AUSTRALIAN
RESEARCH
INDEPENDENT INVESTMENT RESEARCH

Galan Lithium (ASX: GLN)

March 2019

INDEPENDENT
INVESTMENT RESEARCH

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Galan Lithium Limited (ASX: GLN)

Initiation - March 2019

Note: This report is based on information provided by the company as at February 28, 2019.

Investment Profile	
Share Price as at 28 February 2019	A$0.50
12 month L/H ($)	$0.091/0.48
Issued Capital	
Ordinary Shares	112.1 m
Performance Shares	35.0 m
Unlisted Options	33.2 m
Including In the Money Options	27.9 m
Fully Diluted	180.4 m
Diluted for in Money Options	140.0 m
Market Capitalisation - Undiluted	A$56.1 m
Market Capitalisation - Diluted for In Money Options	A$70.0 m
Cash - December 31, 2018	A$2.18 m
Cash on Option Conversion	A$3.94 m

Board and Management
Mr Nathan McMahon: Non-Executive Chairman
Mr Juan Pablo "JP" Vargas de la Vega: Managing Director
Mr Christopher Chalwell: Non-Executive Director
Mr Terry Gardiner - Non-Executive Director
Mr Jinyu "Raymond" Liu - Non-Executive Director
Mr Mike Robbins: CFO/Company Secretary

Major Shareholders	
Hangze Group Ltd (Mr Raymond Liu)	11.93%
Mr Clive Jones	6.51%
Mr Juan Pablo "JP" Vargas de la Vega	6.20%
Mr Nathan McMahon	5.57%
Directors and Management	30.5%
Top 20	55.3%

Price Chart

Mark Gordon - Senior Analyst

The investment opinion in this report is current as at the date of publication. Investors and advisers should be aware that over time the circumstances of the issuer and/or product may change which may affect our investment opinion.

HIGH GRADE LITHIUM

Galan Lithium ("Galan" or "the Company") is concentrating activities on its 100% owned lithium tenements located over Salar de Hombre Muerto in Catamarca and Salta Provinces, Northern Argentina. Salar de Hombre Muerto is a proven lithium producer, with Livent (NYSE. LTHM, formerly FMC) having operated the Fenix lithium operation since 1992, and Galaxy Resources (ASX.GXY, "Galaxy") looking to develop the 100% owned Sal de Vida Project - Galaxy has recently sold part of its large Sal de Vida Resource to POSCO for US$280 million, with the funds to be put towards development of Sal de Vida.

Galan's first drill hole on the Candelas property, adjacent to Sal de Vida on the eastern side of the salar, has returned 165 m of high grade, low contaminant lithium brines, highlighting the prospectivity of Candelas. This supports results of recent gravity and controlled source audio frequency magneto-tellurics ("CSAMT") surveys which defined a potential brine reservoir with a length of 15 km, a width of 3 km to 5 km and thicknesses between 160 m and 400 m. Drilling is ongoing, with a view to an initial Mineral Resource Estimate ("MRE") in the short term.

Galan's targeting has concentrated on areas that are partly covered by younger sediments or volcanics, and have thus been ignored by previous operators - these include Candelas which represents the main inflow channel to the salar (and for which results of work to date speak for themselves), and the Western Projects, which are over areas peripheral to the main salar, but for which the CSAMT surveying again has highlighted the brine potential, supported by the results of surface brine sampling. One of these western projects, Santa Barbara, is adjacent to Livent's Fenix operation.

In short, work to date has highlighted the prospectivity of all areas at Hombre Muerto, and we should expect positive results from ongoing activities.

KEY POINTS

- **Proven salar:** Salar de Hombre Muerto is a proven high grade, low contaminant producer of lithium, with plans for further development on the salar - it hosts the highest Li grade and lowest contaminant grade brine resources in Argentina.
- **Transport infrastructure**: Although remote, Salar de Hombre Muerto is 390 km by road from the city of Salta; in addition there is a 3 km long airstrip at the Fenix operation.
- **Access to gas:** Salar de Hombre Muerto is served by the 300,000 m^3/day multi-user Fenix Gas Pipeline, that was commissioned in 2015, and designed to supply industrial operations in the region.
- **In the right commodity**: Although there are differing demand forecasts for lithium, the fundamentals look strong over the medium to long term with the expected +20% CAGR growth largely in electric vehicle ("EV") battery markets, with Galan ideally situated to take advantage of this.
- **Strong management and committed personnel**: Company personnel, including consultants, have extensive industry experience in varied regions (including Argentina) and commodities. In addition directors hold significant share holdings, and thus will be motivated to producing strong returns for shareholders.
- **Relatively quick to prove up:** Given the requirement for only relatively wide spaced drilling, JORC 2012 compliant Resources for brine operations can be delivered relatively rapidly and at reasonable costs - as an example the average well coverage/polygon size for the Sal de Vida 2012 MRE of 7.23 Mt lithium carbonate equivalent ("LCE") was ~8 km^2, with 56% of this being in the Measured and Indicated categories.
- **Strong cash position:** With A$2.19 million as of December 31, 2018 and close to A$4 million due from the conversion of in-money options at the end of 2019, the Company should be well funded for all activities through 2019. However should the Company decide to fast track activities in 2019 some earlier funding may be required.
- **Steady news flow**: Ongoing activities including drilling, well testing and the estimation of an initial MRE will lead to steady news flow over coming months.

SWOT ANALYSIS

Strengths

- **Quality project in a proven salar:** This is the key strength of Galan, with results of work to date highlighting the potential of the Company's Salar de Hombre de Muerto properties, particularly Candelas - the brine chemistry from work to date matches that of the other Salar de Hombre Muerto projects, including Fenix and Sal de Vida.
- **Size potential at Candelas:** Work to date highlights the size potential of the Candelas Project.
- **Proven brine mining destination:** Argentina is a proven brine mining destination and host to a number of world class deposits, with well developed mining legislation.
- **Transport access:** Although remote, the area is 390 km by paved and unpaved roads from the city of Salta (~600,000 population), with this also providing services; there is also a 3 km airstrip at Fenix that has been certified by the Argentinean Air Force.
- **Gas infrastructure:** A key point is that the region is served by the Fenix Gas Pipeline, which should provide relatively cheap power; in the past operations, including Fenix, had to rely on relatively expensive diesel generation with diesel trucked from Salta.
- **Experienced people with skin in the game:** Company personnel have significant experience in the resources game, as well as significant share holdings.

Weaknesses

- **One of many:** Galan is one of many hopefuls in the lithium space, with these companies vying for what we would see is a relatively limited pool of funding and potentially offtake agreements – this will become more critical when companies approach development and will need development finance, with the players then needing to differentiate themselves to attract funding. A key mitigating factor with Galan is the potential relatively high lithium/low contaminant grades should a viable resource be delineated.

Opportunities

- **Large resource at Candelas:** The results of work to date (and comparisons with Sal de Vida) highlight the potential for a large resource at Candelas.
- **Asset sales:** Although the strategy is to develop the projects, here may be the potential to return value through the sale of assets, particularly the Western Projects.
- **Lithium fundamentals:** Despite recent falls in price, these currently look reasonably strong for the foreseeable future, which should facilitate progress and investor interest in Salar de Hombre Muerto.

Threats

- **Resources and hydrology:** The key technical threat is that the projects do not stack up resource wise, with factors including physical dimensions, chemistry and hydrology. This however is mitigated by the results of work to date and the quality of the salar as a whole.
- **Markets and funding:** These are perennial threats for junior resources companies, and include the effects of the stock and metals markets on the ability to fund juniors. Short of a catastrophic fall in the share price, Galan is reasonably protected against funding issues with the current cash position and the potential cash from option conversion (although the Company may need to go to the market should they want to fast track activities in 2019 prior to exercise of the options). Also, despite recent falls in lithium prices we see prices holding up in the medium to long term.
- **Politics and sovereign risk:** Although President Macri has introduced much needed reform, including the relaxation of capital controls and floating the Argentinian Peso to attract foreign investment, the economy continues to perform poorly, and there is a risk that the 2019 election could see a change back to a more populist or socialist government, that may work on undoing some of these measures. Argentina has a history of political and social instability (and corruption), and as well the separate provinces perform badly in the Fraser Institute surveys. Mitigating this is that the country is a proven brine producer, with recent entrants including Orecobre showing that projects can be developed. This is supported on the provincial level by the approval of the Galaxy/POSCO Sal de Vida transaction, which straddles the boundary between Catamarca and Salta Provinces.

OVERVIEW

STRATEGY AND PROJECT OVERVIEW

- Galan (formerly Dempsey Minerals) is concentrating activities on its 100% owned tenements covering areas of the Salar de Hombre Muerto in Northern Argentina (Figure 1), with the original tenements being acquired in mid-2018 through the acquisition of 100% of Blue Sky Lithium Pty Ltd ("Blue Sky"), a company founded by the now MD of Galan, Mr Juan Pablo "JP" Vargas de la Vega.

Figure 1: Maricunga location map

Source: Galan

- The Company's target is brine hosted lithium (+- potash and boron) mineralisation, for which the salars of the "Lithium Triangle" of Argentina-Chile-Bolivia are a major global producer, supplying some 50% of non-Chinese LCE production in 2018.
- Salar de Hombre Muerto is a proven producer, with Livent having operated there for 27 years, and currently producing ~18,000 tpa LCE - other companies with interests in Hombre Muerto include Galaxy and the South Korean conglomerate, POSCO - POSCO's entry was through the recent purchase of brine resources containing 2.54 Mt LCE from Galaxy.
- Galaxy plan to use the US$280 million received from the POSCO acquisition to part fund their Sal de Vida project at Salar de Hombre Muerto.
- Salar de Hombre Muerto is characterised by relatively high lithium grades (~650 to 780 mg/l Li), and very low contaminant levels; resources defined by Livent and Galaxy also highlight the potential for very long life operations - the brines also contain appreciable potassium making this a potential by-product.
- Galan's strategy is to target areas largely peripheral to the main salar basins and covered by alluvium that however are considered prospective for brine resources - the key target area is Candelas at the south-eastern end of the salar, covering the Los Patos Channel, the main source of inflow into the basin - this is also adjacent to Galaxy's Sal de Vida project. The results of drilling completed to date at Candelas have vindicated this approach.

