RESOURCES LTD


# Updated Savannah Feasibility Study <br> "Enhances fundamentals for a decision to restart" 

Investor Presentation 30 October 2017

## Disclaimer

## Cautionary Statements and Important Information

This presentation includes information extracted from Panoramic Resources Limited ASX announcement dated 27 October 2017 entitled "Updated Savannah Feasibility Study - Enhances fundamentals for a decision to restart". The Savannah optimisation includes approximately $1.1 \%$ of material on a contained nickel basis classified as Inferred Resource. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised.

## No New Information or Data

This presentation contains references to exploration results, Mineral Resource estimates and Ore Reserve estimates, all of which have been cross referenced to previous market announcements made by the Company. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of estimates of Mineral Resources and Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed.

## Forward Looking Statements

This presentation may contain certain "forward-looking statements" which may not have been based solely on historical facts, but rather may be based on the Company's current expectations about future events and results. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, forward looking statements are subject to risks, uncertainties, assumptions and other factors, which could cause actual results to differ materially from future results expressed, projected or implied by such forward-looking statements. Such risks include, but are not limited to metals price volatility, currency fluctuations, increased production costs and variances in ore grade or recovery rates from those assumed in mining plans, as well as political and operational risks in the Countries and States in which we operate or sell product to, and governmental regulation and judicial outcomes. For a more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other filings. The Company does not undertake any obligation to release publicly any revisions to any "forward-looking statement" to reflect events or circumstances after the date of this announcement, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.

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## OVERVIEW

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## Updated Feasibility Study Highlights

- Payable operating cash costs - US\$2.40/lb Ni

■ Sustaining cash costs - US\$3.50/lb payable Ni

- Pre-production and ramp-up capital - $\mathrm{A} \$ 36 \mathrm{M}$
- Mine life - 8.3 years
- Average annual production forecast*

■ $10,800 \mathrm{t} \mathrm{Ni}$

- 6,100t Cu
- 800t Co
- Short lead time to production
- Strong interest from potential off-take partners


## Mine Gate Gross Revenue Contribution by Metal



- Significant cobalt revenue

[^0]
## Key statistics

| Operating Metric | Details |
| :---: | :---: |
| Mineral <br> Resources | 13.2Mt @ 1.65\%Ni, 0.75\% Cu, 0.11\% Co containing <br> 218,300t Ni 99,100t Cu 14,900t Co |
| Mine Production | 7.65Mt @ 1.42\% Ni, 0.68\% Cu, 0.10\% Co containing <br> $108,700 \mathrm{t} \mathrm{Ni} \quad 51,700 \mathrm{t}$ Cu $7,300 \mathrm{t}$ Co |
| Mine Life | 8.3 years |
| LOM production (metal in concentrate) | 90,200t Ni 50,700t Cu 6,700t Co |
| Annual production (metal in concentrate) | 10,800t Ni 6,100t Cu 800 t Co |

- Long mine life ~8.3 years (excluding future Resource to Reserve conversion and exploration upside potential)
- Significant nickel production

■ averaging 10,800 t nickel in concentrate over LOM

- Significant by-product credits
- $41 \%$ of gross mine-gate revenue from copper and cobalt

The Mineral Resources and Ore Reserves underpinning the above production target have been prepared by a competent person or persons in accordance with the requirements of the JORC Code - refer to PAN's ASX announcements of 24 August 2016, 30 September 2016 and 2 February 2017.

