EXHIBIT A: AMC COMPETENT PERSON'S REPORT

AMC Consultants Pty Ltd
ABN 58 008 129 164

Level 1, 1100 Hay Street
WEST PERTH WA 6005
AUSTRALIA

T +61 8 6330 1100
F +61 8 6330 1199
E perth@amcconsultants.com
W amcconsultants.com

Competent Person's Report – Mineral Assets
PJSC Polyus

AMC Project 216081
5 June 2017

5 June 2017

The Directors
PJSC Polyus
15/1 Tverskoy Boulevard
Moscow 123104
Russian Federation

Dear Sirs

Competent Person's Report on Certain Mineral Assets of PJSC Polyus

Purpose and scope of the Competent Person's Report

PJSC Polyus (Polyus) commissioned AMC Consultants Pty Ltd (AMC) to prepare an independent Competent Person's Report (CPR) on certain mineral assets (Mineral Assets) of Polyus located in the Russian Federation (Russia) for inclusion in a prospectus (Prospectus) for a possible offering of shares and global depositary shares in Polyus (Offering).

AMC consents to the inclusion of this letter and the attached CPR (which are to be read in conjunction with each other) in the Prospectus and the inclusion of AMC's name in the form and context in which it appears in the Prospectus to be issued in connection with the Offering.

The CPR was prepared in accordance with the requirements and recommendations of:

- The United Kingdom (UK) Financial Conduct Authority (FCA) which is the United Kingdom competent authority for the purposes of Directive 2003/71/EC, as amended (Prospectus Directive).
- The Prospectus Rules and Listing Rules published by the FCA from time to time.
- The European Securities and Markets Authority – "ESMA update of the CESR recommendations – The consistent implementation of Commission Regulation (EC) No 809/2004 implementing the Prospectus Directive, 20 March 2013, ESMA/2013/319" (ESMA Recommendations) and, in particular, paragraphs 131, 132, and 133 of the ESMA Recommendations which pertain to mineral companies, save for the section on valuation of reserves, which is not required to be included herein.

Polyus is considered to be a mineral company as defined in the ESMA Recommendations paragraph 131, given that its principal activities are the extraction, refining, and sale of gold. The mining and processing facilities of Polyus are located in the Krasnoyarsk and Irkutsk regions and the Sakha Republic of Russia. Polyus also undertakes gold exploration, evaluation, and development work; the development work being primarily at the Natalka licence area located in the Magadan region and other regions of Russia.

The ESMA Recommendations paragraph 132 requires that prospectuses include information pertaining to:

a) Mineral resources, ore reserves and exploration results in accordance with an acceptable internationally recognized reporting standard.
b) Anticipated mine life and exploration potential.
c) An indication of the duration and main terms of licences and other conditions for exploring and developing those licences.
d) An indication of the progress of mineral exploration and extraction and related aspects.
e) An explanation of any exceptional factors that have influenced a) to d) above.

The CPR satisfies the requirements of the ESMA Recommendations paragraph 132 as referred to above.

In relation to acceptable codes as referred to in a) above, the CPR has also been prepared in accordance with the following mining industry codes as referred to in the ESMA Recommendations Appendix I (Appendix I):

- The JORC Code[1].
- The VALMIN Code[2] to the extent that this code is relevant to the scope of the CPR. In this regard, it should be noted that the scope of the CPR, as specified by Polyus, does not include a valuation of the Mineral Assets. The CPR includes technical assessments, as defined in the VALMIN Code, of the Mineral Assets.

Under the ESMA Recommendations paragraph 133, the Prospectus should contain a CPR that should:

a) Be prepared by an individual who:
   - Possesses the competency as prescribed by the relevant codes as referred to in relation to the ESMA Recommendations paragraph 132 above.
   - Is independent of the company, its directors, senior management and its other advisers; has no economic or beneficial interest (present or contingent) in the company or in any of the mineral assets being evaluated and is not remunerated by way of a fee that is linked to the admission or value of the issuer.

b) Be dated not more than six months from the date of the prospectus provided the issuer affirms in the prospectus that no material changes have occurred since the date of the CPR.

c) Report mineral resources and where applicable ore reserves and exploration results in accordance with one or more of the reporting standards that is acceptable under Appendix I.

d) Contain information on the company's mineral assets, having regard to the recommended content of a mining CPR as outlined in the ESMA Recommendations Appendix II (Appendix II).

The CPR satisfies the requirements of the ESMA Recommendations paragraph 133 as outlined above.

AMC's Qualifications

AMC is a firm of independent geological, mining geotechnical, mine engineering and mine management consultants offering expertise and professional advice to the exploration, mining and mining finance industries from its offices in Australia (Melbourne, Perth, Brisbane, and Adelaide), United Kingdom (Maidenhead), Canada (Toronto and Vancouver), and Singapore. AMC's activities include the preparation of due diligence reports on, and reviews of, mining and exploration projects for equity and debt funding, and for public reports.

AMC employs a total of approximately 140 staff.

AMC has extensive experience in conducting feasibility studies and reviews of Mineral Resources and Ore Reserves. AMC has undertaken over eighty assignments in the last ten years involving Mineral Resource and Ore Reserve estimation and reviews of worldwide Mineral Resources and Ore Reserves. AMC personnel have become familiar with the Polyus management team and Polyus Mineral Assets through its work on Polyus operations and projects, including preparation of a report on the Polyus 2016 Mineral Resource and Ore Reserve estimates.

AMC conducts independent assessments of Mineral Resources and Ore Reserves for the purposes of public issue documents. This is a key competency of AMC, and AMC's public reports have included:

- Australian Stock Exchange – independent technical specialist's reports in relation to takeovers, mergers and acquisitions, sale agreements, option agreements, and prospectuses.
- Hong Kong Stock Exchange – prospectus.
- Toronto Stock Exchange – technical reports.
- London Stock Exchange – AIM listings – competent person's reports.
- Singapore Stock Exchange – competent person's reports in relation to initial public offerings.

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[1] Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2012 Edition. Effective 20 December 2012 and mandatory from 1 December 2013. Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australasian Institute of Geoscientists and Minerals Council of Australia (JORC).

[2] Australasian Code for Public Reporting of Technical Assessments and Valuations of Mineral Assets The VALMIN Code 2015 Edition, Prepared by the VALMIN Committee, a joint committee of the Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists.

The members of AMC's team who prepared the CPR are listed in the Appendix to the CPR. They include:

- Mr Mark Chesher who has overall responsibility for preparation of the CPR. He has 30 years of experience in the mining industry in a broad range of operations, management and senior technical roles. He is AMC's Open Pit Manager, based in Perth, Australia and is a Fellow and Chartered Professional of the Australasian Institute of Mining and Metallurgy.
- Mr Lawrie Gillett, who led AMC's peer review of the CPR. He has 40 years of experience in the mining industry and is AMC's Practice Leader – Corporate Consultancy Australia, and is a director of AMC's parent company. He is a Fellow and Chartered Professional of the Australasian Institute of Mining and Metallurgy, and is a Graduate Member of the Australian Institute of Company Directors.

AMC's Independence

AMC has undertaken several technical consulting assignments on the Mineral Assets for Polyus or related companies during 2013 to 2017. In all these assignments, AMC acted as an independent party and has no pecuniary interest in the performance of the Mineral Assets.

AMC's consulting assignments for Polyus comprise:

- Mineral Resource estimation for Olimpiada, Blagodatnoye, Verninskoye, the Alluvials, Kuranakh, Natalka, Sukhoi Log, Poputninskoye, Chertovo Koryto, Bamskoye, and Medvezhy.
- Ore Reserve estimation for Olimpiada, Blagodatnoye, Verninskoye, the Alluvials, Kuranakh, Natalka, and Chertovo Koryto.
- Assistance with early identification of problems and mine planning at Natalka, and contribution to an optimization study for Natalka.
- Evaluation of mine plans for Verninskoye and Chertovo Koryto to assist with planning and technical ranking of development options for the region.
- Overall reporting of Mineral Resources and Ore Reserves for the Mineral Assets.
- Preparation of the attached CPR for inclusion in the Prospectus.

For these consulting assignments and preparation of the CPR, AMC was paid a fee according to its normal per diem rates and being reimbursed for out-of-pocket expenses related to the preparation. AMC has also submitted proposals to Polyus for other technical consulting assignments. Polyus has commissioned others to do the work in some of those instances and, in other instances, AMC has not been advised as to whether its proposals have been accepted or not.

Neither AMC nor the contributors to the CPR have any interest, direct or indirect, in Polyus, its subsidiaries or associated companies that could be reasonably construed to affect their independence, and will not receive benefits other than the fee paid to AMC in connection with preparation of the CPR. That fee paid to AMC is not dependent on the findings of the CPR. Therefore, AMC does not have any pecuniary or other interests that could reasonably be regarded as capable of affecting its ability to provide an unbiased opinion in relation to the estimates of Mineral Resources, Ore Reserves, and the projections and assumptions as presented and opined upon by AMC and reported herein.

AMC does not, nor do its directors or employees, have any other business relationship with Polyus or related companies other than the carrying out of individual consulting assignments as engaged. AMC does not have any relationship with the advisors to the Offering, and has had no part in formulation of the Offering or interest in the outcome of the Offering.

Based on the above, AMC concludes that it is independent.

AMC's sources of information

Principal sources of information considered by AMC in the preparation of the CPR are listed in section 11 of the CPR. That list is not exhaustive.

AMC visited the following sites of the Mineral Assets:

- Natalka — numerous occasions through 2014, 2015 and 2016
- Verninskoye — 28 September 2015 to 1 October 2015
- Medvezhy — 28 September 2015 to 1 October 2015

- Kuranakh 22 September 2015 to 25 September 2015
- Blagodatnoye 11 October 2016 to 19 October 2016
- Olimpiada 11 October 2016 to 19 October 2016
- Titimukhta 11 October 2016 to 19 October 2016
- Poputninskoye 20 October 2016 to 22 October 2016
- Bamskoye 20 January 2016 to 23 January 2016
- Alluvials 18 January 2017 to 19 January 2017
- Sukhoi Log 19 January 2017

AMC has not visited Chertovo Koryto. The site can currently only be accessed in the summer months and, therefore, there has not been an opportunity to visit the site since AMC was engaged to prepare the CPR. Polyus has planned that AMC will visit Chertovo Koryto during the coming summer.

For the purposes of preparing the CPR, AMC has reviewed material technical reports and management information and held discussions with management staff of Polyus. AMC has not audited the information provided to it, but has aimed to satisfy itself that all of the information was prepared in accordance with proper industry standards and is based on data that AMC considers to be of acceptable quality and reliability. Where AMC has not been so satisfied, AMC has included comment in the CPR and made appropriate modifications in the estimates and forecasts provided by AMC in the CPR.

In correspondence relating to AMC's commission by Polyus to prepare the CPR, Polyus agreed to comply with those obligations of the commissioning entity under the VALMIN Code including that to the best of its knowledge and understanding, complete, accurate and true disclosure of all relevant material information will be made. Polyus has represented in writing that to the best of its knowledge, it has provided AMC with all material information relevant to its Mineral Assets as described in the CPR.

In preparing the CPR, AMC has relied on information provided by Polyus, and AMC has no reason to believe that information is materially misleading or incomplete or contains any material errors.

By way of Polyus's acceptance of AMC's proposal to prepare the CPR, Polyus has agreed to release and indemnify AMC for any loss or damage howsoever arising from AMC's reliance on any information provided by Polyus in connection with the CPR that is materially inaccurate or incomplete.

Polyus was provided with drafts of the CPR to enable correction of any factual errors and notation of any material omissions. The views, statements, opinions and conclusions expressed by AMC are based on the assumption that all data provided to it by Polyus are complete, factual and correct to the best of its knowledge. The CPR and the conclusions in it are effective at 31 December 2016. Those conclusions may change in the future with changes in relevant metal prices, exploration and other technical developments in regard to the Mineral Assets and the market for mineral properties.

Inherent mining risk

Open pit and underground mining is carried out in an environment where not all events are predictable. Whilst an effective management team can, firstly, identify the known risks, and secondly, take measures to manage and mitigate these risks, there is still the possibility for unexpected and unpredictable events to occur. It is therefore not possible to completely remove or mitigate all risks or state with certainty that an event that may have a material impact on the operation of a mine, will not occur.

There are additional economic risks associated with the development and mining of gold deposits due to the difficulty of accurately estimating their metal content due to the frequently spotty and discontinuous distribution of the gold mineralization.

The achievability of the estimates and projections as included in the CPR are neither warranted nor guaranteed by AMC. They cannot be assured; they are necessarily based on technical and economic assumptions, many of which are beyond the control of Polyus or AMC. Future cash flows and profits derived from such estimates and projections are inherently uncertain and actual results may be significantly more or less favourable.

Effective date

The effective date (Effective Date) of the CPR is deemed to be 31 December 2016. To the knowledge of AMC, and as informed by Polyus, there is no material change in respect of the Mineral Assets since 31 December 2016, apart from depletion due to normal mining activities and the acquisition by Polyus of its interest in the Sukhoi Log project. The Mineral Resources and Ore Reserves are presented as at 31 December 2016, with the exception of Sukhoi Log, and the CPR is based on technical information available to that date.

AMC is not aware of material change since the Effective Date that has any material impact on the opinions expressed in the CPR, apart from the acquisition by Polyus of its interest in the Sukhoi Log project.

AMC is of the opinion that the metal prices used in estimating Mineral Resources and Ore Reserves, and the assessments of mine and project economics as presented in the CPR are appropriate at the Effective Date and, consequently, the estimates Ore Reserves and Mineral Resources remain valid.

The CPR and the conclusions and opinions expressed in it are effective as at the Effective Date. Those conclusions and the opinions expressed may change in future with changes in gold prices and currency exchange rates, operating and capital costs, and exploration and other technical developments that relate to the Mineral Assets.

Reliance

This letter is addressed to and stated as being capable of being relied upon by the Directors of the Board of Polyus.

AMC is responsible for the CPR as part of the Prospectus and for all of the information in the Prospectus that has been extracted directly from the CPR and declares that it has taken all reasonable care to ensure that the CPR and the information extracted therefrom and included in the Prospectus is, to the best of its knowledge, in accordance with the facts and contains no omission likely to affect its import.

AMC confirms that the presentation of information contained elsewhere in the Prospectus which relates to information in the CPR is accurate, balanced and not inconsistent with the CPR. AMC notes that the CPR has undergone regulatory review.

Limitations

AMC believes that its opinion must be considered as a whole and that selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in the CPR.

The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary. The CPR should always be presented and read in full.

AMC’s assessments in relation to the estimates of Mineral Resources and Ore Reserves and forecasts are based on information provided by Polyus throughout the course of AMC’s investigations, which in turn reflect various technical-economic conditions prevailing at the Effective Date. In particular, the estimates of Ore Reserves and economic assessments are based on expectations regarding the commodity prices and exchange rates prevailing at the Effective Date. These can change significantly over relatively short periods of time. Should these change materially, the estimates and assessments could be materially different in these changed circumstances. Further, AMC has no obligation or undertaking to advise any person of any change in circumstances which comes to its attention after the date of the CPR or to review, revise or update the CPR or opinion.

The CPR includes technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, AMC does not consider them to be material.

Consent

AMC has given and has not withdrawn its written consent to the inclusion of this covering letter and the CPR in the Prospectus and references to the CPR in each case and its name in the form and context in which they are included in the Prospectus.

Yours faithfully

MD Chesher
F AusIMM
Principal Mining Engineer

LJ Gillett
F AusIMM
Practice Leader - Corporate Consultancy Australia

Competent Person's Report
Polyus Mineral Assets

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Appendix

Qualifications and Experience of the Contributors to the Competent Person's Report

1 Introduction

1.1 Background

The principal activity of PJSC Polyus (Polyus) is gold production by mining and processing ore from hard rock and alluvial gold deposits. The gold mining and processing operations of Polyus are located in the Krasnoyarsk, Irkutsk, and the Republic of Sakha (Yakutia) regions of the Russian Federation (Russia). Polyus's current major development project is located in the Magadan region of Russia. Polyus also conducts mineral exploration and evaluation in Russia in support of its gold production activities.

Polyus is reported to be the largest gold producer in Russia and the eighth largest gold producer in the world. Polyus's gold production in 2016 was 2.0 Moz.

Polyus has announced a possible offering of shares and global depository shares in Polyus (Offering).

The UK Listing Authority (UKLA) requires Polyus to issue a prospectus in relation to the Offering (Prospectus), and that the Prospectus include an independent Competent Person's Report (CPR) on its mineral assets.

Polyus commissioned AMC Consultants Pty Ltd (AMC) to prepare this CPR on certain mineral assets (Mineral Assets) for inclusion in the Prospectus. This CPR is an attachment to AMC's covering letter dated 5 June 2017 and must be read in conjunction with that covering letter.

The operations, and development and exploration projects that comprise the Mineral Assets are listed in Table 1.1. They are all gold assets, with the exception of Burgakhchany, which is a porphyry copper exploration project. In this CPR, the licence number, and grant and expiry dates and other information concerning the key mining licences for the Mineral Assets are presented in the mineral tenure section for each asset.

The Mineral Assets are located as shown in Figure 1.1.

Polyus also has exploration projects which, based on information provided by Polyus, are not considered to be material for the purposes of this CPR, and are not considered in this CPR.

Table 1.1 Polyus - Mineral Assets considered in CPR - by region

Mineral Asset	Region
Mines in Operation	
Olimpiada	Krasnoyarsk
Blagodatnoye	Krasnoyarsk
Titimukhta	Krasnoyarsk
Verninskoye	Irkutsk
Alluvials	Irkutsk
Kuranakh	Yakutia
Mine in Construction	
Natalka	Magadan
Development and Exploration Projects	
Sukhoi Log	Irkutsk
Panimba	Krasnoyarsk
Razdolinskoye – Poputninskoye[1]	Krasnoyarsk
Razdolinskoye – Zmeinoye[1]	Krasnoyarsk
Chertovo Koryto	Irkutsk
Bamskoye	Amur
Burgakhchany	Chukotka
Medvezhy	Irkutsk
Degdekan	Magadan

1 Both Poputninskoye and Zmeinoye are two main deposits within the larger Razdolinskoye project area.

Figure 1.1 Polyus - Mineral Assets - locations

An overview of the Mineral Assets is:

Krasnoyarsk region:
Polyus's principal mineral assets in the Krasnoyarsk region are the Olimpiada, Blagodatnoye, and Titimukhta open pit gold mines, which operate under the Krasnoyarsk Business Unit (KBU), and the Razdolinskoye (including Poputninskoye and Zmeinoye) and Panimba gold development projects. The locations of these assets within the Krasnoyarsk region are shown in Figure 1.2. Based on the estimated Ore Reserves as at 31 December 2016, the scheduled life-of-mine for Olimpiada (combined with Titimukhta) is 31 years and for Blagodatnoye is 18 years.

Figure 1.2 Krasnoyarsk region - Mineral Assets – locations

Olimpiada commenced production in 1996 and, in 2016, produced approximately half of the total gold produced by Polyus. Olimpiada is the largest gold mine in Russia with 11.3 Mt of ore being processed in 2016. Polyus plans to evaluate underground mining at depth at Olimpiada, in addition to the current open pit operation.

The Blagodatnoye and Titimukhta operations are also located in the Krasnoyarsk region.

Blagodatnoye is located 25 km north of the Olimpiada mine.

The proximity of Blagodatnoye to Olimpiada has allowed Polyus to utilize some of its existing and available social, maintenance and warehousing infrastructure when developing the Blagodatnoye operation. Construction of the mine was commenced in 2007, and the process plant was commissioned in 2010 with a nominal capacity of 6 million tonnes of ore per year. In 2016, the Blagodatnoye mine accounted for 23 per cent of the total gold production of Polyus.

Titimukhta is located 9 km north-west of the Olimpiada mine.

The close proximity of the Titimukhta deposit to the Olimpiada mine allows Polyus to use Olimpiada's facilities for mining and processing the Titimukhta deposit. Processing of the oxidized ore from the Olimpiada deposit concluded in 2008, enabling Polyus to use Plant No.1 at the Olimpiada mine to process ore from the Titimukhta deposit, following reconstruction of that plant which was completed in 2009. After completion of another upgrade in September 2016, Plant No.1 can now be configured to process ore from either Olimpiada or Titimukhta.

In 2016, the Titimukhta mine accounted for only 2 per cent of the total gold production of Polyus.

The Panimba deposit is located approximately 36 km south-east of the Olimpiada processing complex. It is an exploration project that is being considered for future development by the Krasnoyarsk Business Unit.

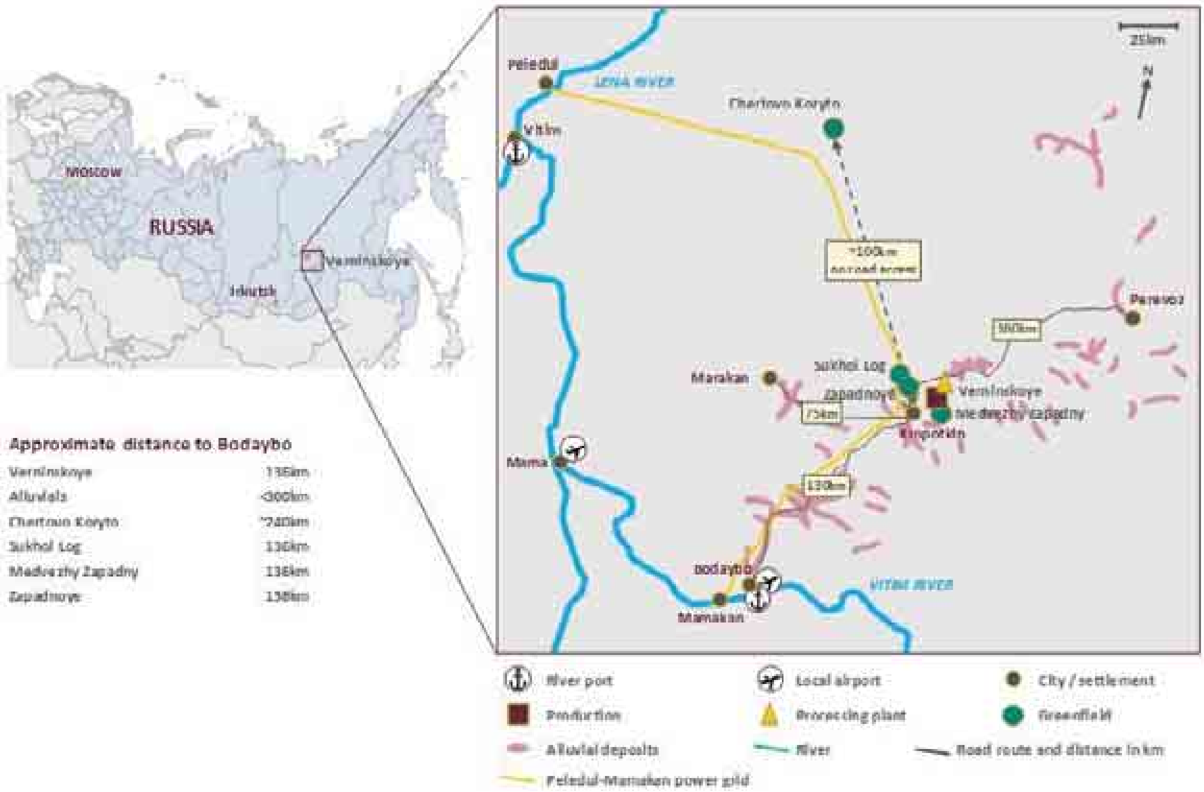
The Razdolinskoye gold development project is located approximately 240 km to the south of the Olimpiada mine, and comprises nine mineralized zones, including the Poputninskoye and Zmeinoye deposits. The Poputninskoye deposit is the most advanced part of the Razdolinskoye project, with trial mining having been conducted. Polyus is evaluating options for development of Razdolinskoye.

Irkutsk region:

Polyus's principal mineral assets in the Irkutsk region are the operating Verninskoye open pit gold mine and the Alluvials, the Sukhoi Log and Chertovo Koryto development projects, the Medvezhy exploration project for which a Mineral Resource has been estimated, and the suspended Zapadnoye open pit gold mine. The locations of these assets within the Irkutsk region are shown in Figure 1.3. Based on the estimated Ore Reserves as at 31 December 2016, the scheduled life-of-mine for Verninskoye is 33 years, for the Alluvials is 9 years, and for the Chertovo Koryto development project is 18 years (from the commissioning date). There is no reported Ore Reserve or Mineral Resource for Zapadnoye as at 31 December 2016.

Polyus acquired its interest in the Sukhoi Log development project on 21 February 2017. The licence area containing the suspended Zapadnoye gold mine abuts the Sukhoi Log development project. Polyus indicates that resources for both projects may be considered jointly in future studies to maximize the benefits from both projects. Sukhoi Log is one of the largest undeveloped gold deposits in the world and has a reported Mineral Resource of 58 Moz of gold. An Ore Reserve has not been estimated for the project but should follow based on additional technical studies to be conducted.

Figure 1.3 Irkutsk region - Mineral Assets – locations



Verninskoye is located in the northern part of the Irkutsk region, in the Bodaybo district near the town of Kropotkin.

Development of the Verninskoye mine began in 2006 and the operation was fully commissioned in 2012 with a processing plant capacity of 2.2 Mtpa. Polyus has continued to evaluate options for expanding the Verninskoye processing plant capacity and in 2016, 2.5 Mt was processed.

In 2016, the Verninskoye mine accounted for 10 per cent of the total gold production of Polyus.

The Alluvials operations are located close to the Verninskoye mine. Mineral Resources and Ore Reserves are located across 90 licences and registered for use by six Polyus subsidiary companies. Production is derived from various alluvial deposits, amounting to approximately 9 per cent of Polyus's total gold production in 2016, despite limited Mineral Resources and Ore Reserves.

The Chertovo Koryto advanced development project is located approximately 200 km north of Bodaybo and approximately 100 km from the Verninskoye mine. It is in a remote area and there is no permanent road access. Polyus is evaluating options for developing Chertovo Koryto.

Republic of Sakha (Yakutia region):

Polyus's principal mineral asset in the Yakutia region is the Kuranakh open pit gold mine which is located approximately 400 km south of the capital city of Yakutsk, 300 km north of the transportation hub of Neryungri, and 25 km north of the service centre of Aldan. The location of this asset within the Yakutia region is shown in Figure 1.4. Based on the estimated Ore Reserves as at 31 December 2016, the scheduled life-of-mine for Kuranakh is 22 years.

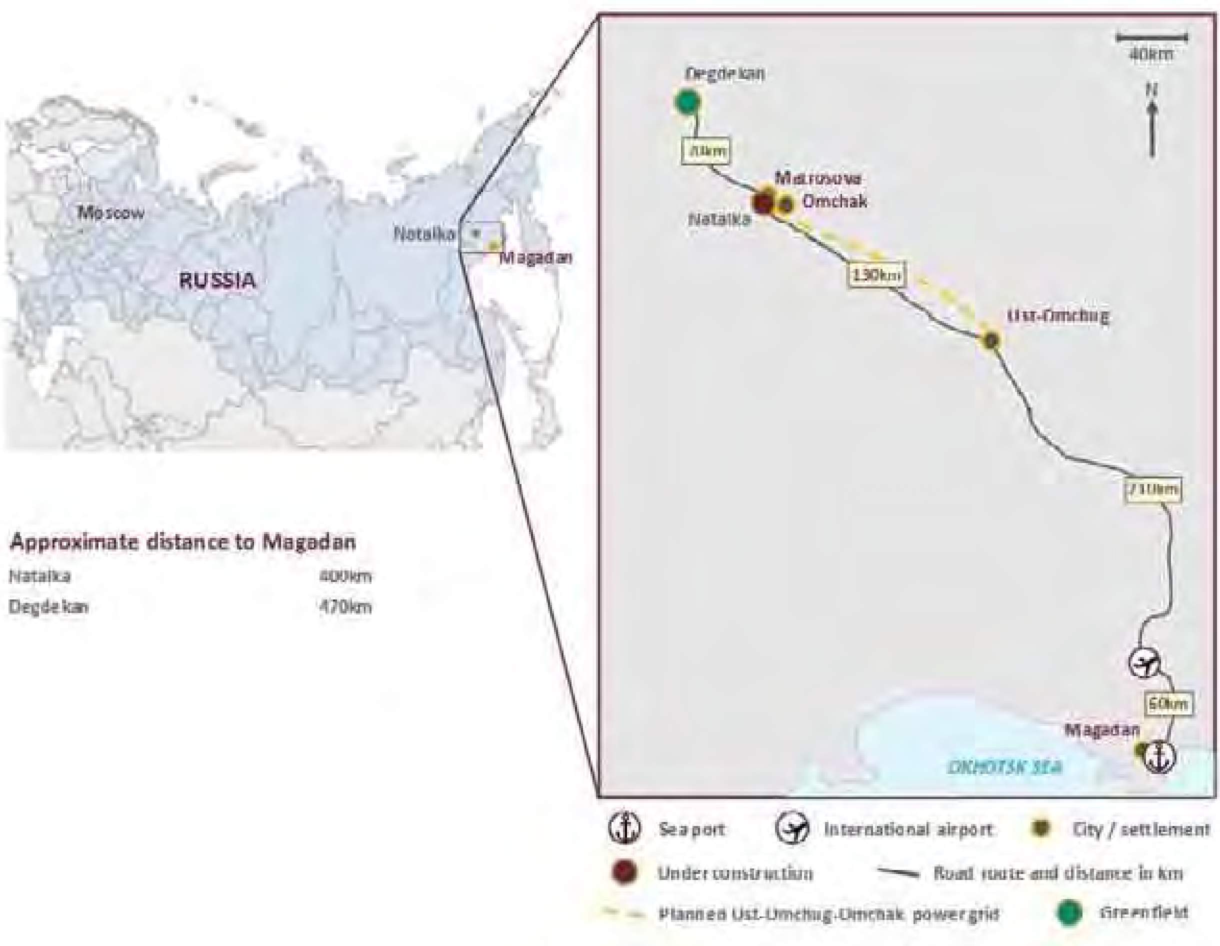
Figure 1.4 Yakutia region - Mineral Asset – location

A processing plant has been in operation at Kuranakh since 1965. In 2016, Kuranakh processed 4.2 Mt of ore and accounted for 8 per cent of the total gold production of Polyus.

Magadan region:

Polyus's principal mineral asset in the Magadan region is the Natalka open pit gold project, which is located near the town of Omchak in the Tenkinskiy district, and 400 km northwest of the city of Magadan. The Degdekan gold exploration project is also located in the Magadan Region, approximately 70 km northwest of Natalka. The locations of these assets within the Magadan region are shown in Figure 1.5. Based on the estimated Ore Reserves as at 31 December 2016, the scheduled life-of-mine for Natalka is 31 years.

Figure 1.5 Magadan region - Mineral Assets – locations



Construction of Natalka was suspended in December 2013, pending re-assessment of the Mineral Resource modelling and further processing studies. Construction restarted in 2016 and mining in January 2017. The Natalka processing plant is scheduled to commence commissioning late in 2017.

Polyus expects Natalka to become a significant gold producer, with a nameplate processing capacity of approximately 10 Mt of ore per annum. The Natalka operation currently has a scheduled mine life of 31 years in the Reserve Case production schedule (refer section 1.6 of this CPR). However, the Mineral Resource base is large and there is good potential for a significantly longer mine life.

Polyus indicates that it has been developing an exploration plan for the Degdekanskoye project with a view to deciding on options for merging this asset with the Natalka project once it is commissioned.

Amur region:

The Bamskoye gold deposit is located 120 km north west of Tynda, the principal city of the Tyndinskogo area of north-eastern Amur region, eastern Siberia; and 80 km distance via a year-round road to the Khorogochi rail station as shown in Figure 1.6.

Figure 1.6 Bamskoye project – location

Bamskoye is an exploration project currently being considered for future development by Polyus.

Chukotka region:

The Burgakhchany porphyry copper deposit is a Polyus development project located in the Bilibinsk region of Chukotka Autonomous Region. The Burgakhchany deposit is located 250 km from the Bilibino town, as shown in Figure 1.7.

Figure 1.7 Burgakhchany project – location

Polyus acquired the Burgakhchany project in 2006. The project consists of three licence areas with early stage exploration in progress on each. The licences are south east of the Peschanka Copper Porphyry deposit in the Chukotka region.

Polyus has advised that geochemistry and exploration drilling is in progress with the aim of ranking exploration targets on the licence areas to identify the most prospective drilling targets for drilling in the future. Polyus indicates that gold-quartz vein type mineralization has also been identified during this programme, and that these deposit types will be investigated.

1.2 Reporting standard and compliance

AMC has prepared this CPR in accordance with:

- The United Kingdom (UK) Financial Conduct Authority (FCA) which is the United Kingdom competent authority for the purposes of Directive 2003/71/EC, as amended (Prospectus Directive).
- The Prospectus Rules and Listing Rules published by the FCA from time to time.
- The European Securities and Markets Authority – "ESMA update of the CESR recommendations – The consistent implementation of Commission Regulation (EC) No 809/2004 implementing the Prospectus Directive, 20 March 2013, ESMA/2013/319" (ESMA Recommendations) and, in particular, paragraphs 131, 132, and 133 of the ESMA Recommendations which pertain to mineral companies, save for the section on valuation of reserves, which is not required to be included herein.

Furthermore, AMC has considered the reporting and compliance guidance as included in the ESMA Recommendations, specifically:

- Appendix I – Acceptable Internationally Recognised Mineral Standards, specifically the Mining Reporting and Valuation components.
- Appendix II – Mining Competent Person's Report – recommended content.

This CPR includes content that satisfies the ESMA Recommendations, Appendix II items, namely:

- **(i) Legal and Geological Overview**: includes a description of the rights of exploration and extraction as they apply to operational aspects of the licences and permits. This CPR includes lists of the key tenements for the Mineral Assets, including date of grant and expiry in the context of life-of-mine planning. However, for legal aspects of tenure, refer to the Prospectus which provides a description of the exploration and extraction rights of the subsoil licences, and principal terms and conditions.
- **(ii) Geological Overview**: includes a geological description of the properties.
- **(iii) Mineral Resources and Ore Reserves Estimates**: includes tabulations of the estimates, descriptions of the processes for estimation and assumptions made including commodity prices and costs, and reconciliations between actual production and the estimates.
- **(iv) Valuation of reserves**: a valuation of Ore Reserves is not included. However, for operations, this CPR includes annual projections of production and cost for each of the next five years (2017 to 2021 inclusive) with annual projections aggregated into five year periods thereafter.
- **(v) Environmental, Social and Facilities**: includes descriptions of environmental conditions and permits, mine closure plans and social aspects, and material support facilities.
- **(vi) Historic Production/Expenditures**: includes actual production and cost performance for each of the last three years.
- **(vii) Infrastructure**: includes discussion of the location, availability of power and water, tailings storage facilities and occupational health and safety.
- **(viii) Maps**: includes location maps as appropriate to complement the text.
- **(ix) Special Factors**: includes description of any special factors that impact on the production or exploration activities such as operations in polar regions.

In accordance with ESMA Recommendations Appendix I and Appendix II, the mineral reporting standard adopted for this CPR for the reporting and classification of Mineral Resource and Ore Reserve estimates, and for reporting of exploration results and exploration targets is the JORC Code[3]. The JORC Code is a reporting code which is aligned with the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) reporting template. Accordingly, AMC considers the JORC Code to be an internationally recognized reporting standard which is recognized world-wide for market-related reporting and financial investment.

In accordance with ESMA Recommendations paragraph 133, this CPR was prepared under the direction of a Competent Person who, according to the JORC Code:

- "….is a minerals industry professional who is Member or Fellow of The Australasian Institute of Mining and Metallurgy, or of the Australian Institute of Geoscientists, or of a 'Recognised Professional Organisation' … with enforceable disciplinary processes including the powers to suspend or expel a member."
- "…must have a minimum of five years relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking…."
- each Competent Person is independent of Polyus, its directors, senior management and its other advisers, and has no economic or beneficial interest (present or contingent) in Polyus or in any of the Mineral Assets being assessed and is not remunerated by way of a fee that is linked to the admission or value of Polyus.

The Competent Person assumes overall professional responsibility for this CPR. This CPR is, however, published by AMC, the commissioned entity and, accordingly, AMC assumes responsibility for the views expressed herein. Consequently, where relevant, all references to AMC shall include the Competent Person and vice-versa.

Also as referred to in the ESMA Recommendations Appendix I and Appendix II, this CPR has been prepared in accordance with the VALMIN Code[4], to the extent that VALMIN Code is relevant to the scope of this CPR. In this regard, it should be noted that the scope of the CPR as specified by Polyus does not include a valuation of the Mineral Assets. The CPR includes technical assessments of the Mineral Assets. A technical assessment is defined in the VALMIN Code as the evaluation, by a specialist, of the technical aspects of a mineral asset.

Specialists are defined in the VALMIN Code as persons whose profession, reputation or relevant industry experience in a technical discipline (such as geology, mine engineering or metallurgy) provides them with the authority to assess mineral assets, and who prepare and accept responsibility for a public report such as this CPR. Similar to the requirements of the JORC Code, the requirements of a specialist under clause 2.2 of the VALMIN Code include that the specialist:

- "…. be Competent in, and have had at least five years of recent and relevant industry experience in relation to, the specific Mineral Asset to be reported upon;
- "…. have at least five years of recent and relevant experience in Technical Assessment …;"
- "…. be a member of a Professional Organisation with an enforceable professional Code of Ethics and understand that a violation of the VALMIN Code may result in an investigation in accordance with the rules of the Professional Organisation; … "

Those who have prepared and accept responsibility for this CPR satisfy these requirements of the JORC Code and the VALMIN Code.

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3 The 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the "JORC Code") as published by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia.

4 Australasian Code for Public Reporting of Technical Assessments and Valuations of Mineral Assets The VALMIN Code 2015 Edition, Prepared by the VALMIN Committee, a joint committee of the Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists.

1.3 Macroeconomic inputs

All currency in this CPR is expressed in terms of the United States dollar (US$) and the Russian rouble (RUB) unless otherwise noted.

Any and all references in this CPR to ounces (oz) of gold are references to troy ounces of gold.

A forecast gold price of US$1,250/oz was used by AMC for the purposes of estimating Polyus Ore Reserves as at 31 December 2016. The price was advised by Polyus and accepted by AMC as being reasonable.

The pit shells that AMC generated for estimating the Mineral Resources used a gold price of US$1,500/oz. This is 20% higher than the price used in estimating the Ore Reserves to reflect the prospects for eventual economic extraction.

The majority of Polyus's operating costs are denominated in RUB. The RUB to US$ exchange rate is therefore significant in determining the overall operating costs of the operation in US$. Polyus recommended use of RUB65 to US$1.00 exchange rate.

The RUB continued to devalue against the US$ throughout 2015. However, since the start of 2016, the currency has strengthened and remained at approximately RUB65 to US$1.00 for most of the year during preparation of the Ore Reserve estimates. Fluctuations may continue and there is a wide range of predictions for the likely long-term exchange rate. AMC believes the RUB65 to US$1.00 assumption to be reasonable for use in determining pit shells used as part of the process for estimating Ore Reserves.

No escalation has been applied to either the historical or the planned costs presented in this CPR. Accordingly, historical costs are nominal, and planned costs are in terms of 2017 US$.

All years are calendar years (1 January to 31 December).

1.4 Ownership structure

The Mineral Assets comprise certain gold production operations, and development and exploration projects. AMC understands that interests in the Mineral Assets are held by Polyus or its subsidiaries and are managed by Polyus or its subsidiaries or its business units. Accordingly, this CPR is presented on the basis that interests in the Mineral Assets are those of Polyus.

In this CPR, all statements of historical performance, and estimates of Mineral Resources and Ore Reserves, and schedules of production schedules and costs for 2017 and future years are on a 100% basis, even where 100% of an operation or project is not held by Polyus.

In this CPR, a section is presented for each of the operations and projects that comprise the Mineral Assets, typically with technical sub-sections for: geology and Mineral Resources, mining and Ore Reserves; ore processing; economic viability; permitting, environment, community, safety, and mine closure; and risks and opportunities, to the extent that those subsections are relevant to the operation or project.

1.5 Estimates of Mineral Resources and Ore Reserves

The estimates of Mineral Resources and Ore Reserves presented in this CPR are classified and reported in accordance with the JORC Code unless otherwise stated.

The reported estimates of Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to estimate Ore Reserves, that is, the Mineral Resources are reported on an 'inclusive basis'. The contained gold in the estimates of Mineral Resources and Ore Reserves is prior to allowance for metallurgical recovery, except for the Alluvials where the gold grade and contained gold are estimated on a recovered gold basis.

All the estimates of Mineral Resources and Ore Reserves presented in this CPR are on a 100% basis.

The gold price assumed in estimating the Ore Reserves is US$1,250/oz of gold and in estimating the Mineral Resources is US$1,500/oz of gold, unless otherwise stated.

A summary of the Mineral Resource estimates by deposit, and by source (open pit, underground, and stockpiles), is presented in Table 1.2. Summary totals of those estimates by deposit are presented in Table 1.3. The estimates are as at 31 December 2016, with the exception that the Sukhoi Log Mineral Resource estimate is as at 21 February 2017.

A summary of the estimates of the Ore Reserves as at 31 December 2016 is presented in Table 1.4.

Breakdowns of the Ore Reserve summary by method (process plant, heap leach, and alluvial), are presented in Table 1.5.

Additional information, including cut-off grades, for each of the estimates is presented in the relevant section later in this CPR. Details including the Competent Person and Table 1 for each estimate, as required under the JORC Code, are included in the Polyus public releases relating to those estimates. Those details are not repeated in this CPR.

Table 1.2 Polyus - Mineral Resources - as at 31 December 2016 - by deposit - by source[1]

Deposit	Measured				Indicated				Inferred				Total				Cut-off Grade (g/t)
	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	
Mines in Operation																	
Olimpiada																	
Open Pit	0	0	0	0	204	3.2	21	650	16	2.1	1.1	34	220	3.1	22	684	0.7
Underground	0	0	0	0	136	2.9	13	398	111	3.0	11	330	248	2.9	23	728	n/a
Stockpiles	6.5	2.5	0.51	16	0	0	0	0	0	0	0	0	6.5	2.5	0.5	16	n/a
Blagodatnoye																	
Open Pit	0	0	0	0	309	1.5	15	462	69	1.3	2.9	91	379	1.5	18	552	0.4
Stockpiles	42	0.9	1.1	35	0	0	0	0	0	0	0	0	42	0.9	1.1	35	n/a
Titimukhta																	
Open Pit	0.06	2.5	0.005	0.15	7.2	3.3	0.8	24	0.54	1.5	0.03	0.8	7.8	3.2	0.8	25	0.8
Stockpiles	5.2	1.6	0.26	8.1	0	0	0	0	0	0	0	0	5.2	1.6	0.26	8	n/a
Verninskoye																	
Open Pit	0	0	0	0	212	1.6	11	337	14	2.0	0.9	27	226	1.6	12	365	0.7
Stockpiles	11	1.3	0.45	14	0	0	0	0	0	0	0	0	11	1.3	0.45	14	n/a
Alluvials																	
Open Pit	0	0	0	0	243	0.21	1.6	50	34	0.40	0.44	14	277	0.23	2.1	64	n/a
Kuranakh																	
Open Pit	0	0	0	0	86	1.5	4.2	129	100	1.2	3.8	118	186	1.3	8.0	248	0.6
Stockpiles	0	0	0	0	62	0.6	1.2	39	0	0	0	0	62	0.6	1.2	39	n/a
Mine in Construction																	
Natalka																	
Open Pit	142	1.7	7.9	243	251	1.7	14	437	127	1.7	6.8	211	520	1.7	29	892	0.6
Underground	0.7	5.4	0	4	10	4.8	1.5	45	21	4.6	3.1	97	31	4.7	4.7	146	2.5
Stockpiles	6.8	1.3	0.28	9	0	0	0	0	0	0	0	0	6.8	1.3	0.28	9	n/a
Development and Exploration Projects																	
Sukhoi Log																	
Open Pit	0	0	0	0	0	0	0	0	887	2.0	58	1,804	887	2.0	58	1,804	1.0
Panimba																	
Open Pit	5.0	2.3	0.36	11	11	2.3	0.83	26	24	1.8	1.4	44	40	2.0	2.6	81	0.7
Poputninskoye																	
Open Pit	0	0	0	0	37	3.2	3.9	120	4.4	2.9	0.42	13	42	3.2	4.3	133	0.8 ox; 0.7 fr[2]
Zmeinoye																	
Open Pit	0	0	0	0	0.93	5.0	0.15	4.7	2.0	4.5	0.28	8.8	2.9	4.6	0.43	13	1.0
Chertovo Koryto																	
Open Pit	0	0	0	0	67	1.5	3.3	102	7.8	1.3	0.33	10	75	1.5	3.6	112	0.6
Bamskoye																	
Open Pit	0	0	0	0	15	1.8	0.9	27	5.1	1.6	0.26	8.0	20	1.8	1.1	35	0.6
Medvezhy																	
Open Pit	0	0	0	0	0	0	0	0	6.5	1.8	0.38	12	6.5	1.8	0.38	12	0.75
Total	**219**	**1.6**	**11**	**340**	**1,652**	**1.7**	**92**	**2,851**	**1,429**	**2.0**	**91**	**2,824**	**3,301**	**1.8**	**193**	**6,015**	

Notes:

1. The estimates for all deposits are presented on a 100% basis.
2. Any minor discrepancies for sums in the table are related to rounding.
3. For the Alluvials, cubic metres (m^3) have been converted to tonnages using the general bulk density factor of 1.85 t/m^3 strictly for the purpose of the summary accumulations. Gold grades have been adjusted from g/m^3 to g/t accordingly. Contained gold estimates are not affected.
4. ox = oxide, fr = fresh
5. Sukhoi Log Mineral Resource estimate is as at 21 February 2017.

Table 1.3 Polyus - Mineral Resources - as at 31 December 2016 - totals by deposit[1]

Deposit	Measured				Indicated				Inferred				Total			
	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Grade (g/t)	Gold (Moz)	Gold (t)
Mines in Operation																
Olimpiada	6.5	2.5	0.51	16	340	3.1	34	1,048	127	2.9	12	364	474	3.0	46	1,428
Blagodatnoye	42	0.9	1.1	35	309	1.5	15	462	69	1.3	2.9	91	420	1.4	19	587
Titimukhta	5.3	1.6	0.27	8.3	7.2	3.3	0.8	24	0.54	1.5	0.03	0.8	13	2.5	1.1	33
Verninskoye	11	1.3	0.45	14	212	1.6	11	337	14	2.0	0.9	27	237	1.6	12	379
Alluvials	0	0	0	0	243	0.21	1.6	50	34	0.40	0.44	14	277	0.23	2.1	64
Kuranakh	0	0	0	0	148	1.1	5.4	168	100	1.2	3.8	118	248	1.2	9.2	286
Mine in Construction																
Natalka	150	1.7	8.2	256	261	1.8	16	482	148	2.1	9.9	309	558	1.9	34	1,047
Development and Exploration Projects																
Sukhoi Log	0	0	0	0	0	0	0	0	887	2.0	58	1,804	887	2.0	58	1,804
Panimba	5.0	2.3	0.36	11	11	2.3	0.83	26	24.0	1.8	1.4	44	40	2.0	2.6	81
Poputninskoye	0	0	0	0	37	3.2	3.9	120	4.4	2.9	0.42	13	42	3.2	4.3	133
Zmeinoye	0	0	0	0	0.93	5.0	0.15	4.7	2.0	4.5	0.28	8.8	2.9	4.6	0.43	13
Chertovo Koryto	0	0	0	0	67	1.5	3.3	102	7.8	1.3	0.33	10	75	1.5	3.6	112
Bamskoye	0	0	0	0	15	1.8	0.9	27	5.1	1.6	0.26	8.0	20	1.8	1.1	35
Medvezhy	0	0	0	0	0	0	0	0	6.5	1.8	0.38	12	6.5	1.8	0.38	12
Total	**219**	**1.6**	**11**	**340**	**1,652**	**1.7**	**92**	**2,851**	**1,429**	**2.0**	**91**	**2,824**	**3,301**	**1.8**	**193**	**6,015**

Notes:
1. The estimates for all deposits are presented on a 100% basis.
2. Any minor discrepancies for sums in the table are related to rounding.
3. For the Alluvials, cubic metres (m^3) have been converted to tonnages using the general bulk density factor of 1.85 t/m^3 strictly for the purpose of the summary accumulations. Gold grades have been adjusted from g/m^3 to g/t accordingly. Contained gold estimates are not affected.
4. Sukhoi Log Mineral Resource estimate is as at 21 February 2017.

Table 1.4 Polyus - Ore Reserves - as at 31 December 2016 - by deposit[1]

Deposit	Proved				Probable				Total				Cut-off Grade (g/t)
	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Gold (t)	
Mines in Operation													
Olimpiada													
Open Pit	0	0	0	0	206	3.0	20	627	206	3.0	20	627	0.7
Underground	0	0	0	0	103	2.9	9.6	299	103	2.9	9.6	299	1.5
Stockpiles	6.5	2.5	0.51	16	0	0	0	0	6.5	2.5	0.51	16	n/a
Blagodatnoye													
Open Pit	0	0	0	0	182	1.5	8.9	276	182	1.5	8.9	276	0.4
Stockpiles	42	0.9	1.1	35	0	0	0	0	42	0.9	1.1	35	n/a
Titimukhta													
Open Pit	0.06	2.3	0.005	0.15	6.5	3.1	0.65	20	6.5	3.1	0.65	20	0.8
Stockpiles	5.2	1.6	0.26	8.1	0	0	0	0	5.2	1.6	0.26	8.1	n/a
Verninskoye													
Open Pit	0	0	0	0	86	1.7	4.8	150	86	1.7	4.8	150	0.7
Stockpiles	11	1.3	0.45	14	0	0	0	0	11	1.3	0.45	14	n/a
Alluvials													
Open Pit	0	0	0	0	105	0.34	1.1	35	105	0.34	1.1	35	
Kuranakh													
Open Pit	0	0	0	0	74	1.4	3.2	100	74	1.4	3.2	100	0.6
Stockpiles	0	0	0	0	62	0.6	1.2	39	62	0.6	1.2	39	n/a
Mine in Construction													
Natalka													
Open Pit	139	1.6	7.0	218	147	1.8	8.5	263	286	1.7	16	482	0.6
Stockpiles	6.8	1.3	0.28	8.6	0	0	0	0	6.8	1.3	0.28	8.6	n/a
Development and Exploration Projects													
Chertovo Koryto													
Open Pit	0	0	0	0	62	1.5	3.1	95	62	1.5	3.1	95	0.6
Total	**210**	**1.4**	**9.7**	**301**	**1,033**	**1.8**	**61**	**1,904**	**1,243**	**1.8**	**71**	**2,205**	

Notes:

1. The estimates for all deposits are presented on a 100% basis.
2. Any minor discrepancies for sums in the table are related to rounding.
3. For the Alluvials, cubic metres (m^3) have been converted to tonnages using the general bulk density factor of 1.85 t/m^3 strictly for the purpose of the summary accumulations. Gold grades have been adjusted from g/m^3 to g/t accordingly. Contained gold estimates are not affected.
4. Ore Reserves have not been estimated for Sukhoi Log.

Table 1.5 Polyus - Ore Reserves - as at 31 December 2016 - by method[1]

Deposit	Proved				Probable				Total			
	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Gold (t)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Gold (t)
Mines in Operation												
Olimpiada												
Plant	6.5	2.5	0.51	16	309	3.0	30	925	316	3.0	30	941
Heap Leach	0	0	0	0	0	0	0	0	0	0	0	0
Total	**6.5**	**2.5**	**0.51**	**16**	**309**	**3.0**	**30**	**925**	**316**	**3.0**	**30**	**941**
Blagodatnoye												
Plant	4.4	1.9	0.3	8.3	135	1.8	7.8	243	140	1.8	8.1	251
Heap Leach	37	0.7	0.9	27	46	0.7	1.1	33	84	0.7	1.9	60
Total	**42**	**0.9**	**1.1**	**35**	**182**	**1.5**	**8.9**	**276**	**223**	**1.4**	**10**	**311**
Titimukhta												
Plant	5.3	1.6	0.27	8.3	6.5	3.1	0.65	20	12	2.4	0.91	28
Heap Leach	0	0	0	0	0	0	0	0	0	0	0	0
Total	**5.3**	**1.6**	**0.27**	**8.3**	**6.5**	**3.1**	**0.65**	**20**	**12**	**2.4**	**0.91**	**28**
Verninskoye												
Plant	11	1.3	0.45	14	86	1.7	4.8	150	96	1.7	5.3	164
Heap Leach	0	0	0	0	0	0	0	0	0	0	0	0
Total	**11**	**1.3**	**0.45**	**14**	**86**	**1.7**	**4.8**	**150**	**96**	**1.7**	**5.3**	**164**
Alluvials												
Alluvials	0	0	0	0	105	0.34	1.1	35	105	0.34	1.1	35
Total	**0**	**0**	**0**	**0**	**105**	**0.34**	**1.1**	**35**	**105**	**0.34**	**1.1**	**35**
Kuranakh												
Plant	0	0	0	0	106	1.1	3.8	119	106	1.1	3.8	119
Heap Leach	0	0	0	0	30	0.6	0.6	19	30	0.6	0.6	19
Total	**0**	**0**	**0**	**0**	**136**	**1.0**	**4.5**	**139**	**136**	**1.0**	**4.5**	**139**
Natalka												
Plant	146	1.6	7.3	227	147	1.8	8.5	263	293	1.7	16	490
Heap Leach	0	0	0	0	0	0	0	0	0	0	0	0
Total	**146**	**1.6**	**7.3**	**227**	**147**	**1.8**	**8.5**	**263**	**293**	**1.7**	**16**	**490**
Chertovo Koryto												
Plant	0	0	0	0	62	1.5	3.1	95	62	1.5	3.1	95
Heap Leach	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**62**	**1.5**	**3.1**	**95**	**62**	**1.5**	**3.1**	**95**
Total												
Plant	173	1.6	8.8	273	851	2.1	58	1,816	**1,024**	**2.0**	**67**	**2,090**
Heap Leach	37	0.7	0.9	27	76	0.7	1.7	53	**114**	**0.7**	**2.6**	**80**
Alluvials	0	0	0	0	105	0.3	1.1	35	**105**	**0.3**	**1.1**	**35**
Total	**210**	**1.4**	**9.7**	**301**	**1,033**	**1.8**	**61**	**1,904**	**1,243**	**1.8**	**71**	**2,205**

Notes:
1. The estimates for all deposits are presented on a 100% basis.
2. Any minor discrepancies for sums in the table are related to rounding.
3. For the Alluvials, cubic metres (m^3) have been converted to tonnages using the general bulk density factor of 1.85 t/m^3 strictly for the purpose of the summary accumulations. Gold grades have been adjusted from g/m^3 to g/t accordingly. Contained gold estimates are not affected.
4. Ore Reserves have not been estimated for Sukhoi Log.

Mineral Resources and Ore Reserves were estimated at 30 September 2016 for each operation and then reduced by the actual production for the corresponding asset in the period from 1 October 2016 to 31 December 2016.

For 2015, Polyus reported a total Mineral Resource (Measured, Indicated, and Inferred for all deposits) of 1,905 Mt at a grade of 2.1 g/t and containing 127 Moz of gold. For 2016, Polyus reports a total Mineral Resource of 3,301 Mt at a grade of 1.8 g/t and containing 193 Moz of gold. The changes from 2015 to 2016 can be broadly summarized as:

- A major increase for the current Polyus Mineral Resource was the addition of Sukhoi Log. The resource was modelled by AMC in 2017.
- Generally, the estimates for 2016 have lower open pit cut-off grades than the equivalent estimates for 2015, resulting in additional tonnages and contained gold, albeit at lower-grades.
- The lower open pit cut-off grades in 2016 are due to a combination of factors including the results of ongoing mining studies, consideration of heap leach potential, and inclusion of certain stockpiles for the first time, primarily for Blagodatnoye and Kuranakh.
- Some resource models have been updated for depth extensions based on new drilling results, or reinterpretation, and account of increased low grade stockwork-disseminated style of mineralization being encountered during mining.
- An underground Mineral Resource is reported for the first time at Olimpiada in 2016.
- The 2016 Mineral Resource estimate fully accounts for mining depletion to 31 December 2016.