- The Company also holds five tenements on the edges of the western basin of Salar de Hombre Muerto (Figure 2) - of these the Catalina and El Deceo tenements were included in the original acquisition (with Candelas), with the other three tenements subsequently being acquired or applied for.

BLUE SKY ACQUISITION

- The Company first announced the acquisition of Blue Sky on February 6, 2018, with the acquisition being approved at a meeting of shareholders that was held on May 4, 2018.
- The key terms of the acquisition, which included the Candelas, El Deceo and Catalina tenements included:
  - An initial 45 day due diligence period under an Option Agreement between Galan (Dempsey) and Blue Sky,
  - An option fee payable to Blue Sky of 3,000,000 fully paid ordinary shares in Galan, and 3,000,000 options each to subscribe for one fully paid ordinary share at an exercise price of A$0.14 on or before December 31, 2019,
  - Upon completion of the acquisition of Blue Sky or the Project (as determined by Dempsey, "Completion") the issue to Blue Sky or Blue Sky's shareholders (as applicable) of 17,000,000 Shares and 12,000,000 Options;
  - Upon the delineation by or on behalf of Dempsey of a JORC resource of not less than 80 kt lithium carbonate equivalent within the area of the mining properties in which Blue Sky has an interest as at Completion, the issue of 15,000,000 Shares to Blue Sky or Blue Sky's shareholders (as applicable); and,
  - Upon the commencement of commercial production from a pilot plant by on or behalf of Dempsey, the issue of 10,000,000 Shares to Blue Sky or Blue Sky's shareholders (as applicable).
- Conditions precedent included the requirement to raise at least A$2 million at a price of not less than A$0.075/share; in addition a finders fee of 5,000,000 shares and 10,000,000 options was due upon Completion.

FINANCIAL POSITION

- As of December 31, 2018 the Company had A$2.179 million in cash and no debt
- During the twelve months to December 31, 2018 Galan spent A$1.351 million on exploration and evaluation and A$0.681 million on administration.
- As part of the Blue Sky acquisition requirements, the Company raised A$2.002 million through the issue of ~25 million shares at A$0.08/share; in addition a further A$2.303 million was raised at the end of CY2018 through the exercise of A$0.14 listed options - 99% were taken up before the December 31, 2018 expiry, with the remainder (180,891 options) being dealt with under an underwriting agreement.
- 27.9 million unlisted options are currently in the money, which have the potential to bring in a further A$3.937 million, with expiry dates by the end of CY2019.

SALAR DE HOMBRE MUERTO LITHIUM PROJECT (GALAN – 100%)

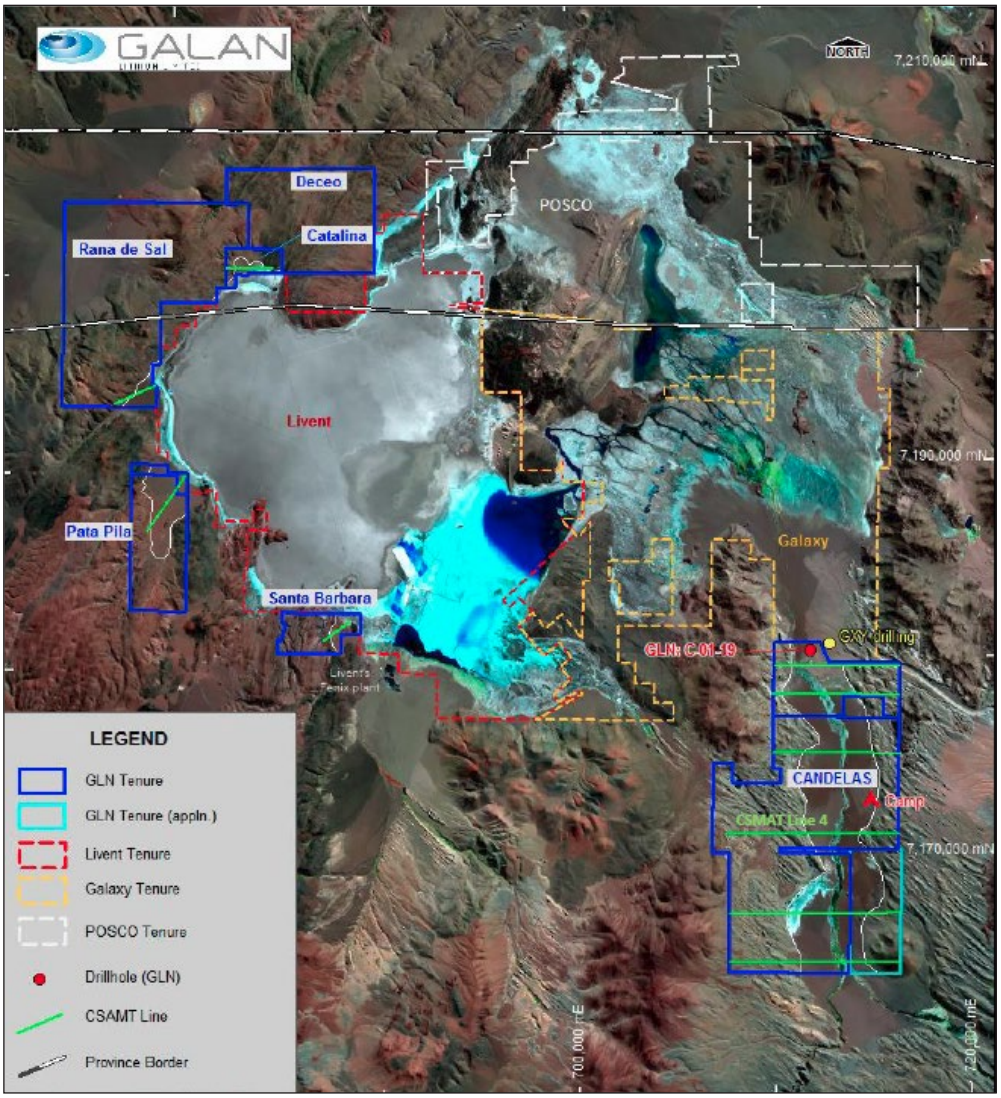
Location and Tenure

- Salar de Hombre Muerto is located in the Catamarca and Salta Provinces of Northern Argentina, with the Project areas being readily accessible by Routes 27/17 and 51 to Salta, an approximately 6.5 hour drive.
- Candelas is in Catamarca Province, with the Western Projects straddling the border between Catamarca and Salta
- The Project comprises 13 granted exploitation concessions over six project areas (Figure 2), with these covering ~25,000 ha, of which the Company considers at least 7,800 ha is prospective for brines, with ~6,000 ha of this at Candelas. Tenements have in indefinite life as long as the work and investment plans are followed, an EIS is completed (and which is to be updated every two years) and a "canon", equalling US$1,600 per tenement unit is paid twice a year.
- The Company has expanded its holdings since the initial Blue Sky acquisition - the following acquisitions/applications were announced on July 23, 2018:
  - Rana de Sal was acquired for US$25,000,

- The Santa Barbara tenements are held under an option agreement whereby Galan can buy 100% of the tenements for US$300,000 within three years - US$40,000 was paid upon signing of the option agreement; and,
- Pata Pila is an application (subsequently granted) by the Company.

- Candelas covers some 15 km length of the Los Patos Channel at the south-eastern end of the salar; the five other project areas are located along the margins of the main western basin of the salar - the Candelas holding was also expanded by the application and grant of the Candelas X tenement in the south-eastern corner of Candelas.
- As mentioned previously neighbours include Livent (~18,000 tpa LCE Fenix operation), Galaxy (Sal de Vida project) and POSCO; Galaxy is looking to develop Sal de Vida, with this to be partially funded by the US$280 million received from the sale of part of their original holdings to POSCO.

Figure 2: Hombre Muerto tenement, CSAMT surveying and drilling map



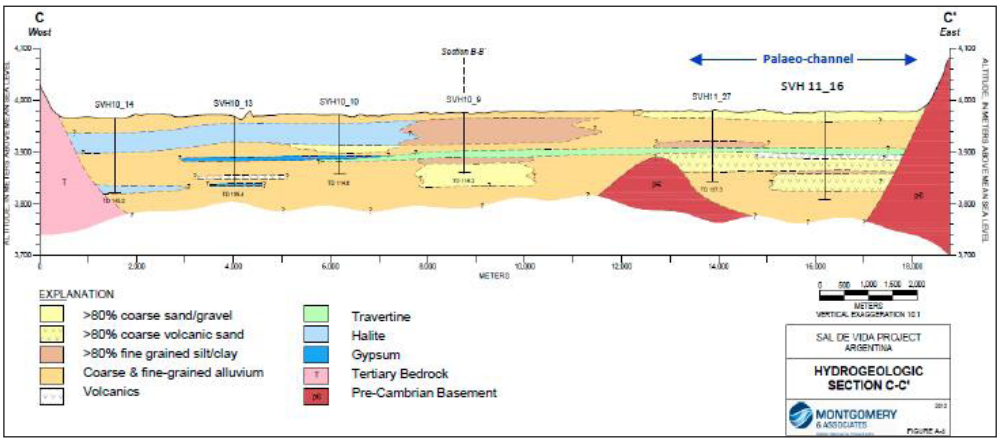
Source: Galan

Geology and Mineralisation

- Lithium mineralisation is hosted within saline brines in Salar de Hombre Muerto, with the brines within clastic sediments and evaporates of the salar - a description of lithium brine deposits is presented later in this note.
- The ~700 km^2 salar has formed in the northern part of a closed intra-montane structurally controlled pull-apart basin located on the eastern side of the Puna of the Andes Mountains, with the basin having a drainage area of some 4,000 km^2; one of the key salar inflow routes is the Los Patos Channel over which the Candelas Project is located.
- Los Patos is interpreted as a paleo-channel along the eastern side of the salar extending north into the Galaxy/POSCO holdings - this is highlighted in Figure 3 which is a cross section through the eastern basin within the Sal de Vida Project; Figure 4 shows the Candelas geology.

