial assumptions, metallurgy, mineralogy and geotechnical etc.) that were made in the previously announced PFS have not materially changed, continue to apply and continue to underpin the new December 2018 Ore Reserve estimate and the revised mine model. For further information, please see Galena's ASX announcements of 25 September 2018 (PFS) and 18 December 2018 (revised mine model, December 2018 Mineral Resource estimate and December 2018 Ore Reserve estimate).

#### Cautionary statement – Mine model

63% of the larger revised total mine model material is contained within Probable Ore Reserves. However, the remainder is currently included in Inferred Resources, with no reduction factor applied to the tonnes and grades of the Inferred Resources. Inferred Resources have a lower level of geological confidence and can't be included in the calculation of Ore Reserves. Further infill drilling will be required to convert Inferred material into Indicated. There is no guarantee that such drilling would succeed in converting adequate quantities of Inferred material into Indicated or return the same grade and tonnage distribution. This may affect mining studies and economic outcomes for Abra.

#### **Competent Person's statement**

The information in this report related to the Abra Ore Reserve estimate is based on work completed by Mr Roger Bryant, BEng (Mining, Member AUSIMM). Mr Bryant is an employee of Galena Mining Ltd. Mr Bryant has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Exploration Targets, Mineral Resources and Ore Reserves. Mr Bryant consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

The information in this report related to the December 2018 Resource estimate is based on work completed by Mr Don Maclean MSc (Geol), MAIG and RP Geo (Exploration and Mining), MSEG, a consultant to Galena Mining and Mr Mark Drabble B.App.Sci. (Geology), MAIG, MAusIMM, Principal Consultant at Optiro Pty Ltd. Mr Maclean was responsible for data review, QAQC, and development of the geological model. Mr Drabble was responsible for resource estimation, classification and reporting. Mr Maclean and Mr Drabble have sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Exploration Targets, Mineral Resources and Ore Reserves. Mr Maclean and Mr Drabble consent to the inclusion in the report of the matters based on this information in the form and context in which it appears.

The information in this report to which this statement is attached that relates to exploration results and drilling data is based upon information compiled by Mr Don Maclean MSc (Geol), MAIG and RP Geo (Exploration and Mining), MSEG, a consultant to Galena Mining. Mr Maclean has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Exploration Targets, Mineral Resources and Ore Reserves. Mr Maclean consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.



#### Forward looking statements

The contents of this presentation reflect various technical and economic conditions at the time of writing. Given the nature of the resources industry, these conditions can change significantly over relatively short periods of time. Consequently, actual results may vary from those in this presentation.

Some statements in this presentation regarding estimates or future events are forward-looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Forward-looking statements include, but are not limited to, statements preceded by words such as "planned", "expected", "projected", "estimated", "may", "Scheduled", "intends", "anticipates, "believes", "potential", "predict", "foresee", "proposed", "aim", "target", "opportunity", "could", "nominal", "conceptual" and similar expressions.

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## **INVESTMENT PROPOSITION**

High-grade Abra Base Metals Project in tier one jurisdiction	"In demand" product	Strong project metrics with outstanding economics <sup>2</sup>	On-track for construction commencement in 2019
<b>37.4Mt Resource<sup>1</sup></b> 7.5% lead and 18g/t silver	Highest grade lead concentrate available globally	<b>14-year mine life</b> 1.2mtpa throughput for total of 15.3Mt	Final permits on- track for Q2 CY2019
<b>10.3Mt Reserve<sup>1</sup></b> 8.8% lead and 24g/t silver	9 indications of interest for offtake	A\$97M annual operating cash flows	DFS due mid-2019
<b>Granted Mining</b> <b>Lease</b> Gascoyne region, Western Australia	Lead market in deficit with inventory close to record lows	A\$528M NPV Pre-tax at 8%	Proposed transaction for Toho Zinc to invest A\$90M for 40% interest in Abra
Port / infrastructure capacity confirmed		<b>50% IRR</b> Pre-tax	

Notes: 1. See Galena ASX announcement of 18 December 2018. 2. Based on the September 2018 PFS (see Galena ASX announcement of 25 September 2018).