## October 2017 Updated FS Financials

| Financial Metric | Units | Base Case Prices | Long Term Prices |
| :---: | :---: | :---: | :---: |
| Nickel price assumption | US\$/lb | 5.50 | 6.75 |
| Copper price assumption | US\$/lb | 3.10 | 2.72 |
| Cobalt price assumption | US\$/lb | 28.00 | 26.00 |
| US\$:A\$ FX assumption | US\$ | 0.78 | 0.75 |
| Revenue | A\$M | 1,470 | 1,720 |
| Initial Capital | A\$M | 36 | 32 |
| LOM Capital (incl. initial capital) | A\$M | 240 | 230 |
| Operating costs plus royalties | A\$M | 900 | 920 |
| Pre-tax cashflow | A\$M | 330 | 570 |
| Pre-tax NPV (8\% discount rate) | A\$M | 210 | 380 |
| IRR | \% | 100 | 200 |
| C1 cash cost (Ni in concentrate basis) | A\$/lb Ni | 1.90 | 2.10 |
|  | US\$/lb | 1.50 | 1.60 |
| Operating cash costs (payable Ni basis) | A\$/lb Ni | 3.10 | 3.40 |
|  | US\$/lb | 2.40 | 2.60 |
| Sustaining cash costs (payable Ni basis) | A\$/lb Ni | 4.50 | 4.80 |
|  | US\$/lb | 3.50 | 3.60 |

## Key changes from Feb 2017 FS

- Improved marketing terms
- Improved Cu and Co recoveries
- Lower Ni price for Base Case
- Ni processing recovery average 83\%
- Initial capex (plant refurb cost estimates updated)
- Opex (salaries and power consumption updated)


## PRODUCTION

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ПKППП
KURRUMULUNY DECLINE SEPTEMBER 2004

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5+5
$$

## Material in Updated FS mine plan

| Classification | Tonnage <br> Mt | Grade <br> Ni <br> $\%$ | Grade <br> Cu <br> $\%$ | Grade <br> Co <br> $\%$ | Contained <br> Ni <br> t | Contained <br> Cu <br> t | Contained <br> Co <br> t |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ore Reserves | 7.58 | 1.42 | 0.68 | 0.09 | 107,500 | 51,200 | 7,200 |
| Inferred Resource | 0.06 | 1.91 | 0.69 | 0.13 | 1,200 | 400 | 100 |
| Total | 7.65 | 1.42 | 0.68 | $\mathbf{0 . 1 0}$ | 108,700 | 51,700 | $\mathbf{7 , 3 0 0}$ |

The Updated FS mine plan has only ~1.1\% material classified as Inferred Resource

## Cautionary Statement

There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised.


## Mining

## Savannah

■ Remaining forecast mine production of 1.68 Mt @ $1.18 \% \mathrm{Ni}$ for $19,800 \mathrm{t} \mathrm{Ni}$ contained

- Use Savannah to top-up production from Savannah North
- Material below 900F is not included in mine plan (Resources - 0.90Mt @ 1.65\% Ni for 14,900t Ni)


## Savannah North

- Forecast mine production of 5.97 Mt @ $1.49 \% \mathrm{Ni}$ for $\mathbf{8 8 , 9 0 0} \mathrm{t} \mathrm{Ni}$ contained
- Commence development when restart Savannah
- First ore 9 months after commencing access development and full production after 15 months



## Processing - Mineralogy

- Savannah North Mineralogy (QEMSCAN ${ }^{\text {TM }}$ )
- Pyrrhotite-dominant sulphides with sub-ordinate pentlandite and chalcopyrite
- Good pentlandite liberation: 60-75\% of pentlandite is liberated, with $\mathrm{P}_{80}$ grainsize between 59 um and 78 um
- Pyrrhotite:Pentlandite ratio is higher compared to Savannah
- Nickel in solid solution in Pyrrhotite comprises 16-17\% of total nickel content at Savannah North (compared to $12 \%$ at Savannah)
- Mineralogy indicates $3-5 \%$ lower Ni processing recoveries at Savannah North compared to Savannah


KUD1562 intersection between 672.2-676.9m 4.70m @ 2.28\% Ni, 1.06\% Cu, 0.15\% Co