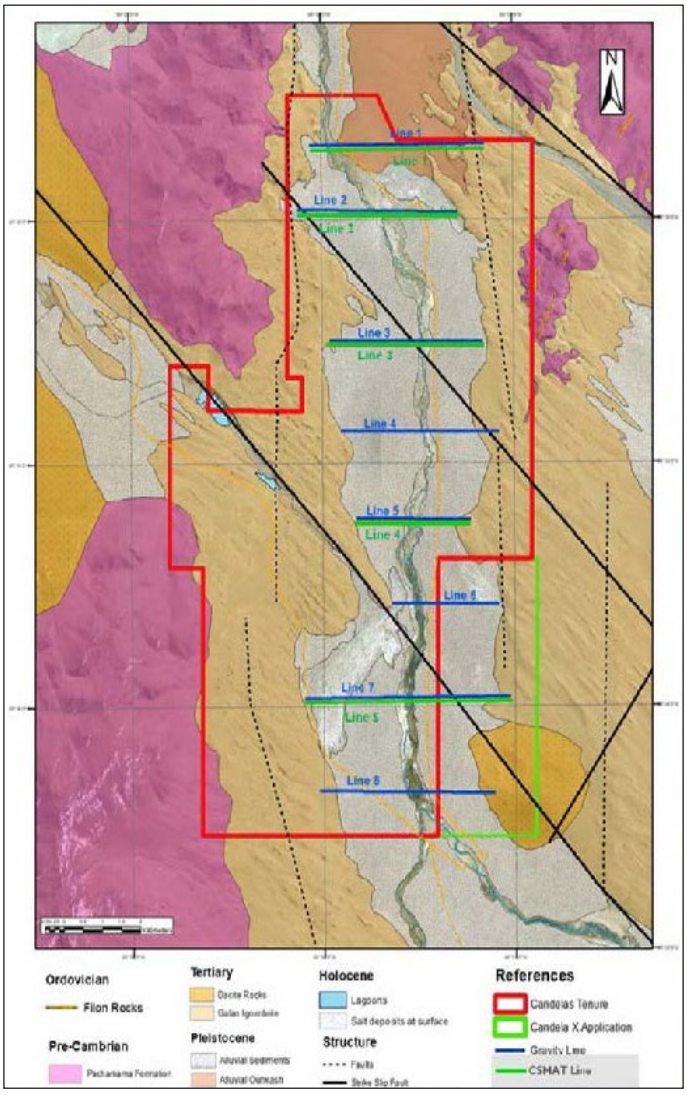
- The basin contains two main parts - a western mature salar and the eastern immature salar; in total the salar extends for 50 km north-south and 30 km east-west - basin development has been largely controlled by north-south faulting with the two sub-salars separated by a ridge of basement.

Figure 3: Eastern basin cross section - Sal de Vida



Source: Lithium One NI43-101, March 2012

Figure 4: Candelas geology and geophysical survey lines



Source: Galan

- The oldest rocks in the region are metamorphics and migmatites of the Neoproterozoic Pachamama Formation, which are overlain by Cambrian to Ordovician sediments and volcanics of the Tolillar and Falda Cienaga Formations; younger basement includes Tertiary volcanics and sediments.

- Basin sedimentation commenced ~15 Ma, coincident with a period of uplift and development of tectonic basins - this was followed by a period of increased volcanic activity.
- The stratigraphy in the western salar includes significant halite, comprised of massive halite interbedded with halite bearing sands and silts, and a lower largely clastic sequence, which includes interbedded silts, clays, sands, gravels, conglomerates and volcanics - the halite sequence is not as well developed in the eastern basin which is largely clastic.
- Volcanics include significant amounts of ignimbite sheets, with these being dated at ~2.0 to 2.5 Ma, and occurring largely along the eastern edge of the salar, and having been intersected in Galan's drilling.
- Quaternary deposits include clastic sediments, evaporites and basaltic lava flows, with these commonly covering pre-existing salars considered prospective for brine mineralisation - the geology of Candelas is shown in Figure 4.
- Concentrated brines have been formed by evaporation of groundwater within the closed basin, with the minerals within the brines being sourced from the surrounding rocks; it is also interpreted that elevated lithium amongst others may be due to hydrothermal activity associated with the Galan Volcano - fumaroles are present in the Candelas area.

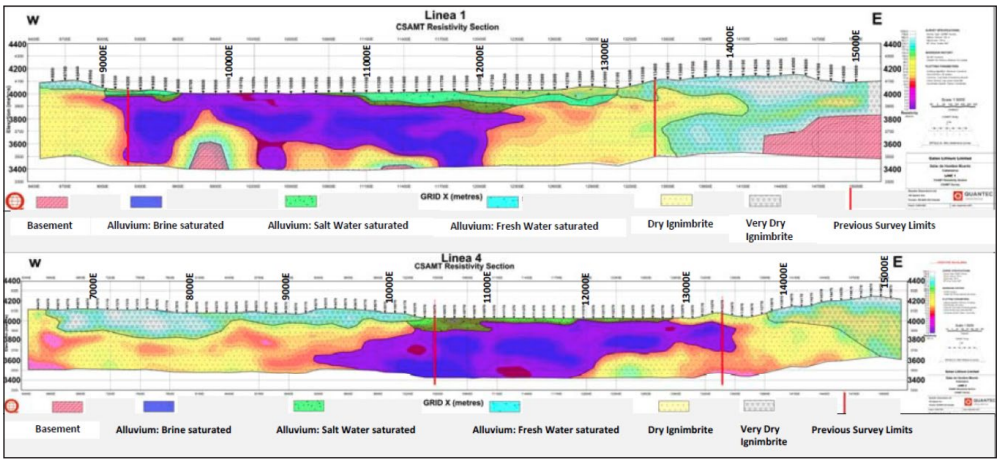
Work by Galan

- Work by Galan has included reconnaissance sampling (as part of the due diligence), gravity and CSAMT geophysical surveying, and the drilling of an initial, 401 m deep hole at the northern end of the Candelas tenements, adjacent to Galaxy's ground.
- The early sampling work at Candelas highlighted the potential for economic brine mineralisation, returning grades consistent with those above the known Sal de Vida brine mineralisation.
- Shallow (1.3 m) auger sampling at Catalina, Rana de Sal and Santa Barbara returned very good results, including up to 1,272 mg/l Li at Catalina, 921 mg/l Li at Rana de Sal and 1,086 mg/l at Santa Barbara - these results were characterised by generally low Mg/Li ratios.

Gravity and CSAMT - Candelas

- The initial gravity and CSAMT surveys were completed over the Los Patos Channel within the Candelas Project, with the aim to elucidate the depth to basement and extent of potential brines - additional CSAMT surveying was completed with the five lines from the first survey being extended and an additional line being surveyed.
- At the end of both rounds of CSAMT surveying, a 15 km length of the channel had been tested by both gravity and CSAMT - in all ~46.2 line km of CSAMT was completed, identifying ~6,000 ha of prospective brines over a length of 15 km, a width of between 3 km and 5 km and thicknesses varying between 160 m and +400 m.
- Profiles from lines 1 and 4 are shown in Figure 5, with all lines shown in Figure 6 - this also shows the location of Galan hole C-01-19 and a hole being drilled by Galaxy.

Figure 5: Candelas CSAMT profiles lines 1 (top) and 4 (bottom)

