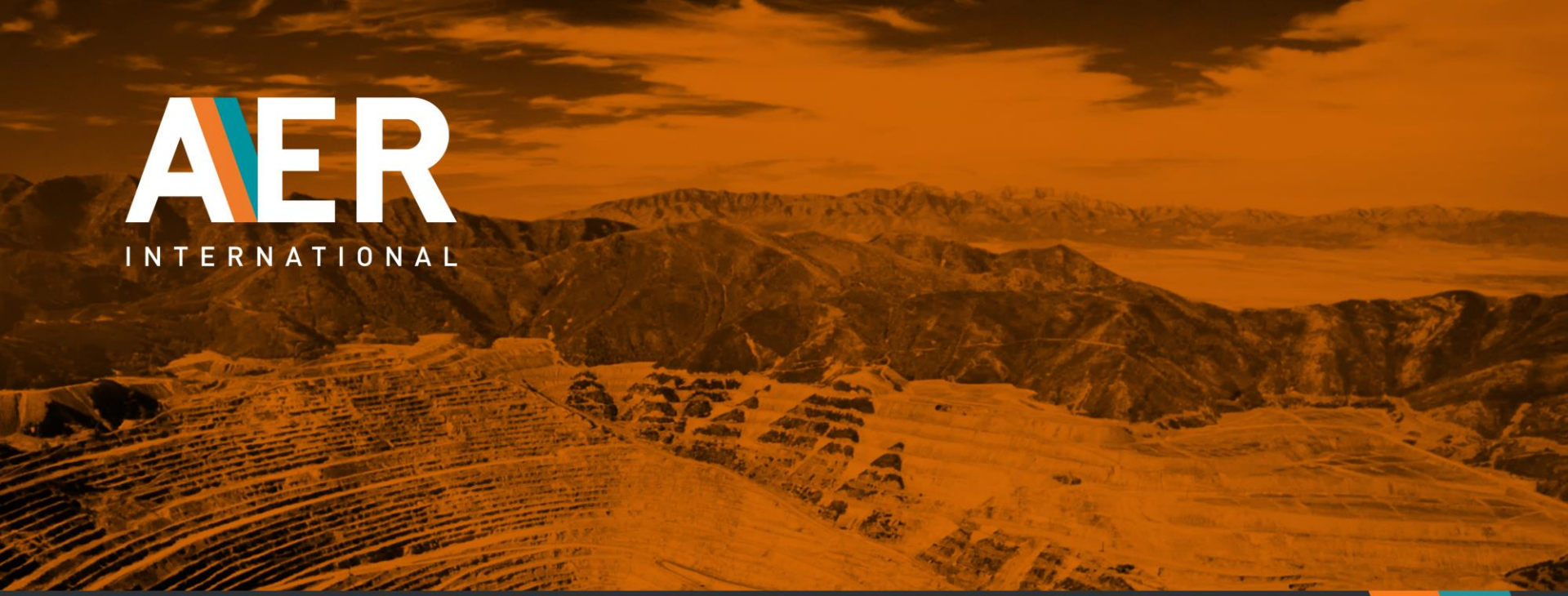

AER INTERNATIONAL

AER INTERNATIONAL QUARTERLY MARKET REPORT

Geology and Technical Services

March 2017

www.aerinternational.com

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Welcome to the quarterly AER International Market Report – Geology & Technical Services

AER International is a leading international recruitment firm dedicated entirely to the mining industry, and in particular to remote site- based roles in emerging economies. Based on many years of experience recruiting for our clients in every continent, and in multiple countries (over 35 so far) we are able to deliver in-depth, and up to date reports on the state of the labour market in this very specific environment.

As the industry continues its steady recovery and projects continue to attract funding at all stages, so we expect to see increasing demand for highly skilled people within the Geology & Technical Services fields. It has been noticeable that from Q2 2016 to date, there has been an increase in geology vacancies quarter on quarter. During the entirety of 2014 and 2015 AER International handled only three exploration vacancies for example. This quarter alone we have six live requirements for skilled explorers.

Our reports are based wholly on our own data which is constantly updated and refined. We have thousands of records and multiple data points which are instantly searchable through our CRM. The data used within this report is detailed and summarised in Section 1. ‘Our Data’.

We hope you enjoy reading the report and find it of some value in benchmarking against the market and helping to inform your decision making when considering staff attraction. Please note that what we have presented here, is a very limited sample of what we can present through our data source. Please also note that we will be providing a Market Report at least once each quarter with the next one due in July 2017.

Following on from this we will be providing reports on the following topics:

- Mind the gap – The gender imbalance in mining
- Technical Roles in Francophone Africa
- The Russosphere and the Russian Diaspora
- Latin America
- Non-Francophone Africa
- The Construction Phase
- EPC contractor v Direct Hire – where should the staffing lines be drawn?
- Asia-Pacific
- The Process Plant

If you would like us to provide your firm with a specific report on a topic important to you, that is not mentioned here, please also contact us as we can commission tailor-made reports. Comments and feedback are actively invited. We want to provide you with the best, most relevant, useful and informative reports we can, so please help us to improve!!

Christopher Hume
Managing Director,
AER International Ltd

Introduction – AER International Market Report: Geology & Technical Services

The main purpose of our reports is to give a summary of labour market conditions for owners and operators of remote mine sites. In this particular report we focus on the Geology and Technical Services disciplines.

We have identified 14 key roles that fall into categories that can be found at almost every operating mine site, with the exception of VP Exploration of course, which is not typically a site-based role. There are;

- Mine Geologist
- Chief Mine Geologist
- Resource Geologist
- Mineral Resource Manager
- Geotechnical Engineer
- Exploration Geologist
- Exploration Manager
- VP Exploration
- Surveyor
- Mining Engineer/Planning Engineer
- Senior Mining Engineer/Senior Planning Engineer
- Chief Mine Engineer
- Technical Services Superintendent
- Technical Services Manager

1. Our data

This report is based on data drawn entirely from our own records. Because we have a full time team in the UK and India dedicated to collating and maintaining accurate, consistent and up to date records we can be totally comfortable with the veracity of the results we present. We can also interrogate the data in ways that are meaningful to us and our clients.

For those reading the report we thought it would be helpful to understand the nature of the data source. If however you have questions relating to the data which you are unable to deduce from the information below, please do ask and we will endeavour to answer.

1.1 Our CRM

AER International uses a specialist recruitment CRM called Eclipse Recruitment Manager. This has been customised to specifically fit the needs of the mining industry and coded accordingly. We have seven core professional categories which are as follows; i) Geology, ii) Finance and Support, iii) Technical and Engineering, iv) Construction, v) Mechanical and Maintenance, vi) Processing and Metallurgy and vii) Corporate and C-Level. Within these categories we have numerous searchable sub-categories (under Geology there are 24 for example, including such as Hydrogeologist, Grade Control, Resource Geologist, Exploration Director, etc.) We then have a third defined area covering generic skills such as languages.

Other aspects such as salary details, notice period, FIFO roster or residential status, preferences in this regard, years of ex-pat experience etc. are contained within the AER International 'Pre-Screen' questionnaire.

We have two separate databases, one containing only those indivudal's who have been interviewed by us and have a completed AER International Pre-Screen questionnaire. The second is of individuals for whom we hold a CV but who have not yet fully processed. This report and all the information contained below, refers only to the main database with the complete records. Individuals for whom we only hold a CV but no other supporting or corroborative information are NOT included.

1. Our data

1.2 Where does our data come from?

Our data is drawn from job vacancies, placements made, CV's, the Pre-Screen questionnaire (as detailed above) and our own interview notes. For this report we have used either data from 'Placements Made' by us, or from the wider database, which would include both professionals we have secured positions for and those we have not, as well filled and as yet un-filled vacancies. Where the data is comprised only of 'Placements Made' this is indicated. Otherwise it is comprised of the wider data set.