1.5.1 Sensitivity to gold price

The sensitivity to change in gold price of the optimum pit size and ore contents for each deposit was assessed by comparing the pit optimization shells generated at the Ore Reserve gold price of US$1,250/oz with pit optimization shells generated at gold prices 20% higher and 20% lower than the Ore Reserve gold price. The contents of the pit shells were evaluated at the cut-off grades derived from the Ore Reserve gold price of US$1,250/oz.

The changes with price are indicative only. Should detailed mine plans be developed using these prices, other factors may also contribute to the Ore Reserve estimate including: orebody geometry, operating costs, and strategic plan.

Table 1.6 shows the changes to the optimum pit shell contents for the open pits that are the main contributors to the Ore Reserves.

Table 1.6 Polyus - sensitivity of optimum pit shells to gold price

Pit	Gold Price Increased by 20%			Gold Price Reduced by 20%		
	Ore Tonnes	Total Material Tonnes	Contained Gold	Ore Tonnes	Total Material Tonnes	Contained Gold
Olimpiada	2%	5%	1%	-5%	-11%	-3%
Blagodatnoye	1%	4%	1%	-4%	-8%	-3%
Verninskoye	209%	331%	190%	-28%	-36%	-22%
Kuranakh	2%	7%	1%	-3%	-10%	-2%
Natalka	1%	4%	1%	-4%	-8%	-3%
Chertovo Koryto	1%	3%	1%	-4%	-6%	-2%

In general, the optimum pit shell contents are insensitive to changes in gold price.

The Verninskoye deposit is an exception and the optimum pit shell responds significantly to changes in gold price. The deposit comprises a series of orebodies, some that are not expressed at the surface. The top of Orebody 3 is approximately 400 m below the surface. Increasing the gold price by 20% allows the optimizer access to this ore and the pit optimization shells increase in size significantly. Once discounting of cash flows is considered during production scheduling, it is likely that the increase in pit size would contribute little positive value to the project. Further analysis would therefore be required if the gold price was to increase by 20%.

The Verninskoye optimization also reduces in size significantly when the gold price is reduced. AMC selected a pit shell generated using a gold price that is 6% lower than the Ore Reserve gold price as the basis for design. This provides some ability to absorb changes to the price without affecting the pit design.

The Vostochniy pit at Olimpiada is limited in depth by the upper portions of the underground mine, so there is only minor change to the Olimpiada inventory in the western end of the pit by changing the gold price.

1.5.2 GKZ estimates

The Polyus operations are in Russia and therefore they are subject to the Russian regulatory regime. Under the Russian regulatory regime, Polyus is committed to preparing estimates of reserves and supporting information that are approved by the Ministry of Natural Resources of the Russian Federation, and the State Commission on Mineral Reserves (GKZ)[5].

However, in line with the ESMA Recommendations, the estimates of Ore Reserves and Mineral Resources presented in this CPR are classified and reported in compliance with the JORC Code. Accordingly, the Polyus estimates that are approved within the GKZ system (GKZ estimates) are generally not presented in this CPR.

The exception is that the GKZ estimate is presented in this CPR for Sukhoi Log, as well as the corresponding estimate of Mineral Resources and Ore Reserves that complies with the JORC Code. The GKZ estimate for Sukhoi Log was approved in 2007. It was prepared by or on behalf of another party that had an interest in the property at that time.

The Polyus interest in Sukhoi Log has only been recently acquired and, consequently, evaluation of this mineral asset by Polyus is limited to the estimation of an Inferred Mineral Resource, which is an estimate that is classified and reported in accordance with the JORC Code. Polyus plans to continue evaluation of the mineral asset with the expectation that estimates of Mineral Resources with a higher level of confidence, and Ore Reserves, will be determined as a result of further work. Meanwhile, and for the purposes of disclosure in this CPR, AMC considers it appropriate to also include the GKZ estimate in this CPR that has been publicly stated.

1.5.3 Reconciliations

The reconciliations undertaken by Polyus involve comparisons of actual mine production against GKZ estimates prepared in accordance with state-defined mining conditions. It is AMC's understanding that the GKZ is also involved in any formal variations of either the GKZ estimates or the mining conditions.

Polyus operations typically involve processing of blends of ore mined from multiple deposits, pit areas, and licence areas. In compliance with the state-defined mining conditions, Polyus mines and stockpiles "on-balance" and, possibly, "off-balance" material, and selectively processes "on-balance" material. Each mining operation is obligated, and monitored, to maintain a periodic balance of its GKZ estimates through depletion by mining, depletion through ore loss, increases through exploration, stockpile balances, and processing to arrive at residual reserves in accordance with the GKZ system. Because the Mineral Resources and Ore Reserves that comply with the JORC Code are both relatively new and different in construction to the GKZ estimates, it has not yet been possible to reconcile actual tonnes and grades of ore mined, and gold produced against those relatively new estimates. Polyus has not yet established comprehensive systems that enable reconciliations of actual production against both Mineral Resources and Ore Reserves estimates that are classified in accordance with the JORC Code. While the various national public reporting systems are evolving and converging, the product of the Polyus reconciliation reporting currently remains designed for comparison of actual mine production with the GKZ estimates.

Accordingly, reconciliations of actual production against estimates of Mineral Resources and Ore Reserves that comply with the JORC Code are not available for this CPR.

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[5] Gosudarstvenaya Komisiya po Zapasam.

1.6 Production and cost schedules

For operations, and projects where Ore Reserves have been estimated, AMC has prepared a production and cost schedule that is referred to in this CPR as the Reserve Case. For Olimpiada, Kuranakh, and Natalka, AMC considers that there is significant likelihood of production in addition to the Reserve Case and, therefore, AMC has also prepared what is referred to in this CPR as an Alternate Case for each of those three Mineral Assets. Each Alternate Case is based on inclusion of consideration of Inferred Resources, with appropriate modifying factors, from which AMC judges there to be a reasonable basis for including an allowance for production in addition to that of the corresponding Reserve Case.

It should be noted that the Alternate Cases include a proportion of Inferred Resources, with modifying factors applied. To the extent that their bases include Inferred Resources, the Alternate Cases are of lower geological confidence than the Reserve Cases because it is not certain that the planned further exploration work will result in the estimation of Indicated or Measured Resources, or that the Alternate Cases will be realised.

Although the Alternate Cases are inherently of a lower geological confidence than the corresponding Reserve Case, AMC considers that Alternate Cases as well as the Reserve Cases have a reasonable basis.

A summary of the total Polyus gold production schedule for the Reserve Cases is presented in Table 1.7. A summary of the total Polyus gold production schedule with the three Alternate Cases (Olimpiada, Natalka, and Kuranakh) substituting for the corresponding Reserve Cases is presented in Table 1.8. Production and cost schedules for the Reserve Cases and the Alternate Cases are presented by Mineral Asset later in this CPR.

All production and costs presented in this CPR are on a 100% basis.

Table 1.7 Polyus - production schedule summary - Reserve Cases[1]

Item	Units	Total	2017	2018	2019	2020	2021	2022-2026	2027-2031	2032-2036	2037-2041	2042-2046	2047-2051
Mined													
Ore mined - tonnes	Mt	1,114	51	47	55	58	57	286	280	116	113	51	0.05
Ore mined - contained gold	Moz	67	2.8	2.8	3.3	3.2	3.1	13.8	19.2	7.6	7.9	3.8	0.003
Waste mined - tonnes	Mt	4,564	264	321	351	350	353	1,543	721	465	171	26	-
Total material mined	**Mt**	**5,678**	**315**	**367**	**406**	**409**	**410**	**1,829**	**1,001**	**581**	**284**	**77**	**0.05**
Processed													
Ore - tonnes	Mt	1,244	41	48	54	62	62	304	224	195	142	103	10
Ore - grade	g/t	1.8	1.9	1.9	2.0	1.7	1.7	1.5	2.2	1.8	2.1	1.5	0.8
Ore - contained gold	Moz	71	2.5	2.9	3.4	3.4	3.3	14.5	15.5	11.0	9.4	5.0	0.2
Processed - recovered gold	Moz	58	2.1	2.4	2.8	2.8	2.8	11.9	12.9	9.0	7.7	3.9	0.2
Recovered Gold By Deposit													
Olimpiada + Titimukhta	Moz	26	1.15	1.23	1.11	1.20	1.16	3.94	5.70	4.34	3.79	2.32	0.003
Blagodatnoye	Moz	8.5	0.46	0.44	0.46	0.59	0.58	2.71	2.38	0.86	-	-	-
Verninskoye	Moz	4.7	0.18	0.19	0.25	0.25	0.25	0.71	0.76	0.60	0.74	0.53	0.17
Alluvials	Moz	1.1	0.14	0.14	0.14	0.14	0.14	0.44	-	-	-	-	-
Kuranakh	Moz	3.8	0.18	0.21	0.27	0.22	0.21	1.05	1.04	0.55	0.12	-	-
Natalka	Moz	12	0.005	0.17	0.61	0.39	0.43	2.15	2.36	2.06	2.86	1.00	0.025
Chertovo Koryto	Moz	2.3	-	-	-	-	-	0.89	0.66	0.56	0.17	-	-

Notes:
1. The schedule is presented on a 100% basis.
2. Any minor discrepancies for sums in the table are related to rounding.
3. For the Alluvials, cubic metres (m^3) have been converted to tonnages using the general bulk density factor of 1.85 t/m^3 strictly for the purpose of the summary accumulations. Gold grades have been adjusted from g/m^3 to g/t accordingly. Contained gold estimates are not affected.

Table 1.8 Polyus - production schedule summary - Alternate Cases[1]

Item	Units	Total	2017	2018	2019	2020	2021	2022-2026	2027-2031	2032-2036	2037-2041	2042-2046	2047-2051	2052-2056	2057-2061
Mined															
Ore mined - tonnes	Mt	1,369	51	48	57	57	58	289	296	154	99	110	102	41	8
Ore mined - contained gold	Moz	84	2.8	2.9	3.4	3.1	3.2	14.3	20.2	9.9	6.8	7.4	6.1	3.1	0.63
Waste mined - tonnes	Mt	5,144	251	314	350	350	351	1,557	677	477	451	300	62	2	-
Total material mined	**Mt**	**6,513**	**301**	**362**	**407**	**407**	**410**	**1,847**	**973**	**631**	**550**	**410**	**163**	**44**	**8**
Processed															
Ore - tonnes	Mt	1,501	41	48	55	63	63	309	229	200	160	129	105	91	8
Ore - grade	g/t	1.8	1.9	1.9	1.9	1.7	1.7	1.5	2.1	2.0	1.7	2.0	1.8	1.5	2.5
Ore - contained gold	Moz	88	2.5	2.9	3.4	3.5	3.4	15.0	15.8	12.8	8.7	8.5	6.2	4.2	0.63
Processed - recovered gold	Moz	72	2.1	2.4	2.9	2.9	2.9	12.3	13.1	10.5	7.0	6.9	5.1	3.1	0.52
Recovered Gold By Deposit															
Olimpiada + Titimukhta	Moz	33	1.15	1.23	1.11	1.20	1.16	3.88	5.42	4.96	4.10	3.87	2.50	2.33	0.52
Blagodatnoye	Moz	8.5	0.46	0.44	0.46	0.59	0.58	2.71	2.38	0.86	-	-	-	-	-
Verninskoye	Moz	4.7	0.18	0.19	0.25	0.25	0.25	0.71	0.76	0.60	0.74	0.53	0.17	-	-
Alluvials	Moz	1.1	0.14	0.14	0.14	0.14	0.14	0.44	-	-	-	-	-	-	-
Kuranakh	Moz	4.2	0.18	0.21	0.26	0.22	0.21	1.05	0.98	0.71	0.36	-	-	-	-
Natalka	Moz	17	0.005	0.17	0.63	0.48	0.51	2.67	2.86	2.85	1.61	2.46	2.38	0.79	0.003
Chertovo Koryto	Moz	2.3	-	-	-	-	-	0.89	0.66	0.56	0.17	-	-	-	-

Notes:

1. The schedule is presented on a 100% basis.
2. Any minor discrepancies for sums in the table are related to rounding.
3. For the Alluvials, cubic metres (m^3) have been converted to tonnages using the general bulk density factor of 1.85 t/m^3 strictly for the purpose of the summary accumulations. Gold grades have been adjusted from g/m^3 to g/t accordingly. Contained gold estimates are not affected.

1.7 Tenure

Under the VALMIN Code, the status of tenure of the Mineral Assets is material and requires disclosure and must recently have been verified independently of the commissioning entity (Polyus).

In consideration of all legal aspects relating to the Mineral Assets, AMC has placed reliance on information concerning licences and permits as provided by Polyus and that the following are correct as at 31 December 2016 and remain correct until the date of the Prospectus:

- That, save as disclosed in the Prospectus, the Directors of the Board of Polyus are not aware of any legal proceedings that may have an influence on the rights to explore for minerals;
- That save, as disclosed in the Prospectus, Polyus is the legal owner of all mineral and surface rights as reported in the Prospectus; and
- That save, as expressly mentioned in the Risk Factors and the Licences and Material Contracts sections of the Prospectus, no significant legal issue exists which would affect the likely viability of the Mineral Assets and/or the estimation and classification of the Mineral Resources and Ore Reserves as reported herein.

The Russian Federal Agency for Subsoil Use (Rosnedra) may grant several types of subsoil licences in relation to the geological survey and exploration and production of natural resources.

In February 2015, the Rosnedra commenced a process that is being referred to as actualization of subsoil licences, which includes bringing them in compliance with the amended regulatory framework, as well as other modifications. The list of licences which are subject to actualization is determined from time to time and updated by the Rosnedra. The actualization process was expected to be completed by the end of 2016. All required licence documentation has been submitted to Rosnedra. Some of the Polyus licences have already been actualized, while documentation for certain other licences is currently under review. Licence numbers are current as at 31 December 2016, but may be updated as the actualization process is progressed.

AMC is advised that the portfolio of tenements held by Polyus is part way through the actualization process that has been commenced by the Rosnedra.

This CPR has been prepared on the basis that all the necessary licences and permits required for the continuation of Polyus operations and projects are in place.

1.8 Health, environmental, social and sustainability policies and standards

Polyus has developed and maintains a suite of internal environmental policies and standards that aim to comply with the International Council on Mining and Metals (ICMM) Principles and the International Finance Corporation Environmental and Social Performance Standards.

Polyus was granted membership of the ICMM in 2015. ICMM membership requires that Polyus commits to a set of 10 Principles, six supporting position statements and transparent and accountable reporting practices. The 10 Principles are:

- Implement and maintain ethical business practices and sound systems of corporate governance.
- Integrate sustainable development considerations within the corporate decision-making process.
- Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.
- Implement risk management strategies based on valid data and sound science.
- Seek a continual improvement in health and safety performance.
- Seek a continual improvement in environmental performance.
- Contribute to the conservation of biodiversity and integrated approaches to land use planning.
- Facilitate and encourage responsible product design, use, re-use, recycling and disposal of products.
- Contribute to the social, economic and institutional development of communities in which they operate.
- Implement effective and transparent engagement, communication and independently verified reporting arrangements with stakeholders.

Polyus has developed a road map which sets out key actions to ensure full compliance with ICMM sustainable development principles, including implementation of the policies and standards across all business units. Polyus will seek independent assurance on its compliance against its ICMM commitments in 2017.

The policies and standards comprise:

- Sustainability management system standard.
- Environmental and social impact assessment standard.
- Reclamation and mine closure standard.
- Involuntary resettlement standard.
- Indigenous people standard.
- Biodiversity conservation standard.
- Standard for the sustainable use of natural resources and the prevention of environmental pollution.
- Standard on cyanide management.
- Human rights policy.
- Stakeholder engagement policy.

Polyus has prepared annual sustainability reports since 2007. The most recent sustainability report was prepared in accordance with the sustainability reporting guidelines of the Global Reporting Initiative (GRI G4 Guidelines) and independently assured in accordance with the International Standard on Assurance Engagements. The report was published alongside Polyus annual financial reports and has been prepared to meet the requirements of ICMM transparent and accountable reporting.

All Polyus hard rock mines are certified under International Organization for Standardization (ISO) 14001 for environmental management systems and Occupational Health and Safety Assessment Specification (OHSAS) 18001 for occupational health and safety systems. Regular audits are required to maintain these certifications. Over the last four years, Polyus has reported consistently low Lost Time Injury Frequency Rates (calculated based on a 200,000 work hours factor) of 0.12 (2016), 0.08 (2015), 0.09 (2014) and 0.11 (2013), which indicates a generally improving trend after implementation of the OHSAS 18001 systems.

The certification of these systems indicates that procedures and plans are in place for each of the hard rock mine sites.

In summary, Polyus has prepared international standards of policies, standards, systems and reporting and has committed to meeting the ten ICMM principles and associated position statements. The policies and systems also provide a corporate wide commitment, together with systems and procedures, to ensure that the company as a whole, and each operation, has the tools to achieve and maintain compliance with local laws, and to build agreements and a social licence to operate.

1.9 Risks and opportunities

The Polyus Mineral Assets either in production or in development are generally located in remote areas. They are often large and relatively complex and, as such, involve some risks and challenges. These risks and challenges have the potential to affect:

- The performance of the facility in terms of production.
- The cost of construction and operation for development projects.
- The implementation schedule for development projects.
- The time required to reach full capacity for expansion and development projects.
- The environmental performance and impacts of the mines and process plants.
- Any of the above items could affect the financial performance of the operation or project.

In common with the mineral assets of other operators, the Polyus operations and projects are typically exposed to technical risks such as open pit slope stability, failure of underground openings, risks associated with the forecasting of gold grades, metallurgical recoveries and capital and operating costs. In addition, changes to the gold price and exchange rate directly impact costs and revenues and have the potential to either increase or decrease Mineral Resources, Ore Reserves and, ultimately, the value of the Mineral Asset.

Specific project risks and opportunities are identified and reported against each Mineral Asset.

1.10 Qualifications of consultants

This CPR has been prepared by AMC.

AMC is a firm of independent geological, mining geotechnical, mine engineering and mine management consultants offering expertise and professional advice to the exploration, mining and mining finance industries from its offices in Australia (Melbourne, Perth, Brisbane, and Adelaide), United Kingdom (Maidenhead), Canada (Toronto and Vancouver), and Singapore. AMC's activities include the preparation of due diligence reports on, and reviews of, mining and exploration projects for equity and debt funding, and for public reports.

AMC's project director for preparation of this CPR is Mr MD Chesher. Mr Chesher is an AMC Principal Mining Engineer and has managed a team of AMC consultants and sub-consultants that contributed to this CPR. Mr Chesher is a Fellow and Chartered Professional (Mining) of The Australasian Institute of Mining and Metallurgy (AusIMM). He has over 30 years of experience in the mining industry, with broad experience in gold and other operations in both planning and management roles. In these roles, he has been responsible for public reporting of Ore Reserves in accordance with the JORC Code, has managed feasibility studies in Australia and other countries for gold and other natural resources, and has conducted operational reviews and prepared valuations of mineral assets.

Mr Chesher is qualified under the provisions of the ESMA Recommendations paragraph 133 i) a) and as a Competent Person as defined in the JORC Code.

Mr LJ Gillett has peer reviewed this CPR in accordance with AMC's internal peer review policy. Mr Gillett is an AMC Principal Mining Engineer and is AMC's Practice Leader - Corporate Consultancy Australia. He is a Fellow and Chartered Professional (Mining) of The Australasian Institute of Mining and Metallurgy (AusIMM). He has over 40 years of experience in the mining industry, and has been the project director or peer reviewer and signatory to numerous public independent technical reports for mineral assets in accordance with the VALMIN Code.

Mr Gillett also qualifies under the provisions of the ESMA Recommendations paragraph 133 i) a) and as a Competent Person as defined in the JORC Code.

The qualifications and experience of the consultants who have contributed to this CPR, and their area of contribution, are listed in the Appendix to this CPR.

2 Olimpiada

2.1 Introduction

2.1.1 Property location and description

The Olimpiada mine is Polyus's largest operation and is Russia's largest gold mine. It is located approximately 540 km north of the major city of Krasnoyarsk in the Krasnoyarsk region of Western Siberia. The mine is located at Eruda in the Severo-Eniseysk administrative district, Krasnoyarsk Territory (refer Figure 1.2).

The Olimpiada deposit was discovered in the 1970s although alluvial gold mining in the region dates back much further.

Olimpiada operates under the Krasnoyarsk Business Unit. The operations of the Krasnoyarsk Business Unit include the Olimpiada, Blagodatnoye and Titimukhta mines.

Gold at Olimpiada occurs in a complex form with arsenopyrite, pyrrhotite, stibnite and pyrite, and coupled with the carbonaceous nature of much of the ore, results in primary Olimpiada ore being highly refractory.

Mining at Olimpiada commenced in 1985 with open pit production of oxide ore. Olimpiada continues as an open-pit mine with surface stockpiling. Mine production uses drill-and-blast with a standard truck and shovel operation, hauling ore to stockpiles for blending (high antimony ore is currently stockpiled).

The mining operation is now focused on the mining Orebody 4 in the Vostochniy (Eastern or Main) pit, which is the principal source of ore, as well as the nearby Zapadniy (Western) pit which has previously been mined for oxide ore and is scheduled for future primary ore production.

Although mining of the Olimpiada deposit is currently by open pit, it is likely that it will eventually be converted to an underground mining operation.

The underground mining method selected for the main underground ore zone that extends below the base of the Vostochniy pit (eastern pit) is sublevel caving (SLC). The SLC will generate a zone of subsidence that will extend into the open pit workings and, for safety reasons, open pit operations cannot continue when the SLC is operating. Therefore, significant mining of the SLC cannot commence until mining of the Vostochniy open pit Ore Reserves is complete.

Toll processing of oxide ore in a plant located 80 km from the Olimpiada mine commenced in 1985. Toll processing continued until 1996, when Plant No.1, a cyanide leaching plant for treatment of oxide ore with a capacity of 1.5 Mtpa was commissioned. Subsequently, various expansions of plant capacity and Plant No.2 and No.3 were constructed, and the processes for treating refractory sulphide ore were introduced.

Olimpiada ore is now processed in Plant No.1, Plant No.2 and Plant No.3. Titimukhta ore was being processed in Plant No.1 until temporarily suspended in April 2016 in favour of higher value ores from Olimpiada. Blagodatnoye ore is processed at Plant No.4, located at the Blagodatnoye mine.

Processing utilizes gravity and flotation concentration methods, with subsequent bio-oxidation of the flotation concentrate and sorption leaching of the bioleach product using the carbon-in-leach (CIL) process. Metallurgical gold recovery averages are improving towards the near-term goal of approximately 82.5%.

In 2016, Olimpiada produced 943 koz of gold, comprising refined gold and gold in concentrate, which represents a 24% increase over the previous year. This growth was achieved due to a number of implemented efficiencies, which lifted the plant throughput by 19% and improved recoveries by 0.9% to 81.0%.

The Stage 3 pit cutback at Olimpiada continued in 2016 and reached the main ore zones. This will provide adequate supplies of ore while the Stage 4 cutback is executed from 2017. A failure of a pit slope closed the operation for a period during 2016. After analysis, Polyus put in place a redesigned ramp access and continued operations.

The grade of treated ore improved by 4% to more normal levels once access to the main ore zones was restored.

During 2016, Polyus reassessed the Olimpiada project by conducting a review of the resource models and the mine plans. Preparation of a new resource model confirmed the Mineral Resource, and the mine planning focused on developing an underground mine plan to mine lower levels of the Olimpiada deposit. Sufficient work was completed to estimate an underground Ore Reserve of 103 Mt grading 2.9 g/t gold and containing 9.6 Moz, with an underground production mine life of approximately 16 years. The open pit Ore Reserve now stands at 206 Mt grading 3.0 g/t gold and containing 20 Moz, with an approximate mine life of 14 years.

The combined open pit and underground operations provide sufficient ore to feed the Olimpiada processing complex at 11.7 Mtpa for approximately 31 years.

The close proximity of the Blagodatnoye and Titimukhta mines enables sharing of some infrastructure between the operations (refer Figure 2.1). The three mines are connected by unpaved roads with river stations on both the Yenisei River, and the Angara River. Both of these rivers are navigable during the summer months. The railway station at Lesosibirsk is located 300 km to the south of the mines.

The town of Severo-Eniseysk is located 83 km to the north of the Olimpiada mine and supports a gold mine of the same name that has been in production for a number of decades. Access to Severo-Eniseysk is either by scheduled air service from Krasnoyarsk which takes approximately 1½ hours, or by road from the south (approximately 8 hours). The town is a major source of services and supplies for the area.

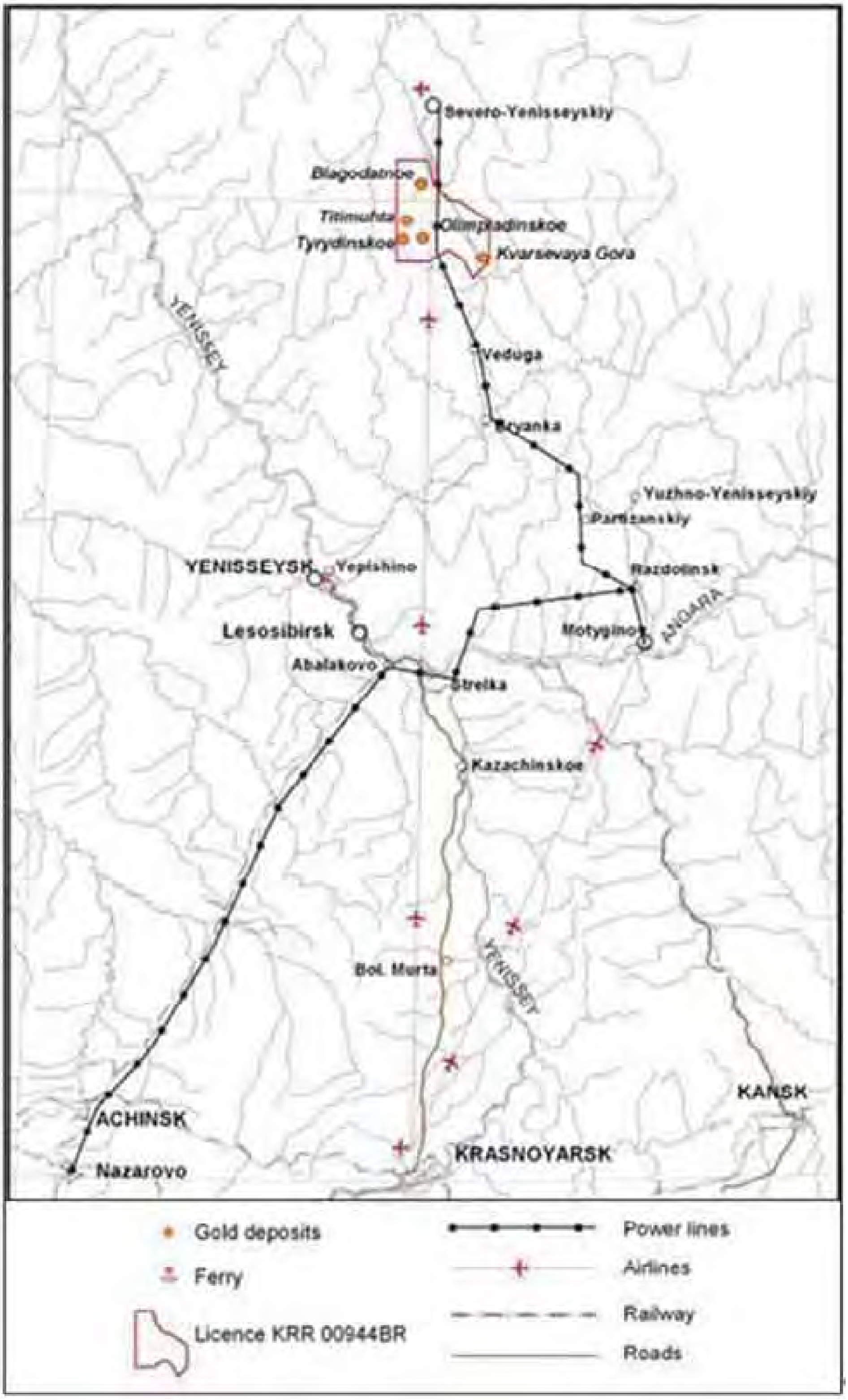
Severo-Eniseysk also serves other mining operations in the area. The other principal land uses in the area are forestry and small scale agricultural activities developed around local settlements. Polyus supports a settlement and social infrastructure at Eruda for its own employees, most of whom are shift workers.

The topography of the mines area consists of rolling hills with a thin cover of soils, low swampy areas and gravel-filled valleys, many of these having been worked as alluvial gold placers.

The elevation of the mines area varies from 640 m to 700 m above sea level, and the vegetation is typical of a northern boreal forest.

The climate is generally considered to be cold with approximately 209 days of the year having average temperatures below 0°C. The average annual temperature is -3°C and the extreme minimum temperature recorded is -61°C.

Figure 2.1 Olimpiada - local infrastructure



2.1.2 Mineral tenure

Polyus holds three subsoil use agreements (mining licences) for the Olimpiada mine:

- Agreement number KRR 02839 BE (Olimpiadinskoye deposit) which applies to subsoil use to a depth of less than 50 m below the natural surface level.
- Agreement number KRR 02840 BR (Olimpiadinskoye deposit) which applies to subsoil use from depths of more than 50 m to a depth of less than 1,000 m below the natural surface level.
- Agreement number KRR 02841 BP (Olimpiadinskoye deposit – deep exploration) which applies to depth of subsoil use at depths greater than 1,000 m below the natural surface level, and to the depth of gold mineralization.

Agreement number KRR 02839 BE comprises a mining licence area around the Olimpiada mine of 0.382 km^2 and provides for exploration and mining of placer (alluvial) deposits from the soil surface to a depth of 50 m below the natural surface level. It was granted on 5 July 2016 and expires on 31 December 2027.

Agreement number KRR 02840 BR comprises the large Olimpiadinskoye mining licence area and includes the Olimpiada mine, the Blagodatnoye mine and the Oleny deposit. The mining licence area covers 1,340 km^2 and provides for extraction to a depth of 1,000 m below natural surface level. The mining licence provides for geological examination, including prospecting and assessment of mineral deposits, exploration and extraction of minerals, processing of minerals, and the use of historical mining wastes. The mining licence excludes the Titimukhta deposit (held separately by Polyus) and the Quartz Mountain deposit (held by others). The mining licence was granted on 5 July 2016 and expires on 1 February 2022. An application for the extension of the licence to 31 December 2028 has been submitted.

Agreement number KRR 02841 BP comprises the Olimpiada mine area from depths greater than 1,000 m below natural surface level. The mining licence area covers 1.059 km^2 and allows for geological exploration of mineral deposits underlying the current mining operations. The mining licence was granted on 5 July 2016 and expires on 10 June 2018.

The separate forest land lots have been leased to Polyus according to land rent agreements between the Polyus and the state forestry authority. The land must be rehabilitated and returned to the state after the project is finished. Figure 2.2 shows the forest land lease boundary (yellow line) and general arrangement of the site.

Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences.

Figure 2.2 Olimpiada - general arrangement and lease boundaries

Source: Conceptual Mine Closure Plan, 2013

2.1.3 Historical production and costs

Olimpiada's historical performance is summarized in Table 2.1.

Table 2.1 Olimpiada - historical production and operating costs

Item	Unit	2014	2015	2016
Mined				
Ore	Mt	6.0	2.8	9.8
Contained gold	Moz	0.71	0.24	1.06
Waste	Mt	59	58	42
Total	**Mt**	**65**	**60**	**52**
Processed				
Ore	Mt	8.5	9.5	11.3
Contained gold	Moz	1.00	0.97	1.21
Recovered gold	Moz	0.73	0.76	0.94
Unit Operating Costs				
Mining	US$/t mined	2.27	1.71	1.78
Processing	US$/t processed	29.17	19.16	17.66
Selling, general & administrative	US$/t processed	4.05	4.14	3.40

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

2.2 Geology and Mineral Resources

The Olimpiada Mineral Resource has been updated in 2016 in preparation for continued open pit mining and eventual transition to underground mining. Cut-off grades for the open pit resource have changed from 1.0 g/t to 0.7 g/t as a result changed economic parameters. A Mineral Resource suitable for assessment of underground mining potential has been estimated and reported. It is based on stope designs, and includes all material falling within interpreted outlines of continuous zones above 1.5 g/t. The estimate reflects the generally proposed non-selective mining methods of SLC and long-hole open stoping (LHOS).

2.2.1 Geology

The Olimpiada gold deposit is located in the Verkhne-Enashiminsky mining district of the Enisey Range. The mining district is located within the Central Anticlinorium which is surrounded by granites of the Chirimbinsky body in the south, granite-gneisses of the Teisky body in the west and granitoids of the Gurakhtinsky massif in the northeast.

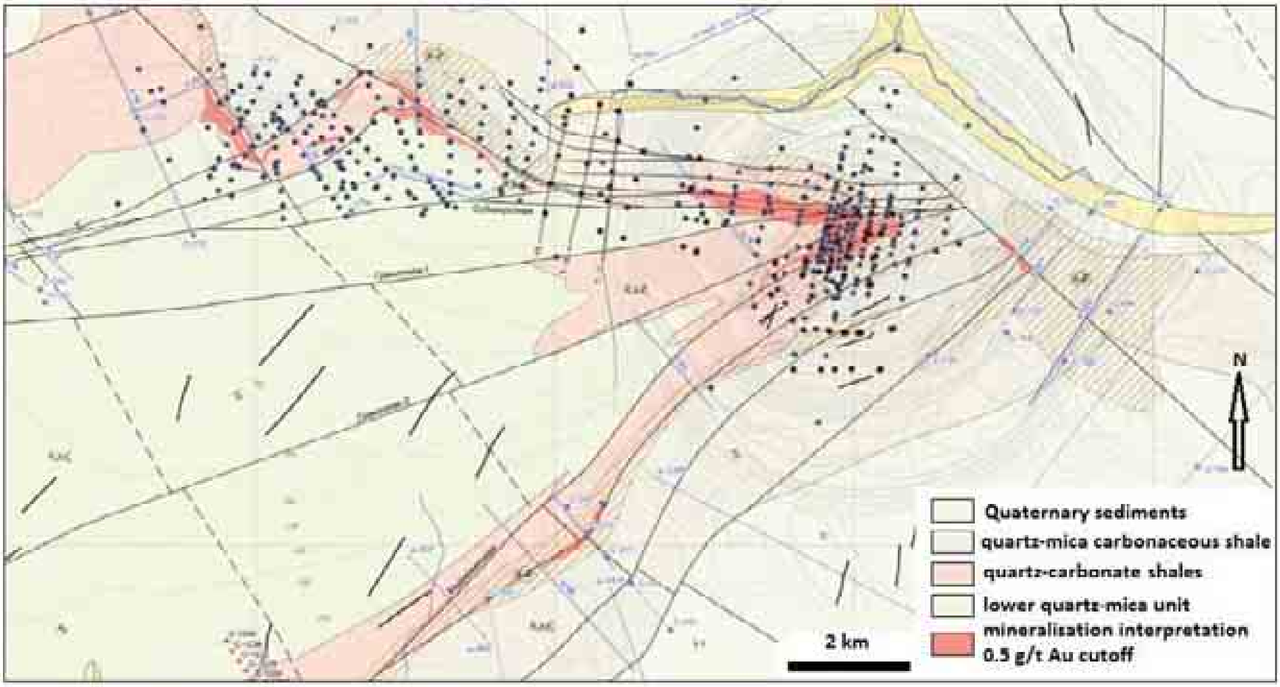
The mining district is underlain by regional-scale fold structures which lie either side of the major northwest trending Tatarsky deep fault. The Tatarsky deep fault influences a tectonic zone several kilometres wide which plays an important role in controlling the mineralization.

The mining district covers metamorphosed terrigenous and terrigenous-carbonate rocks of Early to Late Proterozoic age that have been intruded by large granitoid bodies. The carbonate rocks have undergone several metamorphic processes, including progressive and retrograde regional metamorphism, contact metamorphism and hydrothermal alteration.

Gold mineralization at Olimpiada is limited to a tectonic block bound by the Tatarsky fault to the northeast and the block is bound by granitoids on the southeast and northwest limits. The mineralization is lithologically and structurally controlled.

The Olimpiada deposit is hosted by calcareous-carbonaceous horizons within a sequence of relatively homogeneous micaceous quartz schists (Figure 2.3). The highest gold grades occur in carbonaceous quartz-carbonate metasomatic rocks within the carbonaceous rock units.

Figure 2.3 Olimpiada - geology map



The deposit occurs on the Medvezhinsky anticline at the intersection of northeastern, northwestern and east-west trending fault zones. Gold mineralization occurs in the hinges of the folds and tends to pinch out along the fold limbs. Deformation-induced permeability of the reactive calcareous and carbonaceous rocks has facilitated the mineralization and alteration. Structural deformation is strongest in the hinges of folds. Some deep weathering-related oxidation is found along the permeable fault and hinge zones. All mineralization is associated with significant metasomatic alteration.

The Olimpiada gold deposit is broadly divided into west (Zapadniy) and east (Vostochniy) zones with the west zone consisting of three shallowly-plunging tabular deposits (Ore Zone 1, 2, and 3) that merge into the east zone (Ore Zone 4) in the hinge of the anticline. Ore Zone 4 contains about 90% of the total Mineral Resource.

All material currently being mined at Olimpiada is fresh rock. Oxide mineralization was mined in the east pit at Olimpiada to a depth of 280 m below surface where oxidation was concentrated down the plunging sulphide mineralized zone. Oxide mineralization was also mined in the small west pit. Minor transition material may occur but is not distinguished in mining operations.

Gold mineralization is generally stratabound but controlled by faulting. Primary mineralization is refractory and is processed at Plants 2 and 3 consisting of flotation with bio-oxidation of the concentrate followed by CIL gold recovery. Gold is hosted by sulphides, mainly arsenopyrite, pyrite, pyrrhotite, and stibnite in disseminated and banded forms hosted by micaceous quartz-carbonate and carbonaceous quartz-carbonate metasomatites which can contain up to 1% organic carbon. The metasomatic alteration process is characterized by silicification, carbonization and sericitization, with quartz and calcite being the main minerals of altered rocks.

Two types of primary sulphide mineralization are identified:

- Arsenopyrite and pyrrhotite dominated mineralization with minor pyrite and stibnite.
- Stibnite-dominated mineralization with minor arsenopyrite, pyrrhotite and pyrite.

Total sulphide content varies from 2% to 12% averaging 3% to 5%. Gold mineralization is associated with arsenopyrite, but higher gold grades are associated with the acicular arsenopyrite. which makes it resistant to processing using cyanidation.

Stibnite mineralization forms a distinct zone in the east pit and is blended with low-antimony mineralization for processing. Carbonaceous rocks can be gold-bearing and also need to be blended. Pyrrhotite mineralization is believed to increase with depth which may need to be allowed for in future processing methods/costs. Data is not available to be able to estimate pyrrhotite content in the resource model.

Gold occurs as native gold encapsulated in sulphide minerals. Gold grain size is less than 10 µm and averages 5 µm. The deportment of gold is estimated as:

- 35% in arsenopyrite
- 40% in quartz
- 15% in pyrite
- 5% in stibnite

2.2.2 Exploration

Exploration and prospecting work has been conducted at Olimpiada since 1975, including geological mapping, surface trenching and pitting and diamond drilling. Geological mapping initially at 1:10,000 scale was accompanied by trenching and channel sampling at 50 m intervals in the western part of the deposit, and between 100 m and 200 m in the eastern part that was subsequently infilled to 50 m spacing. The orientation of trenches reflects the changes in apparent strike of mineralization at the surface.

Drillholes were initially drilled on 100 m-spaced lines with holes spaced at 100 m along the lines. Drillhole spacing was infilled to approximately 50 m x 50 m in the east and west parts of the deposit, with the remainder drilled at approximately 100 m by 50 m.

Most of the early drillholes completed in the east part of the deposit were drilled vertically or with slight inclination. Ten drillholes were oriented to the south at 55º drilled down the plunge of the mineralization. Drilling was conducted in the west part of the deposit with inclination of 75º to 80°. Initial drillhole diameters were 132 mm and 112 mm in sulphides and 132 mm and 152 mm in oxides. Drilling between 1980 and 1985 used 76 mm and 59 mm diameter core in sulphides, and 92 mm diameter core in oxides.

Long sample intervals (up to 4.5 m) were allowed in the east part of the deposit because of the long mineralization intersections. In the west samples are 1.5 m to 2.0 m due to the narrower mineralized zones.

Some small-scale underground workings on the 680 m level were excavated on the west part of the deposit between 1981 and 1985, but there was no underground sampling in the east part of the deposit.

From 2008 to 2011 Polyus completed a programme of deep drilling to test the connection between the east and central part of the mineralization and infill some areas of the central zone. About 30,000 m of drilling was completed in this programme.

There are 529 diamond drillholes and 178 advanced exploration in-pit RC drillholes in the data available to AMC for resource estimation. Trench data has been used to define the mineralized volume but has not been used in grade estimation.

Drill core is stored in an outside core yard and also in a recently completed core shed. Sample residues are stored in a sample shed.

Most drillhole collars have been lost in surface mining work.

Drillholes were logged and sampled under geological supervision. Geological logs were prepared for each hole following GKZ protocol. Drill core was marked for sampling by geologists.

Bulk density data for use in Mineral Resource estimation was supplied in summary form only. Polyus advises the historical data and the drillhole locations of samples are no longer available. Therefore, AMC has used the bulk density information provided by Polyus based on the operational experience of Polyus.

Drillholes are logged in detail on hard-copy geological log sheets, and generally in long-hand form (as differentiated from typical standardized logging code). Hard-copy logs are stored in the geology office and seem to be well maintained and accessible. All information related to individual drillholes is compiled in booklets, including all collar survey, downhole survey, geological logging, graphical logs, and assay data.

Limited lithological information from recent drilling is recorded in a digital form.

2.2.3 Mineral Resource estimation parameters

The Olimpiada Mineral Resource estimate as at 31 December 2016 was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- Most drilling used for the resource estimate is diamond drilling but the limited in-pit RC drilling has also been used.
- Drillhole spacing is described in section 2.2.2.
- The data available to AMC for resource estimation comprised 529 diamond drillholes and 178 advanced exploration in-pit RC drillholes.
- Bulk density data for use in resource estimation was supplied by Polyus with 2.7 t/m^3 used throughout.
- Drillholes are logged in detail on hard-copy geological log sheets, and generally in long-hand form.
- Gold assays are performed using fire assay with gravimetric determination. Sb, As, Fe, and Ca are analysed by pressed powder X-ray fluorescence (XRF) and S and C by Eltra gas analyser.
- The quality assurance and quality control (QAQC) protocols for the resource definition drilling were as prescribed by GKZ and largely managed by the assay laboratory.
- Limited geological information is available in drillhole data. Geological interpretation was only available in drafted plans and sections.
- The AMC estimate is based on a probability-based model that defines anomalous populations of gold mineralization (not defined by an economic cut-off grade).
- The east and west areas were modelled separately.
- The East Model was constructed by:
  - Interpreting a boundary between two grade-orientation domains apparent in grade control data.
  - Developing wireframes that map the trends in the two orientation domains and calculating dip and dip direction of the surfaces.
  - Compositing assay data to five-metre lengths.
  - Determining an appropriate mineralization threshold grade (0.3 g/t).
  - Flagging the composites as being above or below the threshold.
  - Estimating the indicator variable using ordinary kriging and variable search parameters (dynamic anisotropy).
  - Selecting a nominal probability threshold (0.4) from the estimated indicator value.
  - Using the part of the model above the probability threshold to define a mineralization envelope and further select composites that fall within the mineralization envelope.
  - Calculating and modelling variograms for the gold grades.
  - Estimating gold grade using ordinary kriging and variable search parameters (dynamic anisotropy).
- The West Model was constructed in a similar fashion to the East Model with the exception of:
  - Compositing assay data to two-metre lengths.
- High-grade caps were assessed separately for each model and domain and applied to the composite grades to limit the influence of outlier values in grade estimation.
- The estimate was classified as Indicated Resource where drillhole spacing is generally at or less than 50 m x 50 m. Beyond the Indicated Resource, the estimate is classified as Inferred Resource within 100 m of drilling and where spacing between drillholes is greater than 100 m.
- The resource estimate has been developed considering mining by a range of methods:
  - Open pit methods with selectivity indicated by blasthole sampling for grade control and mining possibly on 10 m benches.
  - In the East Model area, the estimate is also considered suitable for assessment of underground mining below the main pit using a bulk mining method such as SLC.
  - The Mineral Resource in the West Model between 11100E and 11600E that merges with the East Model may also be amenable to underground mining by LHOS.
- The pit topographic surface available for Mineral Resource reporting was current at 31 December 2016.

Olimpiada maintains active stockpiles to enable blending of ores, with different grade and property characteristics, before feed to the mill.

2.2.4 Mineral Resource estimate

AMC's estimate of the Olimpiada Mineral Resource as at 31 December 2016 is 468 Mt with an average grade of 3.0 g/t and containing 45 Moz of gold, combining open pit material at a cut-off grade of 0.7 g/t and underground material reported including all material falling within interpreted outlines of continuous zones above 1.5 g/t in line with economic analysis (refer Table 2.2).

The Olimpiada 2016 Mineral Resource estimate is reported in a way that now accommodates the proposed transition to underground mining:

- The East pit area reports the Mineral Resource within the current pit design, as material below the pit design is now considered for underground mining via SLC.
- The West pit area now reports the Mineral Resource within a modified constraining shell based on a gold price of US$1,500 per ounce, as agreed with Polyus. This satisfies the JORC Code requirement of the open pit Mineral Resource having reasonable prospects for eventual economic extraction.
- The open pit Mineral Resource is reported at a cut-off grade of 0.7 g/t, in line with economic analysis.
- The underground Mineral Resources have been reported within a general proximity to either the optimized SLC (East) or LHOS (Central) designs. The Mineral Resource is reported including all material falling within interpreted outlines of continuous zones above 1.5 g/t where the proposed mining methods have no potential selectivity if it is incorporated into a stope design and mined.
- Scoping to pre-feasibility study level stope designs have been generated based on a gold price of US$1,250 per ounce, as is used for estimating the Olimpiada 2016 Ore Reserve. Material proximal to the stope designs having similar geological and grade continuity satisfies the JORC Code requirement of this portion of the deposit having reasonable prospects for eventual economic extraction.

Table 2.2 Olimpiada - Mineral Resource - excluding stockpiles - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	0.7	204	3.2	21	650
	Inferred	0.7	16	2.1	1.1	34
	Subtotal	**0.7**	**220**	**3.1**	**22**	**684**
Underground	Indicated	n/a	136	2.9	13	398
	Inferred	n/a	111	3.0	11	330
	Subtotal	**n/a**	**248**	**2.9**	**23**	**728**
Total			**468**	**3.0**	**45**	**1,412**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Open pit mining surface as at 1 October 2016 with depletion of the production for December 2016.
3. Excludes stockpile material.

The estimate of the Mineral Resource for the stockpiles at Olimpiada is shown is Table 2.3.

Table 2.3 Olimpiada - Mineral Resource - stockpiles - as at 31 December 2016

Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Measured	n/a	6.5	2.5	0.51	16
Total		**6.5**	**2.5**	**0.51**	**16**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. In reporting the stockpiles, little or no mining selectivity is intended.

2.3 Mining and Ore Reserves

2.3.1 General

AMC's estimate of the Olimpiada 2016 Ore Reserves incorporates both open pit and underground estimates.

The Olimpiada open pit mine comprises the Vostochniy pit and the Zapadniy pit. The Ore Reserve estimates for these pits result from mine planning work that included: open pit optimization based on a resource model prepared by AMC; design of open pits using the pit optimizations shells as a guide; production scheduling of the resulting design inventories; the process plant flowsheet that incorporates committed expansion plans and a plant throughput of 11.7 Mtpa; analysis to verify economic viability of the project.

Although mining of the Olimpiada deposit is currently by open pit methods, it is likely that underground methods will be employed in the future and eventually the operation will be converted to an underground mine.

The mining method selected for the main underground ore zone that extends below the base of the Vostochniy pit (east pit) is SLC. The SLC will generate a zone of subsidence that will extend into the open pit workings and, for safety reasons, open pit operations cannot continue after mining of the SLC is commenced. Therefore, significant mining of the SLC cannot commence until mining of the Vostochniy open pit Ore Reserves is complete.

For the Olimpiada 2016 open pit Ore Reserve estimation, AMC assumed that the depth of the open pit would be limited to -90 mRL. This constraint is based on current mine planning, completed by Polyus, which identified this to be the appropriate elevation at which to transition from open pit to underground mining. It also satisfies a geotechnical constraint required to maintain an adequate slope stability factor of safety.

2.3.2 Mine operations

Mining operations are currently based on conventional open pit mining methods. The mine operates 24 hours per day, 365 days per year, with 12-hour shifts. The mining equipment is owned, operated and maintained by Polyus employees.

Olimpiada and the neighbouring mines at Blagodatnoye and Titimukhta are located within 25 km of each other and use the same accommodation and support facilities. The proximity also provides opportunities to share mining equipment and personnel.

Almost all material requires drilling and blasting. Blastholes are drilled using SBSh-250MH, Atlas Copco DML, PV-275, or ROC L8 drill rigs. The drilling fleet comprises 11 units, and all drill rigs are used for drilling ore and waste. The typical blast patterns are 6.5 m x 6.5 m in ore and 7.0 m x 7.0 m in waste with between 1.5 m to 2.0 m of sub-drill. The blasthole diameters are either 215 mm in waste or 249 mm in ore. Presplitting blasting has been successfully used on the final pit walls. The presplit holes are drilled at the same angle as the final wall with 2 m to 2.5 m spacing.

Both ore and waste are mined on 10 m benches. Final walls are developed to 20 m or 30 m final benches with berms being 10 m to 14 m in width. Polyus proposes mining Stage 4 benches containing only waste on 15 m working benches.

Ore and waste are dug using ten EKG-10 face shovels with a bucket capacity of 10 m^3, and an EKG-15 face shovel and a Komatsu PC-3000 with a bucket capacities of 15 m^3.

The mining truck fleet consists of Terex MT3300 (136 t), Komatsu 830E (220t), BelAZ 7540 (30 t), Caterpillar (CAT) 785 (136 t), and CAT 777 (90 t) trucks.

Olimpiada uses Wenco Mine Vision system to manage and optimize the operations in the pit. Mine Vision provides a fleet management system for open pit mines to record equipment activity, location, time, and production information. The system provides dispatching by using high precision GPS applications for the positioning and guidance of excavators, dozers, and drills.

An allowance for the purchase and replacement of mining mobile equipment was included in the economic analysis. This analysis takes into account the equipment replacement schedule and the total capital expenditure required over the mine life.

Olimpiada uses sampling of blastholes in ore on a 6.5 m x 6.5 m grid for grade control purposes. The ore is blasted with 249 mm blastholes of 11.5 m to 12 m depth to cover the 10 m bench. One composite sample is taken for the top 10 m of each blasthole (a duplicate is collected every 10th sample), with samples assayed for six elements.

In addition to blasthole sampling, in-pit RC holes are drilled on a 30 m east by 20 m north pattern with vertical drillholes and 2.5 m sample intervals.

A cut-off of 1.0 g/t is used for ore/waste determination, but ore with a high stibnite content (>0.5%) or high carbon content (>4%) is stockpiled separately for future blending and treatment when possible.

Run-of-mine (ROM) ore is directly fed to the mill, with any excess stockpiled for later treatment. Low-grade ore is stockpiled. The stockpiles will be re-handled to meet ore supply requirements.

Waste is generally placed on either the Vostochniy dump or the Severniy dump and, during winter on the Zapadniy 2 dump and the Yuzhniy dump. Carbonate waste is stockpiled for future construction of the tailing storage facility (TSF).

The open pit requires active mine water pumping. The pumping system is currently under review with the plan to establish a main pumping station will be on the 220 mRL and additional pump stations on the 290 mRL and the 410 mRL. Current dewatering from the pit averages 140 m^3/h.

The open pit power supply is carried by transmission lines of 6 kV and 35 kV from the Olimpiadinskaya and Vostochniy substations. Some of the excavators and drill rigs are electric with power also reticulated to lighting plants and the open pit water pumping.

2.3.3 Mining model

The resource model used as the basis for both open pit and SLC mine planning was:

> “mddolp161121.dm”, dated 17 November 2016.

This resource model was developed by AMC.

The resource model was converted by AMC to a mining model suitable for open pit planning (the open pit Mining Model) by reblocking, or regularizing, the resource model at a selective mining unit (SMU) size suitable for the equipment that is considered to be appropriate for the operation. A minimum block size of 20 m in both easting and northing directions and 10 m vertically was used to suit the orebody configuration and 10 m^3 to 16 m^3 face shovels and front end loaders currently employed for truck loading. The resulting open pit Mining Model was used as the basis for the pit optimization and Ore Reserve estimation.

The effect of the dilution and ore loss that results from the reblocking is an increase in ore tonnes of 4% and a decrease in contained metal of 2%. The local amount of dilution and ore loss varies with the local geometry and grade. These dilution and ore loss statistics relate to the portion of the resource model within the ultimate pit design.

2.3.4 Open pit geotechnical analysis

AMC has completed a technical review of the geotechnical design of the Vostochniy open pit undertaken by the Polyus Research and Design Centre (PRDC). AMC has also considered the geotechnical conditions (based on a very preliminary review of drill core) in the context of possible mining method options for potential underground mining of mineralization below the final Vostochniy pit.

AMC reviewed the following reports relating to the Vostochniy open pit:

- A report by a Russian research institute, discussing measures to remediate a failure that occurred on the south wall in May 2016.
- Three reports by a Moscow-based international consultancy, providing Limit Equilibrium based analysis.
- Analysis, kinematic analysis and Finite Element Method analysis of the Stage 4 pit.
- A report by the PRDC presenting conclusions on the design parameters for the Stage 4 pit.

The Russian research institute report recommended a cut-back of the south wall above the May 2016 failure to allow full ramp width to be re-established. AMC agrees with the recommended overall slope angle proposed for the cut-back, and further recommended that cable-bolts be installed to improve the stability of the ramp for Stage 4 production.

The international consultancy reports present analyses of bench-scale, inter-ramp and overall slope stability. The reports include hydrogeological information relating to the operation, and ground water pore pressures are included in the slope stability analyses. In AMC's assessment:

- The design inputs and assumptions are reasonable, and the analysis methodologies are consistent with current industry practice.
- The analyses were completed in sufficient detail and the slope design parameters presented are reasonable.

AMC notes that the maximum height of a 'bench-stack' (inter-ramp vertical height) recommended by the international consultancy was 180 m.

The consultancy reports and the recommended slope design parameters appear to have been largely accepted by the PRDC, although the PRDC's design included some inter-ramp slopes considerably higher than 180 m. AMC concluded that the Stage 4 open pit design should be modified to include a geotechnical berm every 150 m to 200 m, in line with current industry practice.

The current slope design parameters applied by AMC for all pits are presented in the Table 2.4.

Table 2.4 Olimpiada - slope design parameters

Parameter	Unit	Vostochniy Pit	Zapadniy Pit
Inter-ramp slope angle	degrees	40 - 54	31 - 52
Working bench (flitch) height	m	10 - 15	10
Batter angle	degrees	60 - 75	41 - 50
Safety berm width	m	12 - 17	12 - 14
Final bench height	m	20 - 30	20 - 30
Ramp width (dual lane)	m	32 - 35	35.5 - 36.5
Average pit depth	m	790	250

AMC has also considered the geotechnical conditions (based on a preliminary review of drill core) in the context of possible mining method options for potential underground mining of mineralization below the Stage 4 Vostochniy pit. Based on the review, the assessment concluded that it is likely the rock mass will cave readily at the scale of a potential underground operation.

2.3.5 Pit optimization - input parameters

The ultimate pit limits for Olimpiada were determined through analysis using the Whittle implementation of the Lerchs-Grossmann algorithm. The Whittle software applies the predefined maximum slope angles to generate linked resource model blocks that must all be mined within the slope angle constraints. In this way, all linked blocks which have a total value that is positive for a particular set of commodity price and other inputs will be included within a pit shell.