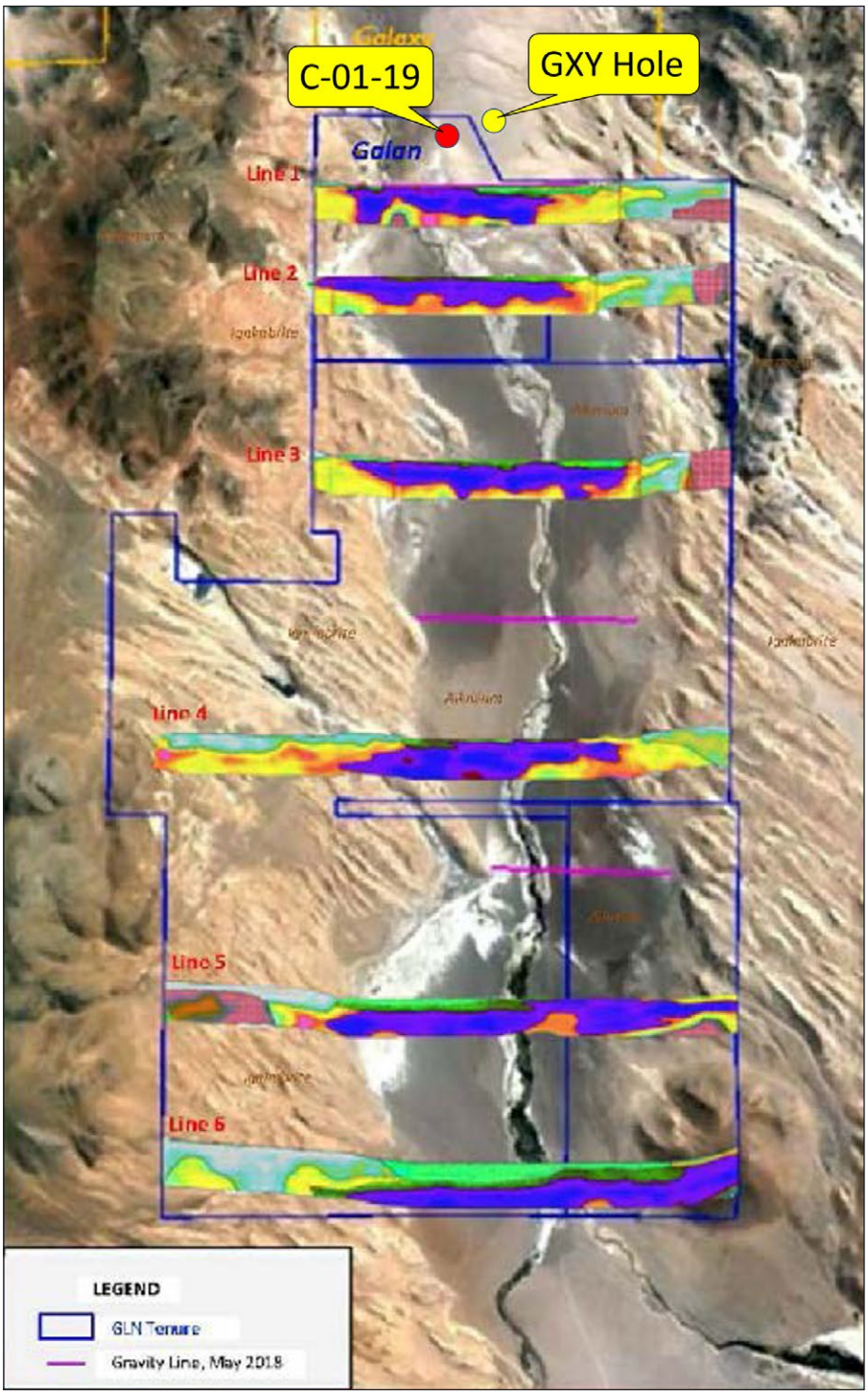


Source: Galan

- As a note on scale, profile depths are 600m, with the north-south extent of the surveyed area being 15 km.

- This work highlights the presence of brines below alluvial cover, as well as a possible structural boundary along the eastern edge of the channel.

Figure 6: CSAMT survey lines and profiles - Candelas - blue colours denote low resistivity

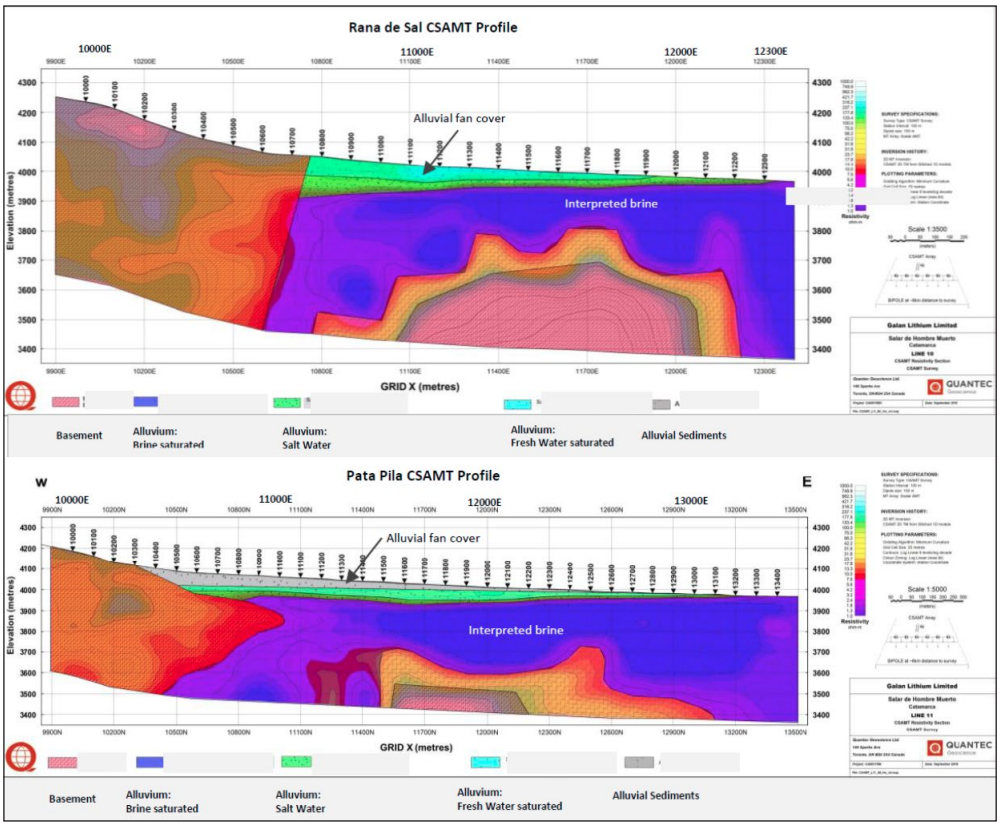


Source: Galan

Gravity and CSAMT - Western Projects

- Four CSAMT lines were surveyed over the Western Projects (Figure 2), with these also highlighting the potential for brines in areas underlying surficial deposits including alluvium.
- The Company has interpreted that there is the potential for 1,860 ha of brine coverage for the Western Projects, with this limited by metamorphic basement away from the salar - contacts are sometimes sharp (faulting of the salar against the basement) and sometimes gradational, which may reflect mixing of the brines and fresher recharge water.
- Figure 7 shows the profiles from Rana de Sal (top) and Pata Pila (bottom), highlighting the presence of conductive zones below alluvial fan cover.

Figure 7: Rana de Sal (top) and Pata Pila (bottom) CSAMT profiles - profile locations are shown in Figure 2



Source: Galan

Drilling

- To date the Company has completed one drillhole - C-01-19 - which was drilled to 401 m depth, and located near the northern end of the Candelas tenement package (Figures 2 and 6).
- The stratigraphy intersected in the hole included:
  - 0 m to 8 m - Fluvial sediments,
  - 8 m to 165 m - Ignimbrite,
  - 165 m to 235 m - Salty water saturated sandy and clay basin fill sediments, generally downward coarsening,
  - 235 m to 311 m - Brine saturated basin fill sediments; and,
  - 311 m to 401 m (EOH) - Brine saturated fractured basement.
- Sampling and assaying of the brines returned the results as shown in Table 1

Table 1: Drillhole C-01-19 assay and field test results

Drillhole C-01-19 assay and field test results									
Sample ID	**From (m)**	**To (m)**	**Li (mg/l)**	**Mg (mg/l)**	**B (mg/l)**	**K (mg/l)**	**Cond.**	**SG**	**Mg/Li**
*GL 101	165	215	118	263	195	1576	73	1.025	2.2
*GL 102	235	267	515	1465	369	4729	>200	1.125	2.8
*GL 103	235	300	858	2355	596	8090	>200	1.21	2.7
*GL 103Dup.	235	300	867	2376	601	8067	>200	1.21	2.7
GL 104	310	330	771	2163	549	8197	>200	1.21	2.81
GL 105	353	354	806	2250	566	8513	>200	1.21	2.79

Source: Galan

- We consider these results to be very positive, and confirm the potential of Candelas:
  - Thick sequences of high grade brine were intersected - the grades of up to 867 mg/l compare very favourably with others at Salar de Hombre Muerto, including the Resource grade for Sal de Vida of 753 mg/l; this is also comparable to Orocobre's Olaroz Resource grade of 690 mg/L,

  - Low contaminant levels, with Mg/Li ratios of under 3; and,
  - High potassium levels, raising the potential for this to be a by-product in any future operation.
- The drill hole stratigraphy is in reasonable correlation with the results for the nearby CSAMT Line 1 (Figures 2, 5 and 6).
- The Company has also reported that flow rates were very good, although they did fall off (as expected) within the fractured bedrock towards the bottom of the hole - the channel samples are generally coarse grained clastics - well testing is planned to elucidate the hydrological properties.

Planned Activities

- The drill rig is currently drilling hole C-02-19, which is located on CSAMT Line 4 - Galan plans to initially drill five holes along the 15 km length of the Los Potas Channel.
- Should the first five holes provide positive results, the Company will look to drill a further six to work towards fast tracking an initial MRE - the Company is of the view that it may take ~15 holes to delineate an Indicated/Measured Resource, and is working closely with independent consultants SRK to determine what drilling will be required.
- Drilling work will also involve casing, geophysical surveying and pump testing all drill holes..

PEER GROUP ANALYSIS

- Table 2 presents largely ASX and TSX listed companies with interests in brine projects in the Americas.
- The majority of the projects are located in Argentina, with the exception of Clayton Valley (Nevada) and Salar de Maricunga (Chile).
- In our table we have sorted the companies by enterprise value ("EV"), which is calculated from undiluted market capitalisation + net debt – cash to give an indicative value for the relevant companies' projects.
- Using the EV we have calculated the EV/tonne of the company's share of contained LCE resources that can be used as a comparison between companies – however care should be used when using this figure, which we consider as indicative only, and will vary according to a number of factors.
- We have not ascribed any value for other projects that the companies may have in their portfolios - this is particularly pertinent in the case of Galaxy, which, in our view, would have most value ascribed to the Mt Cattlin spodumene operation in Western Australia, and thus this distorts the value of the brine mineralisation as presented below. We have however included Galaxy here as the Sal de Vida Project is adjacent to Galan.
- We have however not included Livent, partly because we could not source the details of the Fenix Resource and also that Fenix is just one component of a broader vertically integrated lithium business.