### **Capitalisation summary**

Shares on issue (ASX: G1A)	337.0M
Options on issue <sup>1,2</sup>	34.8M
Share price (7 February 2019)	A\$0.33/share
Market Capitalisation	~A\$111.2M
Cash balance (31 Dec 2018)	~A\$3.3M
Debt	Nil

Notes: 1. Options issued to employees and management with 11.75m having an exercise price of \$0.06 and expiry date of 30 June 2020, and 18m having an exercise price of \$0.08 and expiry date of 30 June 2021, and 5m having exercise price of \$0.30 and expiry date of 6 February 2021. 2. In addition, 16.5m contingent performance rights for CEO/MD.

### ASX: G1A share price history







Adrian Byass Non-Executive Chairman

Geologist and Economist Mine development and board experience



Tony James Non-Executive Director

Senior Mining Engineer

Midcap ASX mining company CEO and underground mine development experience



Jonathan Downes Non-Executive Director

Geologist

Geology, mine development, capital markets and board experience



Tim Morrisson Non-Executive Director

Finance

Extensive ASX capital raising and corporate finance experience



Alexander Molyneux Managing Director / CEO

Mining Executive and Financer

Midcap ASX mining CEO, mine development and corporate finance experience



**Troy Flannery** Chief Operating Officer

Mining Engineer

Extensive underground mining and underground mine development experience



**Edward Turner** GM Geol. and Exploration

Senior Geologist

Base metals exploration experience and former Geology Manager Abra Mining



Stephen Brockhurst Company Secretary

ASX Company Advisor

ASX company compliance, finance and company secretarial experience

## **A\$90M PROJECT EQUITY FROM TOHO ZINC**



- Agreement entered into with Toho Zinc (TYO: 5707) of Japan (30 January 2019) for investment of A\$90M into Abra holding company, Abra Mining Pty Ltd (AMPL) for a 40% stake in AMPL
- Toho Zinc is a large-scale lead and zinc smelting company and experienced miner In 2010 Toho acquired publicly-listed Australian lead and zinc mining company, CBH Resources Limited and continues to operate its Rasp and Endeavor mines in New South Wales
- Transaction provides the equity currently anticipated to be required for Abra development
- Toho to assist AMPL potentially procure a contribution to project financing debt from policyrelated institutions in Japan for Japan-related projects
- Toho to off-take 40% of Abra's product on 'arms length' benchmark terms
- Galena to retain 60% of AMPL and appoint majority of board members to joint-venture board
- Investment to be paid in tranches: A\$20M on close; A\$10M on Galena's publication of the Abra DFS; and A\$60M on confirmation of project financing debt
- Transaction remains conditional on: confirmatory due diligence; definitive documentation; and regulatory consents
- Use of proceeds includes AMPL repayment of A\$10M to Galena
- Parties aiming to close the transaction in April 2019

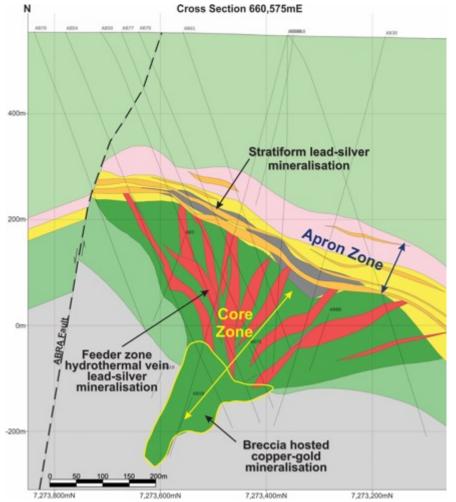
# ABRA LOCATION AND INFRASTRUCTURE



- Located in the Gascoyne region of Western Australia – Approximately 110km from Sandfire Resources' DeGrussa Copper Mine
- Well serviced by existing Shire maintained roads
- Lead concentrate product to be trucked via public roads to the Port of Geraldton
- Port of Geraldton has all permits and infrastructure required to handle lead sulphide concentrates and is a current handler of third-party (Golden Grove) similar product
- Ample storage / ship loading capacity available