The Whittle software develops a series of concentric (or nested) pit optimization shells; each generating the maximum undiscounted operating cash flow for the set of economic parameters used to develop that optimization shell. The shells were developed by varying the gold price above or below that chosen as the base price for the pit optimization process of US$1,250/oz. AMC allows for mining equipment sustaining capital costs by including an allowance approximately equal to 10% of the mining operating cost when selecting the optimum shell. The mining equipment sustaining capital costs are, however, estimated and applied separately in economic modelling.

The input assumptions and results of the pit optimization are reported in the following report sub-sections. The optimization shells produced for the Reserve Case were then used as the basis for detailed pit design, in production scheduling and for subsequent economic analysis.

The parameters used in the pit optimization are derived from a combination of information provided by Polyus and AMC's determinations based on its technical assessments, and can be summarized as:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the recovered gold value (US$75/oz) for cut-off grade calculation.
- Gold recovery of 82.5%.
- Overall pit slope angles as listed in Table 2.4.
- Mining operating costs of US$2.91/bcm mined for both ore and waste, and an additional US$0.012/t per additional 10 m bench below the elevation of 640 mRL.
- Process plant operating cost of US$18.57/t processed, based on Polyus 2017 budget.
- Selling, general and administrative (SG&A) costs as a combination of general and administrative costs of US$2.77/t ore processed and selling costs of US$10.26/oz of recovered gold, based on Polyus 2017 budget.
- Process plant throughput of 11.7 Mtpa.
- Refining and transportation costs of US$2.19/oz of recovered gold, based on Polyus 2017 budget.

Based on these parameters, a cut-off grade of 0.7 g/t was determined for use in the pit optimisation, and open pit Ore Reserve estimation and production scheduling presented in this CPR for Olimpiada.

All Inferred Mineral Resources were regarded as waste in the pit optimization and subsequent pit evaluations.

Pit optimization for the Olimpiada deposit, generated two overlapping pits – the Vostochniy pit (east pit), which contains the majority of the Olimpiada open pit ore tonnages, and the much smaller Zapadniy pit (west pit).

AMC reviewed the size and geometry of the pit limits based on the pit shells and found that development of that pit would require a single, very large cut-back to the current Vostochniy pit open pit. This large cutback would require mining of high volumes of waste for several years and therefore would generate significant negative cash flows for several years.

Conversely, the cutback required for the Vostochniy pit based on a significantly smaller shell, would involve mining of considerably less waste and therefore offers an improved discounted operating cash flow.

Therefore, AMC selected the smaller pit shell as the basis of design for the ultimate Vostochniy pit and for Ore Reserve estimation because it generates the higher discounted operating cash flow surplus of the options considered, based on preliminary mine scheduling.

The pit optimization for Ore Reserve estimation was limited to a depth of -90 mRL for geotechnical reasons and the likely transition to underground mining below this level.

2.3.6 Pit design and contents

The pit design is based on the results of the pit optimization work.

The design parameters used in generating the ultimate pit designs are listed in Table 2.5.

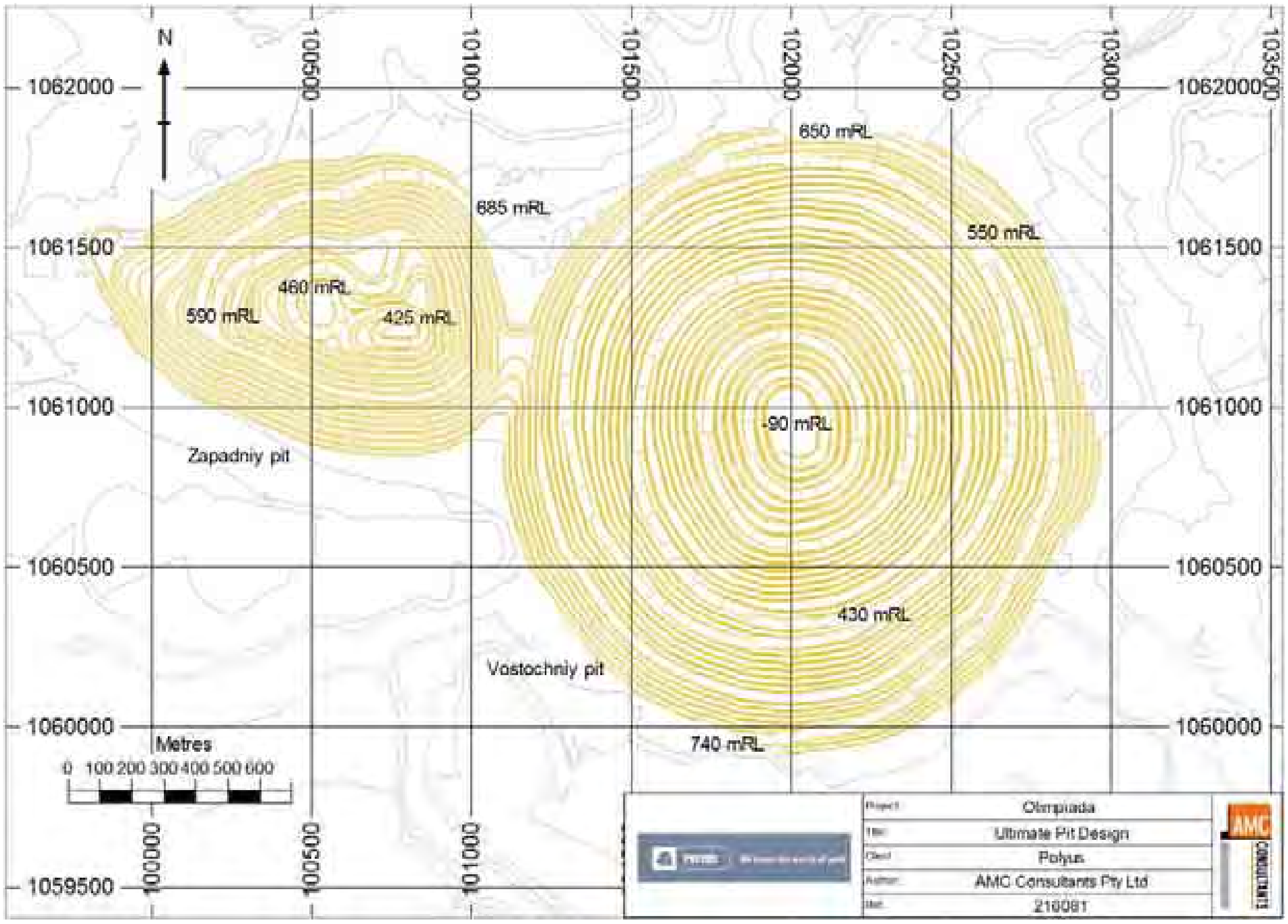
Table 2.5 Olimpiada - pit design parameters

Parameter	Unit	Vostochniy Pit	Zapadniy Pit
Inter-ramp slope angle	degrees	40 - 54	31 - 52
Batter slope angle	degrees	60 - 75	41 - 50
Safety berm width	m	12 - 17	12 - 14
Bench height	m	10 - 15	10
Vertical distance between safety berms	m	20 - 30	20 - 30
Ramp width (two way)	m	32 - 35	35.5 - 36.5
Ramp width (one way)	m	20	25
Ramp gradient	%	10	10

A width of 35.5 m to 36.5 m was used for dual lane access haul roads and 25 m for single lane access. The ultimate pit design by AMC is shown in Figure 2.4. The design includes a maximum ramp gradient of 10% and includes horizontal ramp segments along the ramp length as required by Russian regulations (50 m horizontal ramp segments at 600 m intervals along the ramp length).

The maximum inter-ramp slope height varies by area from 150 m to 200 m. Where slope heights greater than the maximum are required, an additional geotechnical berm of 30 m width was included to divide the slope into two separate inter-ramp slopes.

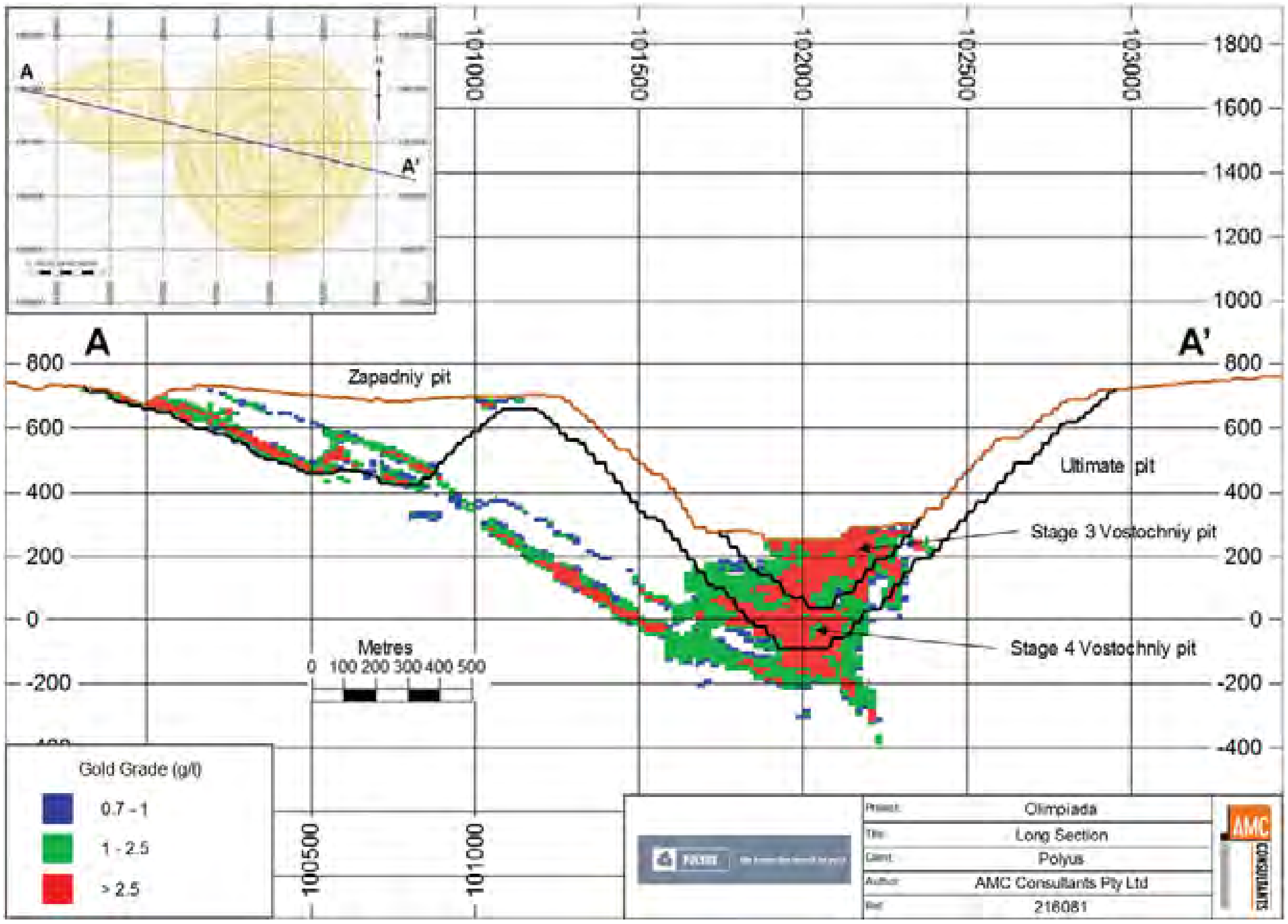
Figure 2.4 Olimpiada - ultimate pit design



Pit staging is required to defer waste mining while providing continuous ore supply to the plant. Figure 2.5 shows a typical section through the pit, and indicates the relativity between the pit stages.

The stage designs include areas of high value ore in early stages. The pit shell selection also considered minimum workable mining widths, generally 80 m, in all cutbacks and to provide continuity of access through the development of the pits. In some short segments of the pit wall, the widths were reduced to 40 m or 50 m.

Figure 2.5 Olimpiada - long section showing pit stages



The content of each detailed stage design was determined by evaluating the contents of the open pit Mining Model within each successively larger pit design. The pit contents were evaluated at a cut-off grade of 0.7 g/t and depleted by the actual mine production as at 30 September 2016. The grade ranges used in the evaluation are:

- High-grade: greater than 2.5 g/t.
- Medium-grade: less than 2.5 g/t and greater than 1.0 g/t.
- Low-grade: less than 1.0 g/t and greater than 0.7 g/t.

The contents of the pit design, by stage, are listed in Table 2.6.

Table 2.6 Olimpiada - contents of pit design stages

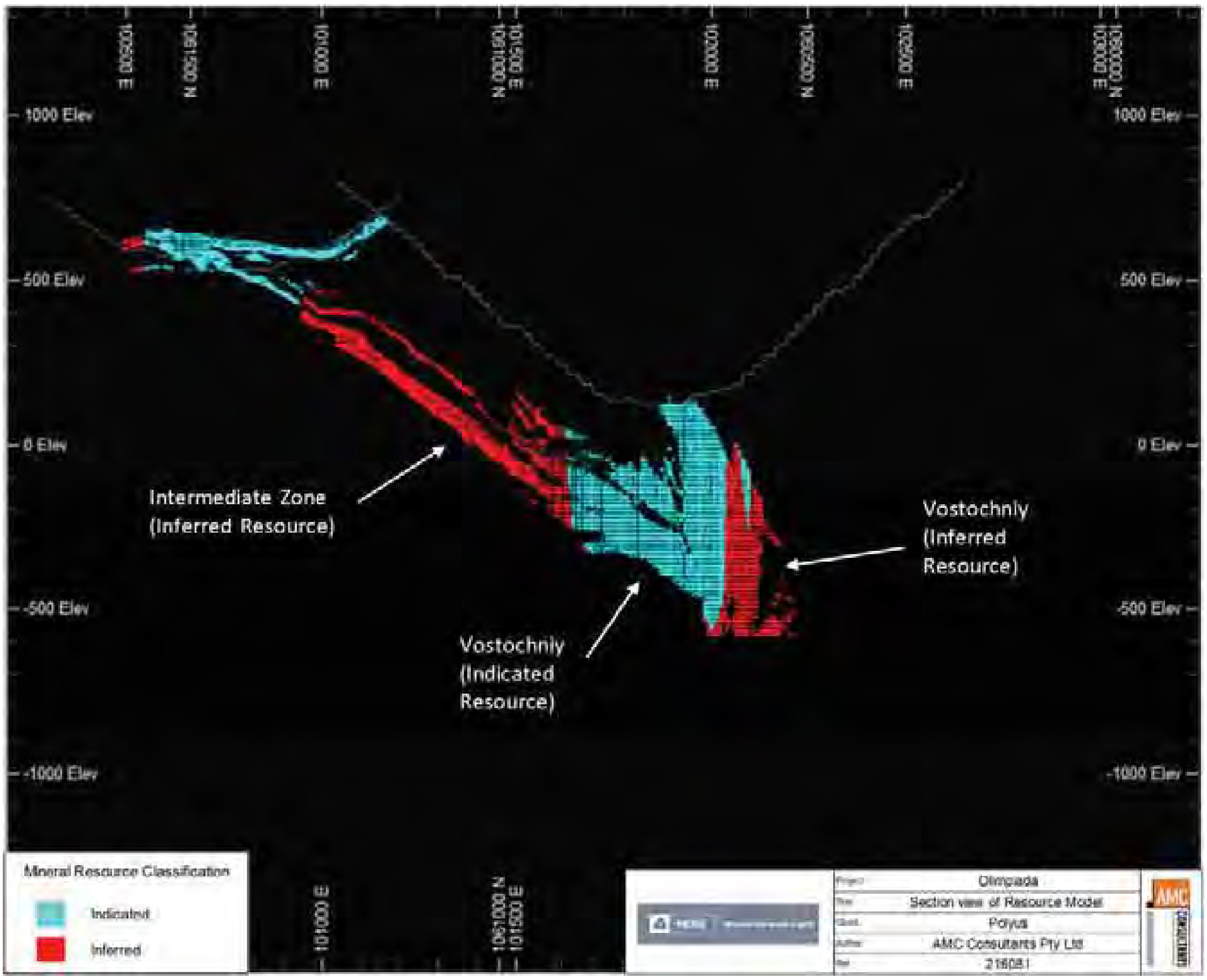
Item	Unit	Vostochniy Pit Stage 3	Vostochniy Pit Stage 4	Zapadniy Pit	Total
Ore tonnes (>0.7 g/t)	Mt	74	97	39	211
Waste tonnes	Mt	17	747	214	978
Total rock tonnes	Mt	91	844	253	1,188
Strip ratio	W:O	0.2	7.7	5.4	4.6
Gold grade (ore >0.7 g/t)	g/t	3.7	3.0	2.0	3.0
Contained gold	t	272	289	80	641
Contained gold	Moz	8.7	9.3	2.6	21
Recovered gold	t	224	238	66	529
Recovered gold	Moz	7.2	7.7	2.1	17
Ore tonnes low-grade (0.7 g/t - 1. 0 g/t)	Mt	1.5	5	6	12
Grade low-grade (0.7 g/t - 1. 0 g/t)	g/t	0.9	0.9	0.9	0.9
Ore tonnes medium-grade (1.0 g/t - 2.5 g/t)	Mt	17	40	23	80
Grade medium-grade (1.0 g/t - 2.5 g/t)	g/t	1.9	1.8	1.7	1.8
Ore tonnes high-grade (>2.5 g/t)	Mt	55	52	11	118
Grade high-grade (>2.5 g/t)	g/t	4.3	4.1	3.4	4.1

Notes:
1. Topographic surface at 30 September 2016 used for evaluation. Ore Reserve estimates adjusted for depletion to 31 December 2016.
2. Ore tonnes and grade do not include existing stockpiles.

2.3.7 Underground mine planning

The Ore Reserve estimate for the Olimpiada underground is based on a mine plan that targets extraction of the down dip extension of the Vostochniy Indicated Mineral Resource below and around the base of the final open pit design. Figure 2.6 presents a section through the AMC resource model showing the Vostochniy Indicated Mineral Resource (blue) and Inferred Mineral Resource (red). The flatter dipping Intermediate Zone Inferred Mineral Resource (red) is also shown.

Figure 2.6 Olimpiada - section through AMC resource model showing resource classification



AMC proposes the SLC mining method for extraction of the Vostochniy Mineral Resource.

Other underground mining methods considered for Vostochniy were block caving, and LHOS. SLC was selected in preference to block caving and LHOS because of a combination of factors including:

- A caving method has a lower unit mining cost than the LHOS method, but can have lower recovery of the resource with greater dilution.
- SLC enables more of a 'top-down' mining sequence than block caving or LHOS. This, in turn enables an SLC to get into production earlier, and at lower initial capital cost than either a block cave or LHOS operation.
- The SLC enables a significantly higher production rate than the LHOS method, thereby enabling better utilisation of the existing processing plant capacity.
- Given the shape of the deposit (lateral extent, footprint, and vertical and dip), SLC would have lower dilution than block caving.

These factors combine to deliver a higher project value when the SLC mining method is employed in the Vostochniy area.

Mining is planned to commence adjacent to the designed pit floor, hence underground mining operations cannot commence until open pit mining is complete. However, establishment of underground decline access, shaft excavation for both ore hoisting and ventilation, along with other infrastructure to support an underground operation can commence before SLC operations begin. Development of this infrastructure is expected to take approximately five years.

AMC considers that significant changes to the process plant and surface infrastructure will not be required for conversion of the operation from open pit mining to underground mining, other than additional power supply will be required. Once the already-constructed Razdolinskoye to Taiga power line is connected to Olimpiada facilities, AMC understands that sufficient power supply will be available from the grid, in conjunction with on-site generating capacity. Connection of the power line to Olimpiada is currently being finalized.

In parallel with compiling an Ore Reserve estimate for the Vostochniy Indicated Mineral Resource, AMC also assessed the potential for extending the underground operation to incorporate the Vostochniy Inferred Mineral Resource and the Intermediate Zone Inferred Mineral Resource. AMC believes that mining of these areas could be economically viable at the currently estimated gold grades should the Inferred Mineral Resources be upgraded to Indicated or Measured Mineral Resources by additional drilling and evaluation.

AMC believes that planning for the underground operation is at pre-feasibility level of study. AMC believes that additional engineering to optimize the cut-off grade, life-of-mine (LOM) design and mine scheduling options will improve the project outcomes. It is AMC’s opinion that this additional work will increase the confidence level of input parameters to the basis of design. The work should include:

- Resource definition drilling to improve the confidence level of the Mineral Resources from Inferred to Measured or Indicated classification.
- Geotechnical analysis for design and positioning of underground development.
- Investigation of using the Zapadniy pit as a portal location.
- Analysis of underground ore haulage and men and materials access options.

Further, AMC believes that the Intermediate Zone could provide additional mine capacity, up to the anticipated shaft hoisting capacity of 8.5 Mtpa and, possibly, a source of ore production that could be accessed prior to completion of the Vostochniy open pit. Further mine planning will be required once the Mineral Resources are upgraded to Measured or Indicated.

Underground mining model

The resource model used as the basis for mine planning was:

“mdolp161117.dm”, dated 21 November 2016.

This resource model was developed by AMC. The SLC level outlines and production schedule is based on Indicated Mineral Resources only to enable reporting according to the JORC Code. There is no Measured Mineral Resource within the portion of the resource model being evaluated for underground mining at Olimpiada. For evaluation and scheduling purposes, all Inferred Mineral Resource was regarded as waste.

The resource model was converted by AMC to a regularized model (underground Mining Model; “rmod_slc7.dm”) by aggregating the tonnage and metal of individual model cells that fall within blocks of a singular size and regular grid pattern that is suited to evaluation of a mining layout designed for SLC mining. A block size of 14 m in both easting and northing directions and 25 m vertically was used to suit the planned mining layout of orebody crosscuts at 14 m spacing, and a level interval of 25 m.

The underground Mining Model used as the basis for the SLC evaluation and the underground Ore Reserve estimate is depleted according to the Vostochniy ultimate pit design, with the gold grades for Inferred Resource blocks set to zero.

Underground mining method

SLC is a top down mining method, with mining of the Vostochniy Zone commencing adjacent to the floor of the completed Vostochniy open pit. Ore is blasted in a series of horizontal slices (sublevels) and extracted via drawpoints. Rock from above the production horizon caves into the void created by ore extraction. The horizontal slices are progressively blasted and extracted from top to bottom of the mining block.

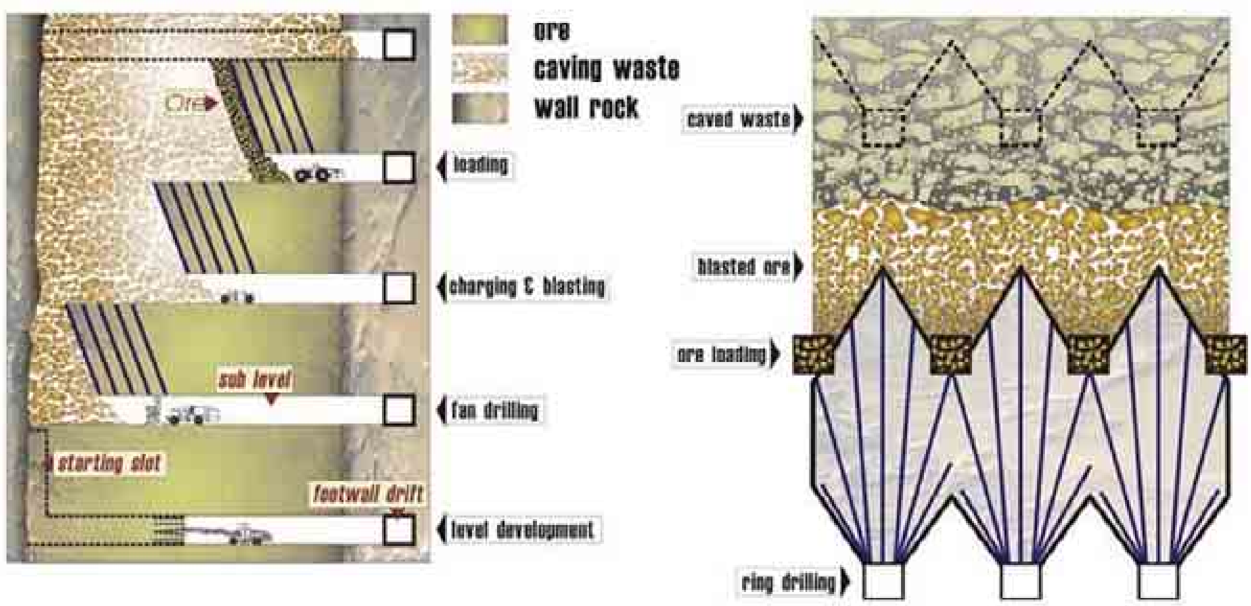
Caved material mixes as the whole broken mass moves downwards, and any waste that is within the cave zone is incorporated into the mass and dilutes the ore within the zone. Modelling the inclusion of waste within the cave zone is critical to estimating the likely production head grade from the SLC operation.

As mining progresses at depth, caving propagates upwards to the surface. The Vostochniy Zone is adjacent to the floor of the Vostochniy pit and, therefore, the cave zone will break through to the pit floor and lower walls of the completed pit shortly after commencement of underground mining operations.

Sectional views of a typical SLC operation are shown in Figure 2.7. For the Olimpiada SLC mine plan:

- Ore is extracted in a direction perpendicular to the strike of the orebody.
- Sublevels are spaced at 25 m vertical intervals.
- Crosscuts have centreline-to-centreline spacing of approximately 14 m. The 14 m crosscut spacing results in many drawpoints on each sublevel, allowing for relatively high production rates.
- Crosscuts are offset by half the centreline-to-centreline spacing on adjacent sublevels to aid ore recovery.
- A uniform drill-and-blast pattern is applied as shown in Figure 2.7. Zones of lower-grade may be included in the cave design as a result of the reduced selectivity associated with a caving mining method, compared with other mining methods.
- Prior to commencing production on each sublevel, a vertical starting slot is developed along the strike length of the orebody to provide a void from which mining is to commence.

Figure 2.7 Typical SLC operation - sectional views



Source: After Bull and Page, 2000

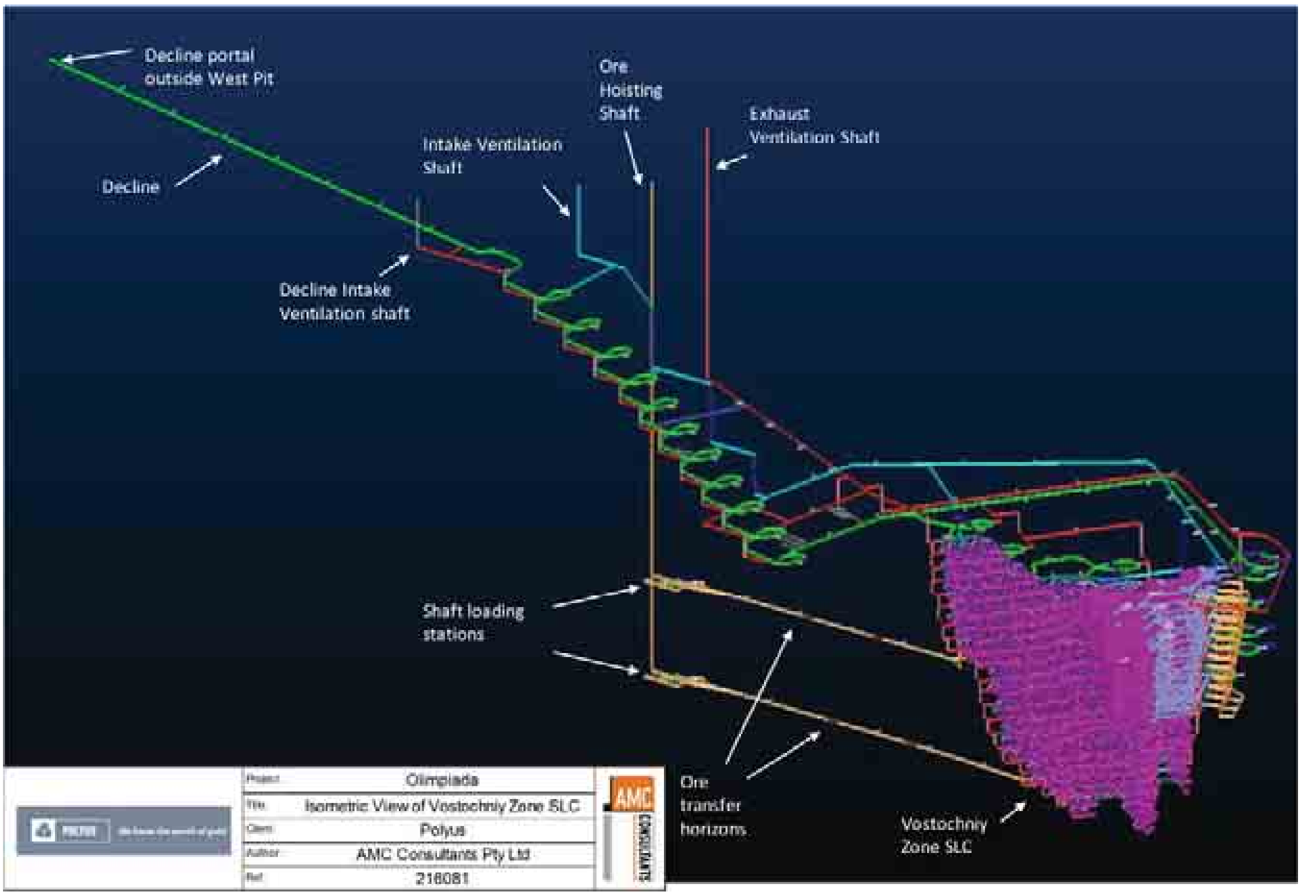
The SLC design for the Vostochniy Zone incorporates uphole rings of 102 mm diameter blastholes drilled to a designed spacing and burden and blasted on each sublevel. Blasted ore is retrieved with 25 t loaders which tip the ore directly into orepasses located on each sublevel.

The ore is loaded from the orepasses either by direct bogging using 25 t loaders or loaded into 60 t trucks via chutefronts, then hauled to a crushing station, where it is crushed and then conveyed to the shaft for hoisting to the surface. The proposed hoisting shaft extends to a depth of approximately 1,200 m below surface. AMC recommends evaluation of alternative haulage options during the feasibility study. Development of deeper sublevels continues in advance of the stoping operations.

Figure 2.8 shows the layout of an SLC sublevel and Figure 2.9 shows an isometric view of the mine layout and access for the Vostochniy Zone SLC design.

Figure 2.8 Olimpiada - plan view of the layout of an SLC level (-115 mRL)

Figure 2.9 Olimpiada - Isometric view of the Vostochniy Zone SLC



AMC proposes accessing the underground operations via a decline with the portal located to the north of the planned Zapadniy open pit ultimate limit. Future studies should investigate the potential for mining the Zapadniy open pit as soon as possible to enable use of the pit ramps to access a portal location near the pit bottom with a view to reducing the decline length. For the evaluation upon which this CPR is based, AMC positioned the portal to ensure timing of the Zapadniy open pit mining operations and decline development are independent. The decline is also aligned to provide access for potential underground mining of the Intermediate Zone.

A fleet of ancillary equipment supports the main production equipment and performs other mine maintenance activities. The operation employs staff on three 8-hour shifts per day, 365 days per year.

AMC proposes crushing ore underground and hoisting to the surface via a single shaft, as was also proposed in feasibility study work undertaken in 2015[6]. As the hoisting shaft needs to be located outside the influence of both the cave zone and the open pit mining operations, the shaft is located approximately 1 km from the SLC. The mine layout includes two lateral transfer horizons connecting the underground crushers, which are adjacent to the SLC orepasses, to the hoisting shaft. AMC proposes using conveyors to transfer the crushed ore from the crushing facility adjacent to the SLC sublevels to the hoisting shaft. Other options for ore haulage should be investigated during the feasibility study.

Separate intake and exhaust airways will be developed for ventilation of the mine operations. These dedicated airways, together with the haulage shaft and the decline, will provide the primary ventilation intake and exhaust connections to the surface.

6 Feasibility Study, Exploration standards for calculation of Olimpiada gold ore deposit, Book 5, Report on Mining Study for Underground Mining, Krasnoyarsk 2015.

Cut-off grade and shut-off grade

For underground mine planning, AMC estimated a cut-off grade and a shut-off grade.

The cut-off grade is applied to determine if an in situ block should be mined.

As ore is mined from a block, the ore mixes with broken and caved material from above. The ore is diluted, and the diluting material can have a lower-grade than is profitable to mine. Generally, as more of a block is mined, the rate of dilution entry progressively increases, and consequently the mined grade progressively reduces.

The shut-off grade is applied to determine how much of a block should be mined, so that incremental tonnes mined are profitable.

The following parameters were used to calculate the mining cut-off grade and are derived from a combination of information provided by Polyus, and AMC's determinations based on technical assessments:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the plant feed gold value (US$75/oz), for cut-off grade calculation.
- Gold recovery of 82.5%.
- The unit mining cost for the 7 Mtpa production rate from the 2015 evaluation work of US$17.68/t mined.
- Process plant operating cost of US$18.57/t processed, based on the Polyus 2017 budget.
- SG&A costs as a combination of general and administrative costs of US$2.77/t ore processed and selling costs of US$10.26/oz of recovered gold, based on Polyus 2017 budget.
- Process plant throughput of 11.7 Mtpa.
- Refining and transportation costs of US$2.19/oz of recovered gold, based on Polyus 2017 budget.

The mining cut-off grade used is 1.5 g/t, and the shut-off grade used is 0.8 g/t, where the shut-off grade is derived using only the costs for loading, haulage, processing, and SG&A. The shut-off grade derivation also excludes costs that are sunk once the decision to mine a block has been made, for example, the cost of developing access to the block.

The evaluation of the SLC mining method for the Vostochniy Zone is based on unit underground mining operating costs estimated as part of the feasibility study work completed in 2015. That work included estimation of capital expenditure as well as operating costs.

Evaluation of the SLC mining outline for each sublevel

AMC's SLC footprint analyser was applied to the underground Mining Model to generate a range of potential SLC inventories. This analyser employs a mixing algorithm to assess the potential inventories against cut-off grade criteria to achieve the goals of the project. For Olimpiada, the goal was to maximize the Ore Reserve. Additional analysis of the cut-off grade and ore inventories should be considered at the next stage of study to optimize the mine plan.

AMC used the following procedure to setup and apply the SLC mixing algorithm:

- Use the underground Mining Model, which has regularized blocks representing caving blocks commensurate with an SLC operation. Each block has a drawpoint to access the block.
- Include a caving block in the SLC footprint if its grade is greater than the mining cut-off grade of 1.5 g/t, which is based on full costs. The mining cut-off grade is used to determine if a caving block is to be mined.
- Use the mixing algorithm to calculate inventories for each caving block based on different draw rates (ranging from 40% to 250% draw of the in situ ore). For example, if a caving block contains 10 kt of in situ ore, and a draw rate of 150% is applied, 15 kt of ore would be drawn.
- Mix the material within a vertical draw column (the dimensions of a regularized block) in increments of the draw rate, based on the tonnes and grade of the blocks above the caving block being mixed. A draw curve is used for this purpose. The draw curve describes the spatial location that material is sourced from within the draw column, and is different for different draw rates. Draw curves are based on AMC

experience of results from different draw marker trials at operating SLC mines. A draw rate inventory is calculated for each position on the draw curve, as shown in Figure 2.10.

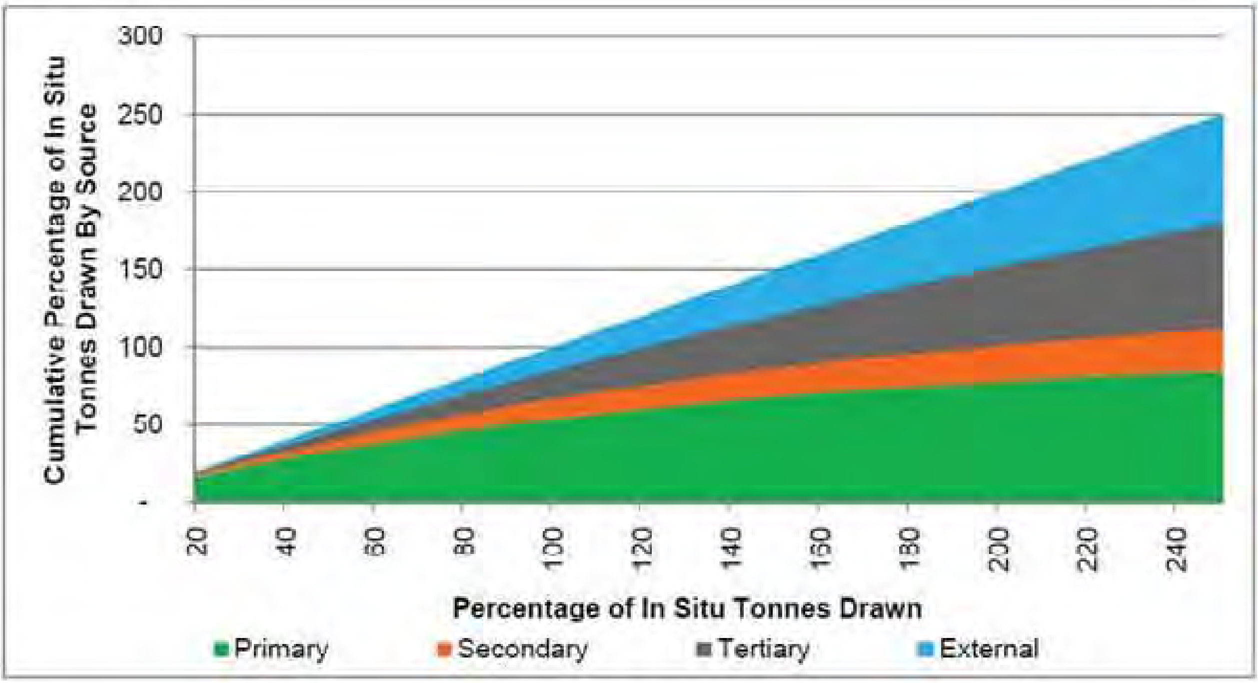
- Generally, as more ore is progressively drawn, more dilution will enter the drawpoint and the average grade of the incremental tonnes will reduce. Material continues to be drawn until the average grade of the incremental tonnes falls below a grade of 0.8 g/t, when only incremental costs are covered, namely, the costs for loading, haulage, processing, and SG&A. That grade is referred to as the shut-off grade. By moving up the draw curve shown in Figure 2.10 (from low draw to high), a point is reached where the average grade of the incremental tonnes falls below the shut-off grade, and drawing from that drawpoint would then be terminated, or "shut-off". Using this process, the shut-off grade is used to determine how much material should be mined from an SLC block, given that the caving block has already been selected for mining because it satisfies the mining cut-off grade. The draw inventory at the point at which the drawpoint is shut-off is determined to be that draw point's ultimate inventory.
- In this way the mixing algorithm balances the recovery of ore against the effect of dilution, to achieve target grades (based on cut-off grade and shut-off grade).

The resulting outlines of economic columns in the SLC were then used as the basis for developing practical SLC sublevel outlines. They are also used for production scheduling and economic analysis.

Figure 2.10 illustrates the draw curve applied in the SLC footprint analyser. The draw curve is applied to the following materials:

- Primary material – material sourced from the ring fired at the drawpoint.
- Secondary material – material sourced from the ring fired on the sublevel immediately above the drawpoint.
- Tertiary material – material sourced from the rings fired on two sublevels or above the drawpoint.
- External material – dilution material from the cave.

Figure 2.10 Olimpiada - SLC footprint analyser draw curve



2.3.8 Ore Reserve estimate

The Olimpiada 2016 Ore Reserve estimate presented in this CPR is based on an update of the resource model completed by AMC during 2016. The estimate is for both open pit and underground ore.

The Ore Reserve estimate has been:

- Prepared and reported under the direction of the Competent Persons using accepted industry practice.
- Classified in accordance with the JORC Code.
- Prepared to reflect the assumed gold price (US$1,250/oz), foreign exchange rate (RUB65 to US$1.00), costs, and mining and metallurgy performance to inform cut-off grades and physical mining parameters.

The 2016 Olimpiada open pit (excluding stockpile) Ore Reserve is estimated to be 206 Mt grading 3.0 g/t containing 20 Moz of gold as at 31 December 2016, as summarized in Table 2.7.

The 2016 Olimpiada underground Ore Reserve is estimated to be 103 Mt grading 2.9 g/t containing 9.6 Moz of gold as at 31 December 2016, as summarized in Table 2.7.

Table 2.7 Olimpiada - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Stockpiles	n/a	**6.5**	**2.5**	**0.51**	**16**
Probable	Open Pit	0.7	206	3.0	20	627
	Underground	1.5	103	2.9	9.6	299
Total Probable			**309**	**3.0**	**30**	**925**
Total			**316**	**3.0**	**30**	**941**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface as at 30 September 2016 with mining depletion to 31 December 2016.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

2.4 Ore processing

Polyus operates four process plants in the Olimpiada area; Plant No.1, Plant No.2, and Plant No.3 at Olimpiada, and Plant No.4 at Blagodatnoye. The three Olimpiada plants treat primary sulphide ores from mines at Olimpiada, Titimukhta, Poputninskoye, and Veduginskoye (owned by a third party). Plant No.1 can be configured to treat oxide ores. Plant No.4 at Blagodatnoye treats ore from the Blagodatnoye mine.

AMC visited the Olimpiada processing plants and key supporting infrastructure installations such as power generating plants and TSFs in October 2016.

AMC observed all plants to be in good operating condition, with acceptable levels of housekeeping throughout the working areas.

Plant management is well organized, and the operating team is clearly focused on delivery of planned performance, and of the expansion project that is in progress. The de-bottlenecking process that has been used to identify possible improvement projects has been thorough and well managed, and operators are able to speak knowledgeably about its findings and the projects that have been developed based on its conclusions.

The ROM ore blending system used at Olimpiada and Blagodatnoye is an excellent example of efficient feed preparation. Management has provided structure and support to empower the blending department to produce consistent, known feed for each plant which results in an optimized result for both mining and processing functions.

2.4.1 Plant history, design, and operations

Primary ore at Olimpiada is regarded as refractory. It is referred to as "low sulphide" type; containing 3% to 5% sulphide. The main sulphide species present are arsenopyrite, antimonite, and pyrrhotite. Gold particles are generally found as inclusions dispersed through the sulphides. Polyus has developed the BIONORD process to oxidize the sulphides and expose gold particles for cyanide leaching. BIONORD utilizes three, moderately thermophilic, chemolithotrophic, microbial species that are able to thrive in Arctic conditions.

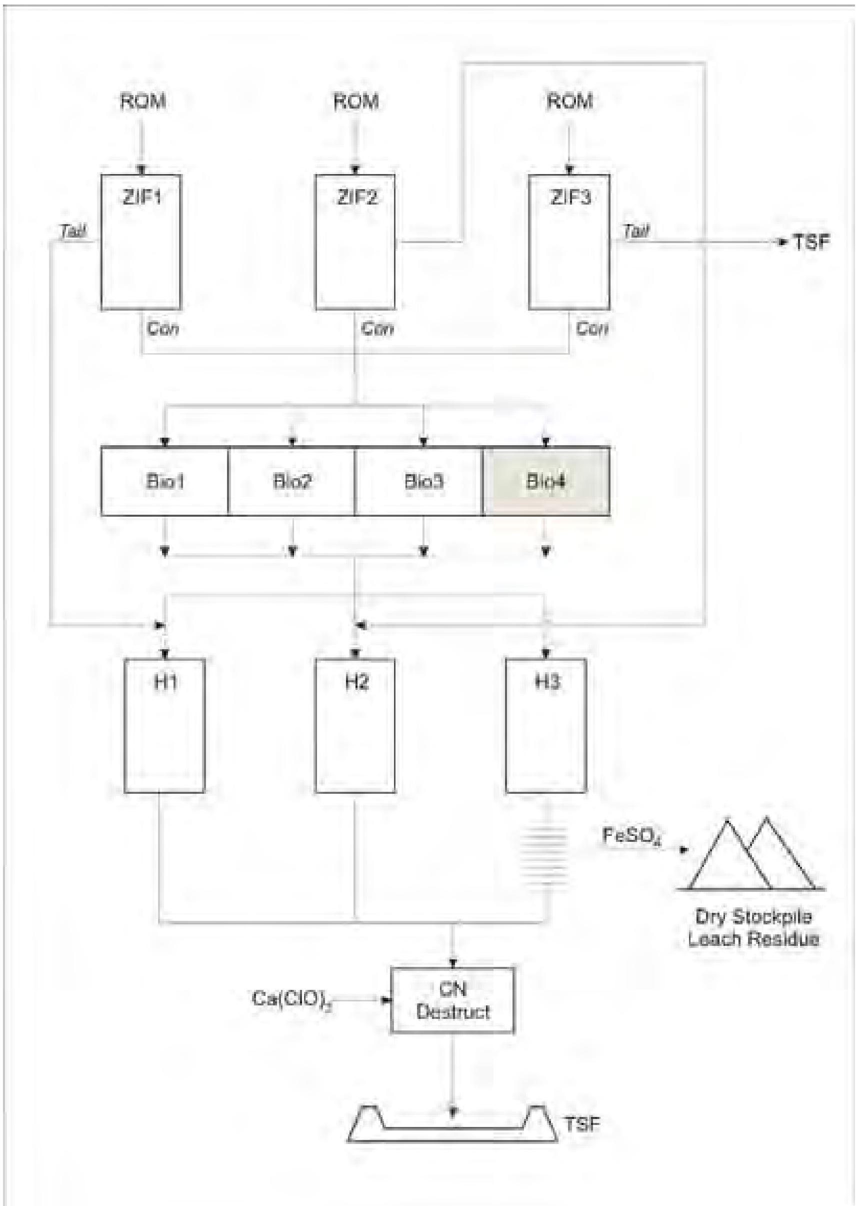
Primary ore is segregated into three basic types:

- Ordinary - further segregated into low-grade (1.0 g/t to 2.5 g/t), and high-grade (>2.5 g/t).
- Stibnite Ore - >0.5% Sb.
- High Carbon - >4.0% C, regarded as preg-robbing.

Transition ore requires 100% cyanide leaching (flotation concentrate and tails) to prevent loss of gold not associated with sulphide.

The Olimpiada processing complex consists of three plants; Plant No.1, Plant No.2 and Plant No.3. The plants are comprised of three primary circuits (ZIF1, ZIF2 and ZIF3), three bio-oxidation circuits (Bio1, Bio2 and Bio3), and three hydrometallurgical circuits (H1, H2 and H3). A fourth bio-oxidation circuit (Bio4) is currently being constructed as part of an overall expansion project. The general circuit arrangement is shown in Figure 2.11. Plant No.1 and Plant No.2 are adjacent and in the same building. Under the Olimpiada expansion scenario, Plant No.1 and Plant No.2 will receive crushed feed from a new, common jaw crusher with a capacity of 1,200 tph. In addition, +40 mm material screened from semi-autogenous grinding (SAG) mill No.1 discharge and SAG mill No.2 discharge will be crushed in a single pebble crusher, with the crusher discharge reporting to ball mill No.2.

Figure 2.11 Olimpiada - process plant - block flow diagram



Production at Olimpiada commenced in 1996 with the treatment of oxide ore at a rate of 1.5 Mtpa in Plant No.1.

Polyus developed a flowsheet capable of treating highly refractory, primary-sulphide ore using bio-oxidation. The process is referred to as BIONORD, and Plant No.2 which features BIONORD was commissioned in 2001. The nominal capacity of the plant was 3.0 Mtpa. Overall capacity at Olimpiada was expanded in 2007 with the construction of Plant No.3 (also using BIONORD to treat primary sulphide) whose capacity was 5.0 Mtpa.

Plant No.1

Plant No.1 processed oxide ore from the Vostochniy area using a simple comminution and cyanide$^-$ leach circuit until this resource was depleted. The plant was shut down in August 2008 and overhauled; reopening in May 2009 to treat oxide ore from Titimukhta. The nominal capacity of the plant while treating oxide ore is stated as 2.4 Mtpa. Titimukhta oxide ore was processed until April 2016, with 500,000 t processed in 2016. In addition, oxide ore from the nearby Veduginskoye mine (not owned by Polyus) was processed in 2015. The average feed rate attained in 2016 while processing oxide ore was 233 tph.

In 2016, Plant No.1 was reconfigured to treat primary sulphide following the completion of oxide shipments from Titimukhta. In addition, the new design was required to handle high-stibnite ore from Vostochniy which currently is not processed using BIONORD as the degree of oxidation is lower, resulting in decreased gold recovery and increased cyanide consumption by residual sulphide reporting to the hydrometallurgical circuits. Numerous modified flowsheets were considered, including use of differential flotation to produce two concentrates; a basic flotation concentrate capable of processing with BIONORD, and a high-stibnite concentrate (24% to 25% Sb, 50 g/t to 85 g/t) to be marketed in China.

The basic throughput capacity of the plant while treating harder, primary Olimpiada ore has been increased by a series of debottlenecking measures including increase of SAG mill grate size, addition of a pebble crusher to reduce critical size fraction material, and increased screening capacity. Flotation capacity was installed, however the differential capability was not implemented. Instead, the capacity of bio-oxidation (Bio1, Bio2, and Bio3) was increased from 1,150 tpd to 1,260 tpd by expansion of the cooling system, automation of H_2SO_4 addition, and other debottlenecking improvements including improved oxygen transfer through optimized reactor impellor design.

Concentrate produced in Plant No.1 was added to the bio-oxidation feed to use available capacity of the expanded maximum of 1,260 tpd, with the balance of concentrate trucked from site for external customers. The expansion option finally chosen in 2016 was further expansion of bio-oxidation (Bio4) such that all flotation concentrate is treated on site and all refined gold production is retained within the Polyus system.

Polyus Project (an internal project study and design group) completed a feasibility study in 2016, and summarized the results in the report entitled “Complex to process flotation concentrate from ZIF-1,2,3 at Olimpiada, ТЭР-937/01-1013”. The study examined various flowsheets and available locations for the new circuit, and concluded that maximum value will be realized using an eight-reactor arrangement in a location outside existing buildings. The maximized value is driven by maximizing the efficiency of oxidation and hence the exposure of gold particles to cyanide solution. Remaining capital expenditure of RUB1.8 billion was estimated for construction of the Bio4 circuit, which will increase bio-oxidation capacity to 1,400 tpd and accommodate processing of 11.7 Mtpa of sulphide ore (10.5 Mtpa of ordinary ore and 1.2 Mtpa of high-stibnite ore) which is included as the target throughput rate in the planned production schedule. Construction of Bio4 is scheduled to be completed by 1 September 2017.

The expansion of Plant No.1 capacity to process 3.0 Mtpa of sulphide ore, including 1.2 Mtpa of high-stibnite ore was completed in September 2016. Following completion of all upgrades, the plant will utilize the following circuits:

- Jaw crushing using a new unit which will be shared with Plant No.2.
- SAG milling and ball milling to 85% -74 µm, with a critical size fraction (-40 mm + 12 mm) isolated by screening and crushed using a new cone crusher (pebble crusher) which will be shared with Plant No.2.
- Coarse gold recovery using Knelson centrifugal separators, intensive leach reactors (ILRs), and electrowinning.
- Flotation of sulphide minerals, with tailings disposed in the TSF.
- Bio-oxidation using Bio1, Bio2, Bio3, and Bio4 (in parallel).
- Cyanide leaching of gold, followed by gold recovery from solution in H1, and electrowinning.
- Gold production from electrowinning product by doré smelting.
- Leach residue detoxification using $Ca(ClO)_2$ and disposal in the TSF.

Plant No.2

Plant No.2 began production in 2001, utilizing the basic Olimpiada sulphide treatment flowsheet as described for Plant No.1. The arrangement also includes a flotation leach circuit to recover gold not associated with sulphides that are recovered to flotation concentrate. Therefore, Plant No.2 features increased flexibility to treat non-standard sulphide feed stocks, such as high-clay content stockpiled material, transition ores containing partially oxidized material, and custom ores from Veduginskoye (not owned by Polyus) which may contain unexpected material.

Plant No.2 was commissioned with a nominal capacity of 3.0 Mtpa. Polyus operators state that debottlenecking, including the addition of SAG mill discharge screening and pebble crushing as described for Plant No.1, has now raised the nominal capacity to 3.2 Mtpa. The September 2016 year-to-date average plant feed rate was 474 tph with an overall time utilization of 90%. This combination yields a projected annual throughput of 3.7 Mtpa. Operators state that replacement of SAG mill No.2 is scheduled for January 2017 as part of the expansion of Plant No.2 production to 3.5 Mtpa nominal feed rate.

The basic elements of the plant are similar to those described for Plant No.3.

Plant No.3

Plant No.3 commenced operation in 2007 at a nominal annual throughput of 5.0 Mtpa. The plant also utilizes the basic Olimpiada sulphide flowsheet to treat primary sulphide ore. The arrangement contains the following basic elements:

- Primary crushing using two units with total capacity of 685 tph. A new jaw crusher with a capacity of 1,200 tph is due to be installed in 2017. The crusher is similar to others being installed for Plant No.1 and Plant No.2, and for Plant No.4 at Blagodatnoye.
- Milling with a SAG mill and two ball mills in parallel, closed circuit combination to produce a nominal product size of 85% -74 µm.
- Pebble crushing of a critical size fraction (-40 mm +12 mm) isolated by screening.
- Extracting a coarse gold concentrate from the grinding closed circuit using Three 48” Knelson centrifugal separators. 7% to 8% of gold produced is in this coarse stream.
- Cleaning of a combined Plant No.2 and Plant No.3 coarse concentrate using shaking tables, and the absorption of gold into solution using ILRs. Gold concentrate is produced by electrowinning.
- Floating of sulphide minerals using two lines of rougher/scavenger cells and two stages of cleaning combined rougher concentrate, with tailings disposed in TSF.
- Bio-oxidation using Bio1, Bio2, Bio3, and Bio4 (in parallel).
- Cyanide leaching of gold, followed by gold recovery from solution in H3, and electrowinning.
- Gold production from electrowinning product by doré smelting.
- Filtering of leach residue using pressure filtration, then dry stacking of solids with cyanide precipitation using $FeSO_4$. Filtrate is detoxified using $Ca(ClO)_2$ and then stored in the TSF.

The stated nominal capacity after all expansion projects are completed is 5.5 Mtpa. The September 2016 year-to-date (YTD) average feed rate is 729 tph, which equates to 5.8 Mtpa at the current YTD average overall utilization of 90.5%.

2.4.2 Plant maintenance

Plant maintenance is managed by an engineering department independent of plant operations management. The manager is the Chief Mechanic of Processing who reports to the site Chief Engineer. Dedicated teams are in place for each plant. A parallel electrical structure reports to the Chief Electrical Engineer who reports to the site Chief Engineer.

No maintenance management software is used to administer maintenance activities. However, plant operators and engineering managers responsible for maintenance have instituted a spreadsheet-based maintenance management system that provides basic functionality, such as preventative maintenance scheduling, shutdown planning, and tracking of work completed by maintenance personnel.

In general, the system is sound and functions well. The plants are planned to deliver around 94% overall utilization of time; with 4% planned maintenance and 2% for unplanned stoppages. These are appropriate goals and often they are achieved. In 2015, Plant No.1 achieved 94.9%, Plant No.2 achieved 97.3%, and Plant No.3 achieved 95.5%.

AMC considers implementation of a maintenance management system to be a logical step for Polyus at the Olimpiada plants. While it is possible to accomplish the basic outcomes of maintenance management using spreadsheets, AMC believes Polyus will accrue additional cost-reduction and equipment-availability benefits by implementation of a formal system that is capable of administering the full range of modern maintenance tools.

2.4.3 Olimpiada processing complex - historical performance all ore feed

The performance of Olimpiada processing complex for the last three years to September 2016 is summarized in Table 2.8. The feed includes ores from Olimpiada and other sources. The processing complex has reliably achieved gold production targets for 2014 and 2015 through a combination of above-budget throughput, on-budget to slightly-above-budget feed grade, and above-budget gold recovery.

Polyus has seen the positive results of the projects to improve throughput and recovery, with all plants delivering above-plan performance in 2016 YTD.