1.3 Our data in numbers

As has been mentioned in the introduction we are a wholly specialised mining recruiter with a particular focus on staffing remote mine sites. Although we do assist with Corporate HQ roles, these make up less than 3% of our total activity. The following information therefore relates almost entirely to remote mine-site specialists.

Individual records may be divided into three categories; 'Global' Ex-pats, 'Local' Ex-pats and 'Locals'.

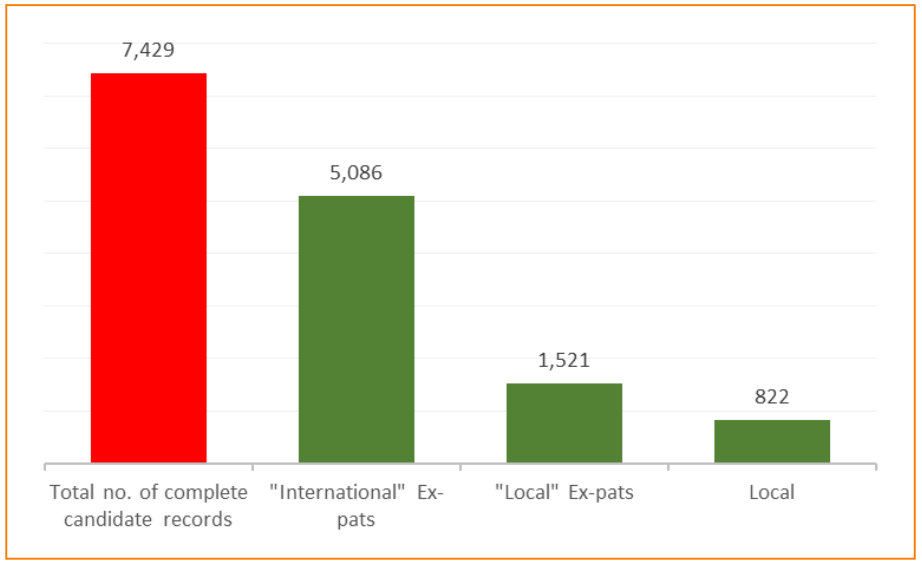

Fig. 1.1.

1. Our data

1.4 Our data in numbers

We define global ex-pats as coming from outside the region in which they are working and normally from ‘developed’ economies. The main exception to this are South African nationals who are defined as global ex-pats even when working in other African countries. ‘Local Ex-pats’ are those who work outside of their own country, but within their own region, for example Russian nationals working in Kazakhstan, Peruvians in Mexico or Tanzanians in Mali.

Mining is a global industry and this is reflected in our database which contains people from over 90 different nationalities.

The top 20 nationalities represented on the database are shown in Figure 1.2 here:

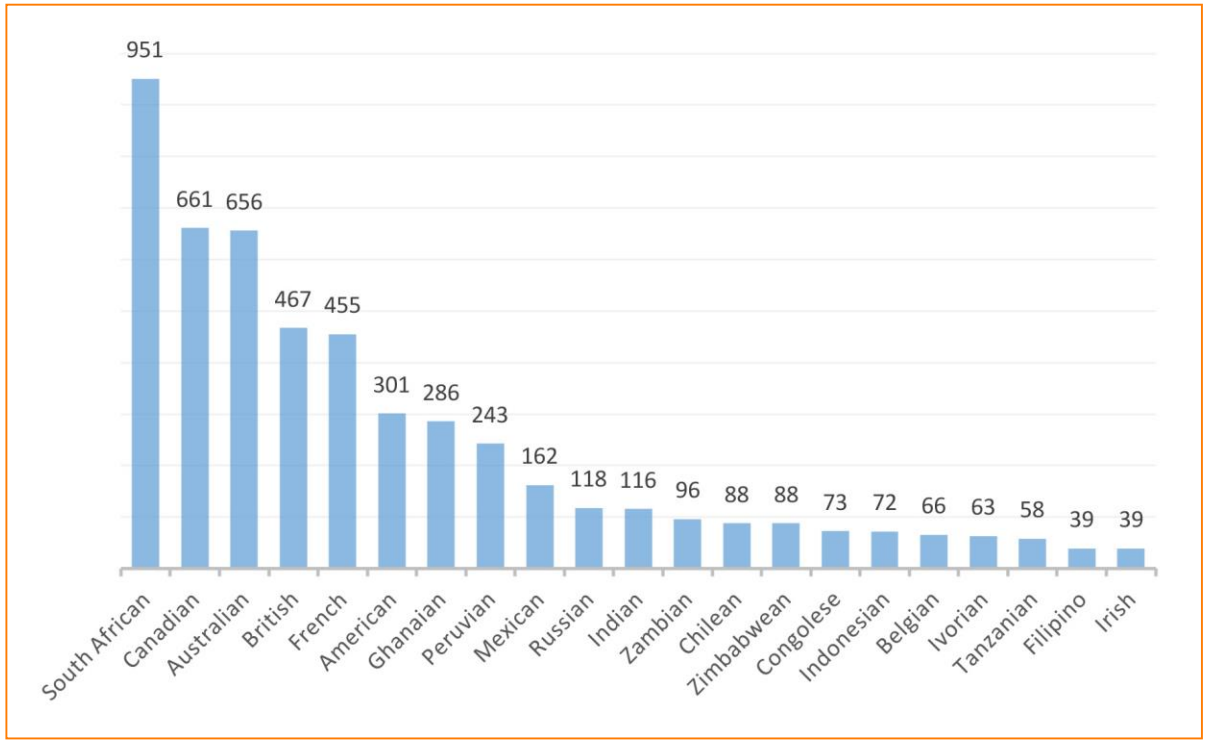

Fig. 1.2.

1. Our data

1.5. Our data in numbers

Additionally, Figure 1.5. below shows a top-level overview of the Geology & Technical Services professionals on our database and where they are currently working:

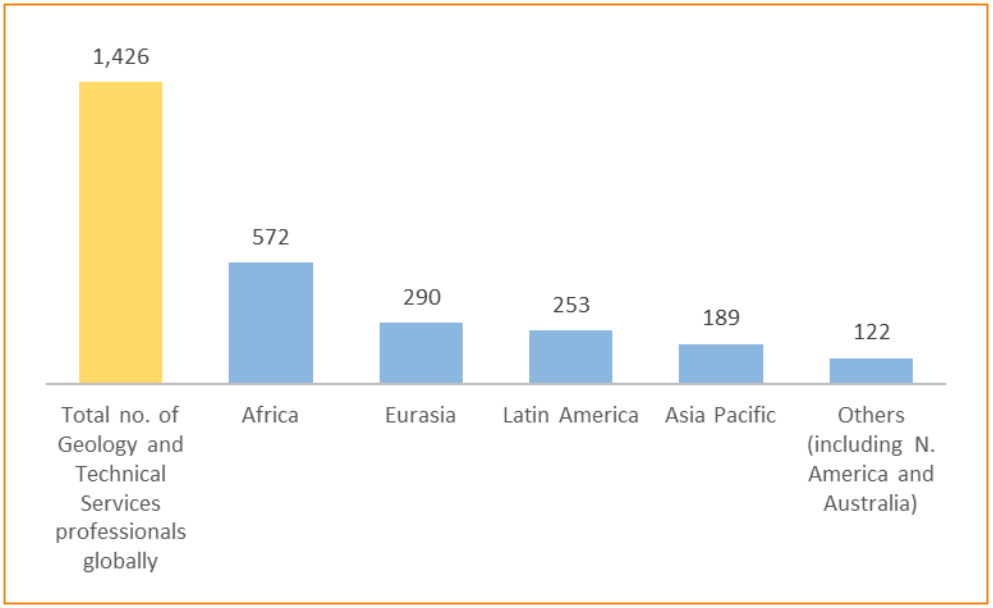

Fig. 1.3.