Port of Geraldton – Primary export port for Abra

# **5** ABRA MINERALISATION MODEL



- Sediments hosting Abra were deposited in a basin setting and have been deformed with large scale folding and faulting in and around the deposit
- Hydrothermal fluids carrying lead, silver, zinc, copper and gold have risen through breccia and fault zones
- Mineralised fluids have risen to a sedimentary boundary and have 'mushroomed' sideways settling in preferential (dolomitic) units
- The Overlying, stratiform hosted mineralisation is called the "Apron Zone" and is largely galena-rich (ie, lead and silver). This is fed by mineralised breccia and vein zones which are called the "Core Zone". Core Zone grades from lead-silver dominant in the upper levels to increasingly coppergold at depth
- The Abra deposit remains open at depth



Massive mineralisation in Core Zone



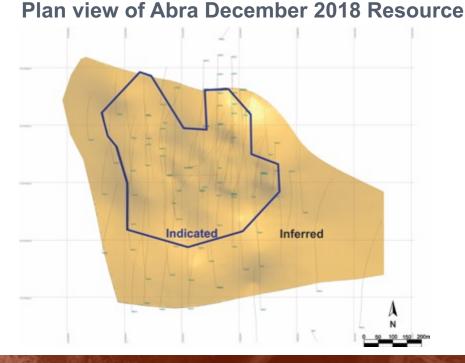
Strata from Apron Zone





JORC Mineral Resource estimate (December 2018 Resource) at a 5% lead cut-off grade <sup>1</sup>				
Resource classification	<u>Tonnes (Mt)</u>	Lead grade (%)	<u>Silver grade (g/t)</u>	
Measured	-	-	-	
Indicated	15.0	8.7	22	
Inferred	22.4	6.7	15	
Total	37.4	7.5	18	

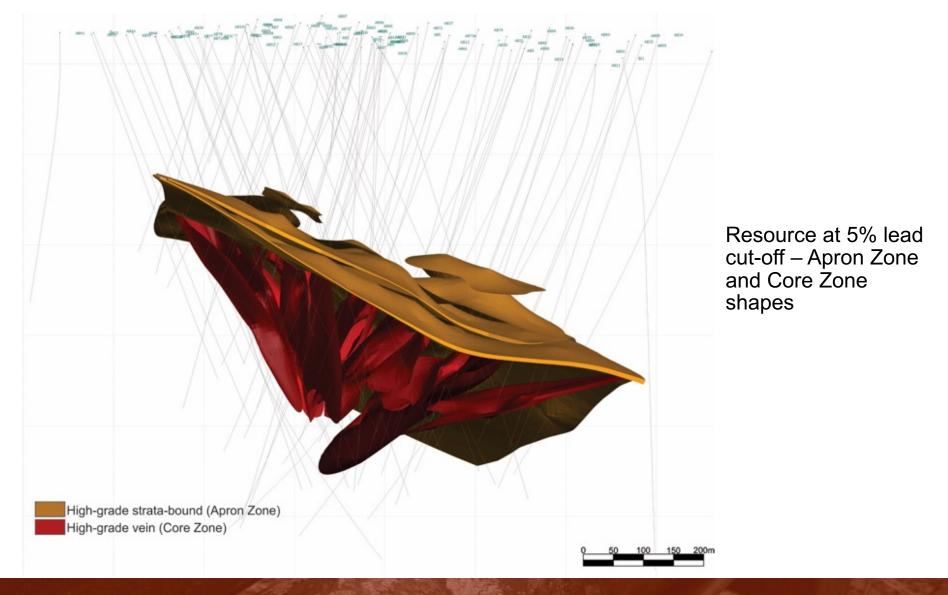
Notes: 1. For more detail please see Galena ASX announcement of 18 December 2018.