Table 2: Galan peer group comparison

Galan peer group comparison								
Company	**Code**	**Key Project**	**EV (A$m)**	**LCE (mt)**	**Li Grade (mg/l)**	**Ultimate Owner-ship**	**EV/t LCE (A$)**	**Stage**
Orocobre	ORE.ASX	Salar Olaroz	$710	6.81	690	66.5%	$157	Producer
Galaxy	GXY.ASX	Sal de Vida	$492	4.69	732	100.0%	$105	FS Completed
Lithium Americas	LAC.TSX	Cauchari-Olaroz	$395	11.75	585	62.5%	$54	Construction
Argosy Minerals	AGY.ASX	Rincon	$117	0.25	325	90.0%	$528	Pilot Plant
Millennial Lithium	ML.TSXV	Pastos Grandes	$111	2.98	455	100.0%	$37	PEA Completed
LSC Lithium	LSC.TSXV	PPG	$99	5.77	448	72.0%	$24	PEA Completed
Advantage Lithium	AAL.TSXV	Cauchari	$82	0.47	380	75.0%	$234	PEA Completed
Galan Lithium	GLN.ASX	Candelas	$54	N/A	N/A	100.0%	N/A	Exploration
Wealth Minerals	WML.TSXV	Various	$43	N/A	N/A	100.0%	N/A	Exploration
Lithium Power	LPI.ASX	Maricunga	$42	2.15	1,160	51.0%	$38	DFS Completed

Galan peer group comparison								
Company	**Code**	**Key Project**	**EV (A$m)**	**LCE (mt)**	**Li Grade (mg/l)**	**Ultimate Owner-ship**	**EV/t LCE (A$)**	**Stage**
Neo Lithium	NLC.TSXV	Tres Quebrados	$28	6.92	605	100.0%	$4	M&I Resource
Lake Resources	LKE.ASX	Kachi	$23	4.40	211	100.0%	$5	Resource
Pure Energy	PE.TSXV	Clayton Valley	$15	0.22	123	100.0%	$70	PEA Completed
Bearing Lithium	BRZ.TSXV	Salar Maricunga	$15	2.15	1,160	17.7%	$39	DFS Completed

Source: IRESS, Company reports

- There is a general increase in EV/tonne LCE with advance in project stage and increasing grade, however we do note a few anomalies, particularly Argosy at the high end and Neo Lithium and Lake Resources at the low end.
- A critical factor to be considered is the recovery factor – figures given above are commonly in-situ resources, and not recoverable resources, with recovery factors being highly variable between different projects and within salars - this will have a significant effect on recoverable resources, thus affecting the relative valuations.
- Another idea of value can be gained from transactions - Table 3 presents a number of recent transactions in both the brine and hard rock spaces - all were announced in 2018, with the exception of Mt Holland which was announced in late 2017.
- This highlights the break between prices paid for the two asset stages - producing and non-producing and also the relatively high value of the Salar de Hombre Muerto transaction.

Table 3: Lithium transactions

Lithium transactions								
Project	**Type**	**Vendor**	**Buyer**	**Price**	**% of asset**	**LCE in Transaction**	**Value per t LCE**	**Status**
Wodgina	Pegmatite	MinRes	Albermarle	A$1,580 m	50%	3,750 kt	A$421	Operating
Mt Marion	Pegmatite	Neometals	Ganfeng	A$104 m	13.80%	281 kt	A$370	Operating
Salar de Hombre Muerto	Brine	Galaxy	POSCO	A$370 m	100%	2,540 kt	A$146	Resource
Mt Holland	Pegmatite	Kidman	SQM	A$150 m	50%	2,279 kt	A$66	Resource
Cauchari-Olaroz	Brine	SQM	Ganfeng	A$125 m	37.50%	2,554 kt	A$49	Resource

Source: IRESS, Company reports

CAPITAL STRUCTURE

- Galan currently has 112.1 million ordinary shares and 233.25 million unlisted options on issue.
- 27.90 million options are in the money, and include 3.125 million options with an exercise price of A$0.15 and an expiry date of November 29, 2019, and 24.77 million options with an exercise price of A$0.14 and an expiry date of December 31, 2019.
- In the money options have the potential to bring in A$3.937 million if exercised.
- There are 35 million performance shares, with award based on MRE and production hurdles.
- The top shareholder at 11.93% is the Hangye Group, a company associated with NED Mr Raymond Lui; directors directly and indirectly hold 30.46% of the Company.
- The Company has 890 shareholders, with the top 20 holding 56.33%.

BOARD AND MANAGEMENT

- **Mr Nathan McMahon (BCom) – Non-Executive Chairman:** Mr McMahon has provided tenement management and corporate advice to the mining industry for over + 25 years. He has specialised in Native Title negotiations and project acquisition due diligence. Nathan is also Joint Managing Director of Cazaly Resources Ltd.

- **Mr Juan Pablo "JP" Vargas de la Vega – Managing Director:** JP is a Chilean/Australian mineral industry professional with 15 years broad experience in ASX mining companies, stockbroking and private equity firms JP has been a specialist lithium analyst in Australia, has also operated a private copper business in Chile and has also worked for BHP, Rio Tinto and Codelco.
- **Mr Christopher William Chalwell (AusIMM) – Non-Executive Director:** Mr Challwell was previously COO of SKILLED Workforce Services Western Mining Region and has been involved in the gas to coal conversion of the Mica Creek Power station in Mt Isa and the Pasminco Century Mine in North Queensland. He has extensive experience with feasibility studies, commercial reviews for project funding, contract appraisal and award.
- **Mr Terry Gardiner (Dip.Fin.Services) – Non-Executive Director:** Mr Gardiner has over 20 years' experience in capital markets, stockbroking & derivatives trading and prior to that had many years trading in equities & derivatives for his family accounts. He is currently a Director of stockbroking firm Barclay Wells Limited and a Non-Executive Director of Cazaly Resources Limited.
- **Mr Jinyu (Raymond) Liu – Non-Executive Director:** Mr Liu is a qualified mining engineer with a commercial background, is a founding Managing Partner of Havelock Mining investment, a Hong Kong investment company and has been involved with numerous investments in ASX listed companies. He is currently a Director of Okapi Resources Ltd. Previously Mr Liu has held technical roles at Rio Tinto, KCGM and Mt Gibson Iron.
- **Mr Mike Robbins – CFO/Company Secretary:** Mr Robbins has over 20 years resource industry experience gathered at both operational and corporate levels, both within Australia and overseas. He held numerous project level management positions as well as CFO and Company Secretarial roles with Cazaly Resources, Bannerman Resources and Blackham Resources Limited.

BACKGROUND – LITHIUM AND MARKETS

What is Lithium?

- Lithium is an alkali metal; the lightest of all metals and the least dense of any of the elements that are solids at room temperature. Because of its inherent instability and reactivity it never occurs freely in nature, but only in compounds.

Lithium Products

- Lithium is supplied as, and prices quoted for a number of products, with the most common being lithium carbonate, followed by lithium hydroxide and lithium concentrates.
- Care has to be used in comparing reported grades, tonnages and expected revenues between companies when they are quoted on different bases.
- Lithium carbonate (Li_2CO_3) contains around 18.8% lithium; therefore one tonne of lithium is equivalent to 5.3 tonnes of lithium carbonate.
- Another compound that is often quoted is lithium oxide – Li_2O – which contains 46.5% lithium, around 2.5 times that of LCE, with lithium hydroxide (LiOH, 29% Li) also being used – conversion factors are shown in Table 4.

Table 4 :Lithium mineral/compound conversion factors

Lithium mineral/compound conversion factors						
Species	Formula	Lithium content	Convert to Li	Convert to Li_2O	Convert to Li_2CO_3	Convert to LiOH
Lithium	Li	100%	1.000	2.152	5.322	3.451
Lithium Oxide	Li_2O	46.46%	0.465	1.000	2.473	1.603
Lithium Carbonate	Li_2CO_3	18.79%	0.188	0.404	1.000	0.648
Lithium Hydroxide	LiOH	28.98%	0.290	0.365	1.542	1.000

Source: IIR analysis

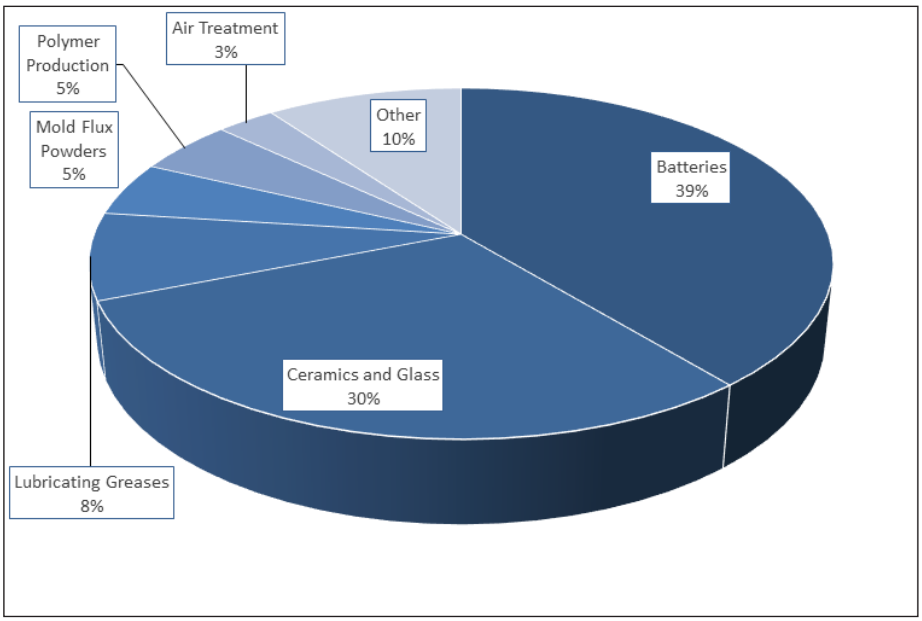
- Our figures and discussions in the following sections are based on LCE - where necessary we have converted figures from other compounds using the ratios in Table 4.
- Lithium products come in three main specifications, with typical values as follows, and with these commanding different prices:
  - Industrial grade (+96% Li, 0.70% H_2O, 0.50% Na_2O) - glass, casting powders and greases.