Table 2.8 Olimpiada processing complex - historical performance all ore feeds

Description	Unit	2014		2015		2016 (YTD September)	
		Actual	Plan	Actual	Plan	Actual	Plan
Throughput[1]	Mt	10.8	10.4	11.0	10.7	8.5	8.4
ZIF1	Mt	2.2	2.4	1.9	2.4	1.5	1.2
ZIF2	Mt	3.5	3.1	3.6	3.2	2.7	3.1
ZIF3	Mt	5.0	4.9	5.6	5.1	4.3	4.1
Processed gold grade	g/t	3.2	3.2	3.1	3.0	3.1	3.0
ZIF1	g/t	1.8	2.1	2.5	1.8	2.9	3.0
ZIF2	g/t	3.6	3.3	3.1	3.4	3.1	3.0
ZIF3	g/t	3.6	3.6	3.2	3.5	3.1	2.9
Gold recovery (doré)	%	73.7	77.9	80.5	76.5	81.2	77.9
Vostochniy	%	75.9	76.6	79.6	75.5	81.3	77.6
Titimukhta	%	81.9	84.7	85.9	80.7	85.7	83.7
Poputninskoye	%	-	-	-	-	73.4	-
Veduginskoye - oxide ore	%	88.5	-	90.4	90.0	-	
Veduginskoye - primary/mixed ore	%	-	-	79.3	-	76.8	76.6

Note:
1. Feed includes ores from Olimpiada pits and other sources.

2.4.4 Process plant expansion

A project to increase the Olimpiada processing complex throughput rate to 11.5 Mtpa and gold recovery to 81% was initiated in 2014. Many modifications to the three plants have already been implemented and, in combination, the Olimpiada plants are now capable of exceeding both the capacity and recovery targets as indicated from the historical performance.

The current status of the individual plant expansion projects is:

- Plant No.1
  - Prior to plant modifications the plant operated at 316 tph while treating primary sulphide ore, equating to 2.5 Mtpa to 2.7 Mtpa.
  - Modifications to the grinding circuit complete as described above and permitting operation at 364 tph to 380 tph (time utilization range of 90% to 94%) resulting in improved throughput of approximately 3.0 Mtpa. Feed rates in excess of 400 tph have been achieved in the past, so average rates up to 380 tph are attainable.
  - Gold recovery from Vostochniy ore averaged 81.3% for YTD September 2016, which exceeds the expansion goal. However, some concentrate is being diverted out of the circuit and sold due to insufficient bio-oxidation capacity. This situation will be exacerbated as the throughput rate of the complex increases.
  - The expansion of bio-oxidation capacity by addition of Bio4 as described above will alleviate the bottleneck and permit efficient treatment of all flotation concentrate produced by Plant No.1, Plant No.2, and Plant No.3.
  - Recovery will also be enhanced by expansion of the coarse gold circuit as described above and recoveries above 81.0% are reasonably expected.
- Plant No.2
  - Plant No.2 has been exceeding the expansion project goal of 3.5 Mt and AMC expects this rate to be maintained.
  - Replacement in 2017 of the SAG mill with a similarly-sized unit will not affect the throughput of the plant.
  - The YTD September 2016 gold recovery of 81.3% is above the goal and AMC expects this recovery to be maintained with further improvements being reasonably expected.

- Plant No.3
    - Plant No.3 has been exceeding the project goals of 5.5 Mtpa and 81.0% recovery.
    - A detailed debottlenecking exercise was conducted to identify opportunities for improvement, and projects were developed around the selected actions.
    - AMC reasonably expects that Plant No.3 can continue to perform at this level, with further improvements reasonably expected.

The modifications completed to date indicate that the individual plants have achieved or exceeded the targets and, overall, AMC believes that a total throughput capacity for the three plants of 11.7 Mtpa is reliably achievable, with potential for further improvements. The capital cost to finalize construction of auxiliary facilities for the Plant No.1 reconfiguration project (completed in September 2016) is expected at US$1.5M and the capital cost for Bio4 addition is expected to be US$19.4M in 2017 and US$8.3M in 2018 with the 2018 capital expenditure related to construction of auxiliary facilities.

Further expenditure is planned to lift the gold recovery to the near-term target of 82.5%, and perhaps higher. Though the gold recovery for the production schedules has been maintained at 82.5% for the production cases. The total expenditure of RUB9,945 million (US$153M) is expected to be expended in:

- 2017 – RUB122 million (US$2M).
- 2018 – RUB2,283 million (US$35M).
- 2019 – RUB3,943 million (US$61M).
- 2020 – RUB2,740 million (US$42M).
- 2021 – RUB857 million (US$13M).

A gold recovery of 81.5% is included for 2017 with 82.5% scheduled thereafter. Higher performance will be dependent on the sources of ore feed.

2.4.5 Tailings storage facility

The Olimpiada TSF is formed by an embankment across the Enashimo valley. It is clay lined. The inner slope of each lift is also clay-lined. Decant water is reclaimed from the surface. The TSF is divided into two compartments. Compartment No.1 (downstream) contains leach residue and compartment No.2 holds flotation tailings. The dam has capacity to store tails at the scheduled rate until 2020. Operators are assessing options for storage after this time; including raising the existing TSF embankment, and using the exhausted Oleny pit for storage. No detailed plan has been made for inclusion of tailings from a possible underground mine at Vostochniy in the current TSF.

Filtered leach residue from Plant No.3 is dry stacked within the local catchment of TSF compartment No.2, so that any drainage or rainfall runoff reports to the TSF.

The TSFs are operated by dedicated personnel and are generally in good condition. All leach streams entering the TSFs are subject to cyanide destruction with a cyanide concentration set point of 5 μg/L. Although the TSF is clay-lined, leaks under the embankment have been observed with downstream ponding. A permanent, three-pump installation returns water from the downstream collection pond to the process plants, with groundwater monitoring bores downstream of the pond.

Cyanide levels in monitoring bores surrounding the TSFs are measured regularly under a regulated programme, with no exceedances reported.

The PRDC is reported to be developing a new cyanide destruction process which has been named the Astra Process. No documentation is available on the Astra Process at this time. Polyus states that the process will be trialled at Olimpiada in the near future.

2.4.6 Infrastructure

Power supply

Approximately 120 MW of power is currently required for the Olimpiada-Blagodatnoye complex, including mining and crushing operations at Titimukhta, and for the township of Eruda. In 2016, approximately 45% (50 MW) was generated on site while the balance (approximately 70 MW) was supplied from the national grid.

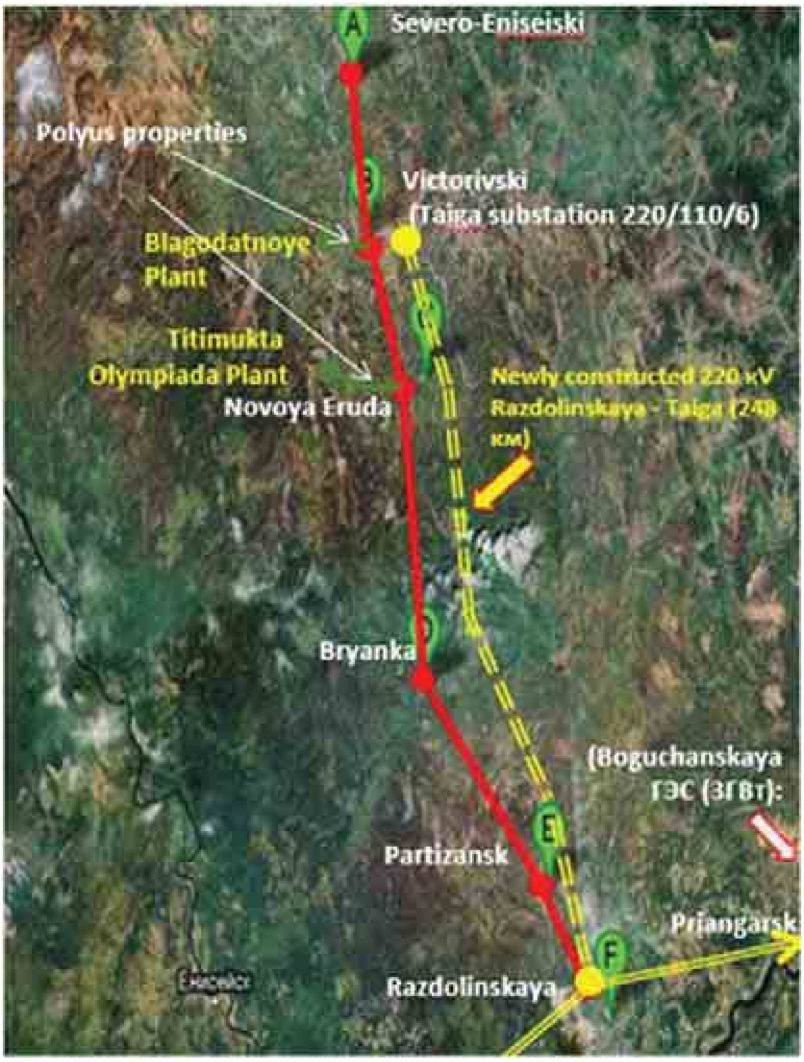
Two coal-fired plants (CHP-1 and CHP-2) supply 18 MW and 24 MW respectively. The coal is sourced from a Polyus-owned mine at Kokuya, and transported approximately 450 km by river barge and ice road to site. Approximately 17 MW is generated by a diesel-fired plant whose four, purpose-built units burn filtered crude oil. The oil is sourced from the Yurubchena-Tokhomskoye oil and gas field, and is transported approximately 280 km to site by river barge and ice road.

The overall expansion plan for the Olimpiada-Blagodatnoye operation requires the total power supply to be increased to 183 MW. However, there is currently a limit of 75 MW on the supply available from the grid. A project to supply additional grid power to Olimpiada-Blagodatnoye was commenced in 2014. A 248 km, 220 kV line was constructed from Razdolinskaya to Taiga to deliver 250 MW to a new 220/110 kV sub-station (refer Figure 2.12). Connection of facilities at Blagodatnoye to the new power line has been completed, with connection of the Olimpiada facilities currently being finalized. Polyus anticipates that cheaper power supplied from the grid will also contribute to reduced operating cost.

Initial estimates of installed power required to operate the surface and underground equipment related to underground production are approximately 82 MW (for the 7 Mtpa option). Adding this capacity will bring the power requirement to approximately 265 MW. AMC understands that sufficient power capacity will be available from the Razdolinskaya to Taiga power line, in conjunction with on-site generating capacity.

Heat for the Olimpiada-Blagodatnoye complex is provided by the two coal-fired plants. This will continue to be the case after commissioning of the expanded grid supply system; with 18 MW at Olimpiada and 5 MW required at Blagodatnoye. The diesel-fired generators will be used as swing units to trim supply to demand as required.

Figure 2.12 New Razdolinskaya to Taiga power line (shown as dashed yellow line)



Water supply

Process water for the Olimpiada-Blagodatnoye complex is provided by recycling of reclaimed water from the Vostochniy pit and the TSFs. No additional water is required from streams or wells. Water is decanted from the surface of the TSFs, and a significant volume is pumped back to the plants from a collection pond downstream of the TSF dam wall. In addition, 600 m^3/h to 1,000 m^3/h is added to the system from the Vostochniy pit dewatering pumps.

Potable water for the community is provided by five, permitted wells that deliver approximately 50 m^3/h to Eruda and the mine and plant sites.

2.5 Planned production and costs

Production and costs - Reserve Case

A LOM plan was prepared using the Minemax schedule optimization software to provide a schedule that improves the overall value of the operation. The results of the schedule were output to Microsoft Excel spreadsheets for review and analysis. The operating and capital cost estimates are based on the production schedule and technical and operating criteria described in this CPR.

Minemax Scheduler computer software is a strategic mine planning software package which jointly optimizes mining and downstream processing. It provides a constraint framework that models the mining operation, mineral processing value chain and business requirements. Minemax Scheduler uses linear programming to maximize the discounted cash flows for a given model to produce optimized schedules for each operational and business scenario to be analyzed.

A summary of the Olimpiada LOM production schedule is presented in Table 2.9 showing the mining, processing, and cost information. Annual mined tonnage and head grade were based on the Reserve Case mining schedule, process plant throughput and gold production rates with all Inferred Mineral Resources regarded as waste. The mining schedule and mining operating costs are based on the current equipment fleet, mining rate and the Polyus 2017 budget, adjusted by AMC where appropriate and including allowances for expanded mining rate to accommodate increased production or haul distance changes.

The production schedule incorporates feed from:

- The Vostochniy open pit operation.
- The Zapadniy open pit operation.
- The Titimukhta open pit operation.
- The Vostochniy underground operation.

Production from the three open pit operations are combined in Table 2.9, while the underground production is summarized separately. Ore from all these operations is treated at the Olimpiada processing plant complex.

Table 2.9 Olimpiada - planned production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25	2042-2046 Y26-30	2047-2051 Y31-35
Mined (Open Pits - Olimpiada + Titimukhta)													
Ore mined - tonnes	Mt	216	14.6	14.4	11.4	11.6	10.0	54.4	99.5	-	-	-	-
Ore mined - contained gold	Moz	21	1.50	1.61	1.32	1.41	1.26	4.39	9.65	-	-	-	-
Waste mined - tonnes	Mt	1,060	57.4	95.9	98.9	98.7	100.2	477.4	131.1	-	-	-	-
Total material mined	**Mt**	**1,275**	**72**	**110**	**110**	**110**	**110**	**532**	**231**	**-**	**-**	**-**	**-**
Mined (Underground - Vostochniy Zone Ore Reserve)													
Ore mined - tonnes	Mt	103	-	-	-	-	-	-	5.8	32.5	35.0	29.7	0.0
Ore mined - contained gold	Moz	9.6	-	-	-	-	-	-	0.60	3.15	3.24	2.60	0.00
Waste mined - tonnes	Mt	7	-	-	-	-	-	-	4.5	2.5	0.1	0.1	-
Total material mined	**Mt**	**110**	**-**	**-**	**-**	**-**	**-**	**-**	**10**	**35**	**35**	**30**	**0**
Mined (Total)													
Ore mined - tonnes	Mt	319	14.6	14.4	11.4	11.6	10.0	54.4	105.2	32.5	35.0	29.7	0.049
Ore mined - contained gold	Moz	31	1.50	1.61	1.32	1.41	1.26	4.39	10.25	3.15	3.24	2.60	0.003
Waste mined - tonnes	Mt	1,067	57.4	95.9	98.9	98.7	100.2	477.4	135.7	2.5	0.1	0.1	-
Total material mined	**Mt**	**1,386**	**72**	**110**	**110**	**110**	**110**	**532**	**241**	**35**	**35**	**30**	**0.049**
Processed (Open Pits)													
Ore - Process Plant - tonnes	Mt	227	11.7	11.7	11.7	11.7	11.7	58.5	52.8	26.0	23.5	7.4	-
Ore - Process Plant - grade	g/t	3.0	3.8	4.0	3.6	3.9	3.7	2.5	3.7	2.5	1.8	0.9	-
Ore - Process Plant - contained gold	Moz	22	1.41	1.49	1.35	1.45	1.40	4.77	6.31	2.11	1.34	0.20	-
Process Plant - recovered gold	Moz	18	1.15	1.23	1.11	1.20	1.16	3.94	5.21	1.74	1.11	0.17	-
Processed (Underground)													
Ore - Process Plant - tonnes	Mt	103	-	-	-	-	-	-	5.8	32.5	35.0	29.7	0.049
Ore - Process Plant - grade	g/t	2.9	-	-	-	-	-	-	3.3	3.0	2.9	2.7	2.2
Ore - Process Plant - contained gold	Moz	9.6	-	-	-	-	-	-	0.60	3.15	3.24	2.60	0.003
Process Plant - recovered gold	Moz	7.9	-	-	-	-	-	-	0.50	2.60	2.68	2.15	0.003
Processed (Total)													
Ore - Process Plant - tonnes	Mt	330	11.7	11.7	11.7	11.7	11.7	58.5	58.5	58.5	58.5	37.1	0.049
Ore - Process Plant - grade	g/t	3.0	3.8	4.0	3.6	3.9	3.7	2.5	3.7	2.8	2.4	2.4	2.2
Ore - Process Plant - contained gold	Moz	31	1.41	1.49	1.35	1.45	1.40	4.77	6.91	5.26	4.59	2.81	0.003
Process Plant - recovered gold	Moz	26	1.15	1.23	1.11	1.20	1.16	3.94	5.70	4.34	3.79	2.32	0.003
Operating Costs													
Mining - Open Pit	US$/t mined	1.30	1.20	1.15	1.15	1.21	1.26	1.32	1.48	-	-	-	-
Mining - Underground	US$/t ore mined	15.06	-	-	-	-	-	-	27.21	18.15	13.40	10.74	349.59
Process Plant (including reclaim)	US$/t ore processed	18.52	18.59	18.52	18.55	18.54	18.59	18.35	18.43	18.51	18.69	18.66	18.57
Selling, general and administrative	US$/t ore processed	3.57	3.78	3.85	3.74	3.82	3.78	3.46	3.77	3.53	3.43	3.41	3.35
Refining and transportation	US$/oz refined gold	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Initial Capital Costs													
Mining - Open Pit	US$M	176	55	55	65	-	-	-	-	-	-	-	-
Mining - Underground	US$M	1,053	-	-	-	-	-	-	1,053	-	-	-	-
Process Plant	US$M	181	22	43	61	42	13	-	-	-	-	-	-
TSF Expansion	US$M	10	-	-	-	-	-	-	10	-	-	-	-
Closure	US$M	15	-	-	-	-	-	-	-	-	-	-	15
Total	**US$M**	**1,435**	**77**	**99**	**126**	**42**	**13**	**-**	**1,063**	**-**	**-**	**-**	**15**
Sustaining Capital Costs													
Mining - Open Pit	US$M	141	3	5	5	10	10	48	58	0	0	0	-
Mining - Underground	US$M	274	-	-	-	-	-	-	-	156	86	31	0
Process Plant	US$M	75	2	2	2	2	2	12	12	12	12	12	1
Total	**US$M**	**489**	**6**	**8**	**8**	**13**	**13**	**60**	**70**	**169**	**99**	**43**	**1**

Notes:
1. The open pit mining unit operating cost is based on the total ore and waste tonnes mined from the pits.
2. The underground mining unit operating cost is based on the total ore tonnes mined (not ore and waste).
3. Any minor discrepancies for sums in the table are related to rounding.

The schedule is based on a process plant throughput rate of 11.7 Mtpa, 81.5% gold recovery in 2017 and 82.5% thereafter, which is based on the improvements from capital projects being realised.

The Olimpiada resource model developed by AMC includes estimates of grade for the deleterious elements arsenic, antimony and carbon. AMC applied the following limits for these elements during scheduling:

- Arsenic < 0.35%
- Antimony < 0.35%
- Carbon < 4.5%

AMC notes that applying these restrictions impacts the production schedule in the years after 2028. To meet the requirement, lower-grade ore was blended with the higher-grade, but out of specification ore. The remaining out-of-specification ore was stockpiled and scheduled for reclaim in later years.

The Olimpiada open pit provides the majority of ore for plant feed. This ore has the highest value and is in the schedule wherever it is available. The current position of the pit face is in significant ore at the base of the Stage 3 design and provides feed for the plant for approximately five years.

The Vostochniy Stage 4 cutback is planned to start in 2017. There is little ore in this cutback above the 270 mRL and minimal ore can be produced from the Vostochniy pit while mining to this level and after Stage 3 is complete. During this period, ore from stockpiles, the Zapadniy open pit and the Titimukhta open pit will provide additional feed until 2024 when ore production from Vostochniy resumes.

AMC applied a maximum combined open pit mining rate at Olimpiada and Titimukhta of 110 Mtpa, and a maximum vertical rate of advance of 100 m per annum. Polyus indicated that a new fleet of 220 t class trucks and a 15 m^3 class shovel will be purchased to improve the productivity and cost performance in the waste material for the Stage 4 cutback.

The SLC operation cannot start until the open pit operation in the Vostochniy Stage 4 pit is complete. AMC maintained a high mining rate in the pit until complete to build a significant stockpile of ore for use as plant feed while the SLC operation increases to the maximum production rate of 7 Mtpa.

Once the Vostochniy open pit is exhausted, the underground production commences. Optimization of the underground mine plan at the feasibility study stage may yield alternative scheduling restrictions that may influence this schedule. AMC recommends that once trade-off studies for the underground operation are complete, the mining schedule should be optimized to improve the project outcomes for Polyus.

Ore from the Zapadniy pit has slightly lower-grade than the main Vostochniy pit and is fed whenever space is available in the plant. It is an important source of ore for the period when Stage 4 cutback mining is in progress.

Titimukhta ore from the Stage 2 design is mined early in the schedule at a low rate due to the low stripping ratio. The Stage 3 design is not used until the end of the production schedule due to the high stripping ratio. This ore is mined and processed at the end of the open pit mine life when the mine is transitioning to an underground operation.

AMC developed a cash flow model based on the LOM plan to satisfy itself that the Ore Reserves are economically mineable as at their reporting date (31 December 2016) as required under the JORC Code.

The production schedule and operating costs are based on the following assumptions and qualifications:

- A gold price of US$1,250/oz.
- All RUB denominated costs were in real 2017 terms and converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on the Polyus 2017 budget with AMC adjustments where appropriate. No provision was made for offsite corporate costs.

Capital cost estimates as described in section 2.4 are included for:

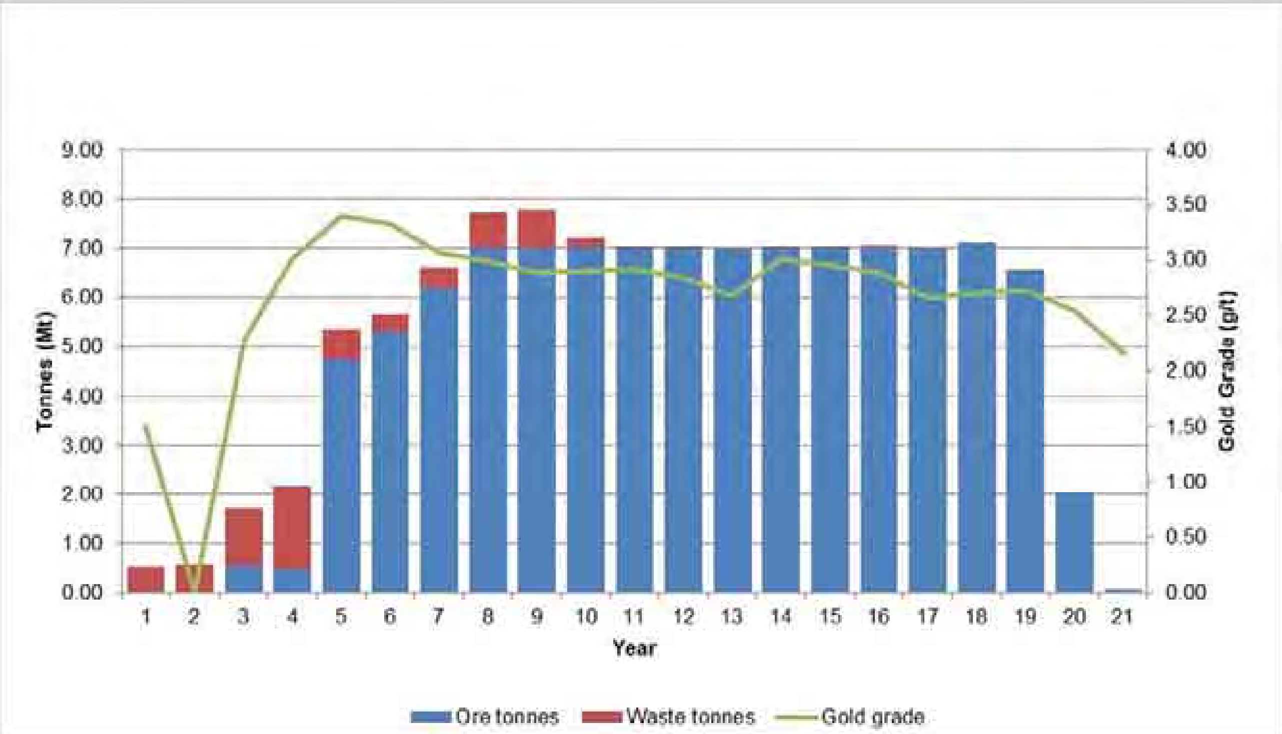
- Completion of auxiliary facilities for Plant No. 1 reconfiguration – US$1.5M as described in section 2.4.4.
- Bio4 addition – US$27.7M as described in section 2.4.4.
- Initial capital cost of US$153M relating to the expansion of the three Olimpiada processing plants, over the years 2017 to 2021, to improve and sustain metallurgical recoveries as described in section 2.4.4.
- Initial capital cost relating to the development of the underground mine.
- An allowance for an initial capital cost of US$10M in relation to a TSF expansion in 2031, when underground production commences.
- A sustaining capital cost allowance of US$2.45M per annum for the plants was included to allow for minor equipment replacement.
- Additional and replacement mining equipment, for both the open pit and underground mining operations. An equipment expenditure schedule was developed to allow for equipment replacement to maintain high availability to the operation.

Closure costs were estimated by an independent consultant and adjusted to 1 January 2017. These costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

Underground production schedule

A LOM production schedule for the underground Ore Reserve was developed using EPS scheduler. The schedule has not been optimized for net present value (NPV). The annual ore tonnes, waste tonnes and gold grade mined from the SLC operation are summarized in Figure 2.13. Underground development mining is planned to start in 2029 and continue for three years before stoping production commences in 2032.

Figure 2.13 Olimpiada - tonnes and grade mined from the SLC



AMC believes that the value of the operation can be improved via the continuation of trade-off studies for the various mining activities, and determining the optimum cut-off grade.

Combined life-of-mine - production and costs - Alternate Case

To recognize the potential increase in production that may be derived from converting Inferred Mineral Resources to Indicated or Measured Mineral Resources for the Vostochniy Zone underground area and the Intermediate Zone underground area, AMC developed a production target based on Inferred Resources from both underground areas. This represents the upside for underground mining operations at Olimpiada and is the basis of the Alternate Case for Olimpiada.

For the Alternate case, the Vostochniy Zone Inferred Mineral Resource was considered for mining as an extension of the SLC operation. The SLC operation is likely to be mined at the same maximum production rate as has been scheduled for the Reserve Case. Therefore, the additional production would result in a significant increase in mine life, but with similar mining unit operating costs as for the Reserve Case.

The Intermediate Zone Mineral Resource is flat dipping and has limited vertical extent, that is, the extent between the footwall and hangingwall is significantly less than is the case for the Vostochniy Zone. A caving mining method is not considered suitable, because the limited vertical extent of the Intermediate Zone Mineral Resource would necessitate excessive dilution to achieve good recovery of the Mineral Resource.

The geometry of the Intermediate Zone is suited to mining by the LHOS method using an engineered backfill (likely to be pastefill) and, therefore, mining of the Intermediate Zone for the Alternate Case is based on the LHOS method.

For the Intermediate Zone, a mining rate of 2 Mtpa is considered achievable. The assumed mining cost is US$35/t and the resulting cut-off grade is approximately 2 g/t. Table 2.10 lists the production target for both the Vostochniy Zone (inclusive of the Indicated Resource evaluated for the Ore Reserve) based on the SLC mining method, and the Intermediate Zone based on the LHOS mining method.

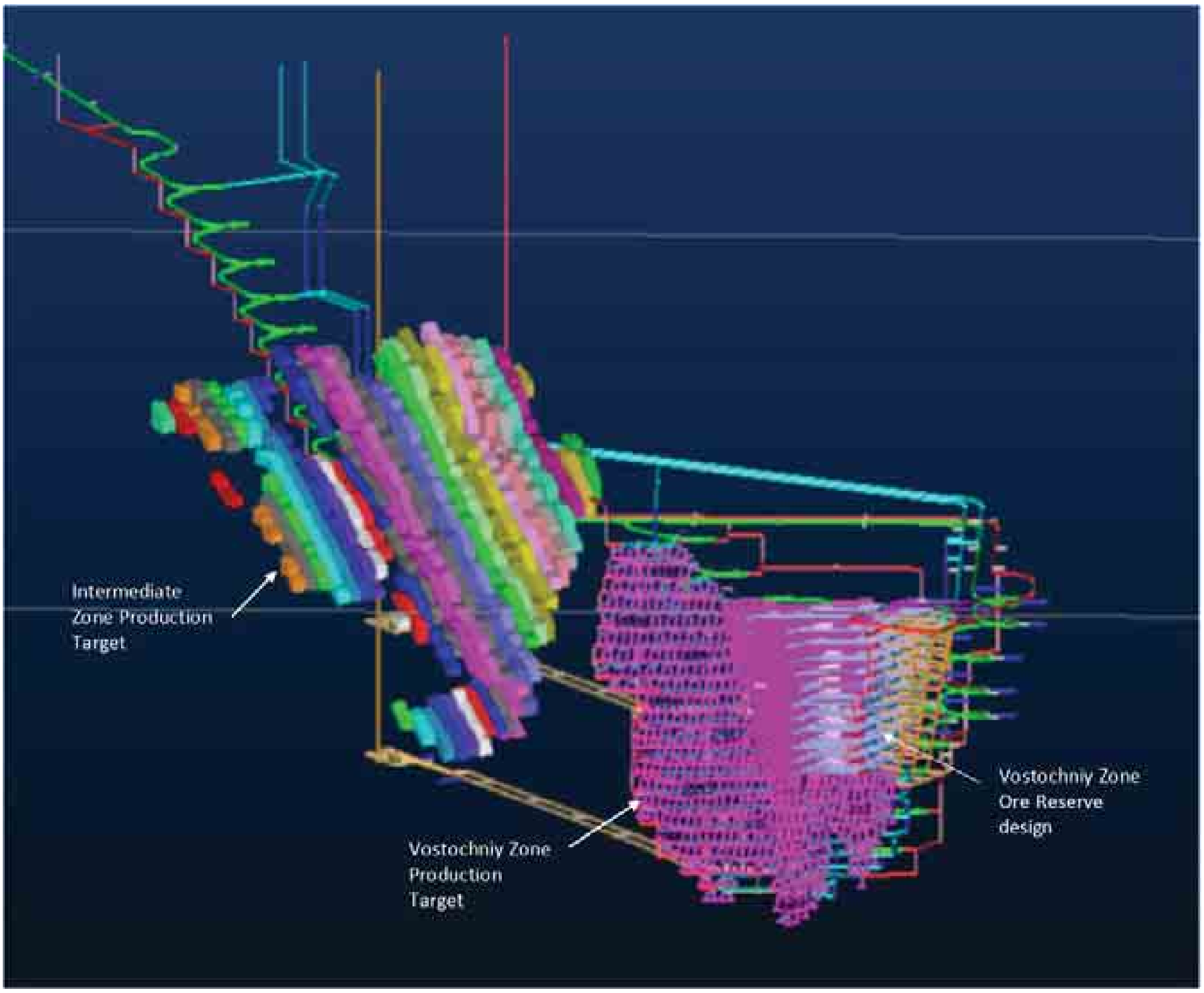
Combined mining of the SLC and LHOS areas is likely to enable to operation to run at the maximum shaft hoisting capacity of 8.5 Mtpa.

Figure 2.14 shows an isometric view of the Alternate Case production targets based on the Inferred Resource for the Vostochniy Zone and the Intermediate Zone. The SLC design for the Reserve Case is also shown.

Table 2.10 Olimpiada - underground - Alternate Case production target

Zone	Mining Method	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Vostochniy Zone	SLC	1.5	186	2.7	16	502
Intermediate Zone	LHOS	2.0	23	3.2	2.4	74
Total underground target			**209**	**2.7**	**18**	**576**

Figure 2.14 Olimpiada - isometric view of the Alternate Case mine layout



Inclusion of the Intermediate Zone would allow better utilization of the processing facilities and increased annual gold output after open pit mining is complete. Commencement of LHOS mining is not dependent upon the completion of open pit mining, so the increase in annual output could be available as soon as planning and construction can be completed.

It should be noted that the Alternate Case includes a significant proportion of Inferred Resources, with modifying factors. To the extent that its basis includes Inferred Resources, the Alternate Case is of lower geological confidence than the Reserve Case because it is not certain that the planned further exploration work will result in the estimation of Indicated or Measured Resources, or that the Alternate Case will be realised.

It should also be noted that the production target tonnes and grade for the Alternate Case are based on inclusion of an evaluation of preliminary SLC and LHOS outlines. However, no development design or scheduling has been prepared for those inclusions. The estimates of capital expenditure and operating costs for the Alternate Case that are presented in Table 2.11 include factoring of the cost estimates which were prepared on the basis of the design and schedules that were developed for the SLC Ore Reserve.

Although the Alternate Case is inherently of a lower geological confidence than the corresponding Reserve Case, AMC considers that Alternate case as well as the Reserve Case have a reasonable basis.

Table 2.11 Olimpiada - planned production and costs - Alternate Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25	2042-2046 Y26-30	2047-2051 Y31-35	2052-2056 Y36-40	2057-2061 Y41-45
Mined (Open Pits - Olimpiada + Titimukhta)															
Ore mined - tonnes	Mt	216	14.6	14.4	11.4	11.6	10.0	52.2	101.7	-	-	-	-	-	-
Ore mined - contained gold	Moz	21	1.50	1.61	1.32	1.41	1.26	4.26	9.79	-	-	-	-	-	-
Waste mined - tonnes	Mt	1,060	57.4	95.9	98.9	98.7	100.2	496.3	112.2	-	-	-	-	-	-
Total material mined	**Mt**	**1,275**	**72**	**110**	**110**	**110**	**110**	**549**	**214**	**-**	**-**	**-**	**-**	**-**	**-**
Mined (Underground - Vostochniy Zone Ore Reserve)															
Ore mined - tonnes	Mt	103	-	-	-	-	-	-	5.8	32.5	35.0	29.7	0.049	-	-
Ore mined - contained gold	Moz	9.6	-	-	-	-	-	-	0.60	3.15	3.24	2.60	0.003	-	-
Waste mined - tonnes	Mt	7	-	-	-	-	-	-	4.5	2.5	0.1	0.1	-	-	-
Total material mined	**Mt**	**110**	**-**	**-**	**-**	**-**	**-**	**-**	**10**	**35**	**35**	**30**	**0.049**	**-**	**-**
Mined (Underground - Vostochniy and Intermediate Zones Production Target)															
Ore mined - tonnes	Mt	106	-	-	-	-	-	-	1.5	7.5	7.5	11.9	35.0	35.0	7.7
Ore mined - contained gold	Moz	9.1	-	-	-	-	-	-	0.15	0.77	0.77	1.11	2.82	2.83	0.63
Waste mined - tonnes	Mt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total material mined	**Mt**	**106**	-	**-**	**-**	**-**	**-**	**-**	**2**	**8**	**8**	**12**	**35**	**35**	**8**
Mined (Total)															
Ore mined - tonnes	Mt	425	14.6	14.4	11.4	11.6	10.0	52.2	108.9	40.0	42.5	41.6	35.0	35.0	7.7
Ore mined - contained gold	Moz	40	1.50	1.61	1.32	1.41	1.26	4.26	10.54	3.92	4.02	3.71	2.83	2.83	0.63
Waste mined - tonnes	Mt	1,067	57.4	95.9	98.9	98.7	100.2	496.3	116.8	2.5	0.1	0.1	-	-	-
Total material mined	**Mt**	**1,492**	**72**	**110**	**110**	**110**	**110**	**549**	**226**	**42**	**43**	**42**	**35**	**35**	**8**
Processed (Open Pits)															
Ore - Process Plant - tonnes	Mt	227	11.7	11.7	11.7	11.7	11.7	58.5	51.3	18.5	16.0	16.8	7.1	-	-
Ore - Process Plant - grade	g/t	3.0	3.8	4.0	3.6	3.9	3.7	2.5	3.5	3.5	1.9	1.8	0.9	-	-
Ore - Process Plant - contained gold	Moz	22	1.41	1.49	1.35	1.45	1.40	4.70	5.81	2.09	0.96	0.98	0.20	-	-
Process Plant - recovered gold	Moz	18	1.15	1.23	1.11	1.20	1.16	3.88	4.80	1.73	0.79	0.81	0.17	-	-
Processed (Underground)															
Ore - Process Plant - tonnes	Mt	209	-	-	-	-	-	-	7.3	40.0	42.5	41.6	35.0	35.0	7.7
Ore - Process Plant - grade	g/t	2.8	-	-	-	-	-	-	3.2	3.1	2.9	2.8	2.5	2.5	2.5
Ore - Process Plant - contained gold	Moz	19	-	-	-	-	-	-	0.76	3.92	4.02	3.71	2.83	2.83	0.63
Process Plant - recovered gold	Moz	15	-	-	-	-	-	-	0.62	3.24	3.31	3.06	2.33	2.33	0.52
Processed (Total)															
Ore - Process Plant - tonnes	Mt	436	11.7	11.7	11.7	11.7	11.7	58.5	58.5	58.5	58.5	58.4	42.1	35.0	7.7
Ore - Process Plant - grade	g/t	2.9	3.8	4.0	3.6	3.9	3.7	2.5	3.5	3.2	2.6	2.5	2.2	2.5	2.5
Ore - Process Plant - contained gold	Moz	41	1.41	1.49	1.35	1.45	1.40	4.70	6.57	6.02	4.97	4.69	3.03	2.83	0.63
Process Plant - recovered gold	Moz	33	1.15	1.23	1.11	1.20	1.16	3.88	5.42	4.96	4.10	3.87	2.50	2.33	0.52
Operating Costs															
Mining - Open Pit	US$/t mined	1.30	1.20	1.15	1.15	1.21	1.26	1.32	1.51	-	-	-	-	-	-
Mining - Underground	US$/t ore mined	17.26	-	-	-	-	-	-	28.82	21.31	17.21	15.10	15.53	15.06	15.06
Process Plant (including reclaim)	US$/t ore processed	18.54	18.59	18.52	18.55	18.54	18.59	18.38	18.50	18.42	18.67	18.60	18.62	18.57	18.57
Selling, general and administrative	US$/t ore processed	3.55	3.78	3.85	3.74	3.82	3.78	3.45	3.72	3.64	3.49	3.45	3.38	3.45	3.45
Refining and transportation	US$/oz refined gold	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Initial Capital Costs															
Mining - Open Pit	US$M	176	55	55	65	-	-	-	-	-	-	-	-	-	-
Mining - Underground	US$M	1,073	-	-	-	-	-	-	1,073	-	-	-	-	-	-
Process Plant	US$M	181	22	43	61	42	13	-	-	-	-	-	-	-	-
TSF Expansion	US$M	34	-	-	-	-	-	-	10	5	5	5	5	4	-
Closure	US$M	15	-	-	-	-	-	-	-	-	-	-	-	-	15
Total	**US$M**	**1,479**	**77**	**99**	**126**	**42**	**13**	**-**	**1,083**	**5**	**5**	**5**	**5**	**4**	**15**
Sustaining Capital Costs															
Mining - Open Pit	US$M	144	3	5	5	10	10	48	61	0	0	0	0	-	-
Mining - Underground	US$M	573	-	-	-	-	-	-	4	177	108	64	99	99	22
Process Plant	US$M	100	2	2	2	2	2	12	12	12	12	12	12	12	2
Total	**US$M**	**817**	**6**	**8**	**8**	**13**	**13**	**60**	**77**	**190**	**120**	**77**	**111**	**111**	**24**

Notes:
1. Underground waste development tonnes for mining of the production target tonnes is not reported because there are no designs. Unit operating costs and sustaining capital costs do however include costs for waste development.
2. More ore is processed in the schedule than is mined, with the difference in plant feed sourced from the open pit stockpiles.
3. The underground mining unit operating cost is based on the total ore tonnes (not ore and waste) mined.
4. Any minor discrepancies for sums in the table are related to rounding.

2.6 Permitting, environment, community, safety, and mine closure

2.6.1 Permitting

Audits of Polyus' ISO14001 and OHSAS 18001 systems by independent environmental consultants in 2015 concluded that the main environmental and safety permits and approvals are in place for the Olimpiada, Blagodatnoye, and Titimukhta operations. These include permits obtained under the following laws and codes:

- Labour Code of the Russian Federation № 197-FZ
- Federal Law "On industrial safety of dangerous industrial objects" № 116-FZ
- The Federal Law "On Technical Regulation" № 184-FZ
- The Federal Law "On licensing of certain activities" № 99-FZ
- Technical Regulations "On Fire Safety" № 123-FZ
- Federal Law "On compulsory social insurance against industrial accidents and occupational diseases" № 125-FZ
- Federal Law "On Subsoil" № 2395-1
- TR CU 010/2011 "On the safety of machinery and equipment"
- TR CU 019/2011 "On the security of personal protective equipment"
- Law of the Russian Federation "On Fire" Law № 69-FZ
- Federal Law "On the safety of hydraulic structures" № 117-FZ
- Federal Law "On Production and Consumption Waste" № 89-FZ
- Federal Law "On protection of atmospheric air" № 96-FZ
- Federal Law "On Environmental Protection" № 7-FZ
- Federal Law "On Environmental Review" № 174-FZ
- Federal Law "On Energy Saving" № 261-FZ
- Government Resolution "On measures to ensure industrial safety of hazardous production facilities in the Russian Federation" № 241
- Resolution of the Government of the Russian Federation "On the organization and implementation of industrial control over compliance with industrial safety requirements at hazardous production facilities"

The conditions and requirements of the various permits and approvals are managed across the organization though the Integrated Management System (IMS).

There are no reports of material non-compliances with legislation and regulation.

2.6.2 Environment

Existing environmental conditions and potential constraints

The topography of the area consists of rolling hills with a thin cover of soils, low swampy areas and gravel-filled valleys. The elevation of the mine area varies from 640 m to 780 m above sea level, and the vegetation is typical of a northern boreal forest (Taiga).

The average annual temperature in the region is -3°C with a minimum temperature of -61°C, with a short summer with maximum temperatures of approximately +34°C.

The area is characterized by mountain Taiga forest predominantly covered by coniferous trees namely spruce, fir and cedar. Topsoil in the area is very thin, between 0 cm to 40 cm in depth.

The region is typically snow covered from the beginning of October until the end of May. The depth of seasonal freezing is between 0.5 m and 2 m. There is no permafrost in the region. Average annual precipitation is 571 mm with the majority occurring during the summer season and an average daily maximum of 56 mm.

The primary river system in the Olimpiada region is the Yenashimo River, which flows into Teya River and then via the Vilmo, P. Tungusska and Yenisey Rivers to the Arctic Ocean. The mine areas are drained by Yenashimo River and its tributaries:

- Olympiadinskiy stream with two tributaries drains the Olimpiada site.
- Titimukhta stream drains the Titimukhta site.
- Yenashimo River and its tributary Blagodatniy drain the Blagodatnoye site. The Yenashimo River is diverted to the south of the Blagodatnoye pits. The Yenashimo River catchment is 1,690 km^2 and the length is 120 km.

The majority of streams and rivers in the mining licence area and surrounds are significantly disturbed as the result of historical and current alluvial gold mining. Water quality controls and post mining rehabilitation of alluvial mining areas appear to have limited effect.

Yenashimo River and its main tributaries are classified as first category fishery water body which makes corresponding national high water quality guidelines applicable.

The ground water system in the area comprises several aquifers with the depths ranging from 5 m to 400 m. The alluvial aquifer comprises sands, gravel, pebbles and coarse gravel with loamy filler along the riverbeds with thicknesses up to 15 m.

Recharge of surface water into other ground aquifers occurs primarily through this aquifer. Groundwater inflow to the pits is mostly from a bedrock aquifer in quartz-micaceous-carbonaceous shales with the water transmissibility up to 1,000 m^2/day as assessed by independent environmental consultants to Polyus in 2013.

Land use in the area is predominantly forestry, with current mining operations at Olimpiada, Titimukhta, Blagodatnoye, Quartz Mountain, Severo Nickel and alluvial mining. Forest land is managed by the Novokalaminsky division of Severo-Eniseyskiy forestry. Forest resources (both for timber and forest products) are utilized by the local population.

There are no specially protected areas or historical, cultural, or natural sites and there are no flora species in the mine area listed in the Red Book of Russia and the Red Book of Krasnoyarsk Region. Protected fauna have the potential to occur, including species registered in the Red Book species such as fish-hawk, peregrine, erne, and white-tailed sea eagle.

The location of the mine and the climatic conditions pose some challenges for transport and infrastructure that service the operations. However, it appears that operational planning typically takes these factors into account, limiting adverse impacts on operations. There does not appear to be any immediately obvious, unusual, significant environmental constraints to the ongoing operation at Olimpiada. Ongoing management of land, ecology, water, waste, air and noise issues will, however, be required.

Waste rock management and mine water management

There has been limited geochemical characterization work completed for the Olimpiada operation. An assessment of acid rock discharge was undertaken in 2014 by independent consultants. This review included analysis of static tests to assess the geochemical properties of waste rock and covered Olimpiada, Blagodatnoye, and Titimukhta.

The assessment showed the geology at Olimpiada was generally not acid generating. Elevated levels of arsenic and antimony were present at low pH levels. Additional waste rock enviro-geochemical characterization will be required to ensure optimal waste rock management.

Environmental and safety management system

Polyus has received certification that includes the Olimpiada operation to ISO14001: 2004 standards for its environmental management system and OHSAS 18001: 2007 for its health and safety management system. The most recent audit report by independent environmental consultants to Polyus was in 2015 and it concluded that:

- The business unit has demonstrated effective implementation, maintenance and improvement of management system.

- IMS documentation as a whole meets the requirements of the audited standards; its structure and composition are sufficient for the implementation and maintenance of the IMS.
- The IMS as a whole has demonstrated compliance with ISO 14001: 2004, and OHSAS 18001: 2007.

2.6.3 Community

At January 2012, the population of the Severo-Eniseyskiy district was 11,500. Approximately 60% of the district population lives in Severo-Eniseyskiy town. Other settlements in the district with population of more than 600 inhabitants include Teya, Novaya Kalami, Eruda, Pit-Gorodok and Bryanka.

The economy of the district is primarily based on gold mining (in situ ore and alluvial gold), which represents more than 90% of all district industrial production. Most of the local residents are involved in gold mining industry. In 2010 the official unemployment rate was 1.2% of the working age people.

The nearest settlements are (population data at 2011):

- Severo-Eniseyskiy, approximately 83 km to the north of the Olimpiada site.
- Eruda, immediately to the east of Olimpiada: Initially a small village, Eruda has been the Polyus gold mine base since 2010. Population of approximately 2,300.
- Novaya Kalami, was founded in 1948 for alluvial gold mining. Population of approximately 600.
- Yenashimo, a local village. Population of approximately 80.
- Teya, with most of the residents employed in the gold industry. Population of approximately 1,700.

The Severo-Eniseyskiy district has a population of indigenous people who are traditional farmers and hunters. The three mining operations are within the limits of their grazing and hunting grounds. There are no known cultural, archaeological or historical heritage around the project area exists, nor are there areas of geological or special scientific interest present. Polyus advises that it has good relations with the surrounding community.

In accordance with the licence conditions, Polyus maintains a comprehensive programme of social support in the region. The Social Department at Olimpiada currently provide funding for medical assistance, sponsorships for further education programmes and hardship funds and rewards/bonuses for good performance. The programme is planned to continue throughout the life of the mine operations.

Complaints procedures are contained within the environmental management plan and all complaints and comments are sent to the Environmental Management department in Krasnoyarsk where they are then forwarded to the relevant department in order to resolve. The IMS tracks and records complaints management and resolution processes.

The remoteness of the operation, together with its location within a predominantly mining area, tends to avoid potential social and community issues. Systems and processes are in place to manage community relations and provide for the ongoing maintenance of good social licence to operate.

2.6.4 Safety

The Krasnoyarsk Business Unit, which comprises the Olimpiada, Blagodatnoye, and Titimukhta operations, had the following occupational health and safety statistics for 2016:

- Injury rate (per 200,000 hours worked) of 0.37, which includes fatalities, lost time injuries and medical treatment injuries.
- Lost time injury frequency rate (per 200,000 hours worked) of 0.10.
- Fatality frequency rate (per 200,000 hours worked) of zero.

The accreditation of the Krasnoyarsk Business Unit’s safety system to OHSAS 18001, together with the good safety performance indicated by the above statistics demonstrates that occupational health and safety does not appear to be a material risk to ongoing operations.

2.6.5 Mine closure

A Conceptual Mine Closure and Rehabilitation Plan was developed by independent environmental consultants to Polyus for the Olimpiada, Titimukhta, and Blagodatnoye operations in 2013. The plan adopts international standards and covers the typical requirements of mine closure plans.

The mine closure plan identified three risks of relevance to Olimpiada:

- After additional characterization work, waste rock, pit walls and tailings material are determined to potentially acid generating and metal leaching. Additional cover and drainage treatment mechanisms may be required if acid and metal drainage are likely to occur.
- Sufficient cover and growth material available are not stockpiled and available for closure. While some material is available, there is the potential for a shortage of cover and growth material. Alternative sources or alternative cover and growth treatments may be required.
- Geotechnical stability of the tailing dams in perpetuity. Design information is required to verify the long term stability of the tailings dams.

The plan includes calculation of closure cost estimates for the three operations. Version 1.4.1 Build 16 of the Standardized Reclamation Cost Estimator was used to prepare the estimates. Key assumptions and exclusions included:

- Exclusion of salvage costs.
- Inclusion of human resources, severance and outplacement costs.
- Inclusion of property holding costs.

Updated total closure costs for Olimpiada were estimated as at 1 January 2017 to be approximately US$15M. The closure cost estimate does not include a contingency. Polyus is not required to pay an environmental security deposit and mine closure costs are included in the capital cost assessments for the operation.

2.7 Risks and opportunities

The following risks are identified for Olimpiada:

- The metallurgical performance of the ore results in reduced recovery or increased costs. Blending to control deleterious elements is based on information collected during mining. Three dimensional geological modelling inclusive of geology, lithology and metallurgical parameters has not been completed. Therefore, the understanding and predictability of future ore types for plant feed could be improved. Noting, however, that the long history of the operation mitigates this risk.
- The ore tonnage or grade deviates from the expected values. A comprehensive reconciliation system would assist in mitigating this risk. None of the Mineral Resource is classified as Measured. Best practice is that sufficient drilling has been completed to define a reasonable proportion of Measured Mineral Resource as part of the near term ore supply. This may result in higher than expected grade variability.
- Plant expansions and upgrades currently underway are delayed, resulting in deferred production and cost overruns.
- The Stage 4 cutback does not proceed according to schedule. The delay in availability of Stage 4 ore is likely to result in reduced gold production or increased cost to source alternative ore.
- There is a failure of a pit slope. A failure occurred during 2016, resulting in temporary loss of access to the ore producing area of the pit. Back analysis and redesign was completed to establish stable slopes for the Stage 3 pit and to develop refined slope designs for the Stage 4 pit and mitigate the risk. Slope monitoring systems have been installed. However, future failure is a possibility and could lead to loss of life, loss of equipment, or loss of access to the main ore source for the Olimpiada plant.
- The underground workings become flooded. The infrastructure at the base of the underground operation is at risk of flooding if the installed dewatering system is not able to handle a surge of water flowing to the cave from the Vostochniy pit. This may occur during periods of heavy rain or during the thaw period. This risk can be mitigated by developing a portion of a lower SLC level to create a void and provide storage capacity.
- A mud rush occurs underground. During periods of heavy rain or during the thaw period, mud can form in the cave as a result of large water flows from the Vostochniy pit. This mud can sometimes be released suddenly to flow out of the drawpoints and onto the levels.
- A significant wall failure within the Vostochniy pit due to undercutting from the cave zone would result in additional waste material entering the cave zone. This additional waste material would dilute the grade of the cave material extracted, as mining progresses at depth.
- There has been limited geochemical characterization work completed for the Olimpiada operation. An assessment of acid rock discharge was undertaken in 2014 by independent consultants. This review included analysis of static tests to assess the geochemical properties of waste rock and covered

Olimpiada, Blagodatnoye, and Titimukhta. The assessment showed the geology at Olimpiada was generally not acid generating. Elevated levels of arsenic and antimony were present at low pH levels. Additional waste rock enviro-geochemical characterization would be required to ensure optimal waste rock management and mitigate the risk of acid mine drainage.

- Geotechnical stability of the tailing dams in perpetuity is not well understood. Design information is required to verify the long-term stability of the tailings dams.
- Additional tailings storage capacity is required to accommodate the underground Ore Reserve. Options are available, however designs and approvals are not finalized.

The following opportunities are identified for Olimpiada:

- Open pit grade control practices utilize blasthole sampling. This is not best practice and opportunities exist for improvements to this method potentially improving mine head grade and reconciliation results.
- The underground Mineral Resource includes a significant quantity of Inferred Mineral Resource at Vostochniy Zone underground area and the Intermediate Zone underground area. This mineralization is not included in the reported underground Ore Reserves, and could potentially increase underground ore supply with additional drilling and appropriate studies.
- Additional drilling identifies mineralization not previously included in the resource models.
- AMC believes that additional work on the underground project to optimize the cut-off grade, LOM design, mine haulage options and mine scheduling options will improve the project outcomes.
- AMC considers implementation of a maintenance management system to be a logical step for Polyus at the Olimpiada plants which will deliver additional cost-reduction and equipment-availability benefits.
- Site management has demonstrated the ability to plan and deliver operational performance improvements to the operation, continuation of which can be expected to deliver further improvements.

3 Blagodatnoye

3.1 Introduction

3.1.1 Property location and description

The Blagodatnoye deposit is located 25 km north of the Olimpiada mine (refer Figure 1.2).

Blagodatnoye ores consist of quartz–micaceous schists, with impregnated and vein-impregnated sulphide mineralization. The main forms of gold in the ores are free, connected with barren minerals and in aggregates.

Blagodatnoye operates as an open-pit mine with surface stockpiling of low-grade ore. The process plant was commissioned in October 2009 with a nominal capacity of 6.0 Mtpa, with gravity concentration, flotation, and CIL sections. Plant throughput increased to the nominal capacity during 2010, and was expanded in 2015 to 7.5 Mtpa, and further to 8.0 Mtpa during 2016.

In 2016, Blagodatnoye produced 457 koz of gold, an increase of 8% increase over 2015. The increase was due to a 4% higher average grade of the ore processed and a 3% increase in tonnes of ore processed.

Blagodatnoye achieved the lowest-cost production in the Polyus portfolio, with the process plant continuing to operate at well above its nominal capacity having processed 7.5 Mt in 2015 and 7.8 Mt in 2016.

Growth options at Blagodatnoye are now focused on commissioning a heap leaching operation to treat low-grade ore from the pit and stockpiles located around the pit.

Blagodatnoye infrastructure is covered with Olimpiada infrastructure in section 2.4.6.

The combined effect of remodelling the orebody and mining-related depletion is that the 2016 Ore Reserve estimate has been increased to 10 Moz, a 20% increase when compared with the 2015 estimate.

Blagodatnoye currently has an estimated remaining life of 18 years.

3.1.2 Mineral tenure

Polyus holds subsoil use agreement (mining licence) number KRR 02840 BR which comprises the Olimpiadinskoye area and includes the Blagodatnoye mine. The mining licence was granted on 5 July 2016 and expires on 1 February 2022. An application for the extension of the licence to 31 December 2028 has been submitted.

The mining licence provides for geological examination, including prospecting and assessment of mineral deposits, exploration and extraction of minerals, processing of minerals, and the use of historical mining wastes.

The mining licence area covers 1,340 km^2 and provides for extraction to a depth of 1,000 m below natural surface level.