- Resource based on 102 drill-holes (incl. 83 diamond-core)
- ~60km of cumulative linear drilling (incl. 54.9km of diamond-core)
- >1/3 of the database made of of new drill-holes from 2017-2018 (35 new diamond-core holes drilled for 20.7km)



## ABRA MINERAL RESOURCE 3D IMAGE



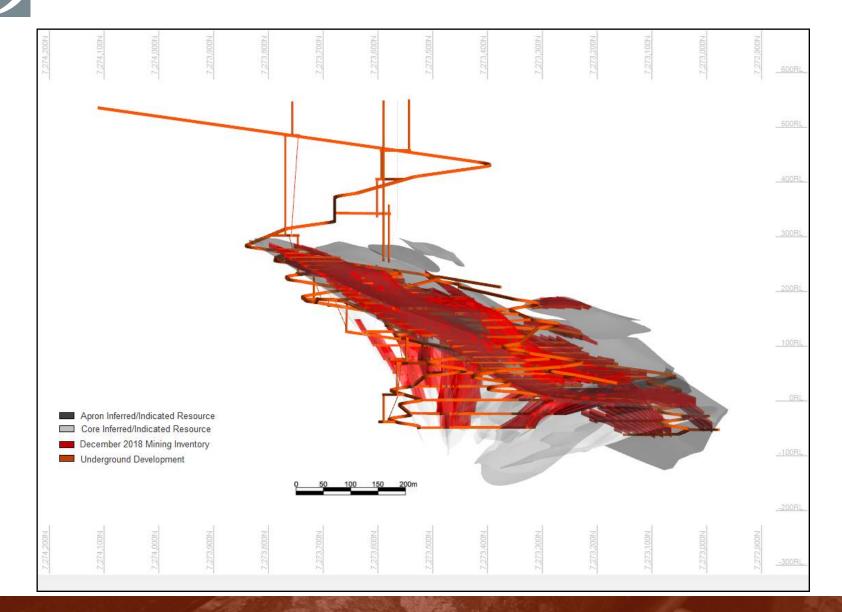
# **5** ABRA MINE MODEL AND ORE RESERVE

- Underground mining primarily using long-hole open stoping but with some room and pillar in certain areas
- Recently updated Reserve (below) based on December 2018 Resource 9% increase in lead grade vs. PFS Reserve – overall 7% increase in contained lead and 18% increase in contained silver
- Good geotechnical conditions allowing for relatively large stopes 85% recovery assumption with 6% dilution
- New mine model also prepared on December 2018 Resource
  - 1-year extra life of mine vs. PFS' 14-years
  - ~6% higher lead grade over life of mine average
  - ~20% reduction in lateral development metres

JORC Ore Reserve statement <sup>1</sup>			
Reserve classification	<u>Tonnes (Mt)</u>	<u>Lead grade (%)</u>	<u>Silver grade (g/t)</u>
Proved	-	-	-
Probable	10.3	8.8	24
Total	10.3	8.8	24

Notes: 1. For more detail please see Galena ASX announcement of 18 December 2018.

## ABRA MINE MODEL 3D IMAGE



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- 1.2mtpa plant throughput
- Conventional crushing, grinding, flotation and filtration
- Metallurgical testing confirms high (96%) recoveries for both lead and silver into highvalue, high-grade concentrate
- Concentrate product expected to be the highest grade primary lead concentrate available globally – 75% lead and 180-220g/t silver
- Abra's product is in high demand, particularly in the context of the global lead market in current deficit and limited new supply growth
- Nine indications of interest for offtake received from potential customers in Europe, East Asia and China
- Proposed Toho Zinc transaction includes offtake for 40% of Abra's product