- Technical grade (~99.3% Li, 0.60% H_2O, 0.20% Na_2O) - ceramics, greases and batteries.
- Battery grade (>99.5% Li, 0.50% H_2O, 0.05% Na_2O) - high end battery cathode materials

Lithium Uses and Demand

- Lithium has a large number of uses, with the most relevant now being in rechargeable batteries, which in 2016, according to the USGS made up some 39% of the then annual demand of over 175,000 t of lithium carbonate equivalent ("LCE"), which is the form that lithium grades and prices are most commonly quoted in.
- Figure 8 presents the USGS's breakdown by application in 2016 - we note that the battery demand here differs from that provided by Roskill and SQM, which estimated battery demand (electronics plus EVs) was ~50% of total demand in 2016, rising to 60% in 2018.

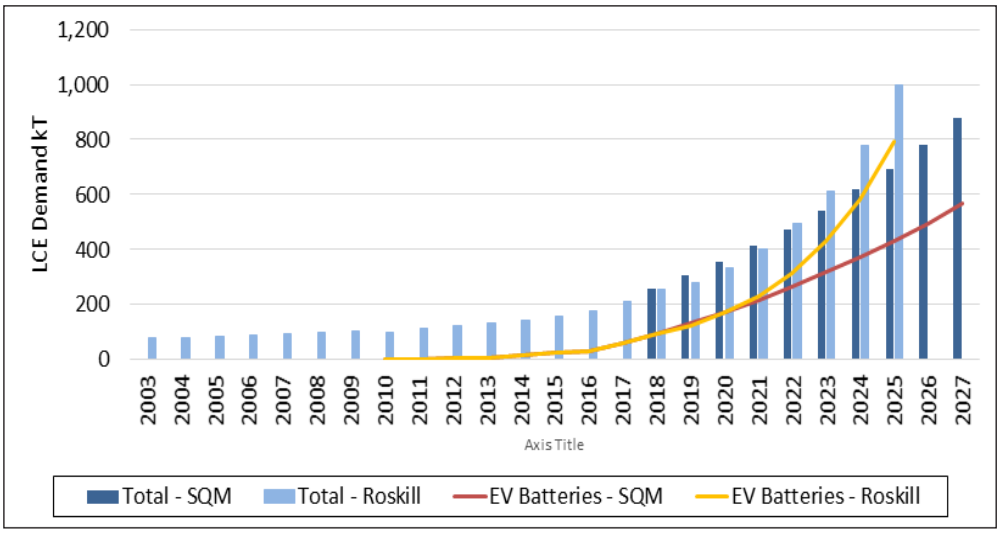
Figure 8: Lithium uses - 2017



Source: USGS

- Demand forecasts also vary quite widely between different parties, with this depending largely on the expected take-up in electric vehicles.
- Figure 9 presents a comparison of recent forecasts by Roskill (as presented in a Livent presentation) and SQM (as presented in a Millenial Lithium presentation) - historic data and non-EV forecasts are similar, however the difference in total future demand is strongly driven by assumptions as to EV demand.

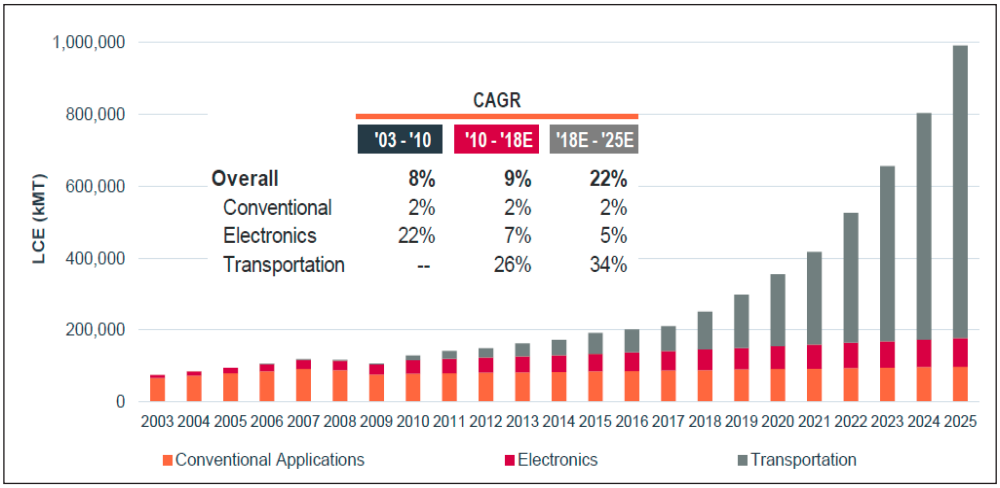
Figure 9: Forecast LCE demand comparison



Source: Adapted from Roskill (Livent presentation) and SQM (Millenial presentation)

- The Roskill forecasts uses an EV CAGR of ~34% to 2025, whereas the SQM forecast has a CAGR of 24% out to the same date - these result in significant differences in the forecast demand, with that for Roskill close to 1,000 ktpa LCE and SQM ~700 ktpa LCE.
- The demand forecasts for non-EV applications are however reasonably similar, increasing to around 200,000 tpa LCE by 2025.
- Figure 10 presents the detailed Roskill forecasts as used in Figure 9 - this highlights a forecast overall 22% CAGR from 2018 to 2015, resulting in demand of ~1,000 kt LCE by 2025, largely driven by electric vehicles (31% CAGR); this also shows the slowing in growth rate in consumer electronics as this market matures.
- Other growing battery uses include home storage, and the potential for grid scale storage to be used in conjunction with solar and wind power generation.
- In Australia over the last few years we have seen AGL Energy launching a home storage product in Australia in line with Tesla's "Powerwall" announcements. The major battery producers are Japan, China and South Korea, with Tesla also now joining the fray.

Figure 10: Roskill LCE demand forecast



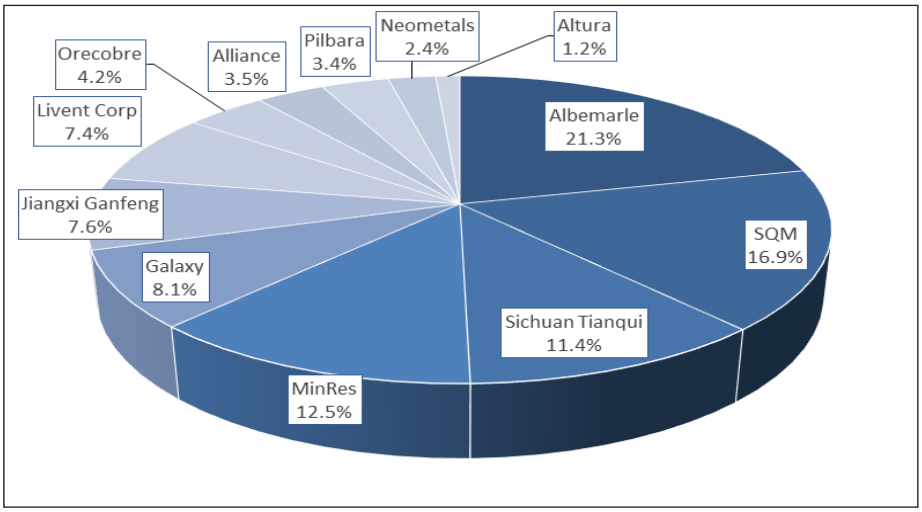
Source: Roskill, in Livent presentation

Lithium Supply

- There are two main sources of lithium – brine deposits and hard rock spodumene deposits.
- Production from brine deposits involves the extraction by pumping of lithium rich brines in salt lakes, followed by concentration by evaporation in evaporation ponds. From this, the concentrated solutions are processed to end products, including lithium carbonate and lithium hydroxide.
- Common by- or co-products include potassium and boron salts, which can significantly improve the economics of brine operations.
- Key points that affect potential brine operations include lithium content, magnesium content (this is relatively expensive to remove, with a rule of thumb stating that the ratio of Mg to Li in brines must be below 10:1 for a brine deposit to be economical), sulphate content and evaporation and rainfall rates – high evaporation rates results in lower costs as smaller ponds and shorter residence times are required.
- Brine deposits are further detailed in the section below.
- Spodumene (which is a lithium pyroxene – $LiAl(SiO_3)_2$) and other silicate mineral (including petalite and lepidolite) deposits are commonly hosted in pegmatites, and are mined by conventional hard rock open cut mining, followed by crushing and grinding, and extraction using a mixture of gravity, heavy media separation, magnetic separation and flotation to produce a concentrate, largely comprised of spodumene, but also commonly containing quartz and feldspar.
- Two spodumene concentrate qualities are often produced from the same deposit – a premium technical grade ("TG") concentrate and a chemical grade ("CG") concentrate, dependent upon customers' requirements. A common by-product is tantalite and other tantalum minerals. The concentrate is then further treated to produce ß-spodumene for ceramics, and lithium carbonate and lithium hydroxide for other applications.