2. Remuneration

2.1. Salaries by key discipline

(See appendix for actual numbers)

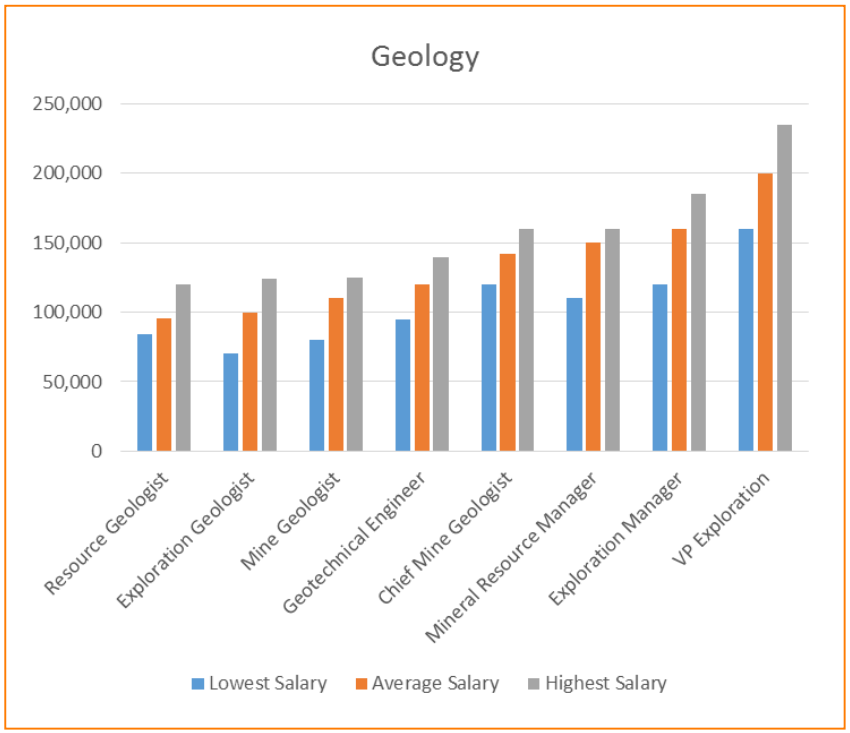

Fig. 2.1. (AER placement data)

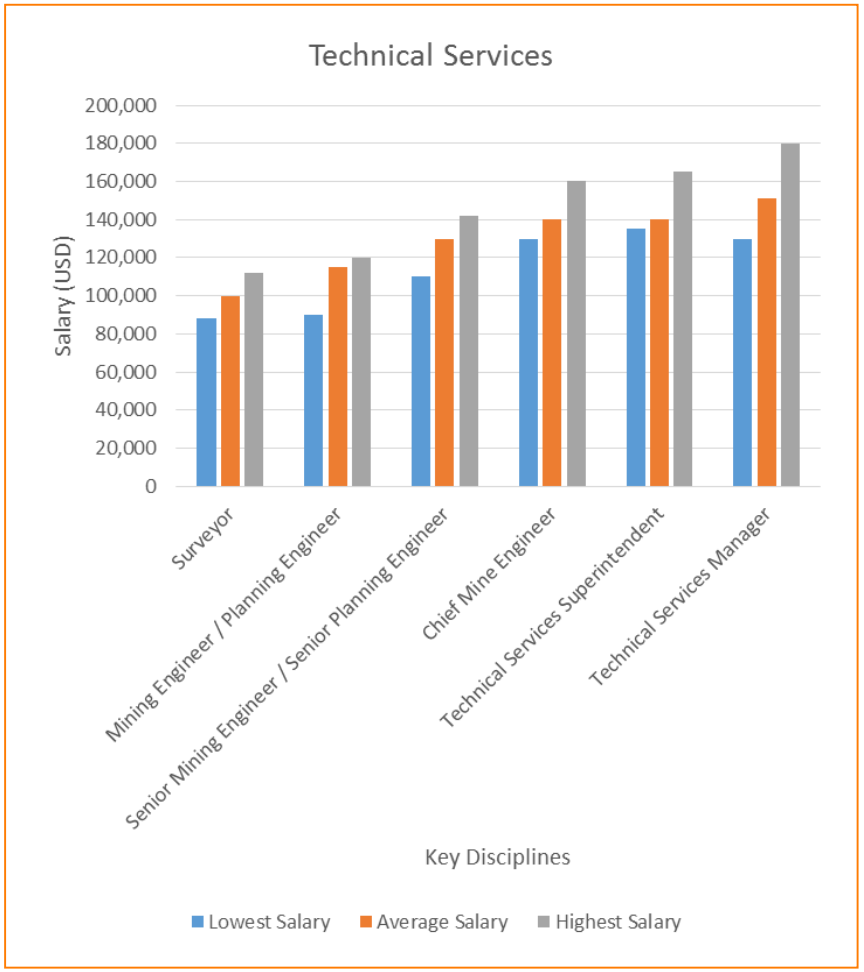

Fig. 2.1.2 (AER placement data)

2. Remuneration

2.1 Salaries by key discipline

As would be anticipated, average salaries across the board declined during the downturn. At this point in the cycle where there is still a bit of slack in the labour market, there is not much in the way of upward pressure on salaries. However, we expect this to change as more projects start ramping up and demand for site geologists and tech services personnel increases accordingly.

The biggest single fall in salary level was at the VP Exploration level, although it should be noted that as there were so few roles during 2014-2015, the sample size is very small. However, as the recovery has gathered momentum, hiring has increased across the exploration roles.