### Abra product concentrate test



**PFS METRICS AND OUTSTANDING ECONOMICS** 

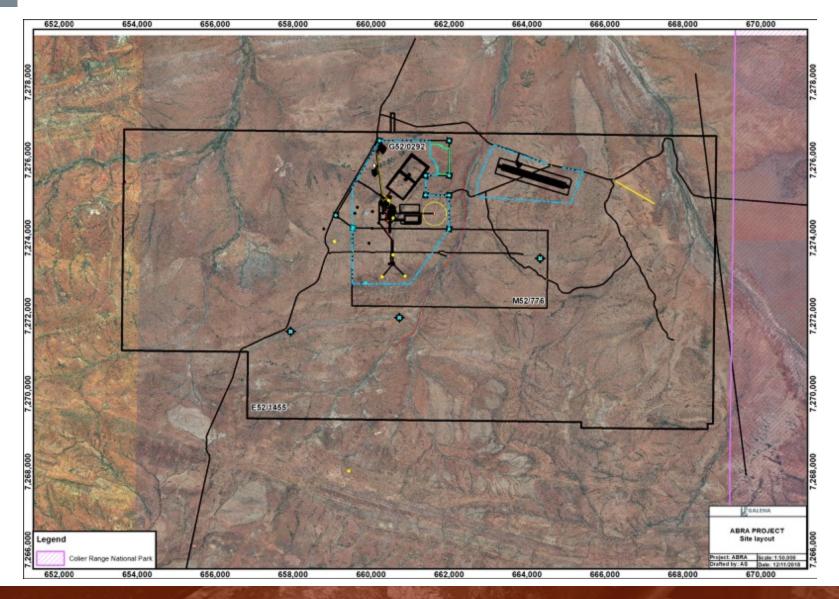
PFS RESULTS	NPV <sub>8</sub> A\$528M	IRR 50% Ca	apex A\$154M
PFS outcomes – Production metrics PFS outcomes – Cap economics		PFS outcomes – Capital investment economics	and project
Mill throughput	1.2Mtpa	Pre-production capital	A\$154m
Initial mine life	14-years	Steady-state average cash flows (yrs 3	-13) A\$97m
Average LOM lead metal produ	ction 91ktpa	Project payback from commercial production	2-years
Average LOM silver metal prod	uction 760kozpa	Pre-tax NPV (8% discount rate)	A\$528M
Lead C1 direct cash cost	A\$0.66/lb / US\$0.48/lb	Pre-tax IRR	50%

- PFS assumptions include: lead price US\$0.95/lb; silver price US\$14.50/oz and A\$1=US\$0.73
- Abra product will be high-value, high-grade concentrate containing 75% lead and 180-220g/t silver – The highest grade primary lead concentrate available globally
- No material impediments in the areas of permitting, concentrate marketing, infrastructure, logistics and native title

# PFS PRE-DEVELOPMENT CAPITAL EXPENDITURE

Abra pre-production capital expenditure		Abra LOM operating cost estimates	
	<u>A\$M</u>		<u>US\$                                    </u>
Mine development (incl. box cut and access)	31.2	Mining	23.4
Processing plant (concentrator)	51.4	Processing <sup>1</sup>	14.7
Surface infrastructure	28.8	TCRCs and outbound logistics	15.4
Offsite road upgrades and miscellaneous	1.5	By-product credit for net silver revenue	(5.6)
Tailings storage facilities	5.0	Lead C1 direct cash cost of production <sup>2</sup>	48.0
EPCM	13.8	Royalties <sup>3</sup>	7.2
Contingency	10.1	lead, 5.0% Western Australian State royalty plus 3.27% in vendor and other royalties, and for silver, 2.5% Western Australian State royalty plus 3.27% in vendor and other royalties.	
Owner's and indirect costs	12.3		
Total	154.0		