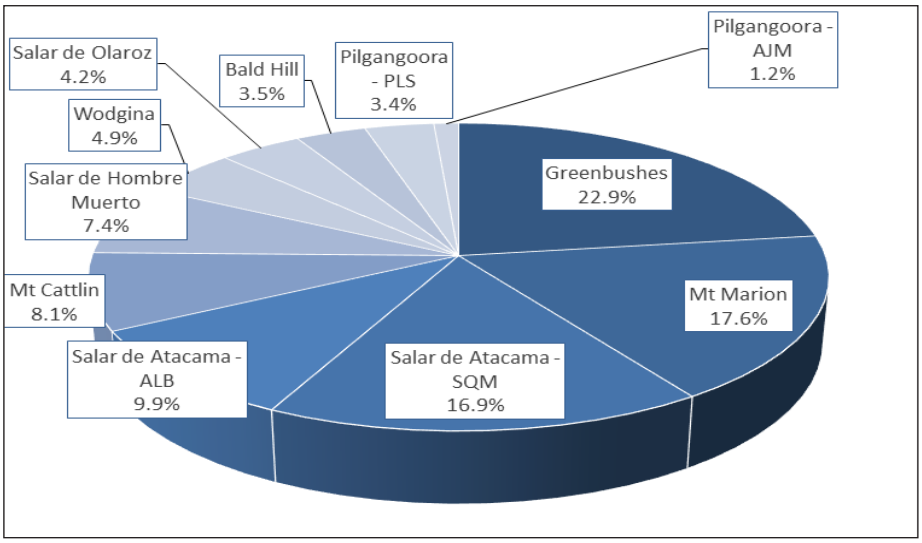
- TG concentrates, which are largely used in glass and ceramics applications, particularly in low thermal shock ceramics, require low iron contents (maximum of 0.2% Fe_2O_3, but significantly lower is preferred), and with LiO_2 grades of at least 6.5%. Specifications for CG concentrate, as used in battery applications, are less strict, with concomitant lower prices.
- Figures 11 and 12 show a breakdown of supply from non-Chinese producers and operations - what this shows is that production outside of China is reasonably concentrated, with only a few companies providing the bulk of supply in the business - note that is some cases accurate production figures are hard to source.
- However what needs to be noted is that a number of the hard rock operations are in the start up phase with first production in 2018, and hence production from these is expected to increase - this includes the Pilgangoora operations of both Pilbara and Altura, Alliance's Bald Hill Operation and Mineral Resources'/Albemarle's planned Wodgina operations.
- These graphs are based on LCE - we have converted reported sales from other sources (DSO, spodumene concentrates and lithium hydroxide) to LCE.

Figure 11: Lithium production by company 2018



Source: Company reports

Figure 12: Lithium production by deposit 2018



Source: Company reports

- Livent, Albemarle and SQM have operated brine operations in the Altiplano of Chile and Argentina for many years – a recent entrant there is Orocobre, which is currently ramping up production at its Olaroz Project in Argentina.
- The largest single producer is the Greenbushes Mine in Western Australia, which is a hard rock spodumene producer and a joint venture between Albemarle (49%) and Sichuan Tianqui Lithium (51%) - Until recently Greenbushes provided some 78% of global spodumene concentrates, with the balance made up largely by Chinese producers,

however this is changing with the recent Australian start-ups and as of the end of 2018 Greenbushes provided some 50% of non-Chinese hard rock supply.

- Albemarle also produces from a number of brine operations in the US and Chile, which, when added to its holding in Talison, makes it the world's largest single mine supplier of lithium with ~21% of market share.
- Greenbushes produces some 65,000 tpa of LCE, however is looking at expansions, including an LiOH plant at Kwinana, to increase production to 180,000 tpa of LCE by the end of 2022 - this LiOH plant is just one of a number of conversion plants planned or under construction in Western Australia.
- Recent developments in the hard rock space have seen the restart of Galaxy's Mt. Cattlin operation and the ramp up of the Mt. Marion operation, owned by Neometals Limited (13.8%, ASX.NMT, "Neometals"). Jiangxi Ganfeng Lithium Co. Limited (43.1%, SHE.002460, "Ganfeng") and Mineral Resources Limited (43.1%, ASX.MIN, "MinRes") - Neometals is selling its stake in the operation, with closure expected very soon.
- Both operations are in Western Australia, with Mt. Cattlin planning to produce up to 137,000 tpa and Mt. Marion up to 400,000 tpa of spodumene concentrate - this is equivalent to ~ 20,000 tpa and 65,000 tpa LCE respectively.
- In the brine space near term production is expected to increase from Orocobre's Olaroz operation in Argentina with this ramping up from the current ~13,000 tpa LCE to 42,500 tpa LCE by 2025.
- The status and quantum of planned expansion projects in the Salar de Atacama in Chile is more opaque, with the Chilean Government recently rejecting part of Albemarle's plans to boost output on environmental grounds and also flagging restrictions on water extraction from the southern areas of the salar.
- Albemarle had been developing a production process that would use significantly less water, however this reportedly has been put on hold, with some conjecture that the process was not working as expected, and also a reason for the Chilean Government's rejection of the expansion plans is that it wanted more details on the process.
- Our analysis indicates that planned (or flagged) start-ups and expansions have the potential to increase supply to ~950 ktpa LCE by 2022, however this will be dependent upon demand - the forecasts discussed earlier see demand increasing only to around 500 ktpa by this date, and thus we would not expect all of these to come to fruition.
- Some planned hard rock expansions may also be stymied by a lack of conversion facilities.

Lithium Pricing

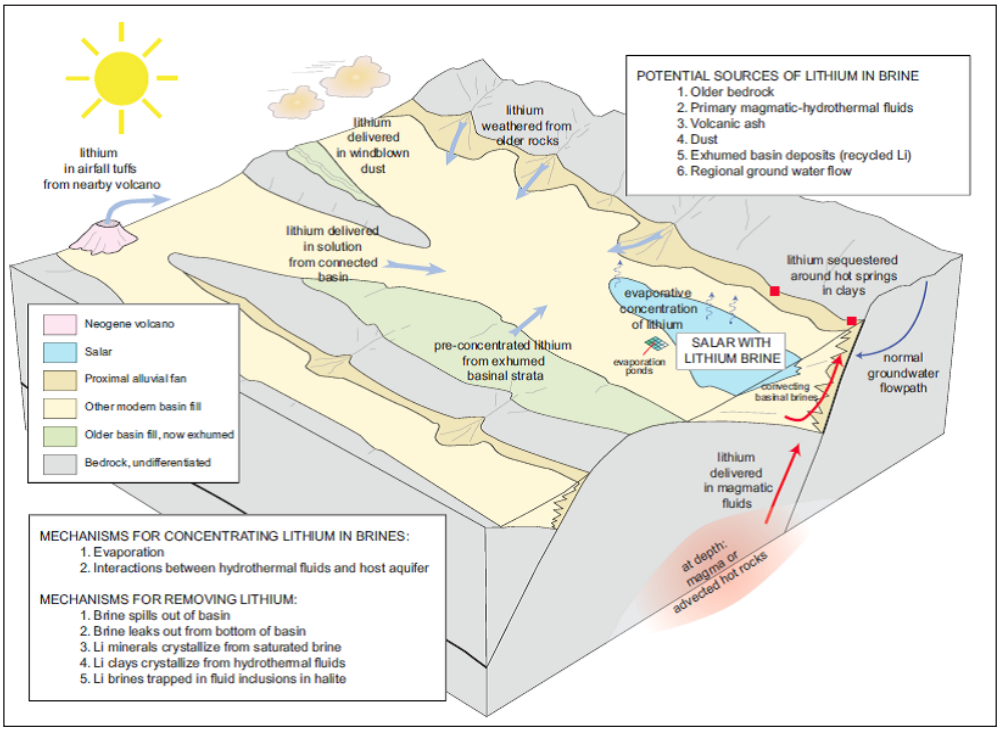
- Like most specialty metals, pricing is opaque and set by direct negotiation between producer and customer - pricing is also dependent upon the type and relative quality of the product.
- Another difficulty involves the plethora of lithium products, however prices trend to track each other.
- Prices have increased significantly since late 2015, with Chinese spot battery grade lithium carbonate prices reaching over US$20,000/tonne CFR in 2018, following on from prices staying around US$5,000 - US$6,000/tonne in the preceding few years.
- These price rises have also been evident in the South American brine producers – according to the TRU Group these averaged around US$4,500/tonne in 2014 (with battery grade product at a premium of US$500 to US$1,000/tonne), reached ~US$15,000/tonne in the September quarter, 2018 however have now retreated to around US$10,000/tonne as presented in Company financial reports.
- Recently announced spodumene concentrate contract prices include US$905/tonne for 6.0% Li_2O product from Galaxy's Mt. Cattlin operation - this is equivalent to US$6,000/tonne LCE.
- Spodumene concentrate prices however vary according to grade and levels of contaminants; these largely track that of lithium carbonate, albeit at a significant discount on an LCE basis due to the requirement for further processing, with this generally having a cost of between US$2,500 and US$3,500/tonne LCE.
- We see prices of lithium carbonate continuing to trade at around US$10,000 tonne.