## Processing - Flotation Test Work

- Savannah North 2017 Flotation Test Work Program
- 46 rougher-scavenger flotation tests
- 19 cleaner tests
- Nickel recoveries in testwork are 3-5\% lower than that achieved for a Savannah reference sample (as predicted by the QEMSCAN ${ }^{\top M}$ mineralogy)
- Predicted recoveries (\%) from flotation test work for $8 \%$ bulk Ni-Cu-Co concentrate:

|  | Ni | Cu | Co |
| :--- | :--- | :--- | :--- |
| Savannah North Upper Zone | 82 | 99 | 92 |
| Savannah North Lower Zone | 84 | 99 | 95 |

## Processing - Mill throughput and recovery

- Mill
- Average 120 tonnes per hour ( $\sim 940,000$ tonnes per year) at full production
- Estimated four months to refurbish plant
- Three months ramp up to steady-state production and 12 months to full production
- Life-of-mine head grade averages $1.42 \% \mathrm{Ni}$
- Lower grades in first year of production, associated with the remnant Ore Reserves at Savannah
- Assumed Average Recoveries over LOM
- $83 \% \mathrm{Ni}$
- $98 \% \mathrm{Cu}$
- $92 \% \mathrm{Co}$



## Concentrate Production

- Bulk Ni-Cu-Co concentrate targeting 8\% Ni
- Low impurities and attractive Fe:MgO and Ni:Fe ratios
- Ideal blending feed for third-party smelters

|  | Grade \% | Life of Mine | Annual Average |
| :--- | :---: | :---: | :---: |
| Concentrate |  | $1,130,000 \mathrm{dmt}$ | $\mathbf{1 3 5 , 0 0 0 \mathrm { dmt }}$ |
| Ni | $8.0 \%$ | $90,200 \mathrm{t}$ | $\mathbf{1 0 , 8 0 0 t}$ |
| Cu | $4.5 \%$ | $50,700 \mathrm{t}$ | $\mathbf{6 , 1 0 0}$ |
| Co | $0.6 \%$ | $6,700 \mathrm{t}$ | $\mathbf{8 0 0 t}$ |



## CAPITAL AND OPERATING COSTS

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## Capital costs

- Total capex over LOM: ~\$240M
- Pre-production and ramp-up: \$36M
- Plant refurb
- Savannah Nth access
- Savannah Nth ventilation
- LOM sustaining capex: \$27M pa

■ Mine dev't average \$17M pa
■ PP\&E capex average $\$ 11 \mathrm{M}$ pa

Capital Expenditure (A\$'M per year)


| Description | Pre- <br> production <br> and ramp-up | Sustaining | Life of Mine |
| :--- | :---: | :---: | :---: |
| Mine development | 8 | 103 | 111 |
| Mining mobile equipment | 4 | 32 | 36 |
| Capitalised pre-production and ramp-up opex | 28 | - | 28 |
| Other pre-production and sustaining capital | 6 | 23 | 29 |
| Savannah North primary ventilation | 4 | 13 | 17 |
| Plant refurbishment | 10 | - | 10 |
| Tailings facilities construction | 2 | 8 | 9 |
| Solar power plant | - | 7 | 7 |
| TSF 1 capping | - | 7 | 7 |
| Concentrate haulage fleet | - | 5 | 5 |
| Initial store inventories | 2 | - | 2 |
| Capitalised Revenue | $\mathbf{2}$ | - | $(28)$ |
| TOTAL | $\mathbf{3 6}$ | 198 | 235 |

## Operating costs

- Site operating unit costs: ~\$100/t
- Major cost impacts:
- Labour costs (higher salaries) - $25 \%$ of total opex
- Power \& fuel (increased ventilation and cooling requirements) $-15 \%$ of total opex

| Description | LOM cost <br> per tonne <br> milled (\$/t) | LOM total <br> $(\$ ' M)$ |
| :--- | :---: | :---: |
| Mining (incl. Geology) | 59 | 440 |
| Processing | 21 | 160 |
| Other site costs | 17 | 130 |
| Total | 97 | 730 |