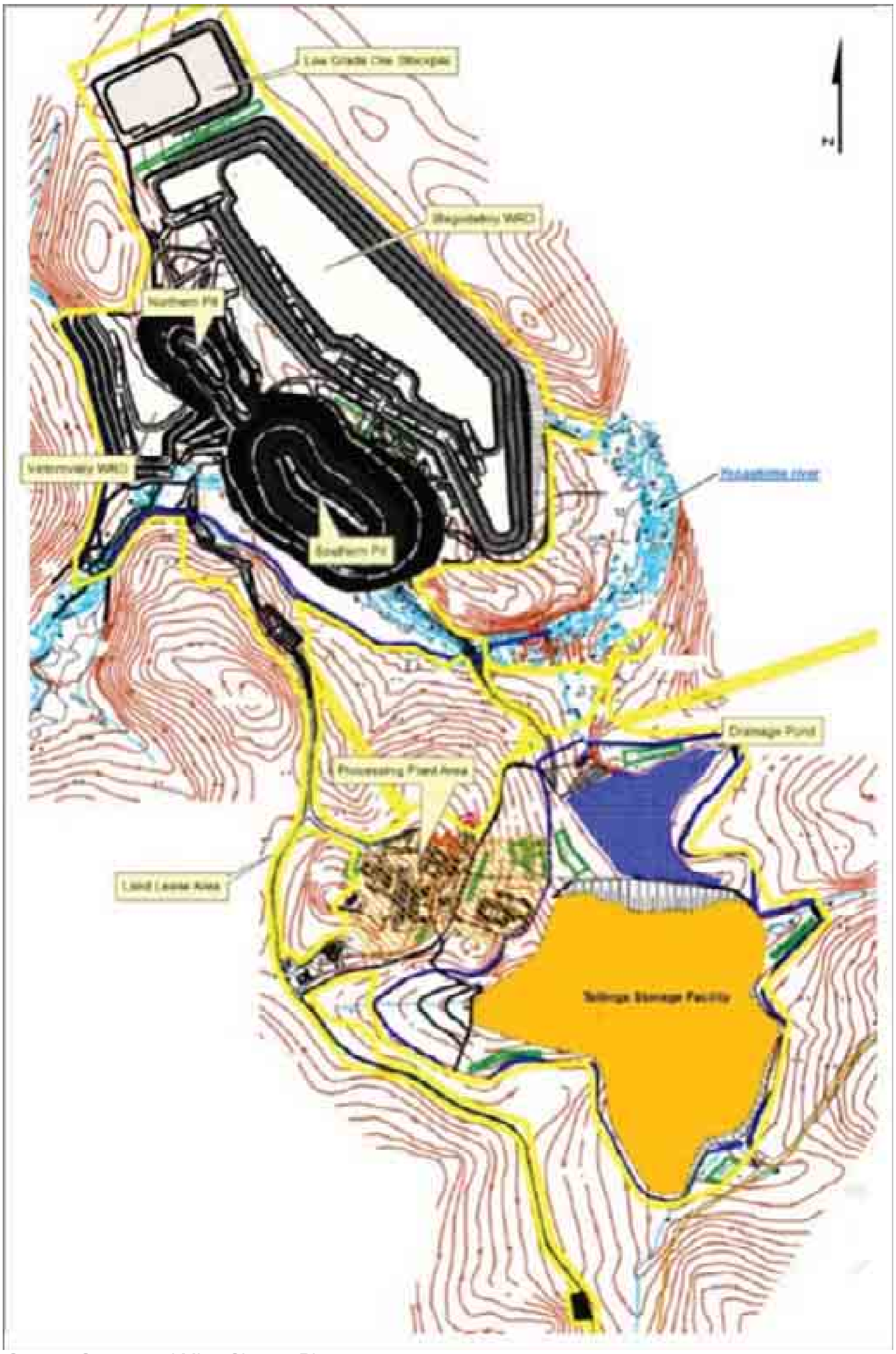
The mining licence excludes the Titimukhta deposit (held separately by Polyus), mining licence number KRR 02838 BE) and the Quartz Mountain deposit which is held by others (refer Figure 3.1).

Figure 3.1 Blagodatnoye - mining licence boundary and areas excluded

Source: Subsoil use agreement no. KRR 02 840 BR

The separate forest land lots have been leased to Polyus according to land rent agreements between the Polyus and the state forestry authority. The land must be rehabilitated and returned to the state after the operation is finished. Figure 3.2 shows the forest land lease boundary (yellow line) and general arrangement of the site.

Figure 3.2 Blagodatnoye - lease boundary and general arrangement



Source: Conceptual Mine Closure Plan

Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences.

3.1.3 Historical production and costs

Blagodatnoye's historical performance is summarized in Table 3.1.

Table 3.1 Blagodatnoye - historical production and operating costs

Item	Unit	2014	2015	2016
Mined				
Ore	Mt	7.4	7.6	11.5
Contained gold	Moz	0.47	0.48	0.74
Waste	Mt	32.5	38.0	37.5
Total	**Mt**	**39.7**	**45.7**	**49.0**
Processed				
Ore	Mt	7.3	7.5	7.8
Contained gold	Moz	0.46	0.48	0.52
Recovered gold	Moz	0.39	0.42	0.46
Unit Operating Costs				
Mining	US$/t mined	1.68	1.18	1.36
Processing	US$/t processed	12.26	7.89	7.39
Selling, general & administrative	US$/t processed	3.28	2.60	2.04

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

3.2 Geology and Mineral Resources

The Blagodatnoye Mineral Resource was updated by AMC in 2016 to incorporate additional drilling data, revised interpretations and estimation method, and modified mining parameters reflecting the proposed addition of a heap leach treatment option for low-grade material. Cut-off grades for the open pit resource have changed from 1.0 g/t to 0.4 g/t as a result of changed economic parameters, and consideration of heap leach potential.

3.2.1 Geology

A description of the regional geology relevant to the Olimpiada, Blagodatnoye, Poputninskoye and Titimukhta deposits is presented in section 2.2 of this CPR.

Blagodatnoye, like Olimpiada, is hosted by Early to Late Proterozoic meta-sediments that have been regionally intruded by granitoid bodies.

At the Blagodatnoye gold deposit, elongated zones of faulted and crushed rock provided a focus for cycles of hydrothermal activity and alteration during the formation of the gold deposit.

The Blagodatnoye deposit is made up of Early Proterozoic rocks (the Teiskaya series) and Late Proterozoic rocks (the Sukhopitskaya series). The Sukhopitskaya series is made of the Kordinskaya suite which hosts the gold mineralization. This Kordinskaya suite is made up of three rock units:

- The oldest unit is a sequence of staurolite-mica schists.
- The middle unit is made up of rhythmic bedded schists, quartz-schist and quartzites.
- The youngest unit is a series of meta-siltstones, meta-sandstones and quartz schists.

The Kordinskaya suite averages 600 m in thickness.

The position of the deposit is influenced by a major thrust zone where the Kordinskaya suite is the allochthonous material. The mineralization is hosted by a shear zone that has a length of 4.5 km and an average thickness of 120 m to 140 m. This zone dips towards the northeast between 45° and 75°.

The mineralization at Blagodatnoye is hosted in two major northwest trending lenticular zones that are joined by a zone of low-grade mineralization. At Blagodatnoye, the mineralization is also associated with intense folding related to a northwest trending shear zones. The well-defined mineralization occurs within the shear zone, with mineralization defined by drilling over a strike length of 4 km.

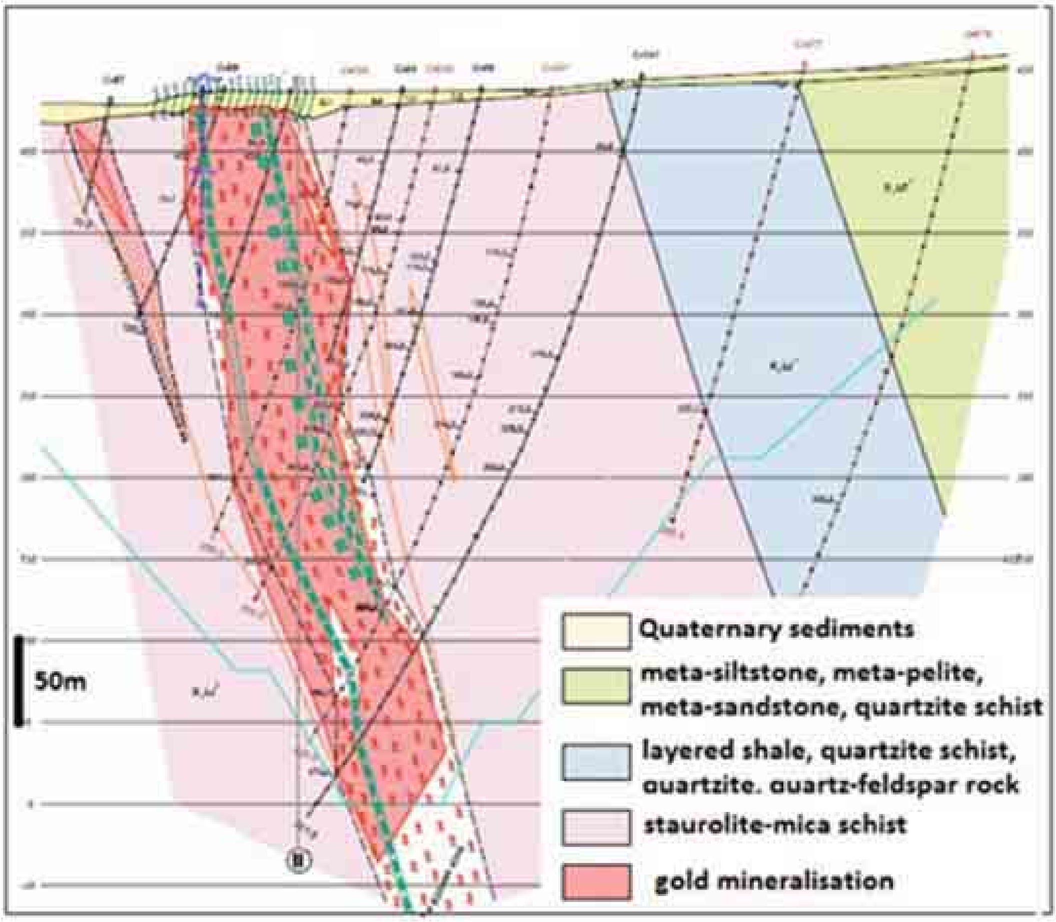
The mineralized zones dip towards the north east at approximately 65° (Figure 3.3).

The northwest mineralization outcrops at surface forming a topographical high. The southeast zone occurs in the bottom of a river valley and was mostly covered by alluvial material.

The mineralization has been drilled down to approximately 800 m below the natural surface.

The mineralized zones are characterized by alternating layers of mineralized and unmineralized material, with the mineralization envelope interpreted to be up to 180 m thick in places.

Figure 3.3 Blagodatnoye - deposit geological cross section



Gold mineralization is associated with silica, chlorite and sericite alteration zones. The mineralization occurs within units containing disseminated sulphides and porphyroblasts of pyrite, and less frequently in zones of intense kaolinite alteration. Sulphide minerals include pyrrhotite (1% to 3%), arsenopyrite (1% to 3%) and pyrite and marcasite (0.5% to 5%) with minor chalcopyrite. The majority of the gold is found as disseminated native gold, the remainder is associated with the sulphide minerals.

There is little weathering and no significant oxide mineralization. Where oxidized sulphides are replaced by iron oxides and hydroxides, the mineralization is generally hidden below a thin alluvial sequence.

3.2.2 Exploration

In 1966 – 1967, regional mapping was undertaken in the area. Further exploration including drilling and trenching was carried out between 1973 and 1976; during this period gold mineralization was identified at Blagodatnoye. Polyus acquired the project in 2000. Additional drilling was completed during the periods 2000 to 2004, 2006 to 2008 and 2013 to 2015.

Drillholes are predominantly diamond core holes of 76 mm in diameter. The drillholes were generally inclined between 60° and 80° towards the southwest along drill lines orientated northeast-southwest, perpendicular to the strike of the gold mineralization. The drill line spacing varies between 50 m and 120 m with some more widely spaced lines at the northern end of the deposit. Drillholes are variably spaced along lines at roughly 25 m, 50 m and 100 m.

Drillholes were generally sampled over their entire length. Diamond drill core was generally sampled at 1 m to 1.5 m intervals varying between 0.1 m and 4 m. HQ and NQ diameter core was split with the diamond saw. One half of the core was submitted for the sample preparation and the second half was retained and stored. Drill core was comprehensively logged in a text format recording details of rock type, alteration, structure and mineralogy.

A total of 1,183 drillholes were recorded in the Blagodatnoye database. A total of 722 drillholes used for the Blagodatnoye Mineral Resource estimate, comprising a total of 94,475 m of assayed intervals.

Tests to determine density and moisture content of ores were undertaken as part of the 2000 - 2004 evaluation programs. A total of 406 drill core samples were assessed. The results indicated an in situ dry bulk density of 2.73 t/m^3 for the northern mineralization zone while for the southern mineralization it was 2.83 t/m^3. Further density determinations were completed on 44 core samples. Accordingly, AMC adopted a dry bulk density of 2.7 t/m^3 for the northern orebody and 2.8 t/m^3 for the southern.

3.2.3 Mineral Resource estimation parameters

The Blagodatnoye Mineral Resource was updated in 2016 to incorporate additional drilling data, revised interpretations and estimation method, and modified mining parameters reflecting the proposed addition of a heap leach treatment option for low grade material. The updated Mineral Resource was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- All drilling used for the resource estimate is diamond drilling.
- Drillhole spacing is as described in section 3.2.2.
- AMC's resource model defines a mineralization envelope using a nominal lower-grade cut-off of 0.4 g/t.
- A total of 722 drillholes used for the Blagodatnoye Mineral Resource estimate, comprising a total of 94,475 m of assayed intervals.
- A boundary was established to divide the mineralization into northern and southern orebodies. Density was assigned to mineralization and background materials based on this division (2.7 t/m^3 for the northern zone and 2.8 t/m^3 for the southern zone).
- Composites were generated using a nominal three-metre length.
- The statistics of the flagged three-metre composites were calculated and histograms, log histograms and log probability charts compiled.
- High-grade cuts were determined for each domain.
- Experimental variograms were calculated and modelled for the gold in each domain using the capped three-metre composite gold data within the domains.
- A three-dimensional geological block model based on a parent cell of 12.5 m (west-east) by 12.5 m (north-south) by 10.0 m (vertically) was constructed for resource estimation purposes. This parent block is considered to be equivalent to the SMU appropriate for the mineralized envelope, orientation of the mineralization, and subsequent modelling method.
- Gold grade was estimated using ordinary kriging. Using the variogram models developed, grade estimates were completed using a two pass search strategy. The domains were used as hard boundaries. The method and parameters were chosen to approximate an SMU model and grade-tonnage performance via appropriately selective mining.
- The model was depleted to a pit surface at 1 October 2016.
- The Mineral Resource estimate has been developed considering mining by open pit methods with selectivity indicated by blasthole sampling for grade control and mining possibly on 10 m benches. The model currently assumes an SMU dimension of 12.5 m x 12.5 m x 10 m.
- The estimate has been classified as Indicated Resource where average distance of contributing composites is generally less than 90 m. Any remaining mineralization within the envelope is classified as Inferred.

- The estimate has been reported within a notional constraining shell developed using pit optimization as for the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell.

Blagodatnoye maintains active stockpiles including material to be potentially treated by heap leach.

3.2.4 Mineral Resource estimate

The Blagodatnoye estimate was classified as a combination of Indicated and Inferred Mineral Resource. The model was developed with a view to open pit mining on 10 m benches using drill-and-blast methods.

The Mineral Resource was reported at a 0.4 g/t cut-off grade in line with economic analysis (Table 3.2). The Mineral Resource has been reported within in notional constraining shell developed using pit optimization as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell.

The pit topographic surface available for Mineral Resource reporting was current at 1 October 2016, with adjustment for mining depletion to 31 December 2016 based on production data.

Table 3.2 Blagodatnoye - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	0.4	309	1.5	15	462
	Inferred	0.4	69	1.3	2.9	91
Total			**379**	**1.5**	**18**	**552**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Depleted to 1 October 2016, adjusted for mining to 31 December 2016.

The estimate of the Mineral Resource for the stockpiles at Blagodatnoye is shown is Table 3.3.

Table 3.3 Blagodatnoye - Mineral Resource - stockpiles - as at 31 December 2016

Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Measured	n/a	42	0.9	1.1	35
Total		**42**	**0.9**	**1.1**	**35**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. In reporting the stockpiles, little or no mining selectivity is intended.
3. Stockpile estimates are provided by Polyus based on its stockpile inventory records.

3.3 Mining and Ore Reserves

3.3.1 General

Mine planning work undertaken to allow for the estimation of Ore Reserves included open pit optimization based on the resource model, design of pits using the pit optimizations shells as a guide, production scheduling of the resulting inventories and economic analysis to verify economic viability of the overall project.

AMC based the Blagodatnoye 2016 Ore Reserve estimate on the existing process plant flowsheet and throughput capacity of 8.0 Mtpa.

3.3.2 Mine operations

Mining operations are based on conventional open pit mining methods. Excavation of ore and waste rock is conducted on 10 m working benches with 20 m final batters, established using pre-split blasting. Mining is undertaken by hydraulic excavators loading out into rigid body haul trucks. Polyus owns and operates the mining equipment, operators and maintenance personal are Polyus employees. Mining equipment and personnel may be interchanged with the near-by Olimpiada mine.

ROM ore is directly fed to the processing plant, with low-grade ore stockpiled for later processing by heap leaching and high-grade excess ore stockpiled for re-handling to meet any supply requirements during the active mining period. Waste and overburden is transported to one of two designated waste dumps referred to as Blagodatniy and Viktorovskiy.

There are two pits in operation: a smaller northern pit and the larger and main southern pit.

Blasting drillhole diameters vary between 152 mm, 165 mm, 215 mm and 250 mm. Blasting uses water resistant emulsion products.

Grade control at Blagodatnoye operates on a 6 x 6 m grid, utilizing blastholes up to a diameter of 249 mm of 12 m depth to cover the 10 m bench. One composite sample is taken per hole (a duplicate is collected every 10th sample), with samples being assayed for six components with a turnaround time of 24 hours in summer, but longer in winter due to the necessity to dry samples.

In addition to blasthole sampling, at Blagodatnoye, in-pit RC drilling is on a 20 m east by 10 m north pattern with 60 m angled drillholes and 2.5 m sample intervals. At Olimpiada, in-pit RC drilling is on a 30 m east by 20 m north pattern with vertical drillholes and 2.5 m sample intervals.

The on-site assay laboratory is used for routine assaying of grade control samples. Samples are initially assayed for gold and samples returning gold grades greater than 1.0 g/t are analysed for Sb, As, C, Ca and S. Silver is not significant in Blagodatnoye mineralization and is not routinely assayed.

AMC considers that the stockpile management system is well conceived and well run, although there are some limitations on the reliability of stockpile samples. The process plant feed head grade is not sampled. Monthly feed head grades do not appear to be reconciled with the Mineral Resource or Ore Reserve estimate grades.

AMC recommends that, in future, actual production be reconciled against Mineral Resource and Ore Reserve estimates so that knowledge gained can contribute to improved resource modelling and estimation of Mineral Resources and Ore Reserves.

Mining operations are conducted using two EKG-10 face shovels with a bucket capacity of 10 m^3, two Komatsu PC- 1250 with a bucket capacity of 5 m^3, and two Komatsu PC-3000 with a bucket capacity of 15 m^3.

The mining truck fleet consists of BelAZ 7540 (30 t), CAT 785 (136 t) and CAT 777 (90 t) trucks.

Waste dumps are located close to the pit to minimize transportation. Overburden is stockpiled for land rehabilitation at the end of mine life.

The design volume of the Blagodatniy waste dump is 161 Mm^3. The dump has four tiers, and the height of the tiers is up to 30 m. The dump slope angle is 37° and the angle of the dump base is 5° to 7°.

The design volume of the Viktorovskiy waste dump is 32 Mm^3. The dump has four tiers, and the height of the tiers is up to 30 m. The dump slope angle is 37° and the angle of the dump base is 6° to 20°.

During mine operations, Polyus plans to maintain the ground water level more than one metre below the main production level. Dewatering holes for the Blagodatnoye open pit were drilled in 2013. These are due to be commissioned in the second quarter of 2016, and will feed into a retention pond before being discharged to the Enashimo River.

Currently the base pumping site is at 310 mRL. Four pumps are installed in the central pumping station which is used to dewater the main sump in the south eastern pit. Water from the North West pit is sent using two pumps down a pressured pipeline to join the gravity fed pipeline in the south eastern pit.

The Blagodatnoye open pit is supplied with power via three stationary 6 kV high voltage lines from SS110/6 kV Blagodatninskaya substation. In future, it is planned to build dual circuit 6 kV electric transmission line with clearance for 35 kV from SS110/6 kV Blagodatninskaya station to the Blagodatnoye pit wall, as well as construction of SS6/6.3 kV Kariyer station. Power supplies electric shovels and drills and pit pumps.

3.3.3 Mining model

The resource model used as the basis for mine planning was:

"md_blgd_161125.dm", dated 25 November 2016.

This resource model was developed by AMC.

The resource model was converted by AMC to the Mining Model by reblocking, or regularizing, the resource model at a SMU size suitable for the equipment that is considered to be appropriate for the operation. A minimum block size of 20 m in both easting and northing directions and 10 m vertically was used to suit the orebody configuration and 10 m^3 to 16 m^3 face shovels and front end loaders currently employed for truck loading. The resulting Mining Model was used as the basis for the pit optimization and Ore Reserve estimation.

The effect of the dilution and ore loss that results from the reblocking is an increase in ore tonnes of 5% and a decrease in contained metal of 1%. The local amount of dilution and ore loss varies with the local geometry and grade. These dilution and ore loss statistics relate to the portion of the resource model within the ultimate pit design.

3.3.4 Geotechnical analysis

The geotechnical conditions of the open pit mining operations are studied on a regular basis by the PRDC located in Krasnoyarsk. There is no permanent on-site geotechnical service at the mines.

AMC understands that the current pit slope design parameters for Blagodatnoye are based primarily on the following PRDC geotechnical reports:

- The Engineering Geological Properties of rocks and pit slope stability assessments, dated 2008 (referred to as the "2008 PRDC Report").
- Stability Monitoring and Ongoing Optimization of Sloping Structure Parameters of Vostochniy, Titimukhta and Blagodatnoye Open Pits, dated 2014 (referred to as the "2014 PRDC Report").

The 2008 PRDC Report presents results of detailed geotechnical investigations, including geotechnical drilling and laboratory testing of the mechanical properties of rock, expected hydrogeological conditions and drawdown resulting from open pit mining, and slope stability analysis for various bench configurations and overall slope angles. Overall slope angles were recommended as summarized in Table 3.4. Based on AMC's review of the 2008 PRDC Report, these are considered appropriate.

Table 3.4 Blagodatnoye - overall slope angles (2008 PRDC Report)

Pit	Sector	Overall Slope Angle (°)
North Pit	north-east	43
	south-east	35
	south-west	41
	north-west	38
South Pit	north-east	44
	south-east	44
	south-west	43
	north-west	44

The 2014 PRDC Report presents updated analysis of bench stability based on additional data including structural mapping data from the Blagodatnoye open pit and laboratory testing of the shear strength of structures. This data was used to calculate the maximum stable bench slope angle subject to regulatory safety factor of 1.5, and to determine the safety factor at specific angles of final bench slopes of 60°, 70°, and 75°.

The recommended pit slope design parameters from the 2014 PRDC Report have been adopted for the current study, and are summarized in Table 3.5. As part of the design process, designs are checked to ensure they satisfy recommended overall slope angles.

Table 3.5 Blagodatnoye - pit slope design parameters

Pit	Design Parameter	Units	Elevation	Value
North Pit	Bench height	m	Above +450 mRL	20
			Below +450 mRL	30
	Bench slope angle	degrees	Above +420 mRL	60
			From +420 mRL to +360 mRL	60, 75
			Below +360 mRL	75
	Berm width	m	From +560 mRL to +470 mRL	14
			From +470 mRL to +270 mRL	10
South Pit	Bench height	m	Above +410 mRL	20
			Below +410 mRL	30
	Bench slope angle	degrees	Above +160 mRL	60
			Below +160 mRL	75
	Berm width	m	From +560 mRL to +450 mRL	16
			From +430 mRL to +390 mRL	12
			From +370 mRL to -20 mRL	10

The following additional points are made regarding the geotechnical aspects of the operation based on AMC's site visit observations of mining operations at Blagodatnoye:

- The intersection of the pit walls with unfavourably oriented faults has resulted in slope instability in certain areas. As such, improved mapping and interpretation of major structures is required on an ongoing basis during mining, and implications for slope stability considered. Areas where unfavourably orientated faults are interpreted should be targeted with slope monitoring systems (for example, prisms or radar systems).
- Generally wet rock mass conditions within the pit were observed, including several areas where water was flowing freely (as opposed to seepage). AMC recommends that further investigations be undertaken to identify slope depressurization requirements and a programme of depressurization drilling be implemented. AMC considers the depressurization of pit slopes is needed to reduce potential for large scale slope failure.

3.3.5 Pit optimization - input parameters

The pit limits for Blagodatnoye were selected through analysis using Whittle software. The shells were developed by varying the gold price above or below that chosen as the base price for the pit optimization process of US$1,250/oz. AMC allows for mining equipment sustaining capital costs by including an allowance approximately equal to 10% of the mining operating cost when selecting the optimum shell. The mining equipment sustaining capital costs are, however, estimated and applied separately in economic modelling.

The Polyus 2017 budget operating costs for Blagodatnoye, with amendments by AMC where appropriate, were used as the basis for pit optimization and economic analysis. Mining costs were applied by estimate the unit mining cost for the bench at the level of the pit exit and then incrementally increasing the cost of mining each bench in the pit design.

The parameters used in the pit optimization are derived from a combination of information provided by Polyus and AMC's determinations based on its technical assessments, and can be summarized as:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the recovered gold value (US$75/oz) for cut-off grade calculation.
- Gold recovery of 89.8% for the plant and 64% for the heap leach.
- Overall pit slope angles for the North Pit vary with depth:
  - 42°-47°-44° for the north-west wall.
  - 33°-58°-44° for the north-east wall.
  - 45°-56°-44° for the south-east wall.
  - 42°-33°-46° for the south-east wall.

- Overall pit slope angles for South Pit vary with depth:
  - 43°-45°-36°-52° for the north-west wall.
  - 33°-45°-32°-47° for the north-east wall.
  - 30°-41°-41°-52° for the south-east wall.
  - 23°-29°-41°-52° for the south-east wall.
- Mining operating costs of US$2.92/bcm mined for both ore and waste, and an additional US$0.012/t for every 10 m bench below the elevation of 430 mRL.
- Process plant operating cost of US$7.95/t processed, based on Polyus 2017 budget.
- SG&A cost that averages US$1.92/t processed, based on Polyus 2017 budget (no selling costs applied to Blagodatnoye production).
- Heap leaching cost of US$5.83/t leached.
- Process plant throughput of 8.0 Mtpa and heap leaching rate of 10 Mtpa.
- Refining and transportation costs of US$2.19/oz of recovered gold, based on Polyus 2017 budget.

A cut-off grade of 0.7 g/t was determined for use in the pit optimization, Ore Reserve estimation, and production scheduling presented in this CPR for Blagodatnoye process plant feed, and cut-off grade of 0.4 g/t was adopted for the heap leach.

All Inferred Mineral Resources were regarded as waste in the pit optimization and subsequent pit evaluations.

3.3.6 Pit design and contents

The pit design is based on the results of the pit optimization work. Parameters used in generating the ultimate pit designs are listed in Table 3.6.

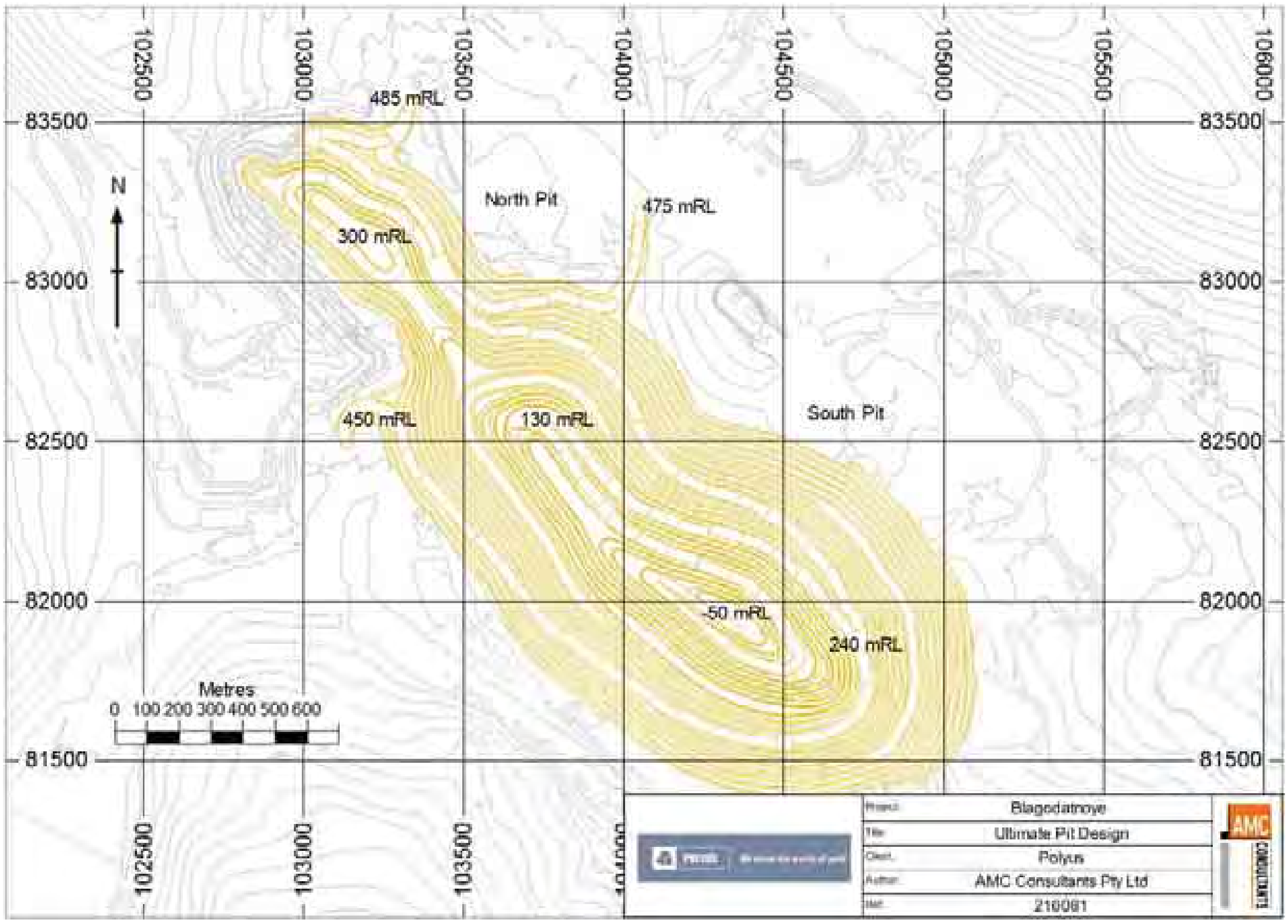
Table 3.6 Blagodatnoye - pit design parameters

Parameter	Unit	Value
Inter-ramp slope angle	degrees	43-59
Batter slope angle	degrees	60-75
Safety berm width	m	10-16
Bench height	m	10-15
Vertical distance between safety berms	m	20-30
Ramp width double travel	m	35
Ramp width single way	m	25
Ramp gradient	%	10

A width of 35 m was used for dual lane access haul roads and 25 m for single lane access. The ultimate pit design is shown in Figure 3.4. The AMC pit design includes a maximum ramp gradient of 10%, and includes horizontal ramp segments along the ramp length as required by Russian regulations 50 m horizontal ramp segments at 600 m intervals along the ramp length.

The maximum inter-ramp slope height varies by area from 150 m to 200 m. Where slope heights greater than the maximum are required, an additional geotechnical berm of 30 m width was included to divide the slope into two separate inter-ramp slopes.

Figure 3.4 Blagodatnoye - ultimate pit design



Pit staging is required to defer waste mining while providing continuous ore supply to the plant. Figure 3.5 shows a typical section through the pit, and indicates the relativity between the pit stages. Figure 3.6 shows the pit stages in plan.

The stage designs include areas of high value ore in early stages. The pit shell selection also considered minimum workable mining widths, generally 80 m, in all cutbacks and to provide continuity of access through the development of the pits. In some short segments of the pit wall, the widths were reduced to 40 m or 50 m. Internal ramps will be required to connect stages 5, 5.1, and 6 with the main pit exits.

Figure 3.5 Blagodatnoye - long section view showing pit stages

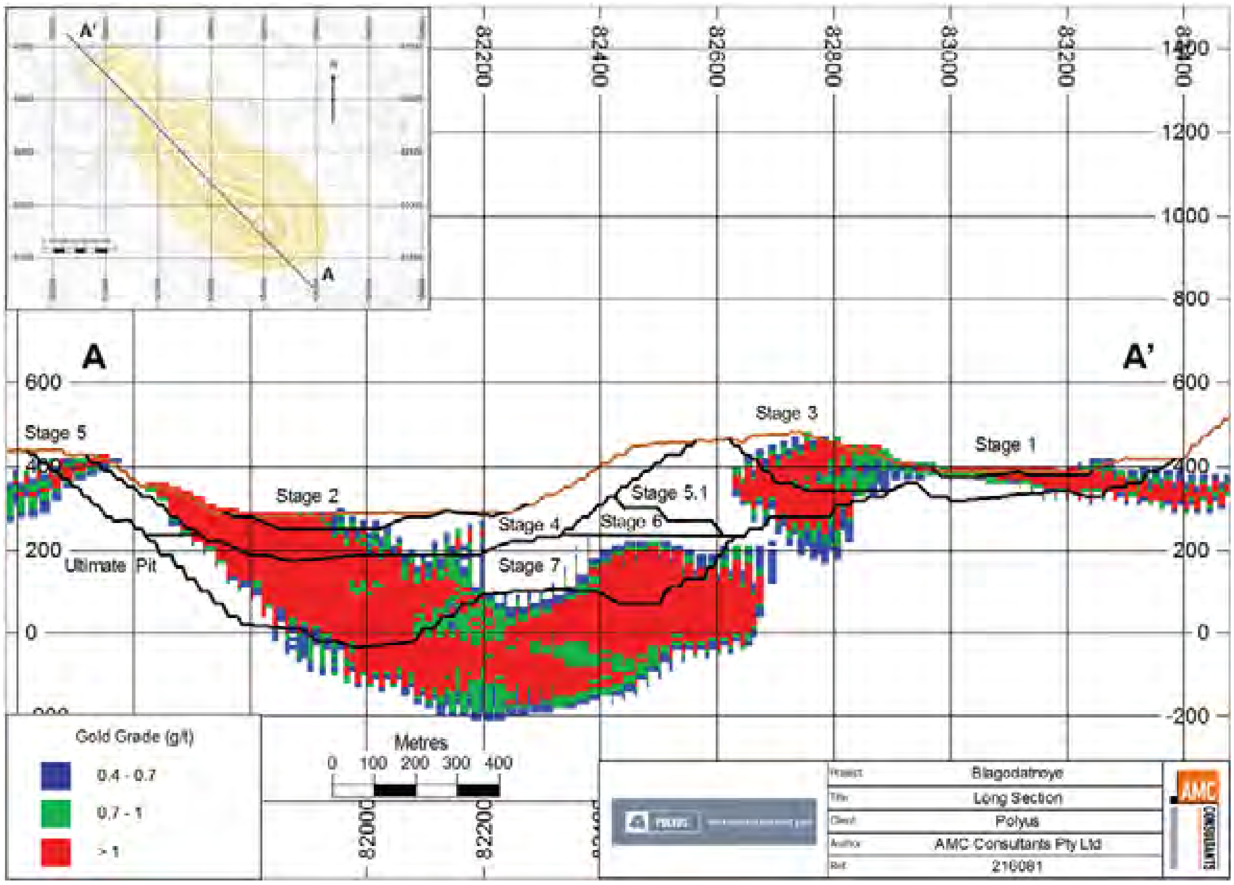
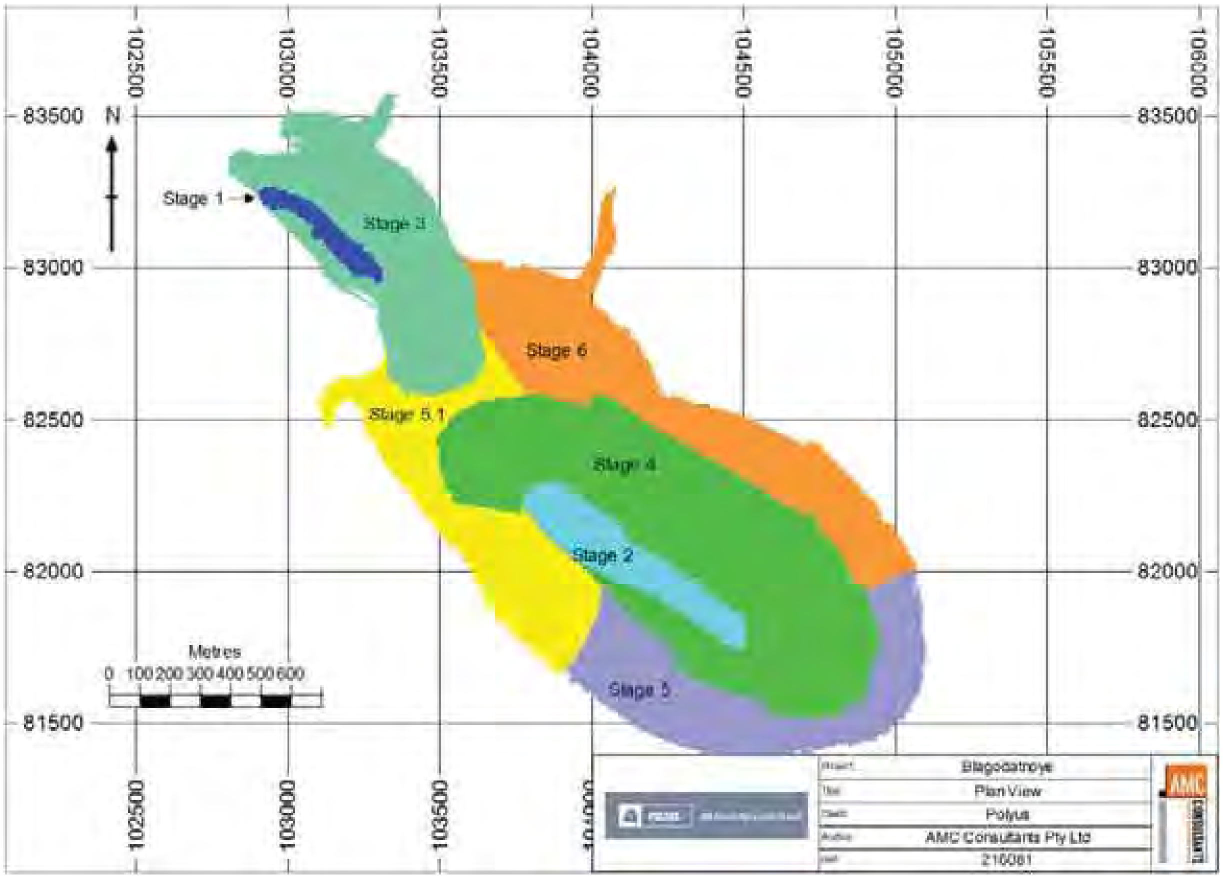


Figure 3.6 Blagodatnoye - plan view showing pit stages



The content of each detailed stage design was determined by evaluating the contents of the Mining Model within each successively larger pit design. The pit contents were evaluated at a cut-off grade of 0.4 g/t and depleted by the actual mine production as at 30 September 2016. The grade ranges used in the evaluation are:

- High-grade to plant: greater than 2.5 g/t.
- Medium-grade to plant: less than 2.5 g/t and greater than 1.0 g.
- Low-grade to stockpile: less than 1.0 g/t and greater than 0.7 g/t.
- Low-grade to stockpile for heap leach: less than 0.7 g/t and greater than 0.4 g/t.

Table 3.7 presents the pit design contents by stage for Blagodatnoye.

Table 3.7 Blagodatnoye - contents of pit design stages

Item	Unit	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 5.1	Stage 6	Stage 7	Total
Ore tonnes (>0.6 g/t)	Mt	1	6	16	37	5	27	0	92	185
Waste tonnes	Mt	0	1	34	107	85	71	178	80	557
Total rock tonnes	Mt	1	8	49	144	90	99	179	172	741
Strip ratio	W:O	0.2	0.2	2.1	2.9	16.9	2.6	652.3	0.9	3.0
Gold grade (ore >0.6 g/t)	g/t	1.8	1.7	1.2	1.7	1.2	1.0	1.3	1.7	1.5
Contained gold	t	1	11	18	62	6	28	0	154	281
Contained gold	Moz	0.0	0.4	0.6	2.0	0.2	0.9	0.0	4.9	9
Recovered gold	t	1	10	17	56	5	25	0	138	253
Recovered gold	Moz	0.0	0.3	0.5	1.8	0.2	0.8	0.0	4.4	8
Ore tonnes heap leach (0.6 g/t - 0.7 g/t)	Mt	0.0	0.4	3.2	4.2	1.0	6.4	0.1	5.5	21
Grade heap leach (0.6 g/t -0.7 g/t)	g/t	0.5	0.6	0.6	0.6	0.5	0.6	0.5	1.5	0.8
Ore tonnes low-grade (0.7 g/t - 1.0 g/t)	Mt	0.1	0.6	3.7	4.3	1.1	8.2	0.0	9.4	27
Grade low-grade (0.7 g/t -1.0 g/t)	g/t	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.9
Ore tonnes medium-grade (1.0 g/t - 2.5 g/t)	Mt	0.4	4.5	8.7	22.0	2.9	12.4	0.2	64.5	116
Grade medium-grade (1.0 g/t - 2.5 g/t)	g/t	1.7	1.7	1.5	1.7	1.5	1.3	1.6	0.1	0.8
Ore tonnes high-grade (> 2.5 g/t)	Mt	0.1	1.0	0.2	6.3	0.0	0.3	0.0	12.8	21
Grade high-grade (> 2.5 g/t)	g/t	2.8	3.0	2.7	3.1	2.7	2.9	3.4	3.1	3.1

Notes:
1. Topographic surface at 30 September 2016 used for evaluation. Ore Reserve estimates adjusted for depletion to 31 December 2016.
2. Ore tonnes and grade do not include existing stockpiles.

3.3.7 Ore Reserve estimate

The Blagodatnoye 2016 Ore Reserve is estimated to be 223 Mt grading 1.4 g/t containing 10 Moz of gold as at 31 December 2016. The estimate is classified and reported according to the JORC Code and is listed in Table 3.8.

Table 3.8 Blagodatnoye - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Stockpiles	n/a	42	0.9	1.1	35
Probable	Open Pit	0.4	182	1.5	8.9	276
Total			**223**	**1.4**	**10**	**311**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Topographic surface at 30 September 2016 used for evaluation. Ore Reserve estimates adjusted for depletion to 31 December 2016.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

AMC does not consider it likely that an underground Ore Reserve will be estimated for Blagodatnoye.

3.4 Ore processing

Ore from the Blagodatnoye mine is processed at Plant No.4. AMC visited the plant in October 2016 and observed the plant to be in good operating condition, with acceptable levels of housekeeping throughout the working areas.

Plant No.4 uses conventional crushing, grinding, gravity, flotation, and cyanide leach technology. The mineralogy of the Blagodatnoye ore is relatively simple and no deleterious elements are found in the ore. The gold recovery in 2015 was 87.9% at a throughput and head grade of 7.5 Mt and 1.99 g/t respectively.

The production for 2016 shows that the feed tonnage and head grade are 7.8 Mt and 2.07 g/t respectively, with a recovery of 88.0%. The Ore Reserve estimate is based on a plant throughput rate of 8.0 Mtpa.

3.4.1 Process plant history, design, and operations

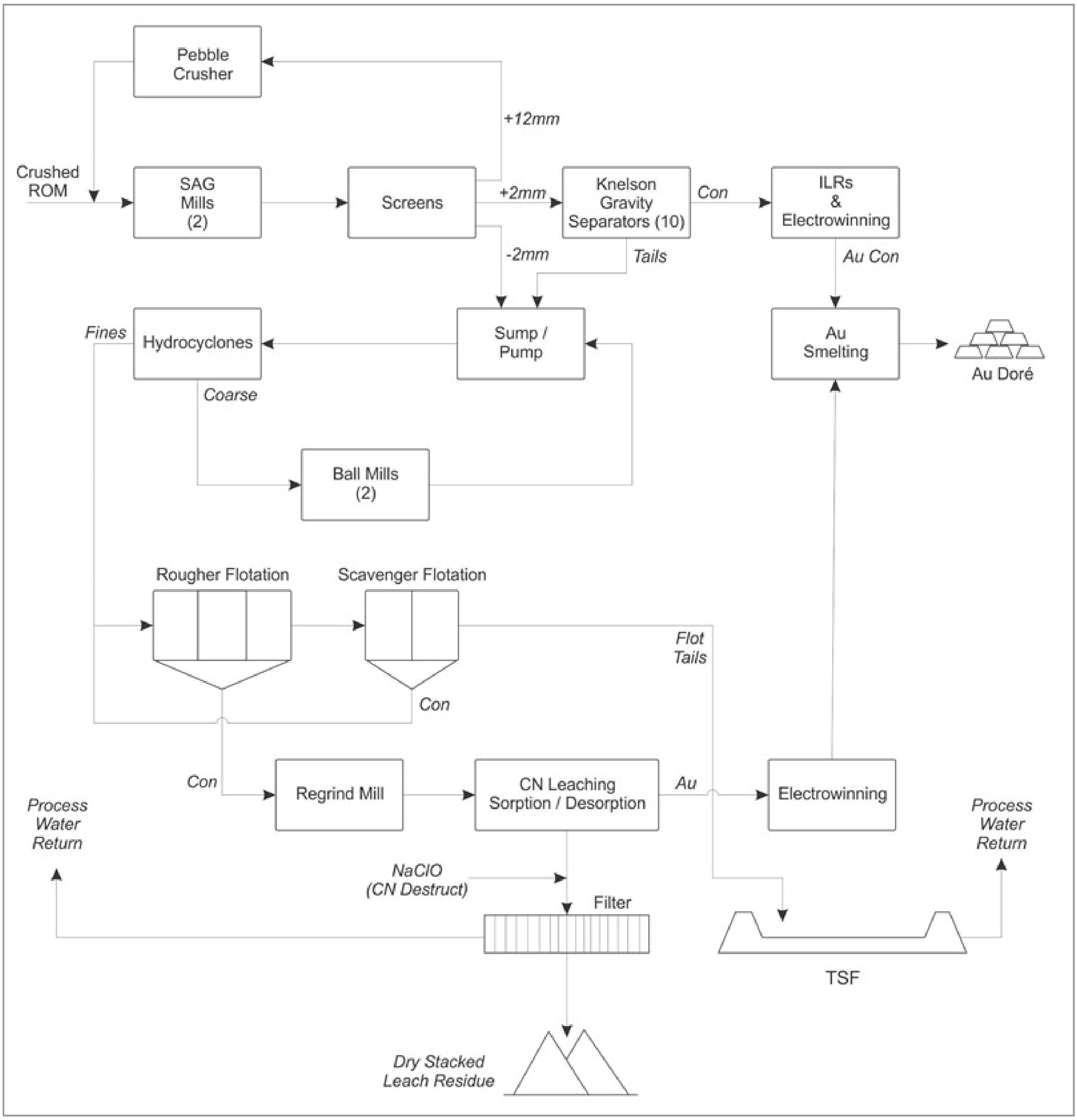
The Blagodatnoye processing plant (Plant No.4) commenced treatment of oxide ore from the Blagodatnoye open pit mine in October 2009. The Blagodatnoye ore can be regarded as moderately hard and free milling. The initial throughput capacity of 6.0 Mtpa was reached during 2010, and has since been increased to 8.0 Mtpa through a series of debottlenecking improvements to the basic flowsheet and equipment. Gold recovery averages approximately 88%. A significant improvement project is in progress to raise the gold recovery to approximately 90%.

ROM ore with a maximum size of 1,000 mm is fed to the primary crushing circuit where it is crushed to minus 400 mm using a toothed roll crusher. It is planned that a jaw crusher with a capacity of 1,200 tph be installed in 2017. The unit will be similar to new crushers being installed at the process plants at Olimpiada to facilitate efficient maintenance management. Significant effort is applied to blending of ROM ore to produce a consistent feed to the plant. The average ore feed grades of gold, and other deleterious elements, for the process plant are controlled within tight ranges by creating ROM stockpiles, containing 300,000 t each, and constructed using skyway dumping in a standard, four-stockpile, chevron arrangement. For each stockpile, 120 assay samples are collected, and a composite is accumulated for pilot plant testing to establish plant parameters to be used in its treatment, and expected plant performance.

The basic flowsheet of the plant is shown in Figure 3.7. Two parallel grinding lines consisting of a SAG mill and a ball mill are used to produce feed for flotation with a size specification of 65% to 70% minus 71 µm. The circuit has been debottlenecked to permit increase of nominal feed rate to 1,000 tph (2 x 500 tph for each line) by increasing the aperture size of SAG mill discharge grates and addition of expanded screening capacity with a pebble crusher to reduce the size of the critical size fraction exiting the SAG mill. These measures have been successful, and the grinding sections now consistently average 972 tph. A finer product size specification of 80% minus 71 µm is now also produced.

Blagodatnoye operates as an open-pit mine with surface stockpiling of low grade ore. The process plant was commissioned in October 2009 with a nominal capacity of 6.0 Mtpa, with gravity concentration, flotation, and CIL sections. Plant throughput increased to the nominal capacity during 2010, and was expanded in 2015 to 7.5 Mtpa, and further to 8.0 Mtpa during 2016.

Figure 3.7 Blagodatnoye - process plant – block flow diagram



Knelson centrifugal concentrators remove a gold-rich fraction from material exiting the SAG mills. ILRs dissolve gold from the Knelson concentrate and gold doré is produced in a conventional electrowinning and smelting operation. Two additional Knelson units (and 2 mm screening units to feed them) will be added to accommodate the increased throughput, and to enhance gold recovery by early removal of gold units from the working inventory of the plant.

Rougher flotation concentrate is produced in a simple, three-rougher – two-scavenger arrangement with scavenger concentrate returning to rougher feed and rougher concentrate reporting to the regrind mill prior to cyanide leaching, sorption and desorption. An opportunity to significantly increase sorption efficiency by decreasing particle size was identified by test work and addition of the regrind circuit was implemented in 2015. Sorption recovery has increased by 3% to 93% through regrinding to 86% to 90% minus 45 µm. Flotation tailings are thickened and the thickener underflow pumped to the TSF.

Blagodatnoye operates a conventional CIL hydrometallurgy plant where thickened flotation concentrate is leached with cyanide and contacted with activated carbon which adsorbs gold from the leach solution. Gold is desorbed from the carbon in a stripping operation and electrowon from the strip solution. A carbon regeneration circuit prepares the carbon for reuse. Electrowinning concentrate is smelted and poured into doré bars in the secured gold room. Leach residue is detoxified using sodium hypochlorite, then filtered. Filter cake is dry stacked in a location where any solution drainage reports to the TSF.

Table 3.9 shows the processing performance of the Blagodatnoye plant since 2014. Generally, the plant has performed reliably; exceeding gold-in-doré production through a combination of above-budget throughput, on-budget plant feed grade, and near-budget gold recovery.

Table 3.9 Blagodatnoye - process plant No.4 historical performance

Description	Unit	2014		2015		2016 (YTD Sep)	
		Actual	Plan	Actual	Plan	Actual	Plan
Throughput	Mt	7.3	6.7	7.5	6.8	5.9	5.8
Processed gold grade	g/t	2.0	2.0	2.0	2.0	2.1	2.0
Gold recovery (doré)	%	87.9	88.1	87.8	88.1	88.0	89.0

3.4.2 Process plant expansion

In 2014, Blagodatnoye embarked on an expansion programme to increase the process plant throughput to 8.0 Mtpa, and to increase the gold recovery rate to approximately 90%. An ongoing commitment to debottlenecking has resulted in identification of a series of circuit modifications and procedural changes that have already produced significant improvement in plant performance, and are expected to yield further gains in 2017.

The opportunity to improve sorption efficiency through regrinding was identified by working with Polyus technical support groups. A regrinding circuit was installed and a 3% increase in sorption efficiency was reported.

Polyus has committed significant resources to blending ROM ore to optimize feed to the plants. Target values for gold, Sb, and C are held to ±20%, and a representative bulk sample for pilot plant testing is accumulated for each 300,000 t blended stockpile. The blending operation is well managed with an independent reporting structure, and operators report that it has resulted in significant improvement in plant productivity. In addition to increases in plant performance, operators have noted a decrease in reagent consumption due to stabilized feed obviating the need to overdose reagents to ensure reagent is available during spikes in gold content. The metal accounting department reported that gold production from each traceable, 300,000 t stockpile is within 3% of that predicted from assays, pilot testing results, and modelling.

Blagodatnoye technical staff also commented that Polyus technical support has been instrumental in investigations of ore mineralogy and in development of improvement projects for the plant based on this intelligence.

The following upgrades and improvements to the circuit have been implemented (or will be implemented soon):

- SAG mill ball load increased.
- Grate size in the SAG mills increased from 25 mm to 40 mm.
- A pebble crusher with 200 tph capacity added to crush the critical size fraction released from the SAG mills by the increased grate size.
- Screening capacity increased to feed two new Knelson separators.
- Knelson centrifugal separator capacity increased from eight to ten units.
- Additional flotation feed thickener capacity added.
- Flotation pre-conditioning tanks converted to first stage flotation units to increase flotation residence time.
- Flotation mechanisms replaced with new, high-efficiency units.
- Oxygen generation and addition capacity installed.

- Additional sorption and desorption capacity provided to expand the capacity of the hydrometallurgical plant.
- Implementation of a flotation control system.
- Installation of automated equipment to decrease SAG mill liner change-out time.
- The TSF expanded to accommodate the increased annual deposition for the nominal life of the mine.

Table 3.10 shows throughput-related parameters for Blagodatnoye. The nominal goal for SAG mill feed rate is 500 tph for each line. The improvement in feed rate since 2014 can be seen in Table 3.10, with the plant reliably now averaging 973 tph. The comminution circuit is capable of operating at 1,000 tph, and operators are developing procedures and experience to be able to maintain this rate. Annual throughput of 8.0 Mtpa would be attained by operation at a feed rate of 973 tph, and with an overall utilization of 94%. Blagodatnoye has achieved this level of reliable operation, and therefore AMC finds the expectation that the plant is capable of 8.0 Mtpa to be reasonable.

Table 3.10 Blagodatnoye - process plant projected throughput

Parameter	Unit	2014	2015	2016 YTD Sep	2016 (projected)	2017 (forecast)
Feed rate	tph	855	939	973	973	973
Overall utilization	%	96.3	95.9	92.3	92.3	94.0
Throughput	Mtpa	7.3	7.5	5.9	7.8	8.0

Plant recovery has been approximately 88% for the last three years. As the expansion project initiatives aimed at recovery are implemented and commissioned, operators are confident that the recovery goal of approximately 90% can be achieved at the increased throughput now being seen. Laboratory test work indicates that 90% is possible. Operators planned for recovery to increase to 88.5% in 2017, and to reach 89.8% in 2018. The plan to increase recovery is detailed and well-conceived, and is based on test work. An appropriate commissioning ramp-up has been planned, and AMC included gold recoveries in the production cases of 88.5% in 2017 and 89.8% from 2018 onwards.

Maintenance is managed by an engineering group and is not under the control of plant operators. No maintenance management software is used to administer maintenance activities. However, plant operators and engineering managers responsible for maintenance have instituted a spreadsheet-based maintenance management system that provides basic functionality, such as preventative maintenance scheduling, shutdown planning, and tracking of work completed by maintenance personnel. AMC considers implementation of a maintenance management system to be a logical step for Polyus at the Olimpiada and Blagodatnoye plants. While it is possible to accomplish the basics of maintenance management using spreadsheets, AMC believes Polyus will accrue additional cost-reduction and equipment-availability benefits by implementation of a formal system that is capable of administering the full range of modern maintenance tools.

3.4.3 Heap leach project

Polyus is currently executing a project to extract gold from stockpiled, weathered, low-grade ore and fresh low-grade ore using the heap leaching method of extraction. The Blagodatnoye Heap Leach Project (BHL) is well advanced, with first production projected in 2019. The BHL is based on the availability of ore grading 0.4 g/t to 1.0 g/t. As at 31 December 2016, approximately 37 Mt had been mined and stockpiled for heap leach, and approximately 46 Mt additional ore is expected to be mined as heap leach feed from 2017 to 2032.

Test work on the Blagodatnoye low-grade ore began in 2006. Tests were conducted by Polyus and external entities.

Key outcomes of the test work are a recovery of approximately 64% was achieved in the 2015 work on multiple samples, and using the optimized reagent dosages.