BACKGROUND – LITHIUM BRINE DEPOSITS

General Characteristics and Geology

- Salars can be classified according to "mature" and "immature" end members.
- "Immature clastic" salars are characterised by significant thicknesses of clastic sediments with gypsum dominated evaporite interbeds, with porosity and permeability characterised by primary depositional features, which can be highly variable given the nature of the sediments.
- The clastic controlled characteristics can extend to several hundred metres depth – the recent drilling by Galan at Salar de Hombre Muerto has demonstrated this with the maiden hole (C-01-19) intersecting porous, lithium brine rich sediments down to at least 365m depth.
- "Mature halite" salars are characterised by high permeability at shallow levels, however this decreases rapidly with increase in depth due to salt recrystallising and sealing fractures – in these salars exploitable resources are limited to shallow depths, generally down to around 50m.
- The immature salars are commonly found at higher and wetter elevations, with the mature type at lower and more arid elevations; however some salars exhibit both styles, with Salar de Hombre Muerto being a prime example - the western basin is a mature system, with the eastern (including Candelas) being an immature system.
- A number of factors are essential in the formation of lithium rich, potentially exploitable saline brines:
  - Arid climate – low rainfall,
  - High evaporation rates,
  - Closed basin, with ongoing tectonic subsidence,
  - Suitable lithium source rocks: and,
  - Thick aquifers with permissive porosity and permeability to allow efficient extraction of the brines.
- Ongoing hydrothermal activity is also considered important for a number of reasons, including enhancing leaching of lithium from source rocks amongst others.

Figure 13: Diagrammatic representation of a lithium-bearing salar



Source: Lithium Brines: A Global Perspective (Munk et al)

- A magnesium to lithium ratio of under 9:1 or 10:1 is also considered essential, given that magnesium is a deleterious element, and incurs additional operating costs in removal.
- High potassium grades are considered positive, as potassium salts can be produced as a by-product; other potential by-products include boron.

- High lithium grades and high evaporation rates generally help operating and capital costs, in that relatively smaller evaporation ponds and shorter residence times are required to concentrate the brines to the specifications required by the downstream processing plants.
- As shown in Table 5 Salar de Hombre Muerto meets all of these requirements, and compares very well with other salars in South America, especially with regards to its exceptional lithium and potassium grades - note that the brine chemistry figures presented are representative only - there is variation in these figures across the different salars, and also due to the reporting of different cutoff grades
- Other factors that affect the viability of a lithium brine operation include access to infrastructure and the operating jurisdiction – again Salar de Hombre Muerto is located favourably with respect to these parameters.

Table 5: Characteristics of South American salars

Characteristics of South American salars						
	Salar de Hombre Muerto	**Salar de Maricunga**	**Salar de Atacama**	**Salar de Centenario**	**Salar de Olaroz**	**Salar de Cauchari**
Country	Argentina	Chile	Chile	Argentina	Argentina	Argentina
Owner	Galan/Galaxy/ Livent/POSCO	LPI/MSB/Li3	SQM/ALB	LPI/Eramet	Orocobre/ Lithium Americas	Orocobre/ Lithium Americas
Lithium (g/l)	0.74	1.25	1.84	0.56	0.69	0.59
Potassium (g/l)	7.40	8.97	22.63	5.11	5.73	4.85
Magnesium (g/l)	1.02	8.28	11.74	3.26	1.86	1.42
Mg/Li	1.40	6.63	6.40	5.87	2.40	2.43
K/Li	9.95	7.18	12.33	9.20	8.30	8.30
K/Mg	7.26	1.08	1.93	1.57	3.46	3.58
Altitude (m)	4000	3800	2300	3900	3900	3900
Rainfall (mm/yr)	100	125	15	100	100	100
Evaporation (mm/yr)	2710	2400	3200	2600	2600	2600

Source: Various company reports and presentations

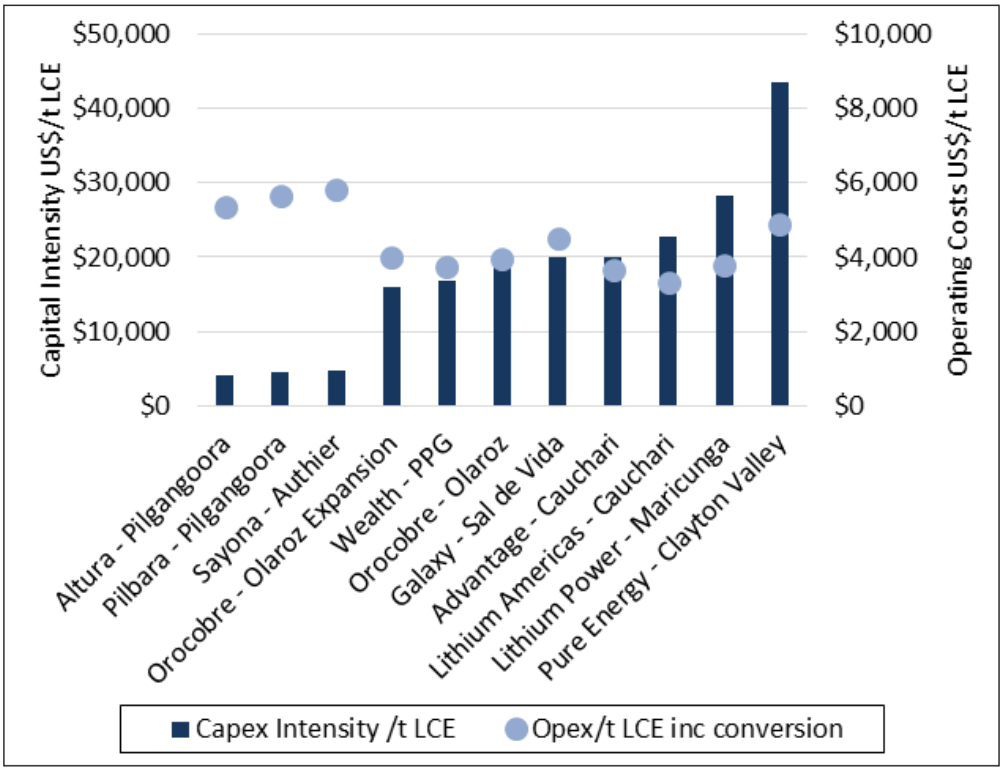
Resource and Reserve Estimation

- Given the fluid nature of the mineralisation Resource estimation techniques are different for brines than for hard rock deposits.
- They are a function of the volume and the "effective" porosity of the aquifer, and the grade of the brines, with the latter usually presented in mg/l.
- Effective porosity ("P_e") is the interconnected porosity of the host unit, and in most cases, except in the case of well sorted sands, will be less than total porosity ("P_t") - there will usually be an element of porosity due to pore spaces that are not interconnected with others.
- Another factor that needs to be taken into account is the specific yield, or drainable porosity ("S_y"); there is also retained porosity ("S_r"), which is that element of the effective porosity that cannot be removed by gravity draining or pumping.
- The relative proportions of S_y and S_r will commonly depend upon the grainsize of the sediments - in the case of fine grained sediments $S_r >> S_y$, and in the case of coarser sediments $S_y >> S_r$ - this is mainly due to adsorption on the surface of the grains and capillary forces - S_y is important when defining Reserves.
- The relationships can be described by the equation $P_e = S_y + S_r$.
- As an example, drainable porosities for Sal de Vida, for which the MRE was based on, ranged from 2% for clays, through 10% for sands and silty sands and to 15% for travertine, tuff and dacitic gravel.
- There will be differences in porosity and permeability depending on the salar types - immature salars may have higher porosities but lower permeabilities when compared to the mature salars, with, at shallow levels, the permeability in halite zones being controlled by highly permeable fractures.
- Permeabilities in halite zones will also be isotropic, whereas that in clastic sediments (as found in immature salars) will tend to be anisotropic.

Costs, Mining, and Treatment

- Mining and treatment of lithium brine deposits is relatively simple, and results in generally low operating costs when compared to hard rock lithium operations (Figure 14).
- This presents figures from recent development studies that we have analysed; the average operating cost for South American brines is US$3,900/tonne LCE, and that for hard rock operations (including conversion costs) is US$5,600/tonne LCE - Orecobre reported operating costs of US$3,974/tonne in the December 2018 quarter (however not including the 4 pesos per dollar short term export tax as announced by the President, Mr Macri, in September 2018).
- Conversion costs associated with converting spodumene concentrates to downstream products are in the order of US$2,500 to US$3,500 per tonne, and hence affect the LCE equivalent price of the concentrates as mentioned earlier.
- What this does show are the high margins for a brine business producing lithium carbonate and other downstream products – hard rock operations commonly produce and sell only concentrate, which can be discounted by up to 60% on an LCE basis compared to the downstream products to allow for the processing costs.
- Capital costs however are relatively high for brine operations, and there can be a longer ramp up to production than in a hard rock mine - our analysis of the results of development studies indicates expected capital cost intensities of US$21,000/annual LCE tonne for brine projects and US$4,400/annual LCE tonne for hard rock operations.
- Treatment involves the harvesting of brines from wells or trenches, with the lithium content in the brine upgraded through evaporation in a series of evaporation ponds.
- As mentioned earlier recoverable resources are commonly significantly lower than in-situ resources, with brine recovery factors commonly in the order of 20-70%.
- The evaporation process, which can take up to 12-18 months to complete and can include up to 10 stages, results in the progressive precipitation of various salts from the brines.

Figure 14: Indicative lithium cost curve



Source: LPI

- The first salt to precipitate is usually halite (NaCl), commonly followed by sylvite (KCl) and then more magnesium rich species.
- The aim of the evaporation process is to increase the lithium grade to at least ~1-2% or above, at which point the brine is treated to produce the end products including lithium carbonate and lithium hydroxide.
- Treatment may include the addition of reagents, including soda ash to remove magnesium – depending on the magnesium to lithium ratio this can significantly increase operating costs.

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