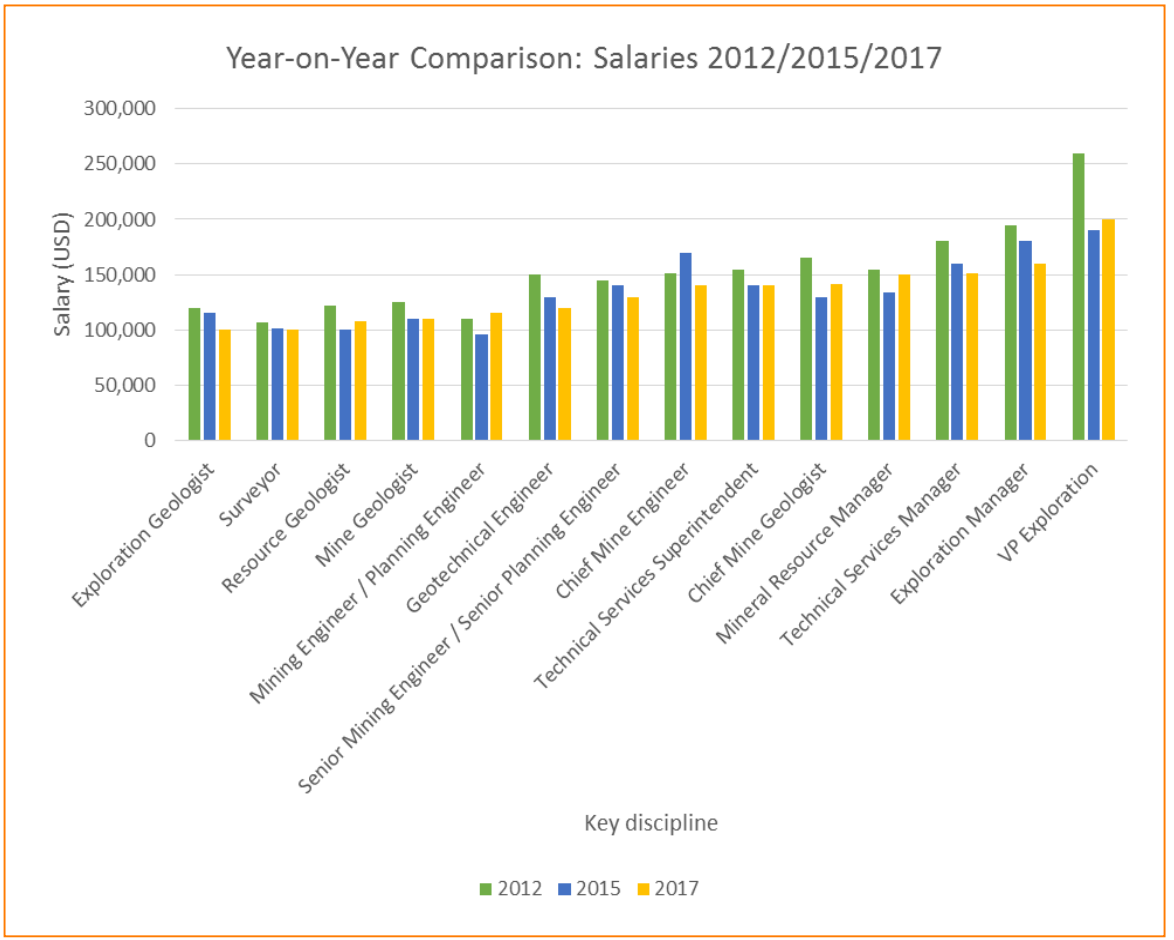

Fig. 2.1.3 (AER placement data)

2. Remuneration

2.2. Average salary by region

For the purposes of regional comparison, we have used only the dataset of global ex-pats in order to ensure fair comparison. It should be noted however, that there are regional variations in terms of the functions in which global ex-pats are typically employed. Whilst it is the case that ex-pats working in Latin America typically have higher salaries than those working in Africa, they also have higher average seniority, as the local workforce is generally better skilled and with higher educational qualifications than is often the case in Africa. Therefore, global ex-pats feature more widely at lower levels of seniority in Africa than in Latin America or Eurasia.

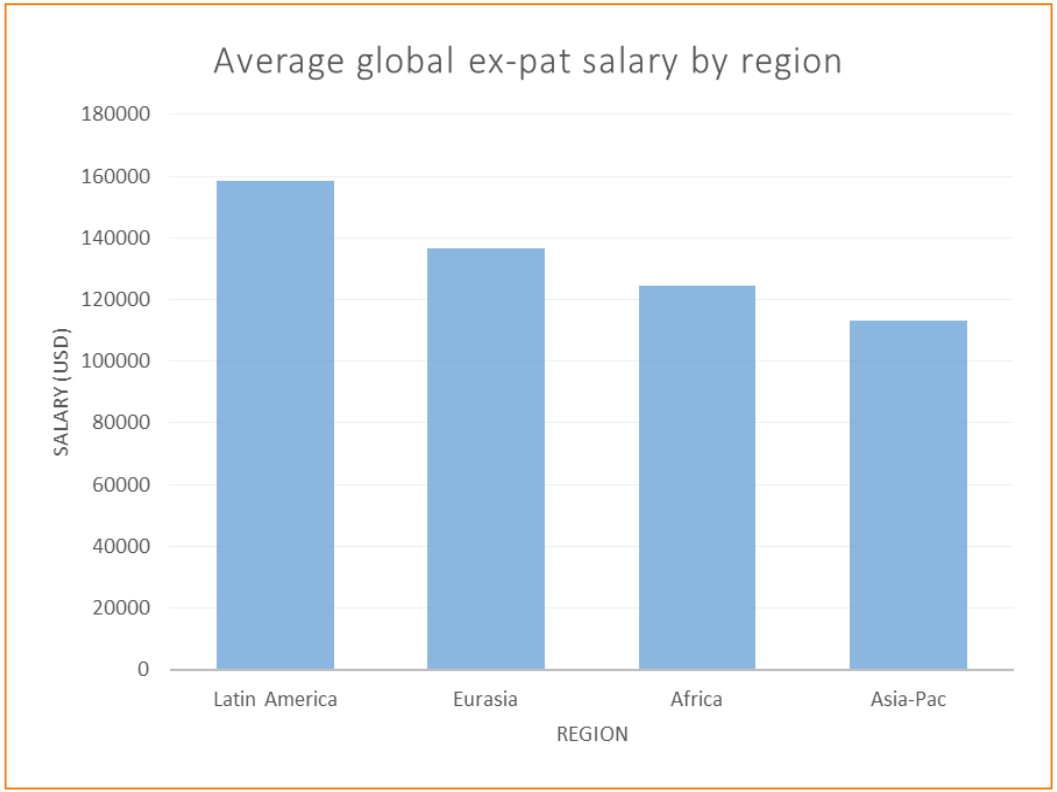

Fig. 2.2.

3. Rosters

3.1 Current roster popularity headline level

This chart reflects the number of professionals working on sites with particular rosters. There are regional variations which often reflect the proximity of expat FIFO staff to site, and we look at these by region in the following sub-sections. Overall though we can clearly see that a clear majority (60%) of FIFO professionals operate under the three most popular rosters of 6:3, 6:2 and 7:3. Variations do occur between what is considered ‘own time’ and ‘travel time’ although the most common arrangement is a 50:50 split.

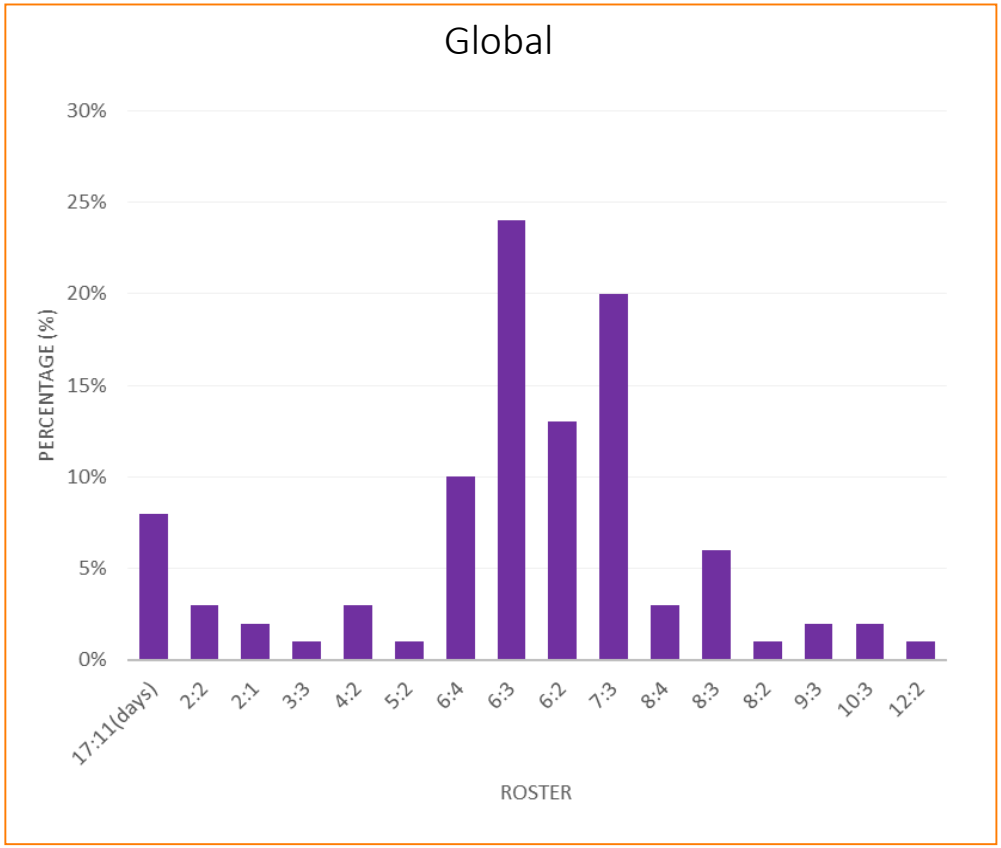

Fig. 3.1.