Polyus undertook a feasibility study for BHL in conjunction with external partners. As part of the study, a global survey of large, gold, heap leach operations was conducted.

The feasibility study considered a range of treatment rates, comminution options, pad construction methods, and plant configurations. The feasibility study was based on a nominal processing rate of 10.0 Mtpa of ore grading 0.7 g/t, achieving approximately 64% gold recovery. A four-stage crushing circuit, culminating with vertical shaft impact crushing to produce 100% minus 5 mm material for stacking was selected. Conveyor placement of material on the heaps was chosen. The pad is designed for placement of 90 Mt of ore in four lifts, over a double-lined foundation. The hydrometallurgical plant selected is an industry-standard, carbon sorption/desorption design.

The initial capital cost for BHL was estimated to be US$136M, including an allowance for continuing studies in 2017.

An independent review of the feasibility study by a recognized external engineering firm was completed in March 2016. In general, the review supported the conclusions and designs developed during the study. However, the review raised several questions that will require further investigation and possible redesign of the plant aimed at reduced complexity and cost.

3.4.4 Tailings storage facility

The main TSF will be used for the flotation circuit tailings. It is located in a valley approximately 0.7 km southwest of the process plant. The engineered water retaining dam is constructed from waste rock with an upstream clay lining.

Cyanide is used in the processing plant and is present in the TSF. Points to note are:

- The TSF dam design is approved and implemented.
- Drainage from the dam is collected in a pond which also collects precipitation and surface water from the diversion channels.
- Monitoring is conducted downstream for, residual cyanide and presence of metals. No exceedances have been recorded to date.
- All analysis of samples is conducted on site.
- The hydrometallurgical dam is fully lined and there is no discharge. OJSC Irgiredmet (Irgiredmet), a well-known Russian mining and metallurgical research institute based in Irkutsk, conducts regular testing of streams above and below the dam location.

3.5 Planned production and costs

Production and costs - Reserve Case

A LOM plan was prepared using the Minemax schedule optimization software to provide a schedule that improves the overall value of the project. The results of the schedule were output to Microsoft Excel spreadsheets for review and analysis. The operating and capital cost estimates are based on the production schedule and technical and operating criteria described in this CPR.

A summary of the Blagodatnoye LOM production schedule is presented in Table 3.11, showing the mining, processing, and cost information. Annual mined tonnage and head grade were based on the Reserve Case mining schedule, process plant throughput and gold production rates with all Inferred Mineral Resources regarded as waste. The mining schedule and mining operating costs are based on the current equipment fleet, mining rate and the Polyus 2017 budget with appropriate allowances for expanded mining rate to accommodate increased production or haul distance changes.

The seven-stage pit design used as the basis for schedule results in a reduction of head grade in years 2022 to 2026. Further analysis of the mine plan and production schedule may enable a more even feed grade to the plant in this period.

The production schedule and operating costs are based on the following assumptions and qualifications:

- A gold price of US$1,250/oz.
- All RUB denominated costs were in real 2017 terms and converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on the Polyus 2017 budget, with AMC adjustments where appropriate. No provision was made for offsite corporate costs.

Capital cost estimates are included for:

- Heap leach processing to achieve 10.0 Mtpa from 2020 as described in section 3.4.3.
- Capital expenditures required to achieve the recovery goal of approximately 90% described in section 3.4.2.
- A sustaining capital cost allowance of US$2.1M per annum for the plant and US$1.4M per annum for the heap leach project was included to allow for minor equipment replacement and for progressive tailings dam wall raising.
- Additional and replacement mining equipment. An equipment expenditure schedule was developed to allow for equipment replace to maintain high availability to the operation.

Closure costs were estimated by an independent consultant and adjusted to 1 January 2017. These costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

Table 3.11 Blagodatnoye - planned production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20
Mined										
Ore mined - tonnes	Mt	182	13.0	10.0	11.9	11.1	13.1	64.3	50.1	8.2
Ore mined - contained gold	Moz	8.9	0.55	0.55	0.61	0.50	0.61	2.82	2.78	0.50
Waste mined - tonnes	Mt	548	62.0	68.0	58.1	58.9	56.9	217.4	25.5	0.7
Total material mined	**Mt**	**729**	**75**	**78**	**70**	**70**	**70**	**282**	**76**	**9**
Processed										
Ore - Process Plant - tonnes	Mt	140	8.0	8.0	8.0	8.0	8.0	40.0	40.0	19.7
Ore - Process Plant - grade	g/t	1.8	2.0	1.9	1.9	1.9	1.9	1.7	1.9	1.5
Ore - Process Plant - contained gold	Moz	8.1	0.52	0.49	0.49	0.48	0.48	2.20	2.50	0.94
Process Plant - recovered gold	Moz	7.3	0.46	0.44	0.44	0.43	0.43	1.98	2.24	0.84
Ore - Heap Leach - tonnes	Mt	82	-	-	1.7	10.0	10.0	50.0	9.5	0.9
Ore - Heap Leach - grade	g/t	0.7	-	-	0.8	0.8	0.7	0.7	0.7	0.8
Ore - Heap Leach - contained gold	Moz	1.9	-	-	0.04	0.25	0.23	1.15	0.21	0.02
Heap Leach - recovered gold	Moz	1.2	-	-	0.02	0.16	0.15	0.74	0.14	0.02
Total Ore - Plant + Heap Leach - tonnes	Mt	222	8.0	8.0	9.7	18.0	18.0	90.0	49.5	20.6
Total Ore - Plant + Heap Leach - grade	g/t	1.4	2.0	1.9	1.7	1.3	1.2	1.2	1.7	1.5
Total Ore - Plant + Heap Leach - contained gold	Moz	10	0.52	0.49	0.53	0.73	0.72	3.35	2.71	0.96
Total - Plant + Heap Leach - recovered gold	Moz	8.5	0.46	0.44	0.46	0.59	0.58	2.71	2.38	0.86
Operating Costs										
Mining	US$/t mined	1.26	1.11	1.16	1.15	1.14	1.20	1.31	1.55	1.71
Process Plant (including reclaim)	US$/t ore processed	8.04	8.11	8.08	8.10	8.02	7.98	8.01	7.97	8.23
Heap Leach (including reclaim)	US$/t ore leached	5.86	-	-	5.96	5.85	5.85	5.85	5.89	5.83
Selling, general and administrative	US$/t ore total	1.21	1.92	1.92	1.59	0.86	0.86	0.86	1.56	1.84
Refining and transportation	US$/oz refined gold	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19	2.19
Initial Capital Costs										
Mining	US$M	75	15	43	17	-	-	-	-	-
Process Plant	US$M	6	6	-	-	-	-	-	-	-
Heap Leach	US$M	136	2	85	46	3	-	-	-	-
Closure	US$M	9	-	-	-	-	-	-	-	9
Total	**US$M**	**226**	**23**	**128**	**63**	**3**	**-**	**-**	**-**	**9**
Sustaining Capital Costs										
Mining	US$M	71	3	12	3	12	12	15	13	1
Process Plant	US$M	38	2	2	2	2	2	11	11	6
Heap Leach	US$M	18	-	-	1	1	1	7	7	1
Total	**US$M**	**126**	**5**	**14**	**6**	**15**	**15**	**32**	**30**	**8**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

3.6 Permitting, environment, community, safety, and mine closure

3.6.1 Permitting

Audits of Polyus' ISO14001 and OHSAS 18001 systems by independent environmental consultants in 2015 concluded that the main environmental and safety permits and approvals are in place for the operation. These include permits obtained under the laws and codes as listed in section 2.6.1 of this CPR.

The conditions and requirements of the various permits and approvals are managed across the organization though the IMS.

There are no reports of serious non-compliances with legislation and regulation.

3.6.2 Environment

The topography of the area consists of rolling hills with a thin cover of soils, low swampy areas and gravel-filled valleys. The elevation of the mine area varies from 640 m to 700 m above sea level, and the vegetation is typical of a northern boreal forest (Taiga).

The average annual temperature in the region is -3°C with a minimum temperature of -61°C, with a short summer with maximum temperatures of approximately +34°C.

The area is characterized by mountain Taiga forest predominantly covered by coniferous trees namely spruce, fir and cedar. Topsoil in the area is very thin, between 0-40 cm in depth.

The region is typically snow covered from the beginning of October until the end of May. The depth of seasonal freezing is between 0.5 m and 2 m. There is no permafrost in the region. Average annual precipitation is 571 mm with the majority occurring during the summer season and an average daily maximum of 56 mm.

The primary river system in the region is the Yenashimo River, which flows into Teya River and then via the Vilmo, Tungusska and Yenisey Rivers to the Arctic Ocean. The deposit sites areas are drained by Yenashimo River and its tributaries:

- Olympiadinskiy stream with two tributaries drains the Olimpiada site.
- Titimukhta stream drains the Titimukhta site.
- Yenashimo River and its tributary Blagodatniy drain the Blagodatnoye site. The Yenashimo river is diverted to the south of the Blagodatnoye pits. The Yenashimo River catchment is 1,690 km^2 and the length is 120 km.

The majority of streams and rivers in the mining licence area and surrounds are significantly disturbed as the result of historical and current alluvial gold mining. Water quality controls and post mining rehabilitation of alluvial mining areas do not appear to be effective.

Yenashimo River and its main tributaries are classified as first category fishery water body which makes corresponding national high water quality guidelines applicable.

The ground water system in the area comprises several aquifers with the depths of five and 400 meters, respectively. The alluvial aquifer comprises sands, gravel, pebbles and coarse gravel with loamy filler along the riverbeds with thicknesses up to 15 meters.

Recharge of surface water into other ground aquifers occurs primarily through this aquifer. Groundwater inflow to the pits is mostly from a bedrock aquifer in quartz-micaceous-carbonaceous shales with the water transmissibility up to 1,000 m^2/day as assessed by independent environmental consultants to Polyus in 2013.

Land use in the area is predominantly forest cover, with current mining operations at Olimpiada, Titimukhta, Blagodatnoye, Quartz Mountain, Severo Nickel and alluvial mining. Forest land is managed by the Novokalaminsky division of Severo-Eniseyskiy forestry. Forest resources (both for timber and forest products) are used by the local population.

There are no specially protected areas or historical, cultural, or natural sites and there are no flora species in the project area listed in the Red Book of Russia and the Red Book of Krasnoyarsk Region. Protected fauna have the potential to occur, including species registered in the Red Book species such as fish-hawk, peregrine, erne, and white-tailed sea eagle.

In summary, the location of the operations, existing transport infrastructure and climatic conditions pose some challenges for the operations. However, it appears that operational planning typically takes these issues into account, limiting adverse impacts on operation. There does not appear to be any immediately obvious, unusual, significant environmental constraints to the ongoing operation at Blagodatnoye. Ongoing management of land, ecology, water, waste, air and noise issues will, however, continue to be required.

Waste rock management and mine water management

There has been limited geochemical characterization work completed for the Blagodatnoye operation.

Acid rock drainage (ARD) testing on the Blagodatnoye waste rock dumps shows potential for ARD. A programme of sampling and analysis will be required for improved characterise of the potential for acid generation and metal leaching potential. Improved remediation/mitigation measures may be required for the ongoing operations and post closure if ARD and metal leaching is determined to be significant.

A site wide mine water balance has not been prepared. Similarly, a post closure water balance and void water balance have not yet been prepared.

Tailings management

The Blagodatnoye TSF has wet and dry (moisture of 15%) tails which are segregated in separate cells. The wet flotation tails are thickened (up to 70%) and are pumped to the upstream tailings facility located in a small secondary tributary valley of Yenashimo River.

A drainage pond collects water seeping from the TSF. The drainage pond also collects precipitation and surface water from the diversion channels around the TSF. The dry sorption TSF is located to the west from the flotation TSF.

Limited tailings ARD and metal leaching testing has been completed. Additional testing and post closure management measures may be required.

A cyanide detoxification circuit is in place to limit concentrations of cyanide in tailings, exposure of fauna, and any potential discharges of tailings liquor and seepage.

3.6.3 Community

At January 2012, the population of the Severo-Eniseyskiy District was 11,458. About 62% of the district population lives in Severo-Eniseyskiy town. Other settlements in the district with population of more than 600 inhabitants include Teya, Novaya Kalami, Eruda, Pit-Gorodok and Bryanka.

The economy of the District is primarily based on gold mining (ore and alluvial gold), which represents more than 93% of all district industrial production. Most of the local residents are involved in gold mining industry. In 2010 the official unemployment rate was 1.2% of the working age people.

The nearest settlements are (population data at 2011):

- Severo-Eniseyskiy approximately 58 km to the north of the Blagodatnoye site.
- Eruda, immediately to the east of Olimpiada: Initially a small village. Since 2010, Eruda is the Polyus gold mine base. Population of approximately 2,300.
- Novaya Kalami: Novaya Kalami was founded in 1,948 for alluvial gold mining. Population of 599.
- Yenashimo Enashimo: Local village. Population of 79.
- Teya: Population of 1689 and most of the residents are employed in the gold industry.

The Severo-Eniseysk Region has a population of indigenous people who are traditional farmers and hunters. The three mining operations are within the limits of their grazing and hunting grounds. There are no known cultural, archaeological or historical heritage around the project area exists, nor are there areas of geological or special scientific interest present. Polyus advises that it has good relations with the surrounding community.

In accordance with the licence conditions, Polyus maintains a comprehensive programme of social support in the region. The Social Department at Olimpiada currently provide funding for medical assistance, sponsorships for further education programmes and hardship funds and rewards/bonuses for good performance. The programme is planned to continue throughout the life of the mine operations.

Complaints procedures are contained within the environmental management plan and all complaints/ comments are sent to the Environmental management department in Krasnoyarsk where they are then forwarded to the relevant department in order to resolve. The IMS tracks and records complaints management and resolution processes.

The remoteness of the operation, together with its location within a predominantly mining area, tends to avoid potential social and community issues. Systems and processes are in place to manage community relations and provide for the ongoing maintenance of good social licence to operate.

3.6.4 Safety

The Krasnoyarsk Business Unit, which includes the Blagodatnoye operation, has received certification to ISO14001: 2004 standards for its environmental management system and OHSAS 18001: 2007 for its health and safety management system. The most recent audit report by independent environmental consultants was in 2015 and it concluded that:

- The business unit has demonstrated effective implementation, maintenance and improvement of management system.
- IMS documentation as a whole meets the requirements of the audited standards; its structure and composition are sufficient for the implementation and maintenance of the IMS.
- The IMS as a whole has demonstrated compliance with ISO 14001: 2004, and OHSAS 18001: 2007.

The status of occupational health and safety for the Krasnoyarsk Business Unit, including the Blagodatnoye operation is described in section 2.6.4.

3.6.5 Mine closure

A Conceptual Mine Closure and Rehabilitation Plan was developed by independent environmental consultants to Polyus for the Olimpiada, Titimukhta and Blagodatnoye operations in 2013. The plan adopts international standards and covers the typical requirements of mine closure plans.

The mine closure plan identified four risks:

- After additional characterization work, waste rock, pit walls and tailings material are determined to potentially acid generating and metal leaching. Additional cover and drainage treatment mechanisms may be required if acid and metal drainage are likely to occur.
- Sufficient cover and growth material available are not stockpiled and available for closure. While some material is available, there is the potential for a shortage of cover and growth material. Alternative sources or alternative cover and growth treatments may be required.
- The location of the Blagodatnoye pit along the bottom of a large river will result in the river flowing through the pit after closure. If the quality of water discharging from the pit does not meet water quality standards, the diversion system would need to be maintained in perpetuity. Additional studies are required to model water quality, or the diversion channel would need to be upgraded for long-term stability.
- Geotechnical stability of the tailing dams in perpetuity. Design information is required to verify the long-term stability of the tailings dams.

The plan includes calculation of closure cost estimates for the three operations. Version 1.4.1 Build 16 of the Standardized Reclamation Cost Estimator was used to prepare the estimates. Key assumptions and exclusions included:

- Exclusion of salvage costs.
- Inclusion of human resources, severance and outplacement costs.
- Inclusion of property holding costs.

Updated total closure costs for Blagodatnoye were estimated as at 1 January 2017 to be approximately US$9M. The closure cost estimate does not include a contingency. Polyus is not required to pay an environmental security deposit and mine closure costs are included in the capital cost assessments for the operation.

3.7 Risks and opportunities

As stated in section 2.1.1 of this CPR, Blagodatnoye, as well as the Olimpiada and Titimukhta mines operate under the Krasnoyarsk Business Unit. The mines are in close proximity, which enables sharing of some infrastructure. Blagodatnoye, being part of a complex project located in a remote area, it is subject to similar risks and challenges to those described for Olimpiada in section 2.7 of this CPR.

The following risks are identified for Blagodatnoye:

- The metallurgical performance of the ore results in reduced recovery or increased costs. Blending to control deleterious elements is based on information collected during mining. Three dimensional geological modelling inclusive of geology, lithology and metallurgical parameters has not been completed. Therefore, the understanding and predictability of ore types future for plant feed could be improved. Noting, however, that the long history of the operation mitigates this risk.
- The ore tonnage or grade deviates from the expected values. A comprehensive reconciliation system would assist in mitigating this risk. None of the Mineral Resource is classified as Measured. Best practice is that sufficient drilling has been completed to define a reasonable proportion of Measured Mineral Resource as part of the near term ore supply. This may result in higher than expected grade variability.
- The majority of mineralization has been captured within an envelope based on a nominal 0.4 g/t lower-grade cut-off. This envelope transgresses lithological and structural boundaries. The implied continuity of the mineralization may be less than is currently modelled.
- Density data are only available as mean values for deposit and some lithologies. Supplementing the original density data with additional determinations would improve density assignment.
- Assay data appears to originally have been recorded to two decimal places but subsequently rounded to one decimal place. Therefore, some data precision is lost in grade estimates. This reduces the confidence in the grade estimates, though the potential error is limited to 0.1 g/t.
- Assayed grades are less reliable. The assay method of fire assay with gravimetric determination may not be suitable at low-grade ores.
- Polyus is currently executing a project to extract gold from stockpiled, weathered, low-grade ore and fresh low-grade ore using the heap leaching method of extraction. An external review raised several questions that will require further investigation and possible redesign of the plant aimed at reduced complexity and cost. Time has been allowed in the schedule for testwork during 2017. Further delays to construction and commissioning could lead to delays in predicted increases in the gold production.
- ARD testing on the Blagodatnoye waste rock dumps shows potential for ARD. A programme of sampling and analysis will be required for improved characterise of the potential for acid generation and metal leaching potential. Improved remediation/mitigation measures may be required for the ongoing operations and post closure if ARD and metal leaching is determined to be significant.
- Expected water shortage or release may occur. A site wide mine water balance has not been prepared. Similarly, a post closure water balance and void water balance have not yet been prepared.
- The location of the Blagodatnoye pit along the bottom of a large river will result in the river flowing through the pit after closure. If the quality of water discharging from the pit does not meet water quality standards, the diversion system would need to be maintained in perpetuity. Additional studies are required.

The following opportunities are identified for Blagodatnoye:

- Open pit grade control practices utilize blasthole sampling. This is not best practice and opportunities exist for improvements to this method, potentially with significant improvement to process plant head grade and reconciliation results.
- AMC considers implementation of a maintenance management system to be a logical step for Polyus at the Olimpiada plants which will deliver additional cost-reduction and equipment-availability benefits.
- Site management has demonstrated the ability to plan and deliver operational performance improvements to the operation, continuation of which can be expected to deliver further improvements.

4 Titimukhta

4.1 Introduction

4.1.1 Property location and description

The Titimukhta mine is located approximately 9 km north-west of Olimpiada (refer Figure 1.2).

The physiography and socio-economic aspects of the area are generally as described for Olimpiada (refer section 2.1.1).

The Titimukhta deposit was originally discovered in 1989. Polyus acquired the project in 2003 and proceeded with resource definition work between 2004 and 2007.

Titimukhta is an open pit gold mine. Production was commenced in 2009. The mine provides ore to supplement production from the Olimpiada operation. However, in 2016, only 0.4 Mt of ore was processed from Titimukhta, and the Ore Reserve is less than 1 Moz.

4.1.2 Mineral tenure

Polyus holds a subsoil use agreement (mining licence) number KRR 02838 BE for the Titimukhta mineral deposit. The licence was granted on 5 July 2016, expires on 31 December 2023, and was actualized (validated under the new regulations) on 8 May 2016.

The licence provides for exploration and mining of the deposit to a depth of 500 m below the natural surface level. The licence covers an area of 1.2 km^2 (Figure 4.1).

Figure 4.1 Titimukhta - mining licence boundary

Source: Subsoil use agreement KRR 02838 BE

The forest land lots have been leased to Polyus according to land rent agreements between the Polyus and the state forestry authority. The land must be rehabilitated and returned to the state after the project is finished. Figure 4.2 shows the forest land lease boundary (yellow line) and general arrangement of the site.

Figure 4.2 Titimukhta - general arrangement and land lease boundaries

Source: Conceptual Mine Closure Plan

Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences.

4.1.3 Historical production and costs

Titimukhta's historical performance is summarized in Table 4.1.

Table 4.1 Titimukhta - historical production and operating costs

Item	Unit	2014	2015	2016
Mined				
Ore	Mt	2.2	3.2	0.4
Contained gold	Moz	0.12	0.16	0.02
Waste	Mt	23.8	10.8	0.6
Total	**Mt**	**26.0**	**14.0**	**1.0**
Processed				
Ore	Mt	2.0	1.5	0.5
Contained gold	Moz	0.12	0.12	0.04
Recovered gold	Moz	0.09	0.10	0.04
Unit Operating Costs				
Mining	US$/t mined	1.76	1.74	2.79
Processing	US$/t processed	20.35	13.62	13.38
Selling, general & administrative	US$/t processed	3.13	3.01	2.98

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

4.2 Geology and Mineral Resources

The Titimukhta Mineral Resource has been updated to incorporate additional drilling data, and revised interpretations and estimation method. Since completion of the resource model, cut-off grades for the open pit resource have been changed from 1.0 g/t in 2015 to 0.8 g/t in 2016. There has been a corresponding change in the constraining pit shell as a result of changed economic parameters.

4.2.1 Geology

The Titimukhta deposit is hosted within a sequence of relatively homogenous quartz-biotite schist. Black shale, similar to those found in the Olimpiada deposit, lie to the east and granite gneisses lie to the west and northwest of the deposit. The shape of the mineralization at Titimukhta is controlled by the black shale and granite along with flanking faults to the east and west. The stratigraphy dips steeply to nearly vertically toward the east.

The deposit area is underlain by a zone of intense faulting with major northwest-southeast trending faults running through the northern side of the deposit. Host rocks are characterized by very high silica contents and the mineralization is infused by narrow quartz veinlets. A few large quartz veins up to 1.5 m wide cross-cut the mineralized zone on surface.

Mineralization occurs as a stockwork of mineralized quartz veins in a barren schist host rock. The main zone of mineralization is up to 550 m x 350 m in extent horizontally with the elongated axis being north-south in orientation. Gold mineralization extends to a depth of 500 m and occurs as stacked elongated zones that dip eastwards at between 30º and 50º, cross-cutting the stratigraphy.

The veins hosting the mineralization have a complex morphology of quartz, quartz-carbonate and quartz-feldspar compositions. The veins can be up to 1.0 m thick, though the average thickness is 0.2 m. The sulphide mineralization concentration is 1.1% to 2.1% and occurs in the form of pyrite and pyrrhotite in small quantities with less common galena, chalcopyrite and molybdenite. Arsenopyrite mineralization is present in very small quantities. There are four major mineral associations for gold, native gold between quartz crystals (36%); occurring within bismuth (48%); associated with sulphide minerals (9%); and associated with titanium minerals, mica and feldspars (7%). Only very limited weathering of bedrock has occurred at Titimukhta and oxide mineralization is not present in significant quantities (~30 m deep from surface).

4.2.2 Exploration

The Titimukhta deposit was discovered in 1989 when the black shale similar to the host rocks at Olimpiada was discovered. Between 1990 and 1996 geological exploration work including geological mapping, 3,900 m of drilling in 59 holes and trial trenching was completed. The technical properties of the mineralization were evaluated at Irgiredmet, utilizing a 40,000 t bulk sample taken from test pits.

From 1998 to 2001, the deposit was explored using a 200 m x 80 m grid. A series of shallow holes (48 in total) were drilled with the purpose of near surface mapping. These holes were drilled at a diameter of 112 mm to a depth of 4 m to 10 m on the north and eastern flanks of the deposit.

Polyus acquired the project in 2003 and, from 2004 to 2007, resource definition work was undertaken on east-west trending section lines spaced 50 m apart along strike, with drilling at 25 m and 50 m intervals along these lines.

In addition to the main exploration programme, Polyus drilled 115 shallow holes to aid in near-surface mapping of the geology and mineralization. These holes ranged in depth from 5 m to 50 m, averaging of 13 m.

The Titimukhta deposit has been defined by diamond drilling at various spacings ranging from 25 m x 25 m near the core of the mineralization, to 100 m x 100 m near the periphery of the mineralized zone. This is augmented by shorter holes drilled to depths that vary between 10 m and 15 m. Trenches were used mainly to map the edges of the deposit. In total, 178 holes, totalling 42,122 m, have been drilled at Titimukhta. This total includes 58 holes drilled prior to Polyus acquiring the deposit.

4.2.3 Mineral Resource estimation parameters

The Mineral Resource estimate for Titimukhta was revised by Polyus in 2015.

The updated Mineral Resource was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- All drilling used for the Mineral Resource estimate is diamond drilling.
- Drillhole spacing is as described in section 4.2.2.
- The Polyus resource model defines the main zone of mineralization within wireframes based on a cut-off grade of 0.4 g/t.
- A total of 374 diamond drillholes were available for the Mineral Resource estimate, comprising a total of 46713 m of drilling.
- An average density values was assigned as 2.25 t/m^3 for oxide material and 2.75 t/m^3 for fresh material based on testwork by Polyus.
- Composites were generated using a nominal two-metre length.
- The statistics of the flagged two-metre composites were calculated and histograms, log histograms and log probability charts compiled.
- High-grade cuts were determined for each domain.
- Experimental variograms were calculated and modelled for the gold indicator thresholds in each domain using the two-metre composite data within the domains. Twelve indicator thresholds were used.
- A three dimensional geological block model based on a parent cell of 10 m (west-east) by 25 m (north-south) by 5 m (vertically) was constructed for resource estimation purposes.
- Gold grade was estimated using multiple indicator kriging (MIK) to determine an e-type mean panel grade. No change of support was applied. Using the variogram models developed, grade estimates were completed using a three pass search strategy incorporating the use of dynamic anisotropy and relatively restricted search radii. The domains were used as hard boundaries. The method and parameters were chosen to generate a panel grade model and global grade-tonnage.
- The resource model has been depleted for mining.
- The resource estimate has been developed considering mining by open pit methods with selectivity indicated by blasthole sampling for grade control and mining possibly on 5 m benches.
- The Mineral Resource estimate has been classified as a mix of Measured, Indicated and Inferred Mineral Resource depending on the average distance of contributing composites to an estimated block grade.
- The estimate has been reported within a notional constraining shell developed using pit optimization as for the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell.

Titimukhta maintains active stockpiles for material to be treated by milling.

4.2.4 Mineral Resource estimate

The Polyus estimate of the Titimukhta Mineral Resource as at 31 December 2016 is 7.8 Mt with an average grade of 3.2 g/t, containing 25 t of gold at a cut-off grade of 0.8 g/t, in line with economic analysis (refer Table 4.2).

The Titimukhta 2016 Mineral Resource estimate is reported within a notional constraining shell developed using pit optimization as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell generated in 2016, incorporating extensions for current pit cutback designs. This price is 20% higher than the gold price of US$1,250 per ounce used for estimating the Titimukhta 2016 Ore Reserve.

Table 4.2 Titimukhta - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Measured	0.8	0.06	2.5	0.005	0.15
	Indicated	0.8	7.2	3.3	0.77	24
	Inferred	0.8	0.54	1.5	0.03	0.80
Total			**7.8**	**3.2**	**0.80**	**25**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface and depletion is as at 31 December 2016.
3. Excludes stockpiles.

The estimate of the Mineral Resource for the stockpiles at Titimukhta is shown is Table 4.3.

Table 4.3 Titimukhta - Mineral Resource - stockpiles - as at 31 December 2016

Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Measured	n/a	5.2	1.6	0.3	8.1
Total		**5.2**	**1.6**	**0.3**	**8.1**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. In reporting the stockpiles, little or no mining selectivity is intended.

4.3 Mining and Ore Reserves

4.3.1 General

The Titimukhta open pit operates on a similar basis to the Olimpiada pit, utilizing standard shovel and truck methods to excavate the ore and waste rock. The pit operates on 10 m benches with excavated materials hauled from the pit to either the waste dumps or the process plant as appropriate. A fleet management system is utilized to manage the pit operations.

Grade control procedures are the same as those used at Olimpiada.

The mining equipment fleet includes two blasthole drills, three rope shovels, and approximately 20 trucks being a combination of Caterpillar and Komatsu 90 t units.

The final pit design extends from the surface to a maximum depth of 440 m and is 875 m wide.

4.3.2 Mine operations

The Titimukhta mine operates as a satellite operation to the Olimpiada mine. Mining equipment is shared between the operations and the mine is operated on an irregular basis when needed to supplement ore feed to the Olimpiada plant.

Mining operations are based on conventional open pit mining methods undertaken by hydraulic excavators loading rigid body haul trucks. Ore is crushed at Titimukhta before transport to the Olimpiada plant.

When active, the mine operates 24 hours per day with two 12 hour shifts, 365 days per year.

Excavation of waste rock is conducted on 10 m working benches. Final walls are developed with 20 m or 30 m slopes, whilst ore mining is carried out on 5 m benches to reduce ore losses and dilution. All final slopes are establish using pre-splitting blasting to reduce back-break and increase stability, with final bench face angles of 60° to 75°.

The mine uses Wenco Mine Vision system to manage and optimize the operations in the pit. Mine Vision provides a fleet management system for open pit mines to record equipment activity, location, time and production information. The system provides dispatching to maximize production by using high precision GPS applications for the positioning and guidance of excavators, dozers, and drills. The Mine Vision system for Titimukhta is based at the Olimpiada control centre.

Blastholes are drilled using SBSh-250MNA-32 or Atlas Copco DML drill rigs. All of the above drill rigs are used for drilling ore and waste. The typical blast patterns are 6.0 m x 6.0 m in ore and waste with between 1.5 m to 2.0 m of sub-drill. The holes are either 215 mm or 245 mm in diameter. Blasting is planned for 97% of the total extracted rock mass.

Mining operations are currently carried out using two EKG-5 face shovels with a bucket capacity of 5 m^3 and one Komatsu PC 1250 with a bucket capacity of 5 m^3.

The mining truck fleet consists of CAT 777 (90 t) trucks.

Waste is transported to the Zapadniy dump located close to the open pit exit. Ore is transported to the ROM pad located next to the crushing plant for processing whilst sub-grade ore is transported to a stockpile. The crushed ore is transported to Olimpiada in 25 t Volvo tip trucks.

An allowance for the purchase and replacement of mining mobile equipment was included in the economic analysis. This analysis takes into account the equipment replacement schedule and the total capital expenditure required over the project life.

Grade control at Titimukhta operates on a 6.0 m x 6.0 m grid, utilizing a 249 mm blasthole of 11.5 m to 12 m depth to cover the 10 m bench. One composite sample is taken per hole.

Open pit dewatering is typically carried out by sump pumps. The inflow of water in the pit is due to both surface run-off and groundwater. Estimated maximum water inflow is approximately 530 m^3/h.

Surface and groundwater are discharged to the mine sump via a system of drainage ditches at the base of the pit walls and is then pumped via 1.4 km, 325 mm diameter pipeline into the surface retention pond. Power to the Titimukhta site is supplied via connection to the existing power supply at the nearby Olimpiada operation.

4.3.3 Mining model

The resource model used as the basis for mine planning was:

> "tit_pmod_01122015.dm", dated 1 December 2015.

This resource model was developed by Polyus. Polyus report that during pit optimization, dilution of 6.1% and ore loss of 1.5% was applied.

4.3.4 Geotechnical analysis

The PRDC completed a technical report for the geotechnical design of the Titimukhta open pit. The current slope design parameters for all pits are presented in the Table 4.4.

Table 4.4 Titimukhta - slope design parameters

Slope Design Parameter	Value
Inter-ramp slope angle	46° to 56°
Working bench (flitch) height	10 m
Batter angle	60° to 75°
Safety berm width	6 m
Final bench height	10 m
Ramp width (2-way)	28 m
Ramp width (one-way)	20 m
Average total depth throughout all pits	20 m - 55 m

Overall pit slope design angles are detailed in Table 4.5.

Table 4.5 Titimukhta - overall slope angles

Slope Design Sector	Slope Angle
North	37.5
East	45.3
South	42.6
West	42.7

AMC has not critically reviewed the geotechnical slope parameters for Titimukhta.

4.3.5 Pit optimization - input parameters

Pit optimizations were conducted under the supervision of Polyus in 2015. No material changes have occurred since the pit optimization work was completed and there is no change to the pit design.

The processing cost for Titimukhta ore is US$13.80/t processed. SG&A, refining and transportation costs are the same as those used for Olimpiada pit optimization.

For Ore Reserve estimation and production scheduling purposes, an ore cut-off grade, based on the economic parameters for the Report, of 0.8 g/t was used for Titimukhta.

4.3.6 Pit design and contents

The pit design is based on the results of the pit optimization work. Parameters used in generating the ultimate pit designs are listed in Table 4.6.

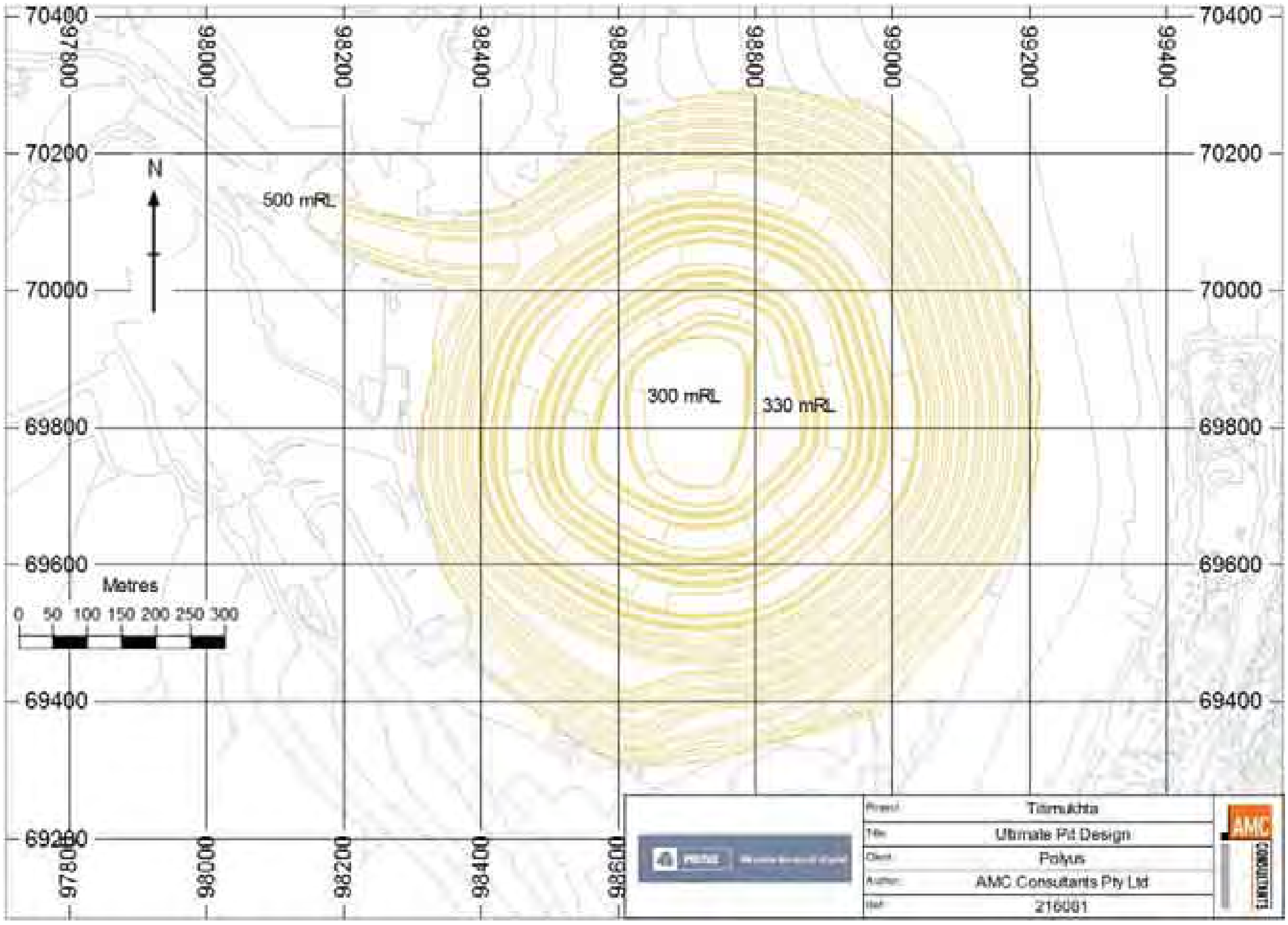
Table 4.6 Titimukhta - pit design parameters

Item	Unit	Parameters
Inter-ramp slope angle	degrees	46-56
Batter slope angle	degrees	60-75
Safety berm width	m	10
Bench height	m	10
Vertical distance between safety berms	m	20-30
Ramp width	m	20
Ramp gradient	%	8

The Titimukhta pit has not changed since development in 2015. It was designed under the supervision of Polyus. It features a three stage design. Stage 1 is complete, and stage 2 is nearly complete. Stage 3 has not commenced yet and a large pre-strip is required in this pit to access the ore.

A width of 28 m was used for design of dual lane access haul roads and 20 m for single lane access. The ultimate pit design is shown in Figure 4.3. The Polyus pit design includes a maximum ramp gradient of 8%, and includes horizontal ramp segments along the ramp length as required by Russian regulations. That is, including 30 m horizontal ramp segments at 375 m intervals along the ramp length.

Figure 4.3 Titimukhta - ultimate pit design



The pit contents were evaluated at a cut-off grade of 0.8 g/t and depleted by the actual mine production as at 31 December 2016 as presented in Table 4.7.

Table 4.7 Titimukhta - contents of pit design

Item	Unit	Stage 2	Stage 3	Total
Ore tonnes (>0.8 g/t)	Mt	0.3	6.2	6.5
Waste tonnes	Mt	1.3	85	86
Total rock tonnes	Mt	2.6	91	94
Strip ratio	W:O	4.4	14	13
Gold grade (ore >0.8 g/t)	g/t	2.3	3.1	3.1
Contained gold	t	0.7	19.7	20
Contained gold	Moz	0.1	0.6	0.7
Recovered gold	t	0.6	16.3	17
Recovered gold	Moz	0.1	0.5	0.5

Note:

1. Ore tonnes and grade do not include existing stockpiles.

4.3.7 Ore Reserve estimate

The Titimukhta 2016 Ore Reserve is estimated to be 12 Mt grading 2.4 g/t containing 0.9 Moz of gold as at 31 December 2016. The estimate is classified and reported according to the JORC Code and is listed in Table 4.8.

Table 4.8 Titimukhta - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Open Pit	0.8	0.06	2.3	0.005	0.15
	Stockpiles	n/a	5.2	1.6	0.26	8.1
Total Proved			**5.3**	**1.6**	**0.27**	**8.3**
Probable	Open Pit	0.8	**6.5**	**3.1**	**0.6**	**20**
Total			**12**	**2.4**	**0.9**	**28**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface as at 30 September 2016, with depletion from production to 31 December 2016 applied.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

4.4 Planned production and costs

Production and costs - Reserve Case

Titimukhta ore is treated at the Olimpiada process plant complex, as described in section 2.4 of this CPR.

The Titimukhta production schedule is included in the Olimpiada production schedule presented in section 2.5 of this CPR.

4.5 Permitting, environment, community, safety, and mine closure

4.5.1 Permitting

Audits of Polyus' ISO14001 and OHSAS 18001 systems by independent environmental consultants in 2015 concluded that the main environmental and safety permits and approvals are in place for the operation. These include permits obtained under the laws and codes as listed in section 2.6.1 of this CPR.

The conditions and requirements of the various permits and approvals are managed across the organization though the IMS.

There are no reports of serious non-compliances with legislation and regulation.

4.5.2 Environment

The existing environmental conditions and potential constraints are essentially the same as for the Olimpiada operations.

Waste rock management and mine water management

There has been limited geochemical characterization work completed for the Titimukhta operations. An assessment of ARD was undertaken in 2014 by independent environmental consultants to Polyus. This review included analysis of static tests to assess the geochemical properties of waste rock at Titimukhta.

Titimukhta geology showed low levels of sulphur so were generally classified as non-acid forming materials. The assessment recommended further kinetic testing to characterize the potential for ARD.

Mine pit affected water is pumped to sedimentation dams for storage and reuse.

Tailings management

Ore from the Titimukhta operations is processed at the Olimpiada processing plants, with tailings disposed of in the Olimpiada TMF, as discussed in section 2.6.2 of this CPR.

Environmental and safety management system

The Krasnoyarsk Business Unit, which includes the Titimukhta operation, has received certification to ISO14001: 2004 standards for its environmental management system. Recent system audits concluded that the system continues to meet these standards.

4.5.3 Community

The assessment of community interaction is essentially the same as for the Olimpiada operation.

4.5.4 Safety

The status of occupational health and safety for the Krasnoyarsk Business Unit, including the Titimukhta operation, is described in section 2.6.4.

4.5.5 Mine closure

A Conceptual Mine Closure and Rehabilitation Plan was developed by independent environmental consultants in 2013 for the Olimpiada, Titimukhta and Blagodatnoye operations. The plan adopts international standards and covers the typical requirements of mine closure plans.

The mine closure plan risks are essentially the same as for the Olimpiada operations.

The plan includes calculation of closure cost estimates for the three operations. Version 1.4.1 Build 16 of the Standardized Reclamation Cost Estimator was used to prepare the estimates. Key assumptions and exclusions included:

- Exclusion of salvage costs.
- Inclusion of human resources, severance and outplacement costs.
- Inclusion of property holding costs.

Updated total closure costs for Titimukhta were estimated as at 1 January 2017 to be US$2.4M. The closure cost does not include a contingency. Polyus is not required to pay an environmental security deposit and mine closure costs are included in the capital cost assessments for the operation.

4.6 Risks and opportunities

Refer to section 2.7 of this CPR because risks and opportunities for Olimpiada are also applicable to Titimukhta.

5 Verninskoye

5.1 Introduction

5.1.1 Property location and description

The Verninskoye gold deposit is located in the northern part of the Bodaybo Administrative District, Irkutsk Region (refer Figure 1.3). Bodaybo is located 900 km (two and a half hours) by air, and 1,440 km by road from Irkutsk. Verninskoye lies 130 km to the north of the town and district centre of Bodaybo. The mine is 6 km from the settlement of Kropotkin. Bodaybo is an established community of approximately 22,000 people, reflecting its long history as the centre for placer gold mining in the area. The numerous outlying settlements are in decline, reflecting the decline in the placer mining business. Other than mining and related services, there is little other industry or land use in the area.

Polyus acquired Verninskoye in 2005. and the plant was commissioned in December 2011. The operation currently has an estimated remaining life of 33 years.

In 2016, Verninskoye produced 10% of the Polyus gold output. Current processing plant's capacity is 2.5 Mtpa, however Polyus is working to expand the plant to a throughput capacity of 3.0 Mtpa.

AMC Principal Consultant mining engineers and geologists have visited the site on several occasions.

The Verninskoye minesite has its own camp facilities and is not reliant on the nearby town of Kropotkin.

The Verninskoye pit is located at the head of the Ugakhan River valley. The TSF are located at the head of the Kadalikan Stream valley located within the adjacent Nygri River valley. The plant is located approximately 6.5 km uphill from the pit exit, and on the watershed between the two river valleys.

5.1.2 Mineral tenure

The Verninskoye deposit is covered by three subsoil mining and exploration licences for the mining of hard-rock gold ore:

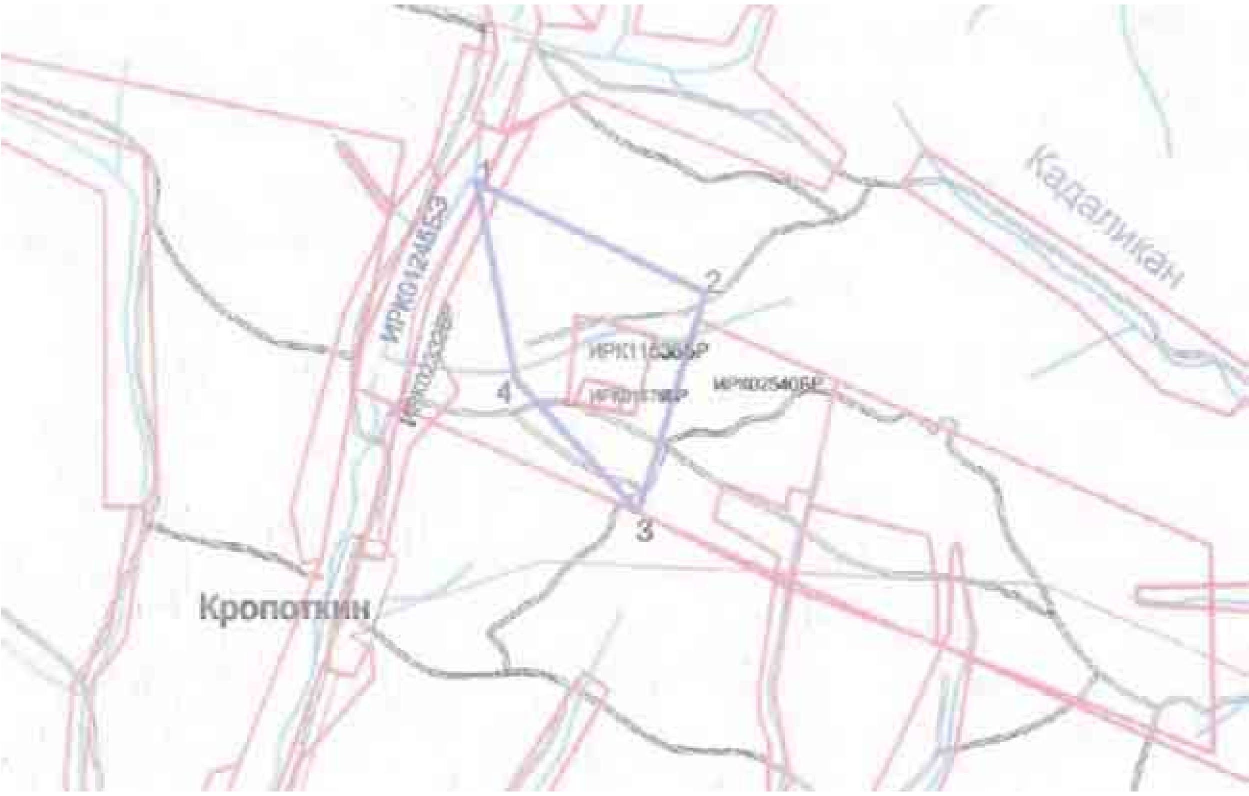
- IRK 03383 BR, Pervenets deposit, granted on 16 January 2017 and expires on 1 June 2020.
- IRK 03384 BR, Verninskoye deposit, granted on 16 January 2017 and expires on 31 December 2025.
- IRK 03385 BR, Smezhny deposit, granted on 16 January 2017 and expires on 10 October 2035.

The Medvezhy deposit, located to the southeast of the Verninskoye deposit, is located on a fourth licence:

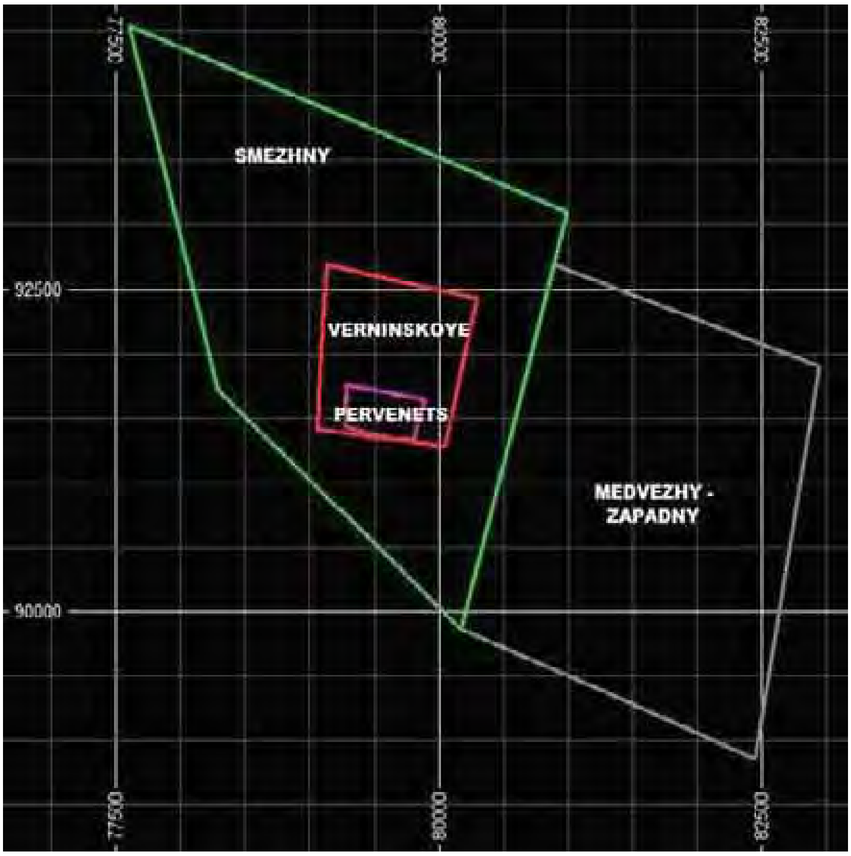
- IRK 03386 BR registered on 16 January 2017 and valid to 25 February 2033.

The location of the four licence areas, together with other active licences in the area, and the nearest settlement of Kropotkin, is provided in Figure 5.1. The IRK 03385 BR licence area is shown in purple.

Figure 5.1 Verninskoye - key licence areas for the deposit and adjacent active licences



Source: IRK 02726 BR



Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences.

5.1.3 Historical production and costs

Verninskoye's historical performance is summarized in Table 5.1.

Table 5.1 shows the historical production and summary cost information for the Verninskoye operation. The trend in production shows improving throughput grade and recovery over the three years in response to a focus on plant performance. This is also reflected in the declining unit process operating cost.

Table 5.1 Verninskoye - historical production and operating costs

Item	Unit	2014	2015	2016
Mined				
Ore	Mt	4.7	4.0	3.4
Contained gold	Moz	0.29	0.27	0.24
Waste	Mt	8.5	12.3	12.9
Total	**Mt**	**13.3**	**16.3**	**16.3**
Processed				
Ore	Mt	2.2	2.3	2.5
Contained gold	Moz	0.19	0.19	0.21
Recovered gold	Moz	0.15	0.16	0.19
Unit Operating Costs				
Mining	US$/t mined	2.31	1.66	1.85
Processing	US$/t processed	25.75	18.33	17.47
Selling, general & administrative	US$/t processed	6.00	5.09	4.92

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

5.2 Geology and Mineral Resources

AMC developed a resource model which incorporates revised interpretations, estimation process, estimation parameters, and a revised cut-off grade. The cut-off grade for the open pit resource is estimated to be 0.7 g/t based on current economic parameters. A corresponding and constraining US$1,500 optimization shell was used for reporting the Mineral Resource.

5.2.1 Geology

The Verninskoye gold deposit is located in the central part of the Lena gold province at the intersection of two large tectonic blocks: the Siberian Platform and the Baykal-Patomsk fold belt. The Lena gold province is characterized by rich gold placer deposits, which have been operated since the middle of 19th century producing more than 2,000 t of gold. It also hosts the large Sukhoi Log gold deposit and other large gold deposits in the Bodaybinskiy area: Vysochaishee and Chertovo Koryto. A large number of smaller deposits also occur in the region.

Hard-rock gold mineralization in Lena province is predominantly structurally controlled and represented by two main types: quartz-vein and quartz-sulphide vein disseminated deposits. The Bodaybinskiy synclinorium is a major structure controlling gold mineralization and is formed in upper Proterozoic metasedimentary rocks of green schist facies folded into series of synclinal and anticlinal folds. The Verninskoye deposit is related to Marakano-Tungusskaya syncline which is a high-order structure in the synclinorium.

The central part of the Marakano-Tungusskaya syncline consists of the upper part of Neoproterozoic sedimentary Patomskaya Series comprising the oldest black shale unit of the Baikal-Patom region. The sequence consists of thick layers of black shale, siltstone and limestones interbedded in different proportions. The stratigraphy has been folded into a moderately inclined, tightly folded antiform. Asymmetric fold vergence is towards the south. Fold axes strike approximately west-northwest with axial planes dipping 30° to 40° towards the north-northeast. Fold deformation has induced a slaty and axial planar cleavage in less competent and altered units. Faults and breccias are related to offsets in stratigraphy.

Shear zones controlling the mineralization at Verninskoye are related to combined fold and fault structures dipping north and north-northeast. The structure of the Verninskoye deposit is complicated with structurally-controlled mineralized zones localized at contacts between black shale, siltstone and limestone around a moderately-inclined, tightly-folded, asymmetric antiform. Stockwork mineralization occurs more broadly within the mixed sedimentary units.

The Verninskoye deposit is a series of lenticular bodies of gold mineralization localized at the contact between black shale and siltstone with limestone units in the hanging wall around the Verninskoye anticline.

Gold occurs in quartz-sulphide veins and associated with disseminated sulphide minerals (pyrite and arsenopyrite) within the sedimentary rocks. Minor pyrrhotite, chalcopyrite, sphalerite, and galena are recorded. Sheeted and stockwork quartz-carbonate vein mineralization and disseminated mineralization occur both sub-parallel to and cross-cutting stratigraphy which seems to include local quartz and sericite alteration overprinting primary sedimentary features.

Most gold in the Verninskoye deposit occurs as free particles finer than 100 µm, with a minor coarse gold component that is greater than 100 µm. The quantity of sulphide minerals increases towards the contact with limestone and can comprise up to 10% to 15% of the rock volume, forming the highest-grade zones. Coarse visible gold was found in the quartz veins of the Pervenets zone associated with pyrite and arsenopyrite.

All material being mined is essentially fresh rock. Oxidation only affects the material within 5 m to 10 m of the natural surface.

In the pit area, gold mineralization is best developed in the upwards facing limb of the fold. In the pit, a limestone unit seems to control structural deformation and distribution of mineralization. Gold mineralization is found adjacent to the upper contact of the limestone on both upwards and downwards facing limbs of the tight anticlinal fold, and also within the axial planar hinge area in the core of the anticlinal fold below the limestone contact.

The mineralization, defined by the limits of low-grade stockwork mineralization, covers an area of 1,500 m along strike and 1,100 m across strike. Mineralization has been intersected up to 740 m below surface.

Sulphide content is variable and ranges up to 10% to 15% of the rock mass. Due to the complex composition of vein and disseminated mineralization, often with gradational margins, the contacts or limits to the mineralization and interpreted thickness of the mineralized zones varies widely. The zones range in thickness from metres to tens of metres, depending on cut-off grades definition and stratigraphy. Contacts or limits to the mineralization appear to be gradational and diffuse.

Silver grade has been reported as part of the GKZ estimate but the grades are derived from a factor of the gold metal content. As noted above, there are no routine assays for arsenic, but arsenic has the potential to cause issues with processing of ore.

Depth of mineralization seems to range from near surface to possibly greater than 700 m depth, with the current open pit mining targeting mineralization down to 300 m to 350 m below surface.

The definition of the mineralized zones was a two-stage process that defines anomalous populations of gold mineralization (as compared to mineralization pre-defined by an economic cut-off parameter). A wireframe was defined to constrain the high-grade gold mineralization associated with the main zone of mineralization. A probability model was used to define a complex grade envelope associated with the remainder of the gold mineralization.

In reviewing the data, AMC concluded that apart from the main body of mineralization, other areas of mineralization are essentially stockwork in form although they can incorporate higher-grade mineralized structures continuous over several drillholes. The main zone is distinguished by the quartz-sulphide vein type of mineralization, and other areas are of disseminated mineralization type. The main zone tends to have more consistent and high-grade gold mineralization. On this basis, AMC considered that the main zone should be interpreted and estimated independently.