## Payable cash costs

- Payable operating cash cost - US $\$ 2.40 / l \mathrm{lb}$ average over LOM (bottom of $2^{\text {nd }}$ quartile)
- Sustaining cash cost - US\$3.50/lb average over LOM (US\$4.20/lb in Years 1 and 2)
- Sustaining cash cost margin - $36 \%$ average over LOM



Source: HSBC Metals Quarterly Q4 2017, 11 October 2017

## PROJECT ECONOMICS

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## Financial assumptions

- Revenue assumptions based on recent indicative sales terms received from potential offtake partners
- Commodity and FX assumptions used in the Base Case model are reflective of current prices:

| Commodity | Base Case |
| :--- | :---: |
| Nickel | US\$5.50/lb |
| Copper | US\$3.10/lb |
| Cobalt | US\$28.00/lb |
| US\$:A\$ | 0.78 |

■ Discount rate 8\%

- Modelling is pre-tax
- Tax losses of $\$ 65 \mathrm{M}$ - at 31 December 2016 PAN had
 accumulated tax losses of approximately $\$ 65 \mathrm{M}$ (not included in modelling)


## Cashflow forecast - LOM

- LOM Revenue - $\$ 1,470 \mathrm{M}$ ( $\$ 180 \mathrm{M}$ per year)
- LOM pre-tax cashflow - \$330M
- Pre-production and ramp-up capex - \$36M
- Payback period - less than 2 years after recommencement of production




## Financial results - viable at spot, highly leveraged to nickel recovery

| Financial Metric | Units | Base Case Prices | Long Term Prices* |
| :---: | :---: | :---: | :---: |
| Nickel price assumption | US\$/Ib | 5.50 | 6.75 |
| Copper price assumption | US\$/Ib | 3.10 | 2.72 |
| Cobalt price assumption | US\$/lb | 28.00 | 26.00 |
| US\$:A\$ FX assumption | US\$ | 0.78 | 0.75 |
| Revenue | A\$M | 1,470 | 1,720 |
| Initial Capital | A\$M | 36 | 32 |
| LOM Capital (incl. initial capital) | A\$M | 240 | 230 |
| Operating costs plus royalties | A\$M | 900 | 920 |
| Pre-tax cashflow | A\$M | 330 | 570 |
| Pre-tax NPV (8\% discount rate) | A\$M | 210 | 380 |
| IRR | \% | 100 | 200 |
| C1 cash cost <br> (Ni in concentrate basis) | A $\$ / \mathrm{ll}$ Ni | 1.90 | 2.10 |
|  | US\$/lb | 1.50 | 1.60 |
| Operating cash costs (payable Ni basis) | A $\$ / \mathrm{ll}$ Ni | 3.10 | 3.40 |
|  | US\$/Ib | 2.40 | 2.60 |
| Sustaining cash costs (payable Ni basis) | A $\$ / \mathrm{lb} \mathrm{Ni}$ | 4.50 | 4.80 |
|  | US\$/Ib | 3.50 | 3.60 |

[^1]
## Leveraged to commodity prices and currency

■ Strongly leveraged to nickel price and US\$:A\$
■ US\$1.00/lb increase in nickel price adds $\sim$ A $\$ 160 \mathrm{M}$ to pre-tax NPV
■ US $\$ 0.05$ cent decrease in the US\$:A\$ exchange rate adds $\sim \mathrm{A} \$ 50 \mathrm{M}$ to pre-tax NPV

| Pre-tax NPV ${ }_{8}\left(\$^{\prime} \mathrm{M}\right)$ |  | Nickel Price US\$/lb) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 |
| US\$:AS <br> FX Rate | 0.65 | 270 | 453 | 635 | 790 | 946 | 1,102 |
|  | 0.70 | 207 | 377 | 546 | 690 | 835 | 979 |
|  | 0.75 | 153 | 312 | 469 | 604 | 739 | 874 |
|  | 0.80 | 105 | 254 | 401 | 528 | 654 | 781 |
|  | 0.85 | 63 | 203 | 342 | 461 | 580 | 699 |

## METAL PRICE OUTLOOK

## PANORAMIC

## Nickel price - outlook much brighter

Figure 76: Price \& supply/demand balance (Mt \& USc/lb)


Figure 77: Price forecasts \& Upside/Downside (US\$/lb)


Source: UBS \& Bloomberg.