3. Rosters

3.2. Roster popularity by region

Within Africa and Eurasia the shorter rosters seen elsewhere, are pretty much non-existent. Some sites offer two rosters, with professionals from more proximate locations such as South Africa and Europe, being offered a choice of a shorter or longer roster (6:2 or 9:3 for example) with those from further afield such as North America or Australia, only being offered the longer option. Asia-Pac offers the most variety and generally shorter ‘swings’. This is probably because this region is dominated by ex-pats whose point of hire lies within the region itself (Australia).

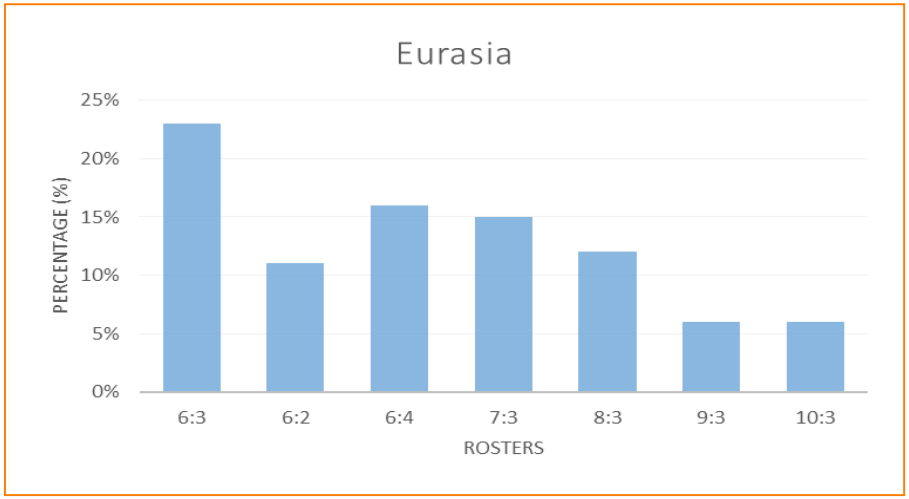

Fig. 3.2.

Fig. 3.2.1

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3. Rosters

3.2. Roster popularity by region

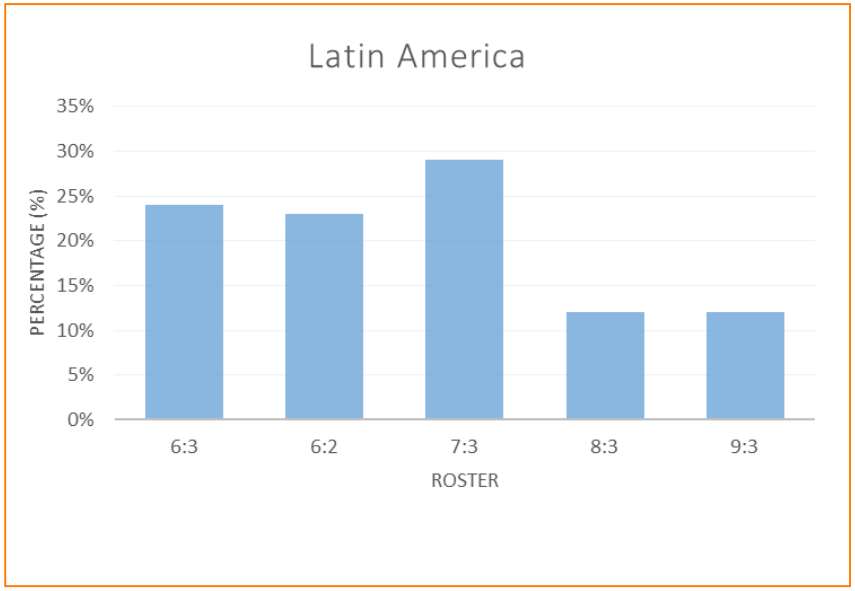

Fig. 3.2.2

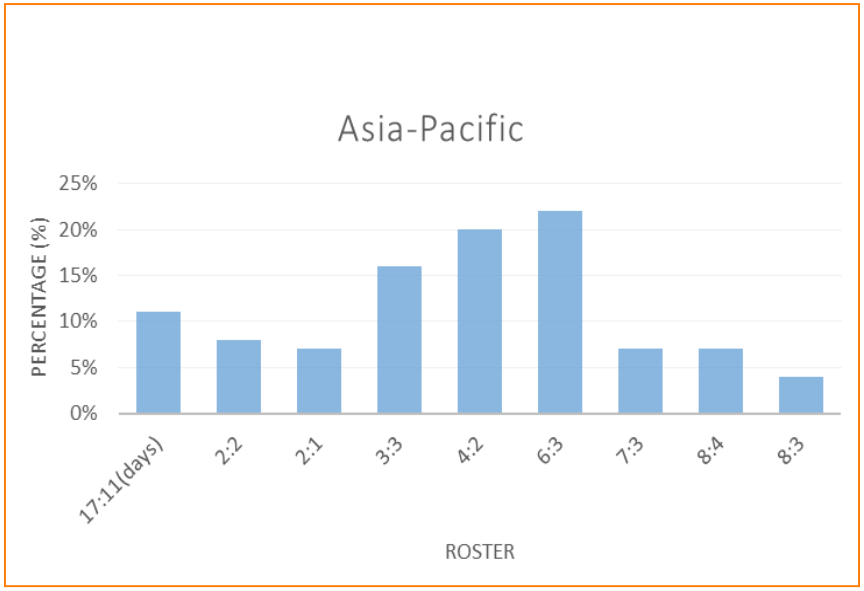

Fig. 3.2.3

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4. National origin of Geology & Technical Services professionals

4.1 National origin of Geology & Technical Services professionals

There is a wide diversity of nationalities represented in the ex-pats working within the Geology & Technical Services fields. This chart covers **all** expats, whether designated as 'local' or 'global'. Certain nationalities are found almost exclusively in the 'local ex-pat' categories such as Mexican and Ghanaian nationals. The number of Peruvian engineers (many of which work in Africa as well as in wider Latin America) suggests that where there is a developed strength within the industry locally, these skills can be exported internationally.