Lithology was also modelled based on supplied sectional interpretations of the geological data.

5.2.2 Exploration

Diamond drilling was carried out in two main periods. The first exploration programmes were completed by Bodaybinskaya exploration group from 1977 to 1990 and Polyus has completed the second major programmes between 2005 and 2013. Exploration drilling carried out between 1974 and 1990 had poor core recovery and showed negative bias relative to later drilling completed in 2005 to 2013. The earlier data has been replaced by drilling completed by Polyus between 2005 and 2013. AMC has only used data from the more recent drilling in the resource estimate. All drilling used for the resource estimate is diamond drilling.

Diamond drillholes were selectively sampled within quartz-sulphide mineralized zones from 1977 to 1990 and over the full length of the drillholes from 2005 to 2013.

A total of 691 diamond holes were recorded in the Verninskoye-Medvezhy database, with 520 holes used for the Verninskoye Mineral Resource estimate comprising a total of 144024 m.

Drillholes are oriented at around 207º grid which is close to normal to the trend of mineralization. Most drillholes appear to have been collared as vertical holes but tend to rise to inclinations of about 80º to the southwest. The main area of mineralization has been drilled at 50 m x 50 m spacing to a depth of 300 m below surface. Below that level, drillhole spacing is about 50 m x 100 m. Parts of the central higher-grade mineralized zone are drilled to 25 m x 25 m.

Core was sampled at 1 m intervals, considering lithological boundaries. Veins 0.2 m to 1 m thick were sampled separately. Drill core from the earlier drilling was only sampled in identified mineralized zones but the entire hole was sampled in drilling from 2005 to 2013. PQ (122 mm outer diameter/85 mm core diameter) and HQ (96 mm outer diameter/64 mm core diameter) diameter core was split with the diamond saw. One half of the core was submitted for the sample preparation and the second half was stored. Full core samples were submitted for NQ (75 mm outer diameter/48 mm core diameter) core.

For 1974 to 1990 drilling, samples were processed in the laboratory of Bodaybinskaya exploration company and for the later drilling in the laboratories of JSC Pervenets and JSC Lengeo. Assay was by 50 g charge fire assay with gravimetric determination.

Drill core was comprehensively logged in a written format recording details of rock type, alteration, structure and mineralogy. This information was not yet available or transcribed to a digital database.

The main mineralized zone strikes roughly east-west and dips at 30° towards the northeast, parallel with the fold limb.

5.2.3 Mineral Resource estimation parameters

The Verninskoye Mineral Resource estimate as at 31 December 2016 was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- The composites were flagged for the wireframed high-grade main zone. Further mineralization domains were determined using the probability model outlined below.
  - AMC concluded that it was necessary to constrain mineralized volumes in the stockwork domains and to estimate gold grades within the gold mineralized parts of the domains. The procedures used to define the mineralization envelopes were:
  - Determine an appropriate threshold (0.3 g/t) for the gold composite data and set a binary indicator variable that was then estimated using ordinary kriging.
  - Estimate the indicator variable using ordinary kriging.
  - Select a nominal probability threshold (0.35) from the estimated indicator value.
  - It should be noted that the indicator threshold value has no economic significance.
- With the mineralization domains flagged in both the model and the composite data, the basic statistics were evaluated to check the validity of the data flagging, determine appropriate high-grade caps or top-cuts, and generate appropriate grade variograms for estimation.
- The final block model utilizes 20 mE x 20 mN x 10 mRL parent blocks.
- Gold grade was estimated using ordinary kriging.

- Grade estimates were completed using a single search pass.
- The defined main zone and stockwork mineralized zones were used as hard boundaries for the estimation.
- The resource estimate assigned a range of densities according to lithologies. Densities ranged from 2.71 t/m^3 to 2.83 t/m^3.
- The resource model was developed below the pre-mining topography.
- The estimate was classified as Indicated Mineral Resource where drillhole spacing is generally less than 50 m x 100 m. Beyond the Indicated Resource, the estimate is classified as Inferred Resource within 100 m of drilling and where spacing between drillholes is greater than 100 m. The resource estimate has been developed considering mining by open pit methods with selectivity indicated by blasthole sampling for grade control and mining possibly on 10 m benches.

Verninskoye maintains active stockpiles for material to be treated by milling.

5.2.4 Mineral Resource estimate

AMC prepared an estimate of the Verninskoye Mineral Resource as at 31 December 2016 of 226 Mt with an average grade of 1.6 g/t and containing 12 Moz of gold. This estimate is based on the resource model depleted by survey to 1 October 2016 pit topography, with a further deduction for mining in the last quarter of 2016.

In 2016, the cut-off grade used for the open pit resource is 0.7 g/t. A constraining US$1,500 optimization shell is used for reporting the Mineral Resource. The Verninskoye 2016 Mineral Resource estimate as presented in Table 5.2 was reported within a notional constraining shell developed using pit optimization as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell. This price is 20% higher than the gold price of US$1,250 per ounce used for estimating the Verninskoye 2016 Ore Reserve.

Table 5.2 Verninskoye - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	0.7	212	1.6	11	337
	Inferred	0.7	14	2.0	0.9	27
Total			**226**	**1.6**	**12**	**365**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Depleted to 1 October 2016, adjusted for mining to 31 December 2016.

The estimate of the Mineral Resource for the stockpiles at Verninskoye is shown is Table 5.3.

Table 5.3 Verninskoye - Mineral Resource - stockpiles - as at 31 December 2016

Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Measured	n/a	11	1.3	0.45	14
Total		**11**	**1.3**	**0.45**	**14**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. In reporting the stockpiles, little or no mining selectivity is intended.

5.3 Mining and Ore Reserves

5.3.1 General

Mine planning included pit optimization based on the resource model, pit designs using the pit optimizations shells as a guide, production scheduling of the resulting inventories and economic analysis to verify economic viability of the overall operation. Polyus indicates that additional testwork is planned to better understand the metallurgical responses of the orebody. As this additional information becomes available, further mine planning is likely to allow optimization of the value of the project through strategic analyses of cut-off grade, pit design, and mine scheduling options for the LOM plan.

AMC based the 2016 Verninskoye Ore Reserve estimate on the expanded process plant flowsheet and throughput capacity (3.0 Mtpa) proposed by Polyus and described in section 5.4 of this CPR.

5.3.2 Mine operations

Small scale mining occurred at Verninskoye in 1995, 1999 to 2001, and 2003, primarily underground mining. Exploration and bulk sampling on the Verninskoye and other Polyus deposits in the area also occurred during this period. Open cut mining by Polyus commenced in 2009 and processing commenced in 2012. Production in 2016 was 187 koz of gold.

The Verninskoye mine is located in an east to west trending valley with the mine facilities spread over approximately 7 km. Mining is by large open pit methods, using diesel hydraulic face shovels, electric rope shovels and a fleet of 90 tonne dump trucks. The pit is centrally located, with the waste stockpile downstream in the valley, and the process plant approximately 6.5 km uphill to the east at the head of the valley. Processing of ore is by milling and recovery via CIL method with gravity and flotation circuits.

The operation employs staff on two 12 hour shifts per day, 365 days per year.

The accommodation village, administration offices and workshops are on the northern flank of the valley adjacent to the waste stockpile. Tailings are discharged into a storage facility constructed in the adjacent valley to the east.

Administrative support and senior management are located in Bodaybo.

Both ore and waste are mined on 10 m benches. Blastholes are drilled to 12 m depth, inclusive of 2 m sub-drill. Blasthole design burden and spacing is generally 6 m x 6 m for waste, with 250 mm diameter blastholes, and 5 m x 5 m for ore, with 212 mm diameter blastholes. Drill cuttings are used for stemming. Blasting appears to produce significant heave and digging face heights of 12 m to 16 m are common. The height of the faces is higher than the recommended height for most efficient digging by the shovels in the mining fleet.

Blastholes are sampled on 5 m intervals (two samples representing 5 m intervals in the top 10 m of hole) using a simple catch-pan placed near the collar of the hole during drilling. Drilling utilizes roller-cone bits in reasonably hard and fresh rock. This blasthole sample collection process can be improved to produce more reliable and representative samples.

Routine assaying is for gold only, using the on-site assay laboratory. Silver is reported in the GKZ estimate but does not appear to be routinely assayed. Arsenic assay data has only been generated for test areas on previously mined benches.

AMC understands that mining defines four types of material from the pits:

- Process plant feed Au>2.5 g/t.
- Low-grade 1.0 g/t <Au<2.5 g/t.
- Mineralized waste 0.7 g/t<Au<1.0 g/t.
- Waste Au<0.7 g/t.

The operation manages hard ore (sandstone versus shale) by blending with softer ore, but little information is available about the proportion of hard material to be encountered in the future.

AMC understands that some ore zones contain organic material with preg-robbing properties and also that high quartz zones may exhibit a high gravity gold component.

Grade control and mining block definition are by single bench, two-dimensional blasthole data contouring, with mining block definition done manually using AutoCAD.

There is no apparent pit floor mapping or blasthole chip logging assist the mining block definition.

Mining blocks are marked out on the bench using survey pegs. Mining block boundaries are surveyed in their original positions without adjustment for material movement during blasting. This is likely to lead to poor reconciliation of actual grade and tonnage mined against estimated grade and tonnage.

Ore and waste are dug using two EKG-10 face shovels with a bucket capacity of 10 m^3, one Komatsu PC 2000 faced shovel with a bucket capacity of 10 m^3, and one CAT 992 front end loader with a bucket capacity of 10 m^3.

The mining truck fleet consists of Komatsu HD785 (90 t) trucks.

Waste and low-grade ore are hauled to nearby storage facilities and ore is hauled to the ROM pad.

A fleet of ancillary equipment supports the main production equipment and performs other mine maintenance activities.

An allowance for the purchase and replacement of mining mobile equipment was included in the economic analysis. This analysis takes into account the equipment replacement schedule and the total capital expenditure required over the mine life.

A large inventory of low-grade mineralization has accumulated since commissioning of the process plant. Previous resource models did not predict this ore, resulting in the decision to remodel the resource.

For the purpose of estimating the Verninskoye 2016 Ore Reserve, the plant was assumed to process 3.0 Mtpa, which is scheduled from 2019 for the remainder of the mine life. Capital expenditure was included for projects to increase the throughput to 3.0 Mtpa and, from that time, only sustaining capital costs were included in the economic analysis.

5.3.3 Mining model

The resource model used as the basis for mine planning was:

“mdvern151218.dm”

This resource model was developed by AMC. There is no Measured Mineral Resource estimated for Verninskoye. The resource model was developed on a local orthogonal grid that is aligned with true north.

The resource model was converted by AMC to the Mining Model by reblocking, or regularizing, the resource model at a SMU size suitable for the equipment that is considered to be appropriate for the operation. A minimum block size of 20 m in both easting and northing directions and 10 m vertically was used to suit the orebody configuration and 10 m^3 face shovels and front end loaders currently employed for truck loading. The resulting Mining Model was used as the basis for the pit optimization and Ore Reserve estimation.

In the reblocking process, all materials within a defined cell size are combined to create one overall grade and tonnage for the cell.

The combined effect of the dilution and ore loss that results from the reblocking is a decrease in ore tonnes of 1.3% and a decrease in contained metal of 4%. The local amount of dilution and ore loss varies with the local geometry and grade. These dilution and ore loss statistics relate to the portion of the resource model within the ultimate pit design.

5.3.4 Geotechnical analysis

AMC conducted a pit slope stability review (Geotechnical Review)[7], which focused on the 2014 PRDC Report[8] on pit slope stability, together with visual observations and discussions with Verninskoye site personnel.

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[7] Chesher M. July 2016. 2015 Verninskoye Mineral Resource and Ore Reserve, Milestone V1, Data Review. Internal report prepared for Polyus Gold International Ltd by AMC Consultants.

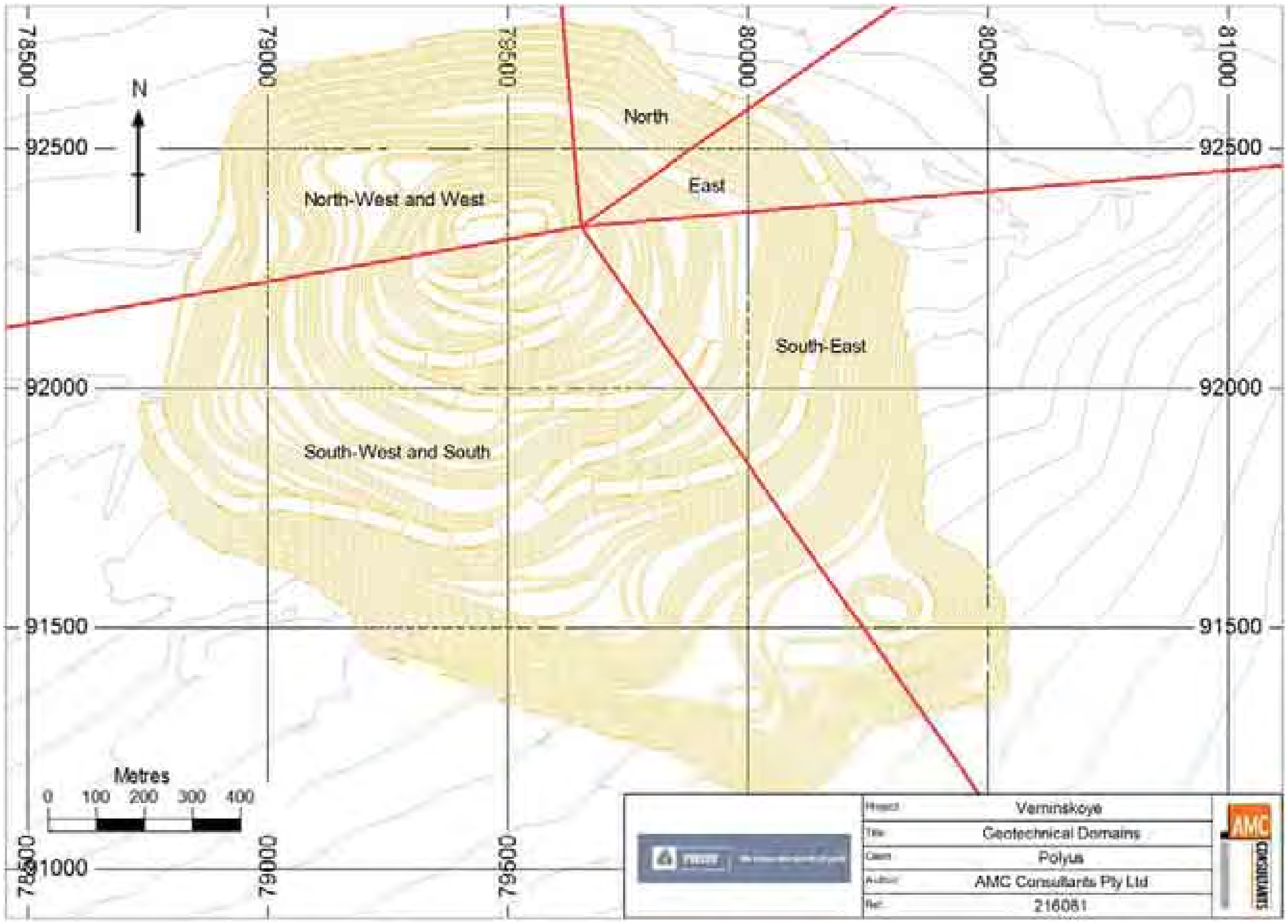
[8] Сартаков, Н.И., Бушков, В.К. и Спирин, В.И. «Отчет: Расчет устойчивости скорректированных контуров бортов карьера и отвала месторождения Вернинское», Исследовательский Центр ЗАО «Полюс», Красноярск, 2014. [Sartakov, N.I., Bushkov, V.K. and Spirin, V.I. “Report on stability assessment of corrected pit- and waste dump walls of Verninskoye deposit”, Research Centre of Polyus JSC, Krasnoyarsk, 2014].

AMC accepted the PRDC pit slope recommendations, made the adjustments regarding ramp allocation summarized in Table 5.4, and adopted for the new slope assumptions for pit optimization and mine design that forms the basis of the Ore Reserve estimate. The wall sectors referred to in Table 5.4 are shown in plan view in Figure 5.2.

Table 5.4 Verninskoye - pit slope design parameters for Ore Reserve estimation

Pit wall parameter	North wall	East wall	South-East wall	South wall	South-West wall	West wall	North-West wall
Bench height	10 m	10 m	10 m	10 m	10 m	10 m	10 m
Batter angle	60°	55°	55°	55°	55°	60°	60°
Safety berm width	10 m	10 m	8 m	8 m	8 m	10 m	10 m
Vertical height between safety berms	30 m	30 m	10 m	10 m	10 m	30 m	30 m
Geotechnical berm width	30 m	30 m	30 m	30 m	30 m	30 m	30 m
Maximum allowable wall height without geotechnical berm (ramp)	200 m	200 m	150 m	150 m	150 m	200 m	200 m
Overall slope angle	44°	39°	28°	28°	28°	44°	44°

Figure 5.2 Verninskoye - geotechnical domains for Ore Reserve estimation



Given the analysis methodology, the limited available geotechnical data and slope heights planned (some exceeding 500 m in height) at the Verninskoye pit, AMC considers the recommended pit slope design parameters are suitable for pre-feasibility study level design and are at a standard to allow an Ore Reserve to be estimated. However, AMC recommends that Polyus undertakes further geotechnical investigations and analysis to advance the slope stability assessment to be in line with industry standards for feasibility study level of confidence and implementation, and to allow the risks of slope failure to be quantified. Increasing the confidence in the pit slope assumptions would also allow the pit slope design parameters to be refined which may allow pit slope angles to be steepened.

Specifically, AMC recommends that Polyus:

- Develops a slope management plan to enable monitoring of pit slopes as they are developed during mining. The plan should detail the slope design rationale, description of potential geotechnical hazards and means of their mitigation, slope monitoring programme and data collection requirements.
- Undertakes more detailed data collection from a comprehensive purpose-designed geotechnical drilling programme followed by a thorough geotechnical study at a feasibility level.
- Improves confidence in structural orientation data of existing drillhole data. It appears that the PRDC analysis was completed on non-oriented exploration drill core. This may involve conducting acoustic tele-viewer surveys in geotechnical and exploration drillholes.
- Completes additional rock tests, especially on discontinuity properties, to improve the level of accuracy.
- Completes probabilistic analysis of slope failure using specialist software. The overall slope stability analysis completed by PRDC was undertaken using a simplistic graphical method.
- Incorporates the following in future geotechnical work:
  - Toppling bench-scale failure analysis.
  - Consideration of potential seismic loading.
  - Assessment of hydrogeological conditions, specifically the potential impact of saturated conditions at depth.

5.3.5 Pit optimization - input parameters

The pit limits for Verninskoye were selected through analysis using Whittle software. The shells were developed by varying the gold price above or below that chosen as the base price for the pit optimization process of US$1,250/oz. AMC allows for mining equipment sustaining capital costs by including an allowance approximately equal to 10% of the mining operating cost when selecting the optimum shell. The mining equipment sustaining capital costs are, however, estimated and applied separately in economic modelling.

The input assumptions and results of the pit optimization are reported in the following report sub-sections. The optimization shells produced for the Reserve Case were then used as the basis for detailed pit design, in production scheduling and for subsequent economic analysis.

The Polyus 2017 budget costs for the Verninskoye operation were used as the basis for pit optimization and economic analysis. The current mining bench (830 Bench) is close to the designed pit exit level of 820 mRL and provides a reasonable approximation of the pit exit reference costs.

The parameters used in the pit optimization are derived from a combination of information provided by Polyus and AMC's determinations based on its technical assessments, and can be summarized as:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the recovered gold value (US$75/oz) for cut-off grade calculation.
- Gold recovery of 88%.
- Overall pit slope angles:
  - 44° for the north, west and north-west walls.
  - 39° for the east wall.
  - 23° for the south-west, south and south-east walls.
- Mining operating costs of US$1.59/t mined for both ore and waste, and an additional US$0.021/t for every 10 m bench below the elevation of 820 mRL.
- Process plant operating cost of US$18.58t processed, based on Polyus 2017 budget.
- SG&A costs as a combination of general and administrative costs of US$4.04/t ore processed and selling costs of US$1.51/oz of recovered gold, based on Polyus 2017 budget.
- Process plant throughput of 3.0 Mtpa.
- Refining and transportation costs of US$2.04/oz of recovered gold, based on Polyus 2017 budget.

Based on these parameters, a cut-off grade of 0.7 g/t was determined for use in the pit optimization, Ore Reserve estimation, and production scheduling presented in this CPR for Verninskoye.

All Inferred Mineral Resources were regarded as waste in the pit optimization and subsequent pit evaluations.

5.3.6 Pit design and contents

Parameters used to create the pit designs are shown in section 5.3.3. A width of 35.5 m was used for dual lane access haul roads and 23.5 m for single lane access. The ultimate pit design is shown in Figure 5.3. The AMC pit design includes a maximum ramp gradient of 10%, and includes horizontal ramp segments along the ramp length as required by Russian regulations - 50 m horizontal ramp segments at 600 m intervals along the ramp length.

The maximum inter-ramp slope height varies by area from 150 m to 200 m. Where slope heights greater than the maximum are required, an additional geotechnical berm of 30 m width was included to divide the slope into two separate inter-ramp slopes.

Pit staging is required to defer waste mining while providing continuous ore supply to the plant. Figure 5.4 shows a typical section through the pit, and indicates the relativity between the pit stages.

The stage designs include areas of high value ore in early stages. The pit shell selection also considered minimum workable mining widths, generally 80 m, in all cutbacks and to provide continuity of access through the development of the pits. In some short segments of the pit wall, the widths were reduced to 40 m or 50 m.

Figure 5.3 Verninskoye - ultimate pit design

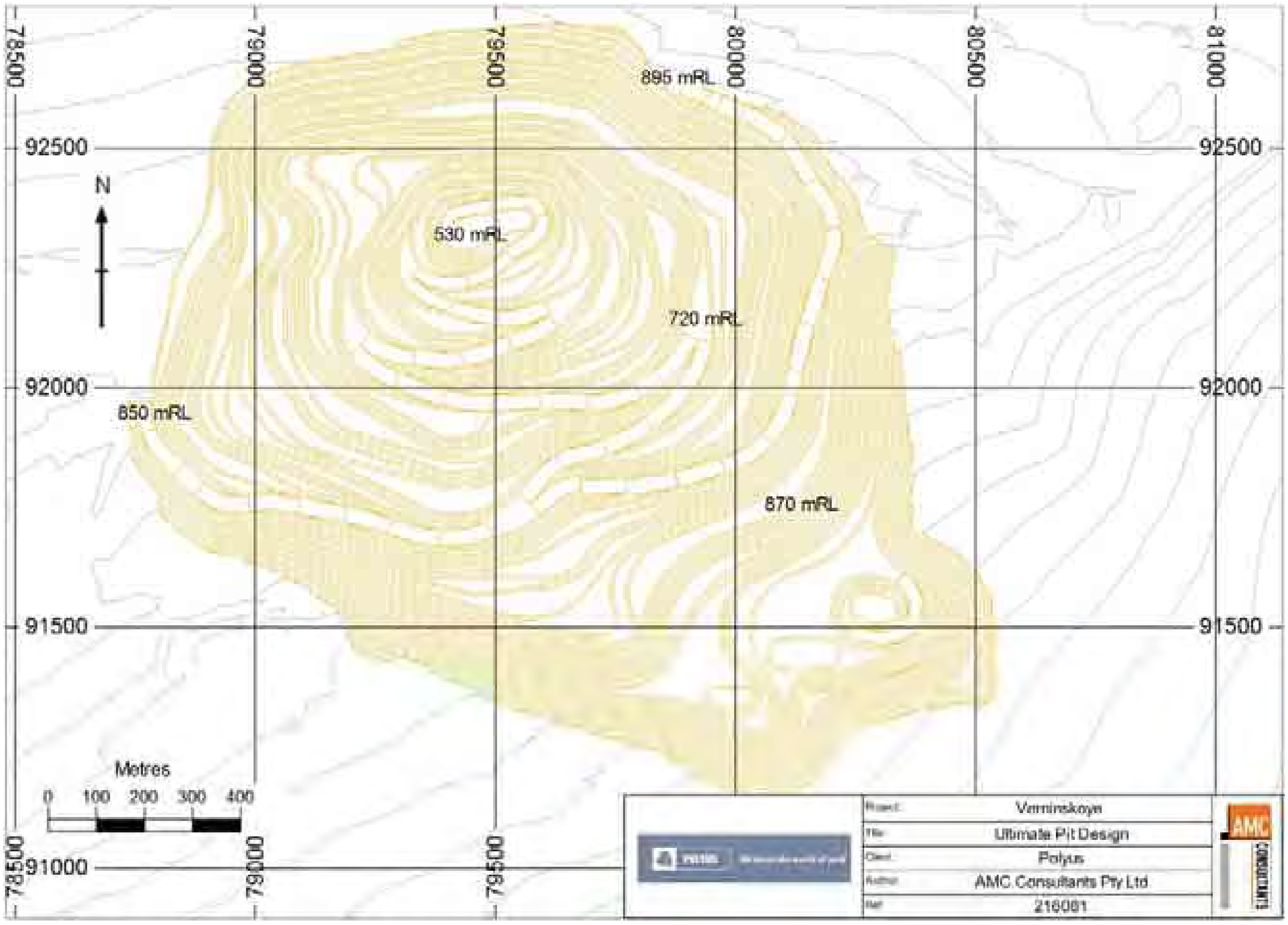
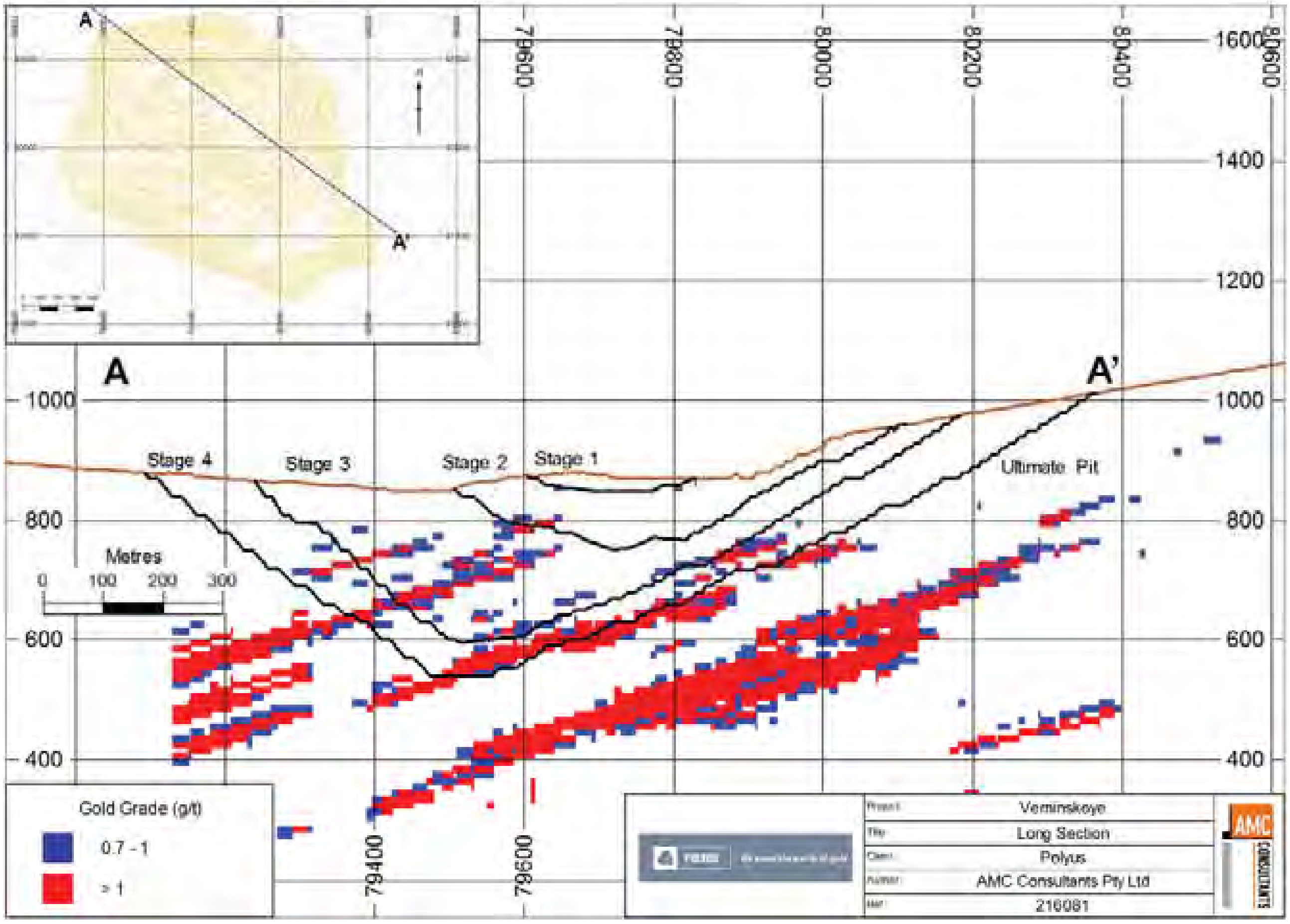


Figure 5.4 Verninskoye - cross-section view showing pit stages



The content of each detailed stage design was determined by evaluating the contents of the Mining Model within each successively larger pit design.

Table 5.5 shows the contents of each stage design. The pit contents were evaluated at a cut-off grade of 0.7 g/t and depleted by the actual mine production as at 30 September 2016. The grade ranges used in the evaluation are:

- High-grade: greater than 2.5 g/t.
- Low-grade: less than 2.5 g/t and greater than 0.7 g/t.

Table 5.5 Verninskoye - contents of pit design stages

Item	Unit	Stage 1	Stage 2	Stage 3	Stage 4	Total
Ore tonnes (>0.7 g/t)	Mt	10	10	32	35	86
Waste tonnes	Mt	16	46	142	271	472
Total rock tonnes	Mt	26	56	174	306	558
Strip ratio	W:O	1.6	4.6	4.5	7.7	5.5
Gold grade in situ (>0.7 g/t)	g/t	2.7	2.0	1.8	1.4	1.8
Contained gold	t	26	20	56	50	152
Contained gold	Moz	0.8	0.6	1.8	1.6	5
Recovered gold	t	23	17	50	44	134
Recovered gold	Moz	0.7	0.6	1.6	1.4	4
Ore tonnes low-grade (0.7 g/t - 2.5 g/t)	Mt	6	7	25	32	69
Grade low-grade (0.7 g/t - 2.5 g/t)	g/t	1.2	1.2	1.2	1.2	1.2
Ore tonnes high-grade (> 2.5 g/t)	Mt	4	3	7	4	17
Grade high-grade (> 2.5 g/t)	g/t	4.8	3.9	3.7	3.5	3.9

Notes:
1. Topographic surface at 30 September 2016 used for evaluation. Ore Reserve estimate adjusted for depletion to 31 December 2016.
2. Ore tonnes and grade do not include existing stockpiles.

Mineralization below 0.7 g/t is calculated to be uneconomic at this time.

5.3.7 Ore Reserve estimate

The Verninskoye 2016 Ore Reserve estimate summarized in this CPR is based on a review completed by AMC during 2016. The estimate is current as at 31 December 2016 and takes into account the assumed gold price (US$1,250/oz), foreign exchange rate (RUB65 to US$1.00), costs, and mining and metallurgy performance to inform cut-off grades and physical mining parameters.

The 2016 Verninskoye Ore Reserve estimate was prepared and reported under the direction of the Competent Person using accepted industry practice, and was classified in accordance with the JORC Code.

The Verninskoye Ore Reserve is estimated to be 96 Mt grading 1.7 g/t gold containing 5.3 Moz gold at a cut-off grade of 0.7 g/t for the open pit ore, as at 31 December 2016. Classification of the estimate is shown in Table 5.6.

Table 5.6 Verninskoye - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Stockpiles	n/a	11	1.3	0.45	14
Probable	Open Pit	0.7	86	1.7	4.8	150
Total			**96**	**1.7**	**5.3**	**164**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface as at 30 September 2016 with mining depletion to 31 December 2016.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

5.4 Ore processing

5.4.1 Plant design and construction history

Test work for the process plant design was conducted by Irgiredmet. Seven ore samples representing domains of the Verninskoye and Pervenets deposits were analysed. The ores were found to be free milling with acceptable gold recovery at 95% passing 74 µm. Up to 65% of the gold in the Verninskoye deposit was classed as 'gravity recoverable', and up to 95% of the gold in the Pervenets deposit was similarly classified. Significant gold is also associated with arsenopyrite which offered a ready method to recover an additional gold fraction by froth flotation followed by cyanide leaching of flotation concentrate.

The basic circuits of the design are:

- Primary crushing using a rotary breaker.
- Primary grinding in a SAG mill.
- Secondary grinding in a ball mill.
- Gravity separation circuit.
- Sulphide flotation (roughing, scavenging, two-stage cleaning) of gravity tailings.
- Conventional CIL circuit to recover gold from flotation concentrate.

The plant was commissioned in December 2011; recovering available coarse gold from the ore (containing up to 95% gravity recoverable gold) that was initially fed during commissioning. The nominal throughput capacity of the plant was 1.8 Mtpa. The CIL circuit was commissioned in August 2012, and the flotation circuit was brought on line later in 2012.

5.4.2 Plant modifications since commissioning

The process plant was unable to attain nominal throughput in its original configuration. A combination of inappropriate choice of processing technologies, inadequate support systems leading to poor maintainability, and inability of the integrated circuit as designed to process at the required rate and with the required gold recovery led to poor results for 2012 and 2013.

Polyus assembled an experienced, in-house technical team to review the performance of the process plant, prioritize the alterations and upgrades that would be required, and to plan and execute the changes. The programme successfully delivered a plant arrangement capable of 2.4 Mtpa and 86% recovery as predicted by the original test work.

Verninskoye plant operators are now engaged in a programme of continuous improvement. Table 5.7 shows year-on-year improvement in throughput. Recovery has also shown significant improvement, increasing to 87.1% for YTD September 2016, in response to the continuous improvement programme.

Table 5.7 Verninskoye - historical processing plant performance

Description	Unit	2012		2013		2014		2015		2016 (YTD Sep)	
		Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan
Throughput	Mt	1.3	1.5	1.6	2.2	2.2	2.2	2.3	2.2	1.8	1.6
Processed gold grade	g/t	2.2	2.2	2.5	2.5	2.7	2.5	2.6	2.5	2.7	2.6
Gold recovery (doré)	%	62.3	71.6	70.8	83.0	79.4	82.0	86.1	84.3	87.1	86.6

Figure 5.5 shows a high-level block flow diagram of the Verninskoye process plant in its current configuration.

Multiple failures of the original rotary breaker resulted in inability to crush 7,000 tpd, which is required to supply the process plant at the required average rate of 300 tph. A second-hand mobile jaw crusher capable of 4,500 tpd was installed in January 2013 and remained in service until October 2014 when a new 8,000 tpd Metso C150 jaw crusher was installed. The new Metso unit can provide feed for a sustainable rate of 2.6 Mtpa. AMC is advised that Polyus intends to complete the primary crusher circuit in the coming year with the installation of a covered, fixed impact breaker for oversize boulder breakage. Apron feeder is installed for reclaiming crushed ore to feed the SAG mill at 300 tph. Plant feed belt scales are installed and automatic feed control systems are fully implemented.

The grinding circuit consists of a 3,150 kW SAG mill (7.0 m x 4.2 m) with pebble crusher, followed by a 2,500 kW ball mill (4.5 m x 7.5 m). A second ball mill (4.0 m x 5.5 m) was installed after the coarse gold gravity circuit to increase the overall grinding capacity of the plant. All mills were supplied from the Ukraine by NKMZ. The capacity of the grinding circuit limits the ability of the plant to treat harder ore types while maintaining the current feed rate (approximately 300 tph).

The fine fraction of centrifugal separator tailings reports to flotation feed. A basic flotation circuit is employed with three roughing tanks followed by three scavenging tanks. Rougher concentrate reports to cleaning with cleaner concentrate advancing to the CIL feed thickener. Cleaner tailings and scavenger concentrate are recycled to rougher feed. Scavenger tailings are pumped to the TSF. The overall operating strategy for the flotation circuit was changed to simplify the operation and maximize gold recovery. Re-cleaning was abandoned, use of potassium butyl xanthate continues, MIBC frother is now added to stabilize the froth, copper sulphate is added as a sulphide activator, and Dispersogen, a proprietary carbon depressant, is now added to control the amount of fine carbon entering the CIL circuit with flotation concentrate.

The gravity circuit features centrifugal separators to recover a gold-bearing concentrate, followed by ball milling of the tailings and recycling as shown in Figure 5.5. A gold concentrate suitable for dispatch to final doré processing is produced by tabling of centrifugal separator concentrate. Table tailings are cyanide leached in ILRs with the leach solution reporting to electrowinning for recovery of the gold. The ILR capacity is currently being expanded to increase the ability of the plant to recover all available gravity-recoverable gold.

Solids from the ILRs are reground in a small ball mill (2.1 m x 2.2 m) and thickened prior to entering the CIL circuit. The regrind mill also can treat flotation concentrate prior to thickening. The plant utilizes 10 leaching tanks and conventional carbon stripping and regeneration technology. The capacity of the carbon treatment has been significantly expanded with the addition of an upgraded elution tank column, and replacement of the regeneration kiln with a larger unit capable of reconditioning the total working volume of carbon each day. Leach tailings are detoxified using the alkaline-chlorination process which requires calcium hypochlorite and lime. Leach tailings are stored in a lined facility which is separate from the TSF which stores flotation tailings. The first pond will reach capacity in 2016, and a second, larger one is currently under construction. Return water is treated by the alkaline-chlorination detox process. Gold is recovered from carbon stripping solution by electrowinning, and smelted in an induction furnace to produce doré bars.

A process plant automation system is fully implemented. Upgrading and reconfiguring the plant has resulted in more stable operations, providing the opportunity for full implementation of the automatic control system of the plant. During the AMC site visit, the plant was operating smoothly.

The process plant design changes and flowsheet improvements are important as they identify ore processing characteristics that should be considered during mine planning to ensure that the planned plant throughput and gold recovery can be maintained. These characteristics include:

1. Limiting the sandstone fraction of the ore feed to 30%.

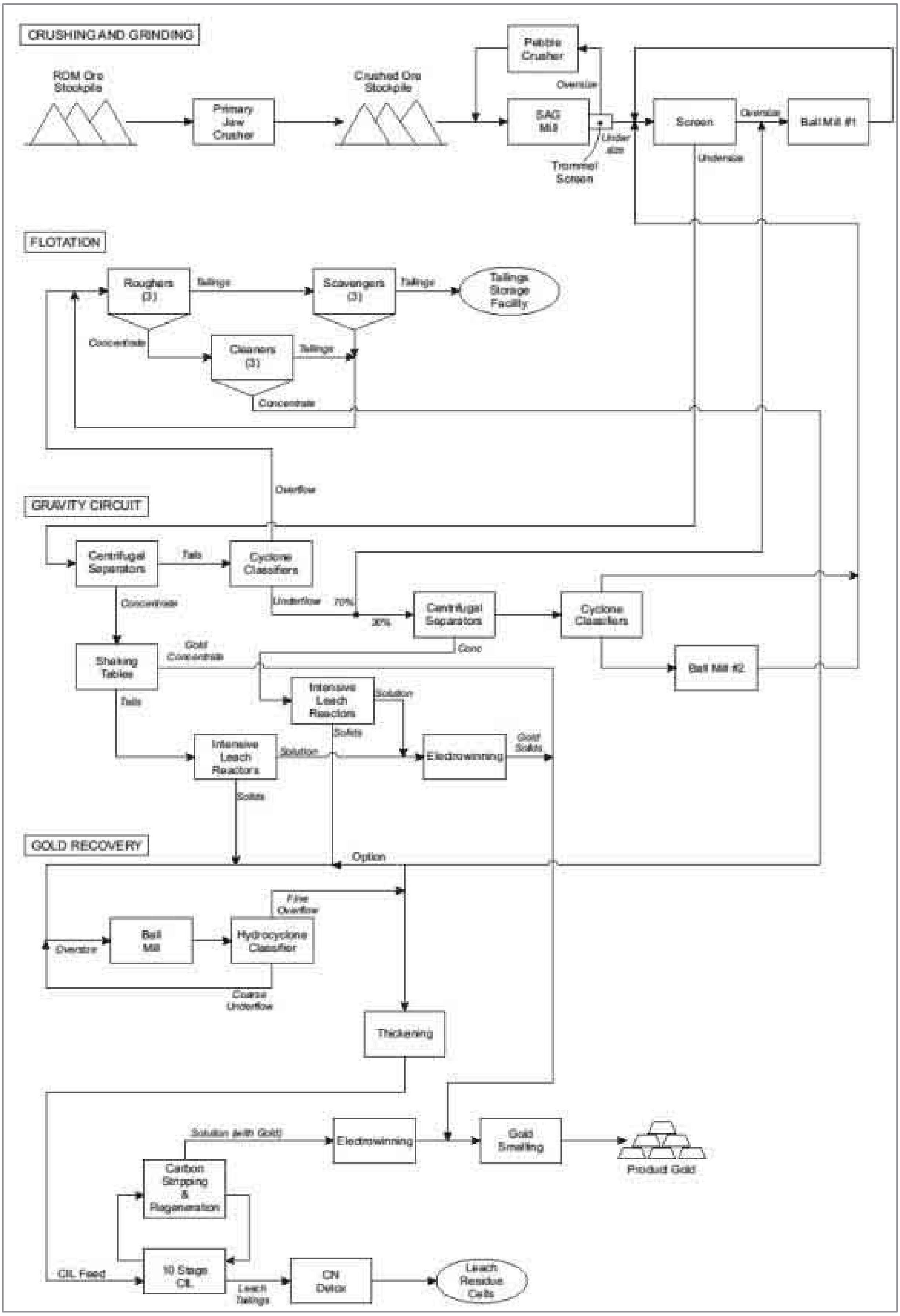
   ROM ore is stockpiled ahead of the primary crusher. Verninskoye personnel indicate that in September 2015, the stockpile contained 737,000 t with an average gold grade of 2.69 g/t. Ore is segregated and stockpiled by lithology and gold grade. Blending from the ROM stockpile carefully is managed to achieve the planned average gold grade while limiting the fraction of harder siltstone or sandstone, which decreases the throughput capacity of the grinding circuit.

   Understanding the distribution and proportion of harder ores offers an opportunity to improve the plant throughput, and AMC recommends that the resource model is updated to include an interpretation of the siltstone and sandstone units. This will enable a reliable blending regime to be developed at the mine planning stage. The confidence in ore blending strategies based on sampling of ROM stockpiles is low.

2. Limiting the amount of carbonaceous material in the ore feed. This will enable the flotation circuit to efficiently depress the carbon to limit the amount of fine, preg-robbing carbon entering the CIL circuit. Preg-robbing refers to the ability of fine carbon particles to gather gold from leach solutions that would otherwise be gathered by appropriately sized carbon and recovered in subsequent process steps. Fine carbon (with adsorbed gold) exits the plant with CIL circuit tailings and is discarded. The carbon content of ROM ore can be up to 20%, and without depression, the content in flotation concentrate was approximately 10%. The use of Dispersogen, a proprietary carbon depressant, has reduced the carbon content in flotation concentrate into the range of 1% to 3%. This has resulted in increased gold recovery.

In 2015, the Verninskoye operation was also connected to Irkutsk regional power via the Peleduy-Mamakan grid project. This project involved construction of a 220 kV transmission line and associated substations, and had the effect of reducing the overall power cost to the Verninskoye project and improving the security of power supply to operations.

Figure 5.5 Verninskoye - process plant - block flow diagram



5.4.3 Future plans

Verninskoye operators are now engaged in work to further enhance the capability of the Verninskoye process plant. The goal of the project is to increase throughput to 3.0 Mtpa by 2019 while achieving gold recovery of 88.0% by 2018. Improvements in performance are scheduled in the LOM plan.

A de-bottlenecking study was completed that identified a range of limiting steps in the processing circuit, and quantified the limits to throughput and recovery imposed by each bottleneck. Operators began implementing some of the items that did not require significant expenditure or extended plant downtime, and immediate positive results have been seen. The plant is now capable of a feed rate greater than 375 tph which is sufficient to achieve 3.0 Mtpa throughput at a typical overall utilization of 92%. Gold recovery averaged 87.3% for 2016 compared with the project goal of 88.0%.

The major bottlenecking items addressed in 2016, or to be implemented in 2017, include:

- Enlarging of scrubber discharge gutters.
- Increasing the size of SAG mill discharge grates from 50 mm to 60 mm.
- Replacing grinding mill discharge screens.
- Replacing two centrifugal separators with higher-capacity units.
- Upgrading flotation tailings thickener.
- Reconfiguring sorption feed system, and expanding sorption/desorption capacity.
- Replacing carbon filter.
- Increasing oxygen generation capacity.
- Expanding TSF capacity to accommodate increased production.

Several large-scale, capital-expenditure-intensive equipment upgrades have been examined to increase throughput. These include lengthening ball mill No.2 by 1,435 mm, and replacing ball mill No.2 by a 4500 x 7500 unit (on the same foundation). However, significant progress with the project has already be made by implementing a range of lower-cost initiatives, and studies show that achievement of the 3.0 Mtpa goal is possible without major expense on the large mills. Using estimates of capital expenditure provided by Polyus, AMC estimates that as at the end of 2016, approximately US$42M is still to be spent in 2017 and 2018.

5.4.4 Tailings storage facility

The TSF is a valley-filled dam located in the catchment of Verninskiy Creek. It was designed by Mechanobyr Engineering; a well-known designer of TSFs in Russia. The TSF has an ultimate design capacity of 32 Mt of solids which is sufficient for 15 years of operation at the nominal throughput rate of 2.2 Mtpa. Clean run-off water from areas surrounding the TSF is diverted around the facility in clay-lined diversion channels. The TSF wall is designed to be constructed in 18 lifts, with lift number 6 currently under construction. Water drains through the TSF wall and is retained in a lined decant pond. The pond is designed to hold approximately 800,000 m^3 of water which is sufficient to supply the process water requirements of the plant through the winter period from beneath the winter ice cover.

No reportable exceedances attributable to the TSF have occurred.

Additional flotation tailings storage will be required after the Verninskiy Creek TSF reaches its capacity. Polyus engineers have identified a potential site for the new TSF in the catchment of Kadalikan Creek, but no detailed or approved designs are available. There is a reasonable likelihood that the second TSF will be available to accommodate the remaining Ore Reserve.

Leach residue is retained in a separate lined storage facility. Approximately 1,000 m^3 of residue is pumped to the ponds for disposal per day. It is a fully lined, zero discharge facility, with installed monitoring locations surrounding the ponds. Irgiredmet conducts the analysis of all water samples. No reportable incidents attributable to the facility have occurred. AMC was not able to visit the residue storage site and has no first-hand knowledge of its condition.

5.5 Planned production and costs

Production and costs - Reserve Case

A LOM plan was prepared using the Minemax schedule optimization software to provide a schedule that improves the overall value of the project. The results of the schedule were output to Microsoft Excel spreadsheets for review and analysis. The operating and capital cost estimates are based on the production schedule and technical and operating criteria described in this CPR.

A summary of the Verninskoye LOM production schedule is presented in Table 5.8 showing the mining, processing, and cost information. Annual mined tonnage and head grade were based on the Reserve Case mining schedule, process plant throughput and gold production rates with all Inferred Mineral Resources regarded as waste. The mining schedule and mining operating costs are based on the current equipment fleet, mining rate and the Polyus 2017 budget with appropriate allowances for expanded mining rate to accommodate increased production or haul distance changes.

The schedule is based on a process plant throughput rate of 3.0 Mtpa from 2019, which incorporates production expansion from planned capital projects.

A total mined material movement rate limit is also expanded to 22 Mtpa to provide the additional ore required to maintain feed to the plant. The plan anticipates mining with similar sized equipment to that already in use to Verninskoye. A maximum vertical advance rate of 10 benches per year was applied in the schedule.

Production from the pit stages overlaps to provide a constant feed tonnage to the process plant while maintaining a constant mining rate. Process plant operators recognize that sandstone and carbon in the plant feed causes reduced throughput and gold recovery respectively. The production schedule does not take these parameters into consideration because there is no information on these parameters in the resource model. AMC recommends that a geometallurgical study be conducted to link processing plant performance with geological units to enable scheduling of deleterious elements and identification to potential issues.

The anticipated head grade remains in a range between 2.6 g/t and 3.0 g/t for the first five years of the production schedule. The grade then starts to decline as the majority of the high-grade core of mineralization is exhausted and the surrounding low-grade zones are then mined for approximately 30 years more until the pit is exhausted and the plant reverts to processing stockpiled ore.

The average ore processed head grade over 33 years of mine life is 1.7 g/t.

While the mining rate in this schedule remains constant for the LOM, the pit depth and haul distances increase requiring an increasing number of haul trucks during the LOM.

The production schedule and operating costs are based on the following assumptions and qualifications:

- A gold price of US$1,250/oz.
- All RUB denominated costs, in real 2017 terms, being converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on the Polyus 2017 budget, with AMC adjustments where appropriate. No provision was made for offsite corporate costs.

Capital cost estimates are included for:

- Plant expansion to achieve 3.0 Mtpa as described in the Verninskoye ore processing section in this CPR.
- Sustaining capital for the plant of US$4.2M per annum was included to allow for minor equipment replacement in the plant and for progressive tailings dam wall raising.
- Additional and replacement mining equipment. An equipment expenditure schedule was developed to allow for equipment replace to maintain high availability to the operation.

Closure costs were estimated by an independent consultant and adjusted to 1 January 2017. These costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

Table 5.8 Verninskoye - production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25	2042-2046 Y26-30	2047-2051 Y31-35
Mined													
Ore mined - tonnes	Mt	86	5.5	1.8	4.3	5.0	2.8	12.9	20.2	8.4	17.6	8.0	-
Ore mined - contained gold	Moz	4.9	0.44	0.14	0.26	0.34	0.26	0.63	0.97	0.49	0.91	0.42	-
Waste mined - tonnes	Mt	472	10.7	15.7	16.2	16.0	19.2	97.2	89.9	101.8	86.7	18.3	-
Total material mined	**Mt**	**558**	**16**	**17**	**20**	**21**	**22**	**110**	**110**	**110**	**104**	**26**	**-**
Processed													
Ore - Process Plant - tonnes	Mt	97	2.4	2.6	3.0	3.0	3.0	15.0	15.1	15.2	15.2	15.0	7.4
Ore - Process Plant - grade	g/t	1.7	2.6	2.6	3.0	2.9	3.0	1.7	1.8	1.4	1.7	1.3	0.8
Ore - Process Plant - contained gold	Moz	5.3	0.20	0.22	0.29	0.28	0.29	0.81	0.87	0.69	0.84	0.61	0.19
Process Plant - recovered gold	Moz	4.7	0.18	0.19	0.25	0.25	0.25	0.71	0.76	0.60	0.74	0.53	0.17
Operating Costs													
Mining	US$/t mined	1.72	1.65	1.61	1.65	1.72	1.67	1.64	1.71	1.65	1.80	2.06	-
Process Plant (including reclaim)	US$/t ore processed	19.01	18.58	19.03	18.83	18.62	18.80	18.99	18.68	19.00	18.67	19.02	19.35
Selling, general and administrative	US$/t ore processed	4.18	5.18	4.77	4.17	4.17	4.17	4.11	4.12	4.10	4.11	4.09	4.07
Refining and transportation	US$/oz refined gold	2.05	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Initial Capital Costs													
Mining equipment	US$M	31	15	-	-	-	15	-	-	-	-	-	-
Processing (incl TSF)	US$M	42	27	15	-	-	-	-	-	-	-	-	-
Closure	US$M	8	-	-	-	-	-	-	-	-	-	-	8
Total	**US$M**	**81**	**42**	**15**	**-**	**-**	**15**	**-**	**-**	**-**	**-**	**-**	**8**
Sustaining Capital Costs													
Mining equipment	US$M	131	1	16	1	1	1	23	38	38	8	2	-
Processing (incl TSF)	US$M	133	4	4	4	4	4	21	21	21	21	21	6
Total	**US$M**	**264**	**5**	**21**	**6**	**6**	**6**	**44**	**59**	**59**	**29**	**24**	**6**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

5.6 Permitting, environment, community, safety, and mine closure

5.6.1 Permitting

AMC has not sighted the permits and approvals register for the Verninskoye operations. Recent, independent audits of the environmental (ISO 14001) and health and safety (OHSAS 18001) systems for the Verninskoye operation did not identify any non-conformances regarding permitting and approvals. AMC considers it a reasonable assumption that the environmental and health and safety systems maintain an up to date permit and approvals register, including procedures for tracking new legislative requirements, and procedures for ensuring implementation of legal requirements across the operation.

The conditions and requirements of the various permits and approvals are managed across the organization though the IMS.

There are no reports of serious non-compliances with legislation and regulation.

5.6.2 Environment

Polyus is guided by internal environmental policies and standards, including those developed in 2015 to comply with the ICMM and International Finance Corporation requirements Verninskoye recently confirmed compliance of their integrated Health and Safety Management System and Environmental Management System with the OHSAS 18001 and ISO 14001 requirements. Regular audits will then be conducted to maintain the certification.

Irgiredmet is the author of the environmental monitoring programme and prepared annual reports. The site follows the design environmental requirements (including the action plan from the Environmental Impact Assessment study report), and all works are conducted according to government regulations. Verninskoye mine also reports that there are no exceedances of the mandated limits (air emissions, water management and waste management).

There is potential for ARD to occur from mine waste and ore. On-site, Polyus personnel assess the potential for ARD as low. However, AMC notes that the following contingencies are in place:

- Designs are in place to collect in-pit water and drainage water from stockpiles.
- A neutralization facility is in place but not in operation as yet.
- Approval from the relevant government authorities is in place to clean and release contaminated water for a period of five years. Subsequent approvals will be sought on a regular basis.
- Waste dump run-off water is not sampled for acid drainage.
- Monitoring bores are in place to monitor run-off (surface and groundwater) from the tails dam facility.
- No dumps have liners or impervious base layers.

Cyanide is used on-site as a critical part of the process flowsheet and is present in the separate leaching tailings dam. AMC note that:

- The TSF dam design is approved and implemented.
- Drainage from the dam is reported as negligible.
- Monitoring is conducted downstream for pH control and presence of metals. No exceedances have been recorded to date.
- All analysis of samples is conducted on-site.
- The leaching tailings dam is fully lined and there is no discharge. The Polyus environmental team and Irgiredmet conduct regular testing of streams above and below the dam location.

Additional testing of waste materials will be required to more thoroughly assess potential for acid generation; regular testing downstream from the waste dump facilities will be required to assess the potential for development of ARD.

The main health risks identified for the site are dust and airborne contaminants. Air sampling is conducted regularly around the project area including the plant, mine, camp and haul roads. Verninskoye staff report that results have not exceeded standards.

In 2015, The Verninskoye operation was connected to the Irkutsk federal grid (Peleduy-Mamakan grid line) after construction of power substations and high voltage transmission lines. The improved power supply provides Verninskoye with a reliable power supply, and is also intended to incentivise the development of new deposits in the area. This improvement reduces the potential for environmental issues and green-house gas emissions.

Expenditure on environmental management varies from year to year, and totalled RUB14M in 2014 and RUB40M in 2015.

Verninskoye is implementing procedures to support the compliance certification systems that are in operation. The main focus is to identify gaps in the current systems and to develop aligned and appropriate attitudes and culture within the organization. Training to achieve this was in planning stages with implementation to follow. AMC supports this approach.

5.6.3 Community

Land use in the surrounding area is dominated by hard rock and alluvial mining, with some local forestry and agriculture.

The nearest settlement is Kropotkin, located approximately 6 km to the south-west of the Verninskoye operation.

The Verninskoye operation includes an accommodation camp for its workforce.

5.6.4 Safety

The occupational health and safety statistics for the Verninskoye operations in 2016 were:

- Injury rate (per 200,000 hours worked) of 0.17, which includes fatalities, lost time injuries and medical treatment injuries.
- Lost time injury frequency rate (per 200,000 hours worked) of 0.17.
- Fatality frequency rate (per 200,000 hours worked) of zero.