## UBS Nickel Price Forecasts

- 2018 - $\$ 5.00 / \mathrm{lb}$
- $2019-\$ 6.00 / \mathrm{lb}$
- 2020 - \$7.50/lb
- 2021-\$7.00/lb

Nickel price to surge in 2019-20e from Electric Vehicles:
"We see substantial price upside from the current spot of $\sim U S \$ 4.60 / \mathrm{lb}$ to US\$7.50/lb in 2020e. Here electric vehicle penetration \& a cathode chemistry shift to greater nickel use will drive a substantial uplift in demand." (UBS $5 / 10 / 17$ )

## Copper price - outlook stable



## UBS Copper Price Forecasts

- 2018 - $\$ 3.00 / \mathrm{lb}$
- $2019-\$ 3.00 / \mathrm{lb}$
- $2020-\$ 3.30 / \mathrm{lb}$
- 2021-\$3.30/lb
"Beyond the near term, we think EV's \& the promise of accelerating demand underpin the case for an incentive price of $\sim U S \$ 3 / \mathrm{lb}$ (real)". (UBS 5/10/17)


## Cobalt price - EV's to revolutionise transport



Source: Macquarie EV Research, CDI, Macquarie Research, October 2017

Cobalt 27 Capital Corp comments

- Cobalt demand in lithium-ion batteries forecast to grow at 11.7\% CAGR to 2022
- Supply currently concentrated in the DRC ( $65 \%$ of 2016 mine output)
- Relatively politically unstable country
- Lack of infrastructure

■ $\sim 15 \%$ of DRC output from unregulated artisanal mining

## Sources:

Macquarie Research - Commodities Compendium, 10 October 2017
Cobalt 27 Capital Corp - corporate presentation, 20 September 2017

## Macquarie Cobalt Price Forecasts

- 2018 - \$27.00/lb
- 2019 - \$20.00/lb
- 2020 - \$22.00/lb
- 2021 - \$32.00/lb
- 2022 - \$41.00/lb


## SUMMARY

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## Summary

$\checkmark$ Savannah is a significant Australian base metal project containing*

- 218,300t contained nickel
- 99,100t contained copper
- $14,900 \mathrm{t}$ contained cobalt


## $\checkmark$ Updated Feasibility Study confirms

- Financially robust project at current commodity prices and US\$:A\$ FX
- +8 year mine life
- Globally competitive cash costs
- Low re-start capex
- Short timeframe to production leveraging off existing Savannah infrastructure
- Significant leverage to nickel, copper and cobalt prices
$\checkmark$ Excellent potential for further exploration success and mine life extension


[^2]
## ASX:PAN

## www.panoramicresources.com

## Mission Statement

We strive to achieve excellence in all aspects of our business to provide long term capital growth and dividend return to our shareholders, a safe and rewarding work environment for our employees, and opportunities and benefits to the people in the communities we operate in.