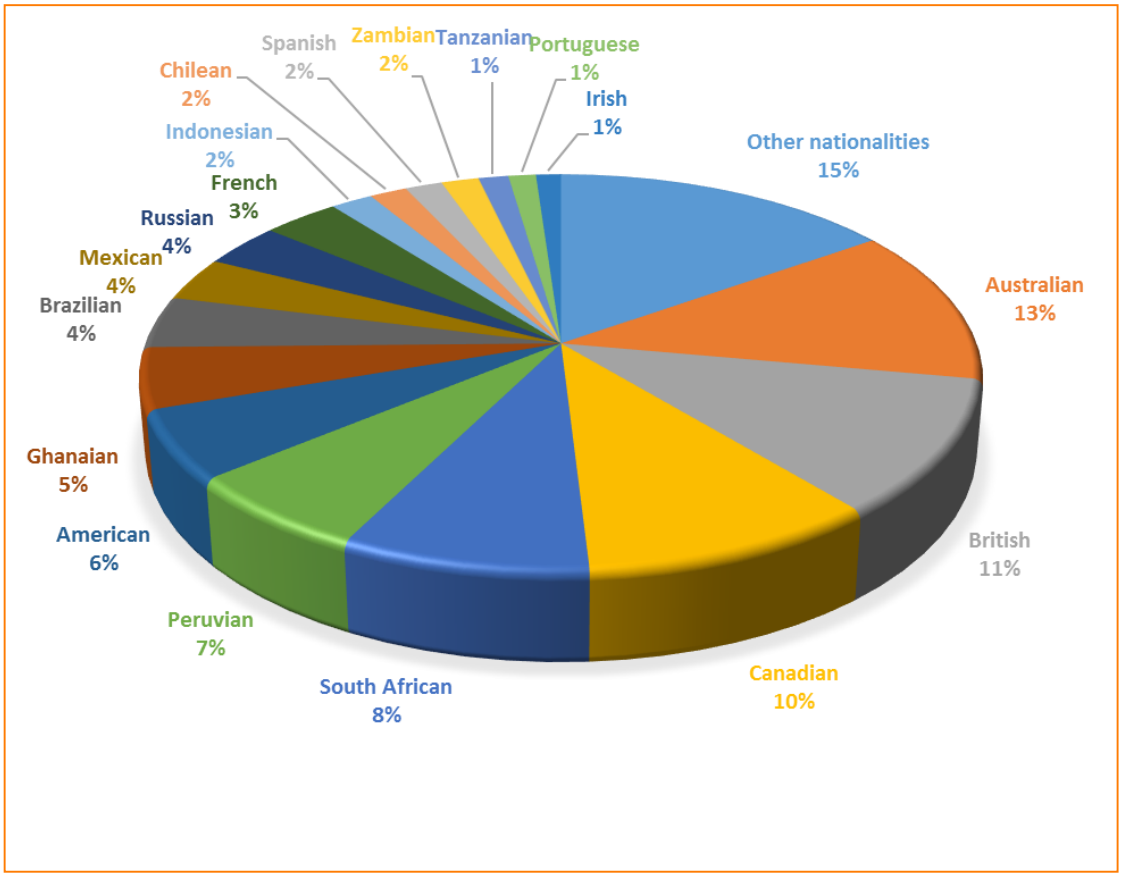


Fig. 4.1.

5. Women in Geology & Technical Services by key discipline

5.1 Percentage of female professionals by key discipline

In comparison to most site-based roles, and certainly in comparison to construction, mining operations and process plant roles, female professionals are relatively well represented within the Geology & Technical Services functions. There is little doubt that opportunities do exist to increase female representation and participation within the industry however. Our next report will explore the gender gap in mine staffing in detail.

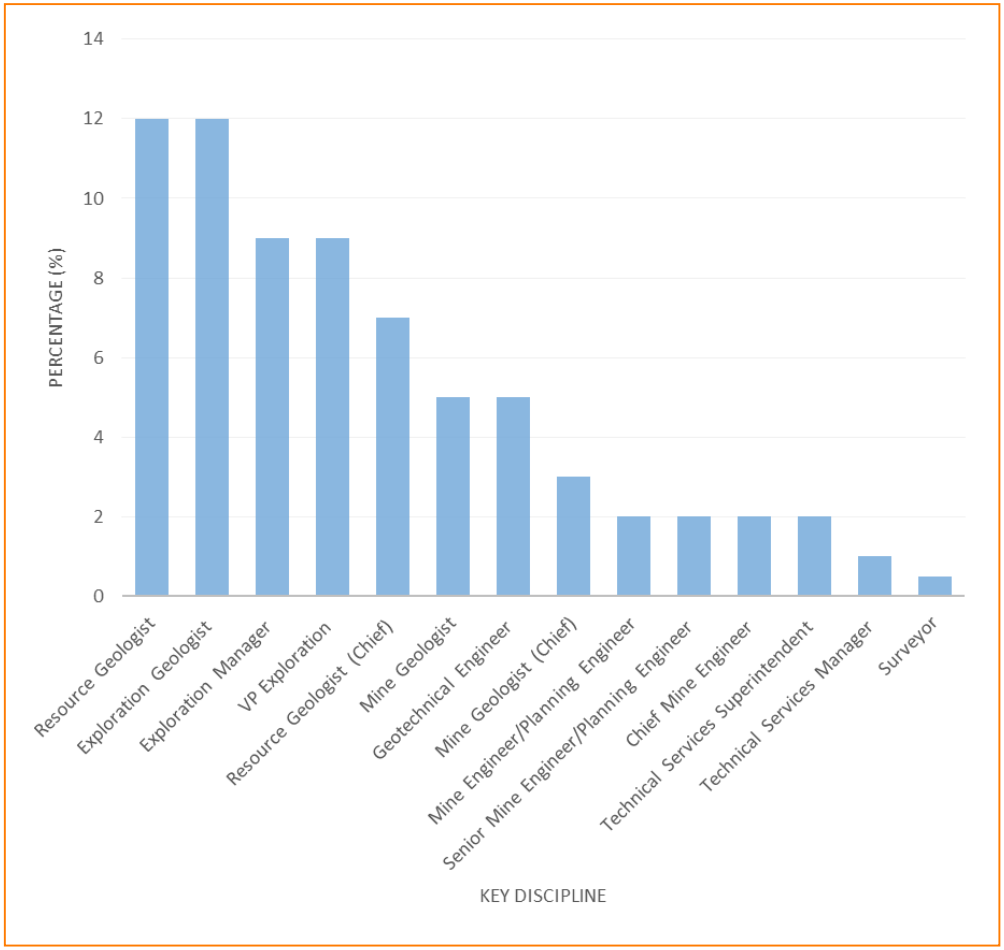
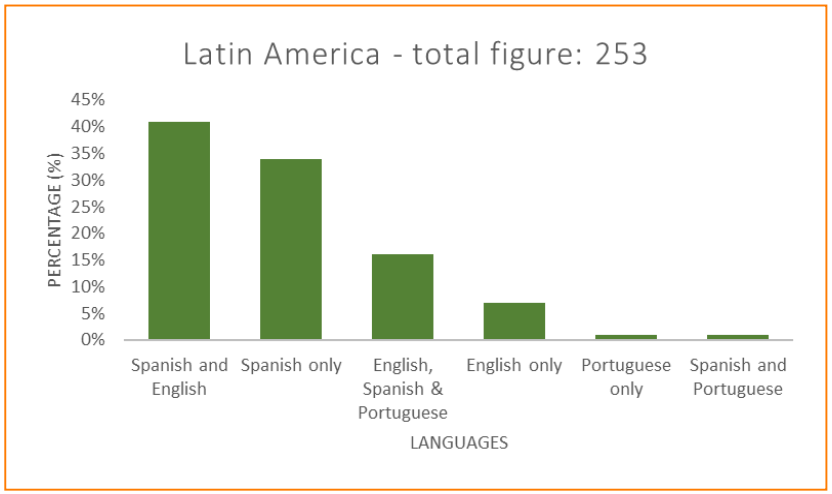


Fig. 5.1.

6. Languages spoken by region

6.1 Languages spoken by Geology & Technical Services professionals by region

This data includes only professionals who can operate day to day in the designated languages. Individuals who have some lower capability in the language are not included. Clearly language proficiency amongst ex-pats is highest amongst those in Latin America where knowledge of Spanish (in the Hispanophone countries) is almost a pre-requisite. It is noticeably lower in Eurasia and particularly in Asia-Pac where there are no one or two dominant regional languages.