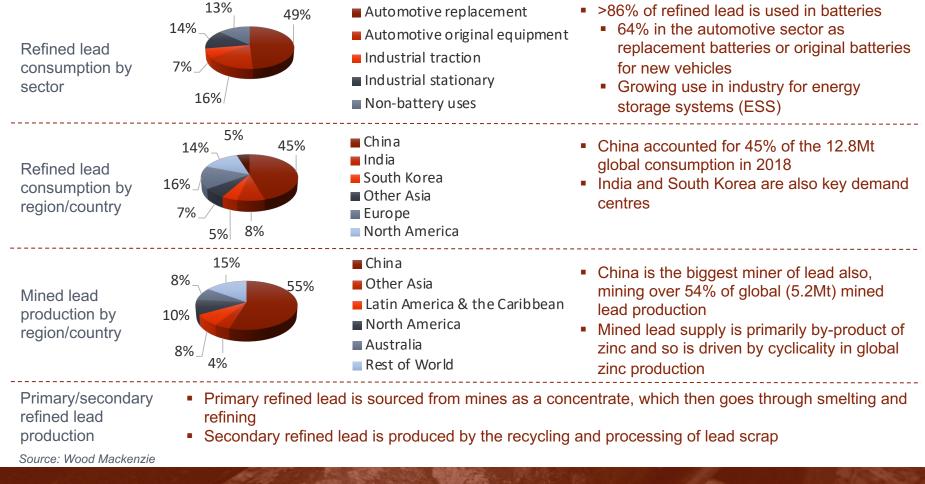
# **PROPOSED SITE LAYOUT**



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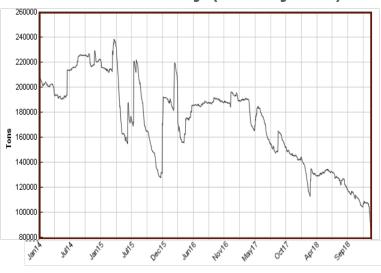


- Lead is a larger overall market than nickel
- 50-60% of lead comes from recycling so the dynamic of the need for primary mine supply growth is equally as important as end-use demand growth for the metal itself



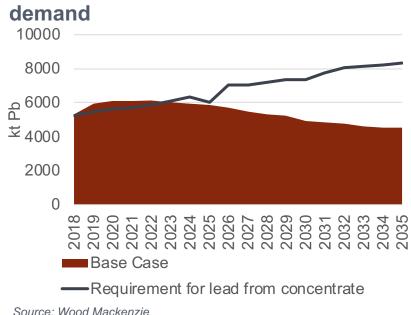


- Short-term conditions are becoming 'extreme' in terms of recent draw-down of physical refined lead stocks – now close to record lows
- Longer-term Wood Mackenzie expects refined lead metal demand to grow 2.4% per year through 2035 but secondary refining capacity issues mean more of the lead supply will need to be met by primary mined supply and thus demand for mined lead is expected to grow 2.9% per year
- Wood Mackenzie base case shows 'deficit' for mined lead re-opening from 2023 without additional new mine supply



Source: www.kitco.com

### LME lead inventory (last 5-years)



Base case mined lead production vs.

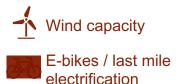
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- Wood Mackenzie's forecasts for global lead demand account for a transition to an electric vehicle future EVs need a separate energy storage system to the lithium-ion propulsion batteries to run the Li-ion battery management computers and safety systems (electric braking, hazard lights etc.) whilst lead is heavier (and therefore not logical for the propulsion battery), its around on tenth the cost per unit of storage so remains the core technology for this application in EVs every Tesla has a lead-acid battery!
- Other transitional emissions reduction automotive technologies require larger than standard lead-acid batteries, ie, typical hybrid cars or internal combustion engine cars with 'idle-stop' technology
- Lead-acid has a role in electrification of bikes and 'last mile' transportation approximately 15M electric bikes are sold in China each year
- The value proposition for lead means it continues to have strong take up in various energy storage solutions such as to provide energy storage for mobile phone tower installations, and small-scale roof-top solar and wind installations – ESS is the fastest growing subsegment of the lead market

## **UPCOMING MILESTONES**

- PFS review / optimisation Optimised PFS to be released early-2019 taking into account the increased metal and lower development metres associated with the new mining inventory model prepared in conjunction with the recently released December 2018 Resource
- Subject to meeting conditions, completion of the Toho \$90M equity investment transaction
- Permitting approvals Abra already on granted mining licence and no requirement for EPA but Galena aims to receive final minor permits mid-2019
- Additional off-take Continued engagement with a select sub-set of the nine parties that already submitted expressions of interest for Abra's high-value, high-grade lead-silver concentrate with a view to concluding formal offtake arrangements for the non-Toho 60% of Abra production
- Construction decision and commencement of construction (by mid-2019)
- Completion DFS (mid-2019)
- Advancing discussions with project financing debt providers

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