## APPENDICES

## PANORAMIC



## SAVANNAH PROJECT - MINERAL RESOURCES

| Resource | Metal | Resource Date | JORC | Measured |  | Indicated |  | Inferred |  | Total |  | Metal Tonnes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Tonnes | (\%) | Tonnes | (\%) | Tonnes | (\%) | Tonnes | (\%) |  |
| Savannah |  |  |  |  |  |  |  |  |  |  |  |  |
| Above 900F | Nickel | Jun-16 | 2012 | 1,275,000 | 1.51 | 759,000 | 1.20 |  |  | 2,034,000 | 1.39 | 28,300 |
|  | Copper |  |  |  | 0.87 |  | 0.90 |  |  |  | 0.88 | 17,900 |
|  | Cobalt |  |  |  | 0.07 |  | 0.07 |  |  |  | 0.07 | 1,400 |
| Below 900F | Nickel | Jun-15 | 2012 |  |  | 780,000 | 1.64 | 125,000 | 1.72 | 905,000 | 1.65 | 14,900 |
|  | Copper |  |  |  | 0.76 |  | 0.75 |  |  |  | 0.76 | 6,900 |
|  | Cobalt |  |  |  | 0.10 |  | 0.09 |  |  |  | 0.10 | 900 |
| Savannah North | Nickel | Aug-16 | 2012 |  |  | 7,168,000 | 1.78 | 3,104,000 | 1.53 | 10,272,000 | 1.70 | 175,100 |
|  | Copper |  |  |  |  |  | 0.77 |  | 0.62 |  | 0.72 | 74,400 |
|  | Cobalt |  |  |  |  |  | 0.13 |  | 0.11 |  | 0.12 | 12,700 |
| Total <br> Savannah Project | Nickel |  |  |  |  |  |  |  |  |  |  | 218,300 |
|  | Copper |  |  |  |  |  |  |  |  |  |  | 99,100 |
|  | Cobalt |  |  |  |  |  |  |  |  |  |  | 14,900 |

## Notes:

- Refer to the Company's ASX Announcements of 24 August 2016 and 30 September 2016 for the relevant JORC Competent Person statements and disclosure tables
- Figures have been rounded and therefore may not add up exactly to the reported totals
- All resources are inclusive of reserves
- Resource cut-off grade is $0.50 \% \mathrm{Ni}$


## SAVANNAH PROJECT - ORE RESERVES

| Reserve | Metal | Date of Reserve | JORC <br> Compliance | Proven |  | Probable |  | Total |  | Metal Tonnes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Tonnes | (\%) | Tonnes | (\%) | Tonnes | (\%) |  |
| Above 900 Fault | Nickel | Jun-16 | 2012 | 1,365,000 | 1.15 | 194,000 | 1.24 | 1,558,000 | 1.16 | 18,100 |
|  | Copper |  |  |  | 0.66 |  | 1.28 |  | 0.74 | 11,500 |
|  | Cobalt |  |  |  | 0.06 |  | 0.07 |  | 0.06 | 900 |
|  |  |  |  |  |  |  |  |  |  |  |
| Savannah North | Nickel | Jan-17 | 2012 |  |  | 6,650,000 | 1.42 | 6,650,000 | 1.42 | 94,500 |
|  | Copper |  |  |  |  |  | 0.61 |  | 0.61 | 40,900 |
|  | Cobalt |  |  |  |  |  | 0.10 |  | 0.10 | 6,700 |
|  |  |  |  |  |  |  |  |  |  |  |
| Total | Nickel |  |  |  |  |  |  | 8,208,000 | 1.37 | 112,600 |
|  | Copper |  |  |  |  |  |  |  | 0.64 | 52,400 |
|  | Cobalt |  |  |  |  |  |  |  | 0.09 | 7,600 |

## Notes:

- Refer to the Company's ASX Announcements of 30 September 2016 and 2 February 2017 for the relevant JORC Competent Person statements and disclosure tables
- Figures have been rounded and therefore may not add up exactly to the reported totals
- Reserve cut-off grade is $0.80 \% \mathrm{Ni}$


[^0]:    *Cautionary Statement
    Approximately $1.1 \%$ of nickel in the Production Target is from material classified as Inferred Resource. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised.

[^1]:    *Long Term Prices
    The Long Term (LT) Real (2017\$) US\$ nickel and copper prices and the US\$:A\$ FX rate are consensus forecasts sourced from UBS Global I/O Miner Price Review, dated 5 October 2017. The LT Real (2017\$) US\$ cobalt price is sourced from Macquarie Bank Limited Research Report titled "Price Forecast Changes", dated 9 October 2017.

[^2]:    *Refer to Appendices