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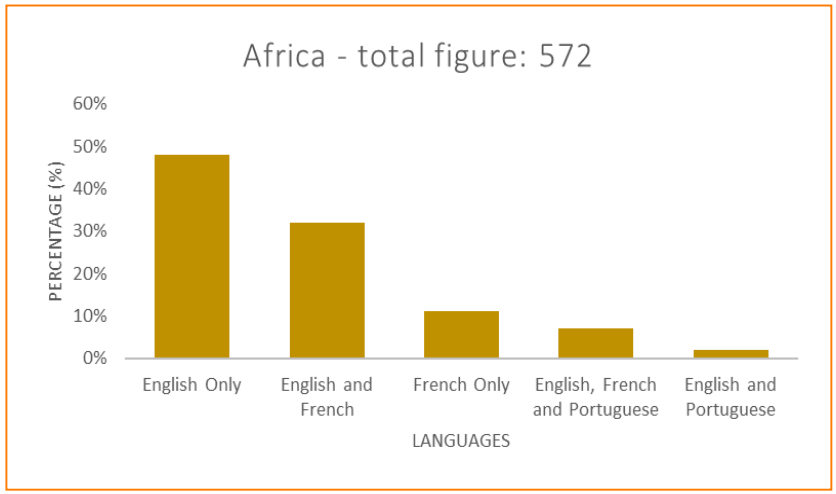


Fig. 6.1.1

6. Languages spoken by region

6.1 Languages spoken by Geology & Technical Services professionals by region

The dominant regional language in Eurasia is Russian, however, there are other local languages such as Turkish, Ukrainian, Arabic and Mongolian, that make up the ‘other’ category.

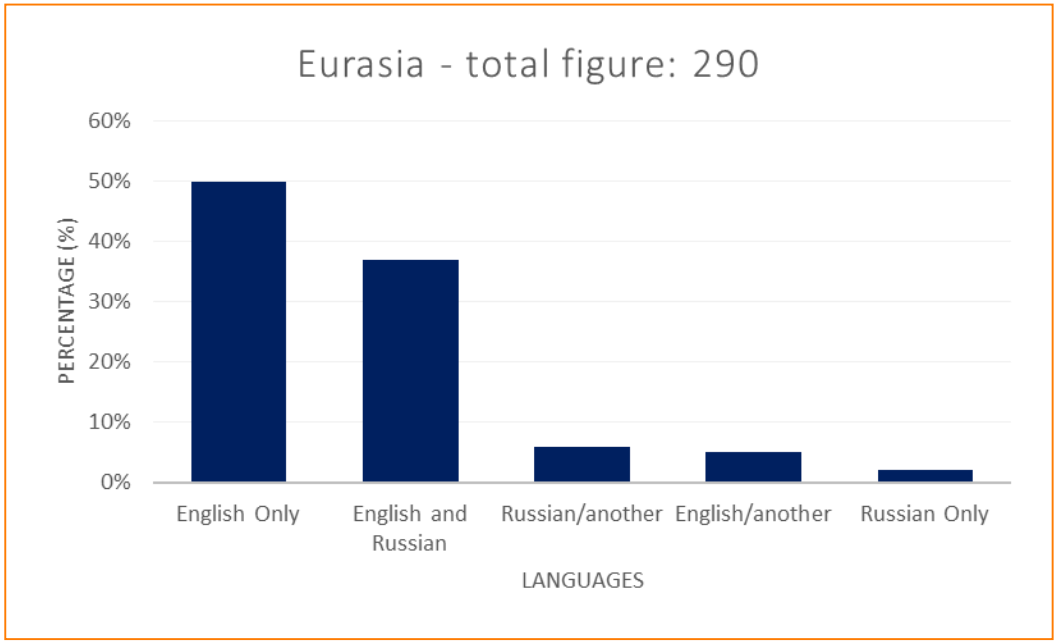


Fig. 6.1.2

7. Age Analysis: Distribution of Geology & Technical Services professionals by key discipline

In comparison to the other functions such as Mine Operations and Process Plant Operations, the demographic within geological disciplines is noticeably younger, with the vast majority of professionals under 50 years of age, and significant numbers in their 20's and 30's. The engineering and other Technical Services Management positions do not demonstrate quite such a balanced demographic, but do still show a younger age profile than is typically seen across the board on mine sites.

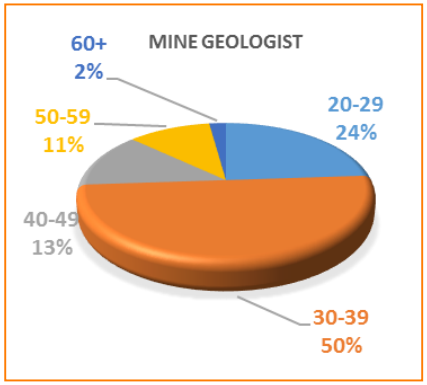
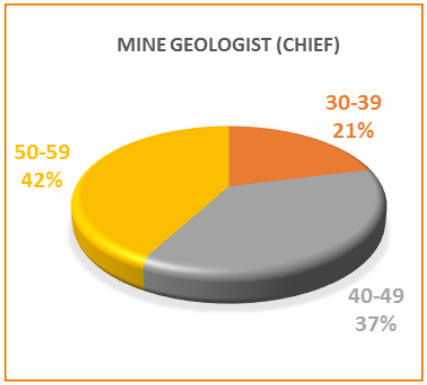


Fig. 7.1.



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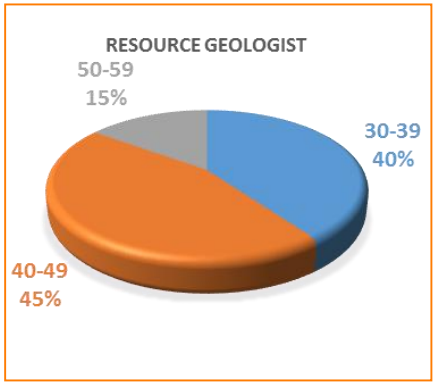

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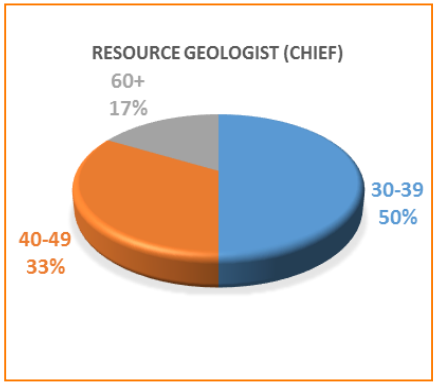
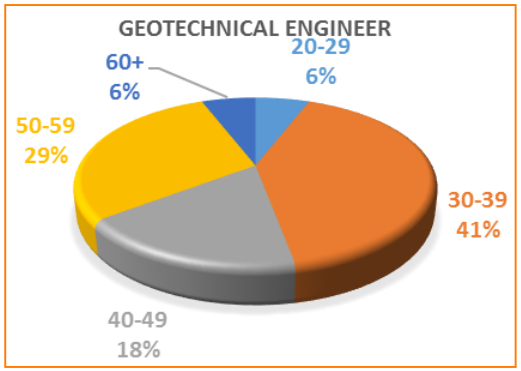


Fig. 7.4.

7. Age Analysis: Distribution of Geology & Technical Services professionals by key discipline



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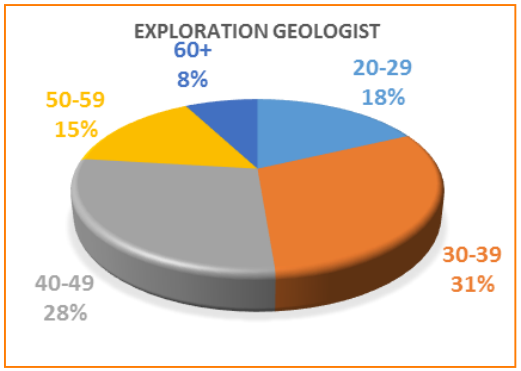

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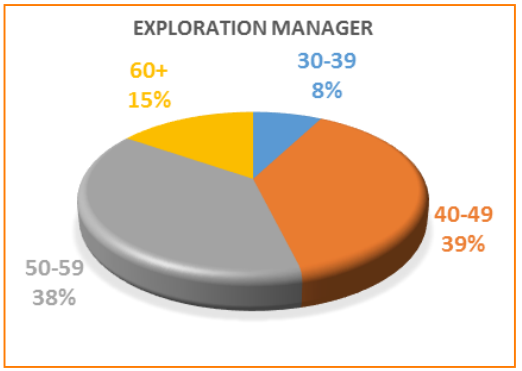

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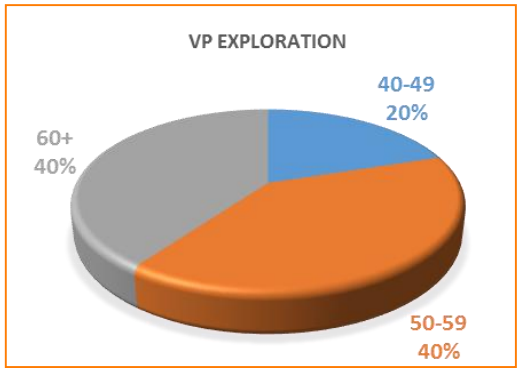

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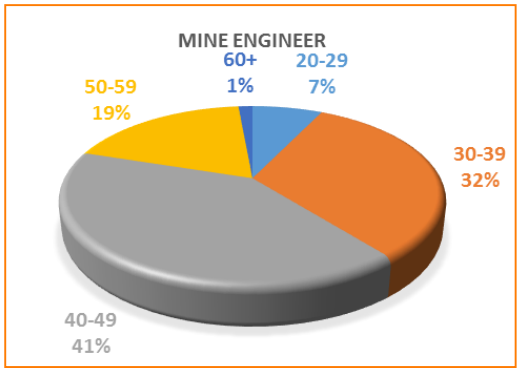

Fig. 7.9.

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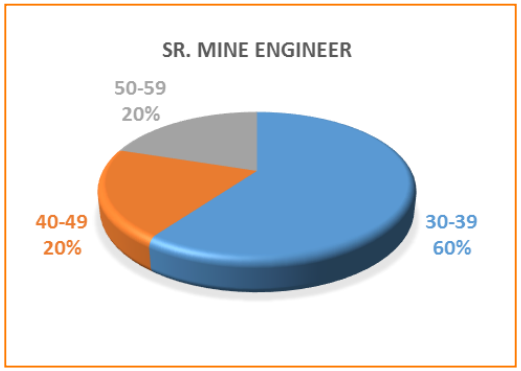

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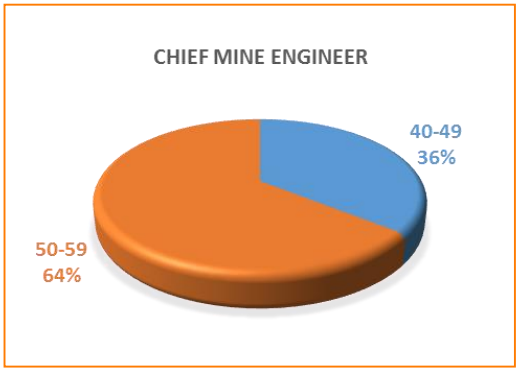

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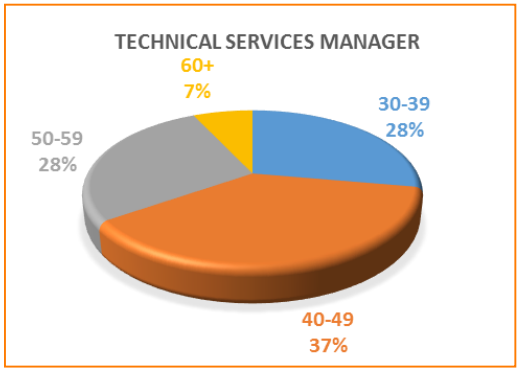

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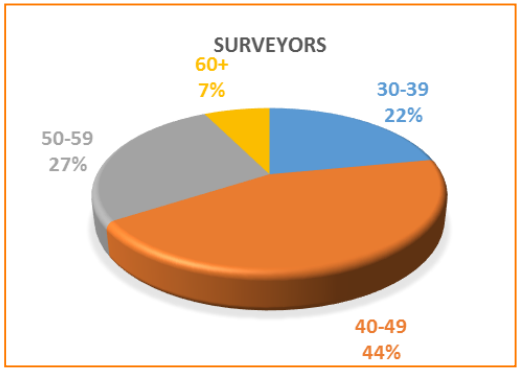

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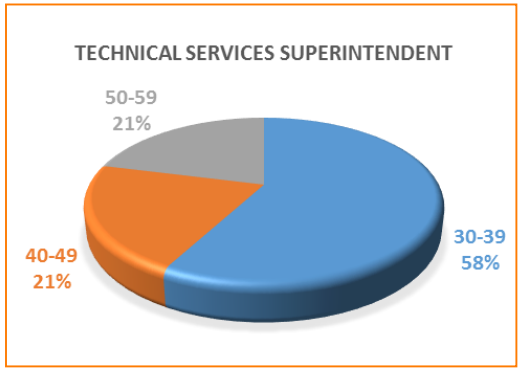

Fig. 7.14.

8. Summary/Conclusion

As the industry continues its recovery, at this stage of the cycle we observe the following:

- A notable increase in demand for both exploration and resource geologists
- No noticeable increase in demand for engineering or other technical disciplines as yet
- Salary and compensation levels across the board have not shown any noticeable upward trend as yet
- Most projected operational ramp-ups have not really began in earnest yet, so the effects of the recovery in terms of skills shortages in the technical disciplines, are not yet being felt.

In recent years, most owner operators have concentrated their efforts on existing producing assets. As these decline in output capability and costs at the margin increase, so we are now seeing a return to project funding and development. This has of course been further encouraged by rising commodity prices. As has been noted in this report, this has clearly been felt in the market for geologists. During the downturn, geology roles, and in particular exploration roles, became extremely rare and qualified applicants exceeded vacancies by a significant factor. The market is now returning to a more balanced state and we anticipate that skills shortages will start to bite towards Q4 2017.

8. Summary/Conclusion

As can be seen, salaries have fallen since the heady days of 2012. We expect to see some uptick in geology salaries this year, but it will not be significant. What we do expect to see is a lengthening of the 'time to hire' and for an increase in failed offers as candidates are able choose between competing offers. In this scenario, it is often package elements such as rosters, flight packages and other benefits, that can tip the balance in favour of one potential employer over another.

For those owner/operators looking at developing a mine site in the coming months we would counsel a well thought out plan to attract the correct staff at the correct point. Understanding the market thoroughly, including the cost and availability of the needed skills, understanding the competitive landscape and where possible building a skills pipeline will pay huge dividends in avoiding overruns and inflated costs, caused by poor or non-existent hiring. The market will tighten, and skills shortages will effect the least prepared the most.

9. Appendix

Tables:

Salaries by Key Discipline:

	Lowest Salary (USD)	Average (USD)	Highest Salary (USD)
Resource Geologist	84,000	96,000	120,000
Exploration Geologist	70,000	100,000	124,000
Mine Geologist	80,000	110,000	125,000
Geotechnical Engineer	95,000	120,000	140,000
Chief Mine Geologist	120,000	141,666	160,000
Mineral Resource Manager	110,000	150,000	160,000
Exploration Manager	120,000	160,000	185,000
VP Exploration	160,000	200,000	235,000

	Lowest Salary (USD)	Average (USD)	Highest Salary (USD)
Surveyor	88,000	100,000	112,000
Mining Engineer / Planning Engineer	90,000	115,000	120,000
Senior Mining Engineer / Senior Planning Engineer	110,000	130,000	142,000
Chief Mine Engineer	130,000	140,000	160,000
Technical Services Superintendent	135,000	140,000	165,000
Technical Services Manager	130,000	151,000	180,000

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