The accreditation of the Verninskoye safety system to OHSAS 18001, together with the good safety performance indicated by the above statistics demonstrates that occupational health and safety does not appear to be a material risk to ongoing operations.

5.6.5 Mine closure

A conceptual closure plan was prepared by an independent environmental consultant to Polyus in 2017. It is reviewed every five years within a strategic planning cycle which is also the best opportunity to adjust the rehabilitation plans to accommodate changes to government policy and community expectations.

Rehabilitation requirements for closure at the end of the mine life include:

- Waste dumps to be battered to design angles.
- No spreading of topsoil is required on the final landforms.
- Topsoil from the tailings dam sites is stored for later use (yet to be determined).

An independent environmental consultant to Polyus estimated the Verninskoye Asset Retirement Obligations (closure costs) using the Standardized Reclamation Cost Estimator in 2012. The resulting estimate was updated as at 1 January 2017 and totals approximately US$10M. Polyus is not required to pay an environmental security deposit and mine closure costs are included in the capital cost assessments for the operation.

5.7 Risks and opportunities

The following risks are identified for Verninskoye:

- The metallurgical performance of the ore results in reduced recovery or increased costs. Blending to control deleterious elements is based on information collected during mining. Three dimensional geological modelling inclusive of geology, lithology and metallurgical parameters has not been completed. Therefore, the understanding and predictability of ore types for future process plant feed could be improved.
- The ore tonnage or grade deviates from the expected values. A comprehensive reconciliation system would assist in mitigating this risk. None of the Mineral Resource is classified as Measured. Best practice is that sufficient drilling has been completed to define a reasonable proportion of Measured Mineral Resource as part of the near term ore supply. This may result in higher than expected grade variability.
- Current blasthole sampling and block definition techniques may lead to increased dilution and ore loss than should be expected.
- Current expansions and upgrades of the process plant are delayed, resulting in deferred production and cost overruns.
- There is a failure of a pit slope. Open pit geotechnical understanding is preliminary, with further investigation recommended. Failure in the future could lead to loss of life, loss of equipment, or loss of access to the main ore source for the Verninskoye plant.
- An approved LOM plan does not exist for the operation; such a plan would identify open pit mining and capital requirements over the life of the operation.
- Sufficient cover and growth materials are not stockpiled during operations for mine closure purposes, resulting in increased closure cost estimates.
- The performance achieved in tailings settling is not understood and there may be uncertainty around the final capacity of the tailings facility resulting in the requirement for additional capacity.

The following opportunities are identified for Verninskoye:

- Pit slope designs may be steepened if further geotechnical drilling and analysis show improved conditions.
- Neighbouring gold deposits at Medvezhy and Zapadnoye may contribute additional ore feed to the processing plant, should additional drilling and studies prove positive results.
- Improved blending practices may yield further plant performance improvements.
- Improved blasting performance in the mine may lead to a reduction in ore dilution and ore loss in the mining process and improvement in throughput rate and reductions in cost at the milling stage.
- Improvements in grade control practices would potentially result in an improvement in mine head grade and improve reconciliation results.
- A more selective approach to mining some flatter and narrow ore zones may result in less ore dilution and improve the head grade and project value.
- Site management has demonstrated the ability to plan and deliver operational performance improvements to the operation, continuation of which can be expected to deliver further improvements.

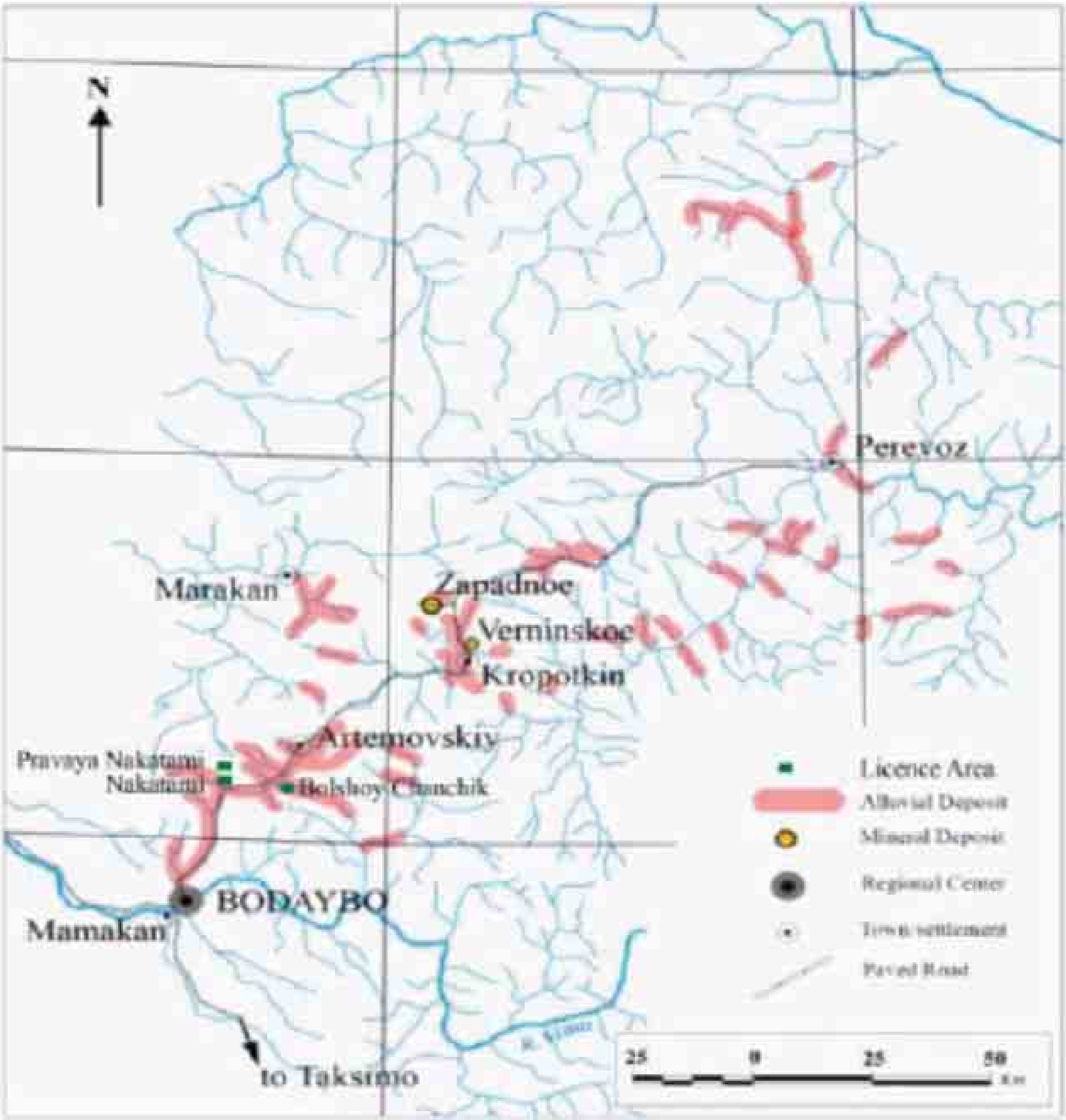
6 The Alluvials

6.1 Introduction

6.1.1 Property location and description

The OJSC Lenzoloto (Lenzoloto) placer gold mining operations (Alluvials) are located in the northern part of the Bodaybo administrative district, Irkutsk Region. The operations are widespread throughout the region stretching from north of Bodaybo to north and west of Kropotkin settlement, which is 130 km north of Bodaybo and in the same area as Verninskoye. Access and support services are similar to those described for Verninskoye. Figure 6.1 shows the location of the Alluvials deposits and the surrounding features.

Figure 6.1 Alluvials - location of the Lenzoloto placer deposits



The Alluvials operations are located in the river valleys and flood plains at elevations of between 600 m to 850 m. Placer mining has been practiced in the area for approximately 160 years and, consequently, many of the valleys and the river systems have been severely degraded.

6.1.2 Mineral tenure

Lenzoloto currently holds 93 licences for the placer deposits. Within this portfolio are deposits currently under exploration, development and operation as well as a number planned for commencement in the near future. Lenzoloto undertakes placer mining through a series of six subsidiary companies each managing a number of licensed operations. The licences held by each company are detailed in Table 6.1 to Table 6.6. Placer mining licences are typically smaller in size than hard rock mining licences, of limited depth, and typically oriented within current or historic river channels.

The mining licences typically provide for geological examination, including prospecting and assessment of mineral deposits, exploration and extraction of minerals, including the use of waste mining and related processing industries.

Table 6.1 Alluvials - Lenzoloto (Лензолото) tenements

No.	Number and Series of Licence	Grant Date	Expiration Date
1	IRK 02260 BR	27 April 2006	1 June 2020
2	IRK 02264 BR	6 May 2006	20 December 2018
3	IRK 02432 BR	10 September 2007	1 December 2022
4	IRK 02437 BR	10 September 2007	1 June 2020
5	IRK 02440 BR	10 September 2007	31 December 2019
6	IRK 02463 BR	5 October 2007	20 December 2017
7	IRK 02533 BR	31 January 2008	30 December 2024
8	IRK 02428 BR	10 September 2007	31 December 2017
9	IRK 02458 BR	26 September 2007	31 August 2018
10	IRK 02442 BR	10 September 2007	20 June 2019
11	IRK 02433 BR	10 September 2007	1 March 2017
12	IRK 02532 BE	31 January 2008	30 December 2017
13	IRK 02531 BE	31 January 2008	30 December 2022
14	IRK 02446 BE	10 September 2007	25 January 2020
15	IRK 02429 BE	10 September 2007	1 July 2027
16	IRK 02465 BE	5 October 2007	1 December 2025
17	IRK 02549 BE	9 April 2008	31 December 2028
18	IRK 02434 BE	10 September 2007	6 May 2026
19	IRK 02430 BE	10 September 2007	1 January 2021
20	IRK 02452 BE	10 September 2007	1 January 2021
21	IRK 02448 BE	10 September 2007	11 June 2019
22	IRK 02444 BE	10 September 2007	6 May 2020
23	IRK 02447 BE	10 September 2007	30 December 2020
24	IRK 02431 BE	10 September 2007	17 August 2019
25	IRK 02535 BE	31 January 2008	1 July 2022
26	IRK 02534 BE	31 January 2008	1 May 2022
27	IRK 02262 BE	27 April 2006	20 December 2022
28	IRK 02601 BR	11 January 2009	1 December 2021
29	IRK 02600 BR	11 January 2009	1 December 2027
30	IRK 02942 BR	4 February 2013	15 February 2028
31	IRK 02943 BR	4 February 2013	15 February 2028
32	IRK 03133 BR	24 November 2014	1 January 2019
33	IRK 03132 BE	24 November 2014	1 December 2024
34	IRK 03172 BE	28 April 2015	1 September 2025
35	IRK 03223 BR	11 December 2015	31 December 2027
36	IRK 03247 BE	21 January 2016	31 January 2028
37	IRK 03270 BP	14 March 2016	10 March 2023
38	IRK 03279 BR	23 March 2016	20 March 2028
39	IRK 03340 BP	11 October 2016	11 October 2028
40	IRK 03391 BP	18 January 2017	18 January 2024
41	IRK 03394 BE	25 January 2017	31 December 2020
42	IRK 03393 BP	25 January 2017	15 October 2023

Table 6.2 Alluvials - JSC Far Forest (Дальняя Тайга) tenements

No.	Number and Series of Licence	Grant Date	Expiration Date
1	IRK 01383 BE	7 August 1998	1 December 2018
2	IRK 01308 BE	7 August 1997	1 December 2021
3	IRK 01397 BE	15 October 1998	25 January 2021
4	IRK 01307 BE	7 August 1997	20 February 2020
5	IRK 01310 BE	7 August 1997	1 December 2029
6	IRK 02764 BE	21 February 2011	20 February 2023
7	IRK 02765 BE	21 February 2011	20 February 2021
8	IRK 02771 БР	28 February 2011	10 March 2026
9	IRK 02772 BR	28 February 2011	10 March 2026
10	IRK 03041 BR	26 December 2013	30 December 2038

Table 6.3 Alluvials - JSC Marakan (Маракан) tenements

No.	Number and Series of Licence	Grant Date	Expiration Date
1	IRK 01264 BE	22 April 1997	1 January 2025
2	IRK 01262 BE	22 April 1997	31 December 2027

Table 6.4 Alluvials - CJSC Lensib (Ленсиб) tenements

No.	Number and Series of Licence	Grant Date	Expiration Date
1	IRK 01766 BR	14 June 2001	1 December 2023
2	IRK 01643 BR	25 October 2000	1 March 2018
3	IRK 01185 BE	14 January 1997	21 May 2021
4	IRK 01183 BE	14 January 1997	31 December 2018
5	IRK 01289 BE	28 April 1997	1 June 2020
6	IRK 01534 BR	26 November 1999	31 December 2019

Table 6.5 Alluvials - JSC Svetliy (Светлый) tenements

No.	Number and Series of Licence	Grant Date	Expiration Date
1	IRK 02190 BR	3 August 2005	1 December 2021
2	IRK 02333 BR	14 September 2006	15 September 2020
3	IRK 02191 BR	3 August 2005	30 June 2017
4	IRK 01245 BE	27 March 1997	30 December 2017
5	IRK 02692 BR	30 April 2010	20 April 2020
6	IRK 02683 BR	23 April 2010	20 April 2025
7	IRK 02703 BR	17 June 2010	10 June 2020
8	IRK 02704 BR	17 June 2010	10 June 2022
9	IRK 14596 BR	11 November 2008	30 December 2021
10	IRK 02548 BR	9 April 2008	15 March 2018
11	IRK 02547 BR	9 April 2008	15 March 2018
12	IRK 01243 BE	27 March 1997	30 December 2017
13	IRK 01236 BE	27 March 1997	30 December 2017
14	IRK 01250 BE	27 March 1997	31 March 2018
15	IRK 01238 BE	27 March 1997	24 September 2018
16	IRK 01248 BE	27 March 1997	1 March 2018
17	IRK 01305 BE	30 July 1997	1 February 2018
18	IRK 02136 BR	6 April 2005	30 December 2017
19	IRK 02106 BR	21 December 2004	24 September 2019
20	IRK 02048 BR	17 June 2004	30 December 2019
21	IRK 02047 BR	17 June 2004	1 February 2018
22	IRK 02332 BR	14 September 2006	15 September 2021
23	IRK 01239 BR	27 March 1997	30 December 2017
24	IRK 01246 BR	27 March 1997	31 March 2018
25	IRK 02684 BE	23 April 2010	20 April 2020

Table 6.6 Alluvials - JSC Sevzoto (Севзото) tenements

No.	Number and Series of Licence	Grant Date	Expiration Date
1	IRK 01602 BR	24 July 2000	1 January 2020
2	IRK 02545 BR	9 April 2008	15 March 2023
3	IRK 01612 BR	24 August 2000	31 December 2019
4	IRK 02520 BE	17 January 2008	30 December 2021
5	IRK 01180 BE	14 January 1997	30 December 2017
6	IRK 01181 BE	14 January 1997	30 December 2016 (prolongation until 19 February 2022 approved by Rosnedra)
7	IRK 03039 BE	26 December 2013	30 December 2028

Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences for the Alluvials operations.

6.1.3 Historical production and costs

There are six main subsidiary companies controlled by Polyus that produce gold from placer deposits, as well as some smaller related companies. Gold production declined from approximately 300 koz in 2002, to approximately 200 koz by 2005. Production has remained relatively stable since then and performance for the last three years is summarized in Table 6.7, with 169 koz of gold being produced in 2016.

Note that the concentrator head grade is expressed in terms of g/m^3 of recovered gold and no recovery factor is required to obtain recovered gold.

Table 6.7 Alluvials - historical production and operating costs

Item	Units	2014	2015	2016
Sands washed				
Ore - volume	Mm^3	9.1	9.4	8.6
Ore - grade	g/m^3	0.65	0.56	0.61
Concentrated				
Ore - Concentrator - recovered gold	Moz	0.19	0.17	0.17
Operating Costs				
Mining	US$/m^3 mined	1.93	1.42	1.45

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

6.2 Geology and Mineral Resources

6.2.1 Geology

The Alluvials deposits are found in the Lenskii goldfield, situated on the northern flanks of the Baikal orogenic belt. Gold mining from placer deposits in the Lenskii region has been ongoing for 160 years. Many of the deposits were subject to multiple previous phases of mining by a number of methods including dredging, open pitting and, in some cases, shallow underground mining.

The gold deposits are largely placer gold in river bed gravels and flood plain terraces. The placer deposits are formed in river channels within incised glacially eroded valleys. The valleys form the drainage network for the region with the streams and rivers forming tributaries for the major Lena River to the north and west and the Vitim River to the south.

The placer gold deposits are buried below a cover of between 10 m and 30 m of glacial till. The deposits are underlain by bedrock. Gold bearing alluvial gravels are typically between 2 m and 6 m thick, and can extend for a few thousand metres along the river channel.

The composition of alluvial gravels is diverse, containing a range of particles from fine shale to small till pebbles and boulders a few metres in diameter. The distribution of the gold in the placer gravels is irregular in both plan and section. The gold grade of the gravels in the deposits is typically low, between 200 mg/m^3 and 300 mg/m^3. The gold grade in the primary placer deposits is higher at 1 g/m^3 or more. Many deposits are small, originally containing pre-mining reserves of less than 500 kg of gold.

Gold is believed to have been derived from low-grade bedrock concentrations and occurs as flake gold in typically large particles up to 0.25 mm. Gold nuggets have been found in the placer deposits up to several kilograms in size. Gold particles less than 200 µm in size are not evaluated since there are no methods in place to recover this fraction.

The fineness quality of the recovered gold varies in each deposit, with the balance mostly silver. The purity is determined at exploration stage from laboratory samples, and the average is considered for planning.

6.2.2 Exploration

During the 1930's the FSUE TsNIGRI institute studied the geology of the placer deposits. Most of the deposits were thoroughly mapped in 1939 during a state funded exploration programme performed in the region in search of placer gold reserves. All river channels in the project area were explored on the prospect of finding economic grade deposits.

Exploration was performed using percussion churn drills on lines spaced up to 200 m apart downstream with holes 50 m apart across the stream. The majority of deposits explored during this expedition have since been subject to many phases of mining. The original exploration data is available and plans exist for most deposits that show the year and method of mining. This information is used as a guide for exploration. After one phase of mining, the placer deposit is considered as a prognostic resource and should be drilled again.

Mineralization of the placer deposits is defined by surface drilling on section lines spaced between 100 m and 500 m along the river channel. For GKZ estimates, C1 mineral reserves are drilled on lines at intervals up to 500 m with churn drillholes at 20 m centres along the lines. Approximately 95% of all deposits are drilled to define C1 mineral reserves. At least two drill lines are required to define C2 mineral reserves.

Exploitation drilling is conducted two years in advance of mining operations so the mineral reserve estimates are generally small compared with the gold production rate. Approximately 40,000 m of drilling is completed annually.

6.2.3 Mineral Resource estimation parameters

The 2016 Mineral Resource estimates for the Alluvials were prepared by the independent specialist consultants at Mentore Pty Ltd (Mentore). The GKZ estimates have been reclassified and reported according to the JORC Code as at 31 December 2016.

Mentore audited the Ore Reserves for the following deposits:

- r.Dogaldyn-Nakatami, dredge No.61.
- Left-bank terrace r.Bol. Ballaganakh.
- r.Bol.Dogaldyn, outflow area.
- r.Marakan, left-bank tributary of r.B.Patom.
- r.Nygri, lower area, range of dredge No.114.
- Vasil'evskij dredge range.

Each estimate deposit represents one subsidiary company and, combined, they represent 22% of the contained gold in the Alluvials Ore Reserve.

Polyus provided Mentore with plans and sections in Autocad format for these deposits and checked volumes and grades of Polyus' mineral reserves statement for blocks from the six deposits.

The volumes for licences 02448BE, 02771BE, and 03039BE were generated by geo-referencing and digitizing the mineralization contours from the Lenzoloto sections and by joining them to build a three-dimensional triangulation (wireframes). Gold grades were calculated by assigning the weighted averaged grades from the drillholes to the wireframes.

The volumes for licences 01766BR, 01264BE and 01245BE were generated by digitizing two-dimensional polygons of the blocks in plan and multiplying the areas of these polygons by average seam thickness derived from the drillholes corresponding to this block.

6.2.4 Mineral Resource estimate

Both on-balance and off-balance blocks of the GKZ estimates classified as B and C1 are considered to be the equivalent of Indicated Mineral Resources. Both on-balance and off-balance blocks of the GKZ C2 category are considered to be equivalent of Inferred Mineral Resources.

Mentore adjusted the Mineral Resource grades to reflect historical mining outcomes in recent years, and also adjusted the Mineral Resource estimate to account for depletion due to mining during 2016.

The combined Indicated and Inferred Mineral Resource for the Alluvials as at 31 December 2016 totals 150 Mm^3 with an average gold grade of 0.43 g/m^3 and contained gold of 2.1 Moz as shown in Table 6.8, where the gold grade and contained gold are estimated on a recovered gold basis.

Table 6.8 Alluvials - Mineral Resource - as at 31 December 2016

Classification	Cubic Metres (Mm^3)	Grade (g/m^3)	Contained Gold (Moz)	Contained Gold (t)
Measured	-	-	-	-
Indicated	131	0.38	1.6	50
Inferred	18	0.74	0.4	14
Total	**150**	**0.43**	**2.1**	**64**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Ore volume converted to tonnage at 1.85 t/m^3.
3. Mentore estimate as at 1 January 2016 and adjusted by production depletion to 31 December 2016.

6.3 Mining and Ore Reserves

6.3.1 General

Lenzoloto employs various mining methods, including: dredging for exploiting bulk, low-grade technogenic deposits; dozing for the smaller, higher-grade primary deposits; and conventional open pit/dozing in permafrost. The choice of method is a function of the physical conditions, gravel grade and economics. Since the bulk of the Mineral Resources are low-grade resources dredging is the predominant method in terms of volume. However, conventional open-pit areas contain the bulk of the gold.

The depth of the primary deposits varies across the region. Nearer to Bodaybo, where placer mining has taken place for more than a century, the deposits are at depths of between 20 m and 70 m. In the centre of the region the depth is between 10 m and 20 m.

A mining plan based on previous production rates has been established for the remaining Alluvials Ore Reserves.

The cost of moving equipment and re-establishing washing plants is considered to be included in the sustaining capital or operating costs. Where a dredge is required to channel through waste to move from one reserve block to another the waste mined is treated as an operating cost. A minimum channel measuring 6 m deep and 60 m wide was assumed to be required to move a dredge.

Where the move is calculated to be too long to move by channelling it was considered more advantageous (faster or cheaper) to dismantle, move and rebuild the dredge. A period of time of six months was assumed to be required to relocate a dredge. When dredge relocation was necessary a capital expenditure of US$1M was assumed. Three dismantling/moving/rebuilding operations are planned.

The plan for dredging operations was created in order to minimize the additional channelling of waste.

6.3.2 Mine operations

Where appropriate, waste stripping utilises draglines. Ore mining is conducted using small excavators and 40 t haul trucks. Pay gravel washing was performed using monitors and steel punch plate screens. Screen undersize was pumped to elevated sluice boxes for gravity separation. Approximately 43 such plants are operated at the Lenzoloto licences.

Lenzoloto operates seven bucket-line floating dredges within the licence areas. The capacity of these dredges ranges from 150-litre to 380-litre buckets, capable of mining up to 2 million cubic metres per year. The dredges operate in a pond established within the river and licence areas. The pond width is generally 70 m wide and the dredge can operate at depths up to 20 m. Face advance is approximately 3 m per day. A diversion channel directs water around the pond to maintain flow in the river.

The dredging operates continuously for up to eight months per year, commencing in March. Draglines operate ahead of the dredges to remove a portion of the waste profile to enable the dredge to operate at deeper levels. Waste is side cast beyond the diversion channel. The final overburden and gravel horizons are then dredged according to the mine plan developed from drilling ahead of the mining operation. The dredges are equipped with sluices for gold recovery.

The ore is washed on board the dredge. The washed tails are dry stacked behind the dredge path. Water recirculates to the dredge pond. A series of settling ponds accepts overflow water from the dredge pond to progressively settle the solids and reduce turbidity before release into the main river course.

Ore is identified by drilling ahead of the mining programme using cased churn drilling. Two metre lengths of 144 mm diameter casing are driven into the gravel bed. Churn drilling within the casing provides samples at 0.5 m intervals. Casing continues to refusal.

Holes are drilled on 600 m fences along the river bed with 40 m spacing between holes. Areas which show payable grades are infilled. Drilling is conducted immediately ahead of mining to provide sufficient information for the coming year’s activities.

The dredges operated by Lenzoloto are old, and as is typical of placer mining, require substantial on-going maintenance, which is conducted during the winter off-season to the extent possible. Dragline and dredging operations are relatively inexpensive as they utilisation available power for the local grid.

Orebodies identified on side creeks are dry mined.

Overburden removal at pit operations occurs by several mining methods, including dragline, truck and shovel mining, and bulldozing. Dredging can only occur for approximately 8 months of the year between March and November. Truck and shovel operations continue year-round and employ drilling-and-blasting of the frozen ground. However, the necessity for blasting is reduced during the summer. Russian electric shovels and hydraulic excavators load the waste to a fleet of BelAZ trucks for haulage to waste dumps. Gravel is mined primarily between June and October by Russian bulldozers supplemented by some Komatsu bulldozers. Pay gravel is loaded by Russian excavators to BelAZ trucks for haulage to the washing plants.

The other bulldozer operations employ Russian draglines and excavators for removal of the overburden, which is side-cast, commencing in March. Gravel mining and washing takes place between June and October employing Russian and Komatsu bulldozers, which push the gravel to the sluices.

Polyus aims to secure licences ahead of the dredges where possible. Operations are planned to limit the number of dredge moves requiring dismantling of the dredge and reassembly at a new site.

6.3.3 Ore Reserve estimate

Mentore estimated the Ore Reserves by calculating a profit ratio for Mineral Resource blocks; simply net revenue at US$1,250/ounce divided by costs. GKZ estimates classified as B or C1 with a profit ratio greater than 0.01 were classified as Ore Reserves.

Mentore adjusted the Ore Reserve grades to reflect historical mining outcomes in recent years, and also adjusted the Ore Reserve estimate to account for depletion due to mining during 2016.

The Alluvials Ore Reserve is estimated at 57 Mm^3 with an average gold grade of 0.62 g/m^3 containing of 1.1 Moz of gold as at 31 December 2016, as shown in Table 6.9, where the gold grade and contained gold are estimated on a recovered gold basis. The Ore Reserve is reported according to the JORC Code, using an ore block profit ratio of 0.01 and a gold price of US$1,250/oz.

Table 6.9 Alluvials - Ore Reserve - as at 31 December 2016

Classification	Cubic Metres (Mm^3)	Grade (g/m^3)	Contained Gold (Moz)	Contained Gold (t)
Proved	–	–	–	–
Probable	57	0.62	1.1	35
Total	**57**	**0.62**	**1.1**	**35**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Ore volume converted to tonnage at 1.85 t/m^3.
3. Mentore estimate as at 1 January 2016 and adjusted by production depletion to 31 December 2016.

Polyus regularly participates in auctions to acquire additional licences to supply additional Mineral Resource to replace ore depleted by mining. Since 2012, acquisitions have more than offset depletion.

6.4 Processing and infrastructure

The gold bearing gravels from the bulldozer mining operations are washed using standard Russian scrubber, screen and sluice arrangements of various unit capacity and of various designs. The type of unit used depends on the gravel, gold size range and the type of operation.

Primary sluice concentrates from the dredge and bulldozer operations are collected daily and upgraded at centralised facilities using secondary sluices, shaking tables and hand finishing to a fineness of 770 to 950, depending on the deposit. Concentrates are transported to the refinery in Krasnoyarsk. Some primary sluice tails washing is conducted by contractors using scavenger sluices.

The operating sites are supplied by 35 kV and 6 kV lines from the VitimEnergo 110 kV grid; the typical site demand is 600 kW. Diesel generators are installed where necessary and for emergency supply in the event of a grid failure.

Water supplies for each licence area are taken from the nearest suitable surface watercourse.

Infrastructure at the subsidiaries' operating sites is by nature transitory and variable according to the type and location. Sufficient facilities are provided at the sites for the workers' accommodation, equipment maintenance and fuel storage. The sites are serviced from the settlements in the area, such as Kropotkin and Marakan, where the subsidiaries' stores and workshops are based. Much of the major supply and equipment repair is conducted during winter when the operating sites are shut down.

6.5 Planned production and costs

Production and costs – Reserve Case

It is apparent from the operations performance indicators that Lenzoloto potentially will represent a relatively low-cost to medium-cost gold producer over the next three years, after which the net cash flow from the operation can be expected to diminish significantly. The operation would then become a relatively high-cost producer. However, it is the nature of placer mining to carry forward only a few years of Ore Reserves in order to defer the significant exploration expenditures required to sustain the Ore Reserve base. For this reason, and considering the long history of operations at Lenzoloto, it is reasonable to assume that new reserves will be developed as a result of the future exploration expenditures.

The challenge at Lenzoloto, as is common to placer mining operations worldwide, is the inherent risk associated with Ore Reserves given the balance struck between the expensive and intensive exploration required to accurately define reserves and the economics associated with mining low-grade deposits. It is usually uneconomic to undertake the exploration required to reduce the risk associated with Ore Reserves to the level achievable in many hardrock gold mines.

The planned production and costs for the Alluvials is presented in Table 6.10. The Reserve Case shows a mine life of nine years. Note that the concentrator head grade is expressed in terms of g/m^3 of recovered gold and no recovery factor is required to obtain recovered gold.

Table 6.10 Alluvials - planned production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-Y10
Sands washed								
Ore - volume	Mm^3	57	7.0	7.0	7.0	7.0	7.0	22.0
Ore - contained gold	Moz	1.1	0.14	0.14	0.14	0.14	0.14	0.44
Waste - volume	Mm^3	399	49.0	49.0	49.0	49.0	49.0	154.0
Total volume mined	Mm^3	456	56	56	56	56	56	176
Concentrated								
Ore - Concentrator - volume	Mm^3	57	7.0	7.0	7.0	7.0	7.0	22.0
Ore - Concentrator - grade	g/m^3	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Ore - Concentrator - contained gold	Moz	1.1	0.14	0.14	0.14	0.14	0.14	0.44
Ore - Concentrator - recovered gold	Moz	1.1	0.14	0.14	0.14	0.14	0.14	0.44
Operating Costs								
Mining and Processing	US$/m^3 mined	1.23	1.23	1.23	1.23	1.23	1.23	1.23
Selling, general and administrative	US$/m^3 mined	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Refining and transportation	US$/oz refined gold	2.34	2.34	2.34	2.34	2.34	2.34	2.34
Initial Capital Costs								
Mining and concentrator	US$M	-	-	-	-	-	-	-
Closure	US$M	28	-	-	-	-	-	28
Total	**US$M**	**28**	**-**	**-**	**-**	**-**	**-**	**28**
Sustaining Capital Costs								
Mining and concentrator	US$M	88	13	13	13	13	13	23
Total	**US$M**	**88**	**13**	**13**	**13**	**13**	**13**	**23**

Notes:
1. The mining and processing costs are combined as both activities are linked by dredging at most operations.
2. Any minor discrepancies for sums in the table are related to rounding.

The operating costs are based on the following assumptions and qualifications:

- All RUB denominated costs were in real 2017 terms and converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on the Polyus 2017 budget, with AMC adjustments where appropriate. No provision was made for off-site corporate costs.

Capital cost estimates are included for:

- Sustaining capital for the process plant of US$13M per annum.

Closure costs were estimated by an independent consultant and adjusted to 1 January 2017. These costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

6.6 Permitting, environment, community, safety, and mine closure

6.6.1 Permitting

Lenzoloto currently holds 93 licences for placer deposits in the Irkutsk region. The environmental, health and safety and social conditions attached to these licences are broadly consistent and include, for example, requirements for the reclamation of disturbed areas after cessation of operations.

Polyus provided AMC with a register of permits and approvals for the following Alluvials operations:

- JSC Far Forest (АО "Дальняя Тайга")
- JSC Sevzoto (АО "Севзото")
- JSC Marakan (АО "Маракан")
- JSC Svetliy (АО "Светлый)

The register indicates that air quality, water supply and wastewater discharge, and (non-mine) waste management permits were in place at the time of its publication.

AMC reviewed the fourth quarter 2015 environmental monitoring report for the Lenzoloto operations. The report indicated that:

- Water quality monitoring results were within permitted limits.
- Air quality monitoring results were within permitted limits.
- No new contaminated land was created.

Mentore has not identified any significant breaches of the conditions attached to the series of permits for air emissions, water discharge and water use and waste management under which current operations are managed. AMC visited several operations, reviewed documentation on health, safety and environment and interviewed personnel on site. No significant issues were raised or observed.

6.6.2 Environment

The placer deposits around Bodaybo have been mined for more than 160 years; the current operations are reworking river channels that have been heavily disturbed historically. Whilst, existing operations are managed in accordance with regulatory requirements, the legacy of historic mining activities continues to exert a major influence on the environment.

Environmental impacts of current and historical operations include:

- Significant direct disturbance to the bed and banks of the river and riparian environs.
- Disturbance of terrestrial and riparian ecosystems.
- Deterioration of water quality at site and downstream.
- Deterioration of aquatic ecosystems at site and downstream.
- Air, noise, light overspill and visual amenity.
- Potential for land contamination from various aspects of the operation.

6.6.3 Community

An assessment of socio-economic impacts and material sustainability risks was carried out on the Alluvials operations in 2015. The assessment comprised the development of a socio-economic baseline of the Irkutsk region and Bodaybinskiy district based on available literature, and an assessment of socio-economic impacts and sustainability risks.

AMC’s summary of socio-economic impacts of the operation from the assessment is:

- Positive impacts:
  - Employment.
  - Demand for local goods and services.
  - Contributing to local and municipal budgets.
  - Contributing to the development of social infrastructure.

- Current and potentially negative impacts:
  - Social tension due to the employment of foreign workers.
  - Reduction in local incomes as a result of employment of foreign workers.
  - Potential for deterioration in the socio-economic situation following mine closures.
  - Additional burdens on health care institutions in the district.
  - Increased waste generation and loads to municipal landfill sites and waste treatment facilities.
  - Increased heavy goods vehicle traffic and associated increased impacts to road infrastructure.

AMC notes that these impacts are common to many operations. Social impact mitigation measures are available to address the potential negative impacts listed above, and it is anticipated that Polyus will develop and implement such measures as part of its ICMM commitments.

6.6.4 Safety

The occupational health and safety statistics for the Lenzoloto group (Alluvial operations) in 2016 were:

- Injury rate (per 200,000 hours worked) of 0.04, which includes fatalities, lost time injuries and medical treatment injuries.
- Lost time injury frequency rate (per 200,000 hours worked) of 0.02.
- Fatality frequency rate (per 200,000 hours worked) of 0.02.

A fatality occurred in the Lenzoloto group during 2016. Polyus has a stated aim to accredit all operations under the safety system OHSAS 18001. AMC understands that the Lenzoloto group is yet to implement this standard. Working towards this goal will reduce the risk of accidents, such that occupational health and safety does not appear to be a material risk to ongoing operations.

6.6.5 Mine closure

Conceptual mine closure planning is included in the rehabilitation section of the technical reports prepared for each operational area.

Polyus stated its plan to implement ongoing rehabilitation programmes with appropriate cost provisions. At the end of 2016, Polyus estimated that the total closure liability (excluding redundancy payments) to be approximately US$28M.

6.7 Risks and opportunities

The following risks are identified for the Alluvials operations:

- The anticipated grade is not achieved. The grades are based on sampling of mining areas by drilling ahead of the mining locations. Predicted grades are determined from drill hole assays and assessment of the ore continuity. Placer-type mineralization has inherent risks in the ability to estimate continuity of the ore zones.
- The areas previously mined are not delineated properly. Some planned mining areas have already been mined in the past. Additional resources are to be mined on the margins of the mined out areas and below the previously mined areas. Accurate determination of the resources relies on an accurate understanding of the mined out volume.
- The metallurgical performance of the ore results in reduced recovery or increased costs. The performance of the mining equipment will determine the gold recovered. Changes in the physical properties of the ore can lead to reduced recovery. The Alluvials mines have been in operation for many years and operational experience of the operators will assist to mitigate this risk.
- Poor equipment performance results in lower than anticipated throughput in the plants. The dredging equipment is old and relies on continuous maintenance to keep the plant availability at the nominated level. Major failure or poor availability will result in reduced operating hours, reduced ore throughput, and reduced gold production.
- Environmental requirements change. At present, the Alluvials operation relies on settling ponds to reduce the turbidity in the water leaving the mining operation. Should expectations change such that cleaner water is to be released, then additional cost may be incurred.

The following opportunities are identified for Alluvial operations:

- Improved grades from areas not predicted by the drillhole assays. Pockets of higher-grade can occur in placer-type deposits which will improve head grade and gold production.
- Acquisition of licence areas that have higher-grades. Polyus actively bids for additional licences to replace depleted resources and to extend life. Should any new licences be acquired that have higher-grades than the existing licences, then production may be higher.

7 Kuranakh

7.1 Introduction

7.1.1 Property location and description

The Kuranakh mine site is located in the Aldansky District of the Sakha Republic in Russia, and approximately 400 km south-southwest of the capital city of Yakutsk and 25 km from the town of Aldan (refer Figure 1.4).

The Kuranakh area was settled in the 1920's when gold was discovered. The Kuranakh deposits are spread along a north to south trend at the head waters of the Greater Kuranakh River valley. There is a relatively long history of open pit mining at Kuranakh with continuous mining and processing of gold ore since 1956. The licences containing the mining areas are large and, in total, comprise an area of approximately 1,500 km^2.

The Kuranakh mine was commissioned in 1965. The process plant originally used the zinc precipitation technology, but in 1974 the plant was expanded and the technology was changed to resin-in-pulp (RIP).

The operation has accumulated significant stockpiles of low-grade ore. These stockpiles have been included in the mineral resource and ore reserve estimates after the success of recent heap leaching trials.

There are 11 gold deposits at Kuranakh, located between 6 km and 25 km from the processing plant. In addition to the 11 deposits, there are 24 stockpiles. The 11 deposits and 24 stockpiles have Mineral Resource and Ore Reserve estimates that have been classified and reported in accordance with the JORC Code. Fives deposits are currently being mined by open pit methods. Most pits are 70 m to 80 m deep, with the deepest, Porfirovoye, approximately 120 m deep.

Drilling-and-blasting is required in the open pits. Before the multi stage expansion was initiated, the processing plant had a rated capacity to treat 3.8 Mtpa of ore by milling and recovery using the RIP method.

The processing plant is in the southwest corner of the project area, with the town of Lower Kuranakh, 3 km further down the valley to the south. The Kuranakh plant processed 4.2 Mt of ore in 2016, producing 160 koz of gold, being 8% of the total Polyus gold output and an increase of 8% over the 2015 production. The Greater Kuranakh River hosts the Kuranakh TSF. Waste dumps and stockpiles are gathered around the extensive workings of the last 60 years.

At 31 December 2016, the reported Mineral Resource was 9.2 Moz and the Ore Reserve was 4.5 Moz.

Kuranakh currently has an estimated remaining life of 22 years.

The Kuranakh town of approximately 6,000 people provides accommodation and services for the workforce. Heating for the town is supplied by a coal fired boiler. Power is supplied to the town and mine from a hydroelectric facility via the local grid.

All season access to Aldan is via paved road from Neryungri (275 km) or Yakutsk (534 km). Both cities have airports with connecting flights to Moscow and other centres.

The climate at Kuranakh is strongly continental, with extreme fluctuations in air temperature (ranging from -49°C to +35°C) and an annual average of -5.5°C. The average daily temperature exceeds 0°C between late April and late September. Precipitation is approximately 450 mm per annum reaching a maximum in July. There is snow cover for six to eight months of the year.

AMC Principal Consultant mining engineers and geologists have visited the site on several occasions.

7.1.2 Mineral tenure

The Kuranakh Ore Reserves are covered by 11 mining licences for subsoil use and gold mining. The mining licences, listed in Table 7.1, were issued in 2015 and are supported by Polyus estimates submitted to the GKZ in 2015.

Table 7.1 Kuranakh - tenements

No.	Number and Series of Licence	Grant Date	Licence Expiration Date
1	YAKU 05134 BE	28 November 2016	31 December 2038
2	YAKU 05135 BE	28 November 2016	31 December 2022
3	YAKU 05136 BE	28 November 2016	31 December 2028
4	YAKU 05137 BE	28 November 2016	31 December 2040
5	YAKU 05138 BE	28 November 2016	31 December 2040
6	YAKU 05139 BE	28 November 2016	31 December 2034
7	YAKU 05140 BE	28 November 2016	31 December 2038
8	YAKU 05141 BE	28 November 2016	31 December 2038
9	YAKU 04600 BE	21 March 2016	31 December 2040
10	YAKU 05142 BE	28 November 2016	31 December 2034
11	YAKU 04744 BE	20 June 2016	30 June 2024

There are also mineral tenement licences granted by Rosnedra for exploration and mining of gold and associated minerals from the Kuranakh deposit stockpiles in Sakha (Yakutia). Licence YAKU 04744 BE, registered on 26 June 2016 to JSC “Aldanzoloto”, consolidated previous licences covering stockpiles and it expires 30 June 2024.

A succession of licences has covered the Kuranakh deposits since the beginning of mining. Reserves were approved in 1955, 1956, 1960, 1963, 1967, 1980, 1987 and 2002. In 2015, Polyus submitted an updated mine plan to the GKZ and gained approval for continued mining. Approval of the permanent exploitation parameters is contained in Statement No.4456 dated 19 January 2016.

Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences.

7.1.3 Historical production and costs

Kuranakh’s historical performance is summarized in Table 7.2.

Table 7.2 Kuranakh - historical production and operating costs

Item	Unit	2014	2015	2016
Mined				
Ore	Mt	4.0	4.0	4.3
Contained gold	Moz	0.16	0.17	0.18
Waste	Mt	18.5	20.8	21.3
Total	**Mt**	**22.6**	**24.8**	**25.5**
Processed				
Ore	Mt	3.8	3.9	4.2
Contained gold	Moz	0.16	0.16	0.18
Recovered gold	Moz	0.14	0.14	0.16
Unit Operating Costs				
Mining	US$/t mined	3.05	2.10	1.79
Processing	US$/t processed	11.63	7.96	6.03
Selling, general & administrative	US$/t processed	2.53	1.98	2.07

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

7.2 Geology and Mineral Resources

The Kuranakh Mineral Resource was updated for four deposits to incorporate additional data, revised interpretations, estimation process and parameters, and revised cut-off grades. The remainder of the deposits had the Polyus estimates reviewed, adopted and reclassified. Similarly, 24 separate Polyus stockpile models were reviewed, reclassified and adopted. Most stockpiles have been reported as potentially economic, with the expectation that most would be treated via potential heap leach.

The cut-off grade applied is 0.60 g/t. Due to the flat-lying and relatively shallow nature of the mineralization, the Mineral Resource is exceptional in that it is currently not constrained using a nominal US$1,500 optimization shell for reporting purposes.

7.2.1 Geology

The geological model for the Kuranakh mine seems to have been well established and understood early in the project's history, and has probably not undergone significant revision for some time.

Relevant stratigraphy comprises relatively flat-lying Cambrian limestones and dolomites that are unconformably overlain by undeformed Jurassic sandstone and limonitic claystone units. The contact between the lower Cambrian basal limestones and the overlying Jurassic sandstones and claystones is marked by a paleo-weathering surface with weathered and oxidized limestone and breccia. The Proterozoic and Mesozoic stratigraphy is intruded and cross-cut by minor Mesozoic dykes.

All material to be mined is oxidized.

Paleo-weathering of the Cambrian limestone basal stratigraphy has resulted in karstic depressions and an uneven surface that is material to the localization and development of the gold mineralization. The karstic topography of the limestone can be highly variable.

Gold mineralization occurs as sub-horizontal lenses following the stratigraphy and structural depressions. Specifically, the mineralization is associated with reddish-brown sandy limonitic claystone that forms at the base of the Jurassic sandstone near the contact with the Cambrian limestone. The mineralization preferentially forms around depressions at the contact related to faults and karsts. There is some preferred orientation of the mineralized zones related to the regional structures and karsts, but locally, thickness (ranging from metres to tens of metres) and continuity is locally erratic. Contacts or limits to the mineralization appear to be gradational and diffuse. Lateral extents of mineralization that might be defined as ore is highly dependent on choice of cut-off grades and limestone basement profile.

Mineralization is similar in character throughout all of the deposits at Kuranakh.

Gold mineralization is documented to be related to low temperature hydrothermal alteration, and can also be found through parts of the Cambrian stratigraphy, although location and controls are not well understood or tested. Gold appears to be fine grained and is not clearly associated with other minerals apart from the clay. Any sulphide minerals that once existed have been oxidized. Other metals occur in conjunction with the gold. Silver forms part of the GKZ estimate, and zinc is notable for causing issues with the RIP processing of ore. Fragments of quartz-feldspar-carbonate-pyrite are assumed to be remnants of the primary mineralization.

It is not clear how much of the clay mineralogy is a primary product of the hydrothermal alteration. The clay causes some issues for grade control and mining.

Depth of mineralization seems to range from near surface to possibly greater than 100 m, with much of the current mining targeting material that ranges from 30 m to 60 m below surface.

The composition of the Kuranakh Mineral Resources is complex. The gold mineralization and Mineral Resources are contained in 11 deposits being mined or expected to be mined in multiple pits for each deposit. Mineralization can be contiguous across at least some of the boundaries of the deposit areas. The 11 gold deposits are documented as:

- Bokovoye
- Delbe
- Dorozhnoye

- Kanavnoye
- Novoye
- Pervukhinskoye
- Porfirovoye
- Severnoye
- Centralnoye
- Yakokutskoye
- Yuzhnoye

A large number of stockpiles that were previously considered to be low-grade or mineralized waste material in early years of production when cut-off grades were higher are considered as part of the current Mineral Resource. Until 2015, the GKZ approved cut-off grade was 1.0 g/t. In 2015, the approved GKZ cut-off grade was changed to 0.6 g/t.

Definition of cut-off grades, sampling protocols, assaying protocols, interpretation parameters (cut-off grade, minimum thickness of orebody or alternative metal cut-off, maximum thickness of waste or uneconomic intervals), data manipulation protocols, and QAQC are primarily as approved by the GKZ.

7.2.2 Exploration

The Kuranakh Project has accumulated a substantial amount of drillhole data, compiled since the 1950s. The current drillhole data sets consist of 45,631 holes totalling 1,198,498 m of drilling. Of that drilling, approximately:

- 87% was completed using churn drilling (including a very small percentage of diamond and other drillhole types).
- 2% consists of test pits or shafts.
- 11% consists of newer conventional RC drilling (with minor diamond drillholes, mainly as infill grade control) that have not been directly incorporated into previous resource estimates.

All drilling is vertical.

The churn drilling method, and test pits and shaft are methods no longer used (as a method of drill testing) for resource definition, although the data comprises the bulk of the resource definition data available for modelling. Churn drilling was typically conducted on 100 m to 50 m spaced lines with 20 m spacing along the lines. Many of the churn holes are selectively sampled and even intermittently sampled (e.g. every second sample) through mineralization. Sample recovery and quality from this method is uncertain. More recent twin-hole studies comparing other drilling types with the churn drilling tend to show mixed results. The churn drilling tends to terminate at hard and impenetrable material or limestone basement material.

Infill RC drilling uses conventional RC downhole hammer with a rig-mounted cyclone for sample recovery. Based on information supplied by Kuranakh, sample reduction is by a cascade riffle splitter and scoop sampling of a final split to produce the field sample.

Infill holes were drilled at a nominal 15 m x 15 m spacing. The RC drilling has been used for resource extension work as well as infilling and duplicating some churn hole drilled areas. AMC used this data up to the 2015 drilling campaign to aid in the resource modelling.

Due to the short depth of holes, no downhole surveys are done.

The chip material produced by the historic churn drilling process and the current RC drilling process is not amenable for bulk density determination. As part of the resource definition process, there appears to be limited on-going data collection and analysis of bulk density data, although there is a substantial history of mill processing of ore. Bulk density data for use in resource estimation has been supplied in summary form only, and is detached from drillhole sources (presumably diamond core holes or test pits or shafts). No significant bulk density work has been done since Echo Bay Mines completed diamond core drilling on the project in 1997.

Drillholes, particularly the old churn holes and test pits and shafts are logged in detail on hard-copy geological log sheets, and generally in long-hand form, as differentiated from typical standardized logging codes. Hard-copy logs are stored on site and are well maintained and ordered. Geology data compiled for use in the digital data files tends to be limited to a digital rock type and associated numeric code.

The QAQC protocols for the resource definition drilling are per the standard Russian GKZ process and largely managed by the assay laboratory.

The site preparation and assay laboratory has been used for processing all exploration, mine and mill samples since 1998. Assay is by 50 g charge fire assay with gravimetric finish, where sample prills are weighed by scales to 0.001 mg accuracy, for all exploration and mine samples.

No reference material (core or field duplicate samples) appears to be stored for the exploration and resource definition drilling. As a consequence, there is no potential for check sampling.

7.2.3 Mineral Resource estimation parameters

Of the 11 deposits at Kuranakh, four have been remodelled by AMC (Delbe, Dorozshnoye, Pervukhinskoye, and Yuzhnoye) to incorporate additional data, revised interpretations, estimation process and parameters, and revised cut-off grades that were lowered in consideration of the potential addition of heap leach treatment of ore in conjunction with milling.

The remainder of the deposits (Bokovoye, Centralnoye, Kanavnoye, Novoye, Porfirovoye, Severnoye, and Yakokutskoye) had the Polyus estimates reviewed, adopted and reclassified.

Similarly, 24 separate Polyus stockpile models were reviewed, reclassified and adopted as part of the Mineral Resources. A total of 23 stockpiles have been reported as potentially economic, with the expectation that most would be treated via potential heap leach. Mining for treatment via milling has depleted one of the stockpiles entirely during 2016.

The updated Mineral Resource was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- For AMC Mineral Resources that were re-estimated by AMC (Delbe, Dorozshnoye, Pervukhinskoye, and Yuzhnoye):
  - AMC used the combined churn drillhole data and the RC drill data to update the geological interpretation/geological model.
  - The limestone hangingwall contact was modelled using a wireframe.
  - Metasomatite (lithology) envelopes and mineralization envelopes were constructed using a probability based method. A threshold of 0.6 g/t was used for mineralization envelope. The metasomatite envelope was used as a sub-domain to separate highly altered sediments from less altered material.
  - The drillhole assay intervals for some holes have been selectively or incompletely sampled (usually churn holes) for various reasons. This has resulted in an incomplete drill dataset. A routine exploration protocol of intermittent sampling seems to be the most common reason for un-assayed intervals. AMC has left the unsampled/unassayed intervals as null values or absent for data used for resource estimation (rather than setting to “0” on the possible assumption that unsampled intervals are “waste”). From a practical perspective during compositing and estimation, this is not likely to result in a materially problem for estimation. It does, however, maintain clearly identified gaps in the raw data.
  - Drillhole intervals were composited to 2 m, based on a median sample length of 1 m and maximum common sample length of 2 m.
  - Statistics were reviewed and top-cuts were applied as appropriate.
  - Variogram models for gold were generated using the composited and top-cut gold sample intervals.
  - Typically, 10 mE x 25 mN x 5 mRL parent blocks were used for the models.
  - Ordinary kriging estimation method was used to estimation the top-cut gold grade into parent blocks.

- An iterative four pass search process was used with flat-oriented, vertically anisotropic variogram models.
- Average bulk densities were applied to the models according to historic values used for the deposits; the applied density values are broadly appropriate for the rock types being modelled:
  - Delbe – 1.78 t/m^3
  - Dorozshnoye – 1.83 t/m^3
  - Pervukhinskoye – 1.70 t/m^3
  - Yuzhnoye – 1.80 t/m^3
- All models were flagged for depletion using pit topographies.
- Mineral Resource classification utilized a combination of proximity to data, search pass, and slope of regression values, including rationalization of results in a second pass using planar strings to incorporate the Competent Person's discretion on other aspects not related to the geostatistical parameters. Material was classified as a combination of Indicated and Inferred Mineral Resource.

- For other Mineral Resources that were reviewed, adopted by, and reclassified by AMC (Bokovoye, Centralnoye, Kanavnoye, Novoye, Porfirovoye, Severnoye, and Yakokutskoye):
  - These deposits were modelled by Polyus and its consultants using the GKZ-style interpretations for mineralization. The models were originally categorized according to the Russian classification system, and were created approximately in late 2013.
  - Data issues were similar as described above.
  - Drillhole data was composited to 1 m downhole intervals.
  - Top-cuts have been applied, but affect a very small proportion of the data. The top-cuts are generally considered to be appropriate based on the data supplied.
  - Anisotropic, directional experimental variograms were generated and modelled using single structure exponential models. Nugget variances range from 24% (Severnoye) to 45% (Porfirovoye). Major axis ranges vary from 70 m (Porfirovoye) to 271 m (Bokovoye and Centralnoye).
  - Most block models have been constructed using 10 mE x 25 mN x 5 mRL parent blocks. Exceptions are Yakokutskoye (20 mE x 25 mN x 5 mRL) and Novoye (20 mE x 20 mN x 5 mRL).
  - All block models have been estimated using ordinary kriging, with only the mineralized zones being estimated. Three pass search regimes have been applied using flat lying anisotropic search ellipses with relatively short major axis ranges and restricted number of composites.
  - Average bulk densities were applied to the models according to historic values used for the deposits; the applied density values are broadly appropriate for the rock types being modelled:
    - Bokovoye – 1.85 t/m^3
    - Centralnoye – 1.80 t/m^3
    - Kanavnoye – 1.70 t/m^3
    - Novoye – 1.61 t/m^3
    - Porfirovoye – 1.97 t/m^3
    - Severnoye – 1.77 t/m^3
    - Yakokutskoye – 1.80 t/m^3
  - Lease and depletion flags were updated in the models.
  - The process used to update the classification for Bokovoye, Centralnoye, Kanavnoye, Novoye, Porfirovoye, Severnoye and Yakokutskoye is almost identical to that used to classify Delbe, Dorozhnoye, Pervukhinskoye and Yuzhnoye, including final classification using planar strings. Material was classified as a combination of Indicated and Inferred Mineral Resource.
- For stockpile Mineral Resources that were reviewed, adopted by AMC, and reclassified:
  - A total of 24 stockpile models existed, of which 23 were reported for Mineral Resources.
  - The stockpiles are located on seven of the ten leases.
  - Stockpiles have been drilled using churn, roller, RC, diamond core, and by test pits, with churn drilling being the predominant drilling method used.
  - Drilling was undertaken in 2005 and 2012 for a total of 2,997 drillholes, for 52,627 m.

- Holes were drilling in variable grids ranging from 10 m x 10 m to 30 m x 30 m oriented north-south and east-west.
- Drillholes were drilled vertically through to contact underlying bedrock or soil. Sampling interval was generally conducted on 1 m to 2 m intervals. Any RC or diamond core was sampled at 1 m intervals.
- There are peripheral areas of the stockpiles that remain untested by drilling due to access issues.
- Five metre bench composites were generated and used for statistical and estimation purposes.
- The 5 m bench composites were assessed globally for the stockpile data to determine appropriate top-cuts for gold grades. It was determined that the top decile of data contained only 24.5% of the metal, and therefore no top-cuts were applied.
- Each stockpile has its own separate block model.
- A 1 m x 1 m x 5 m parent block size was utilized.
- Gold grades have been assigned to blocks using nearest neighbour estimation method utilizing a flat, 2 stage search. The first pass search used a rectangular search of 10 m x 10 m x 5 m. The second pass search was increased by a factor of 2.5. A third pass estimate is generated using an interpolation method with a constrained vertical dimension and limited composite data averaging. All blocks in the dump models are assigned a gold grade.
- The average bulk density value used in the stockpile block models range from 1.58 t/m^3 to 1.72 t/m^3.
- The occasional overlaps with bedrock models were resolved.

  AMC reclassified the stockpile models according to the JORC Code categories whereby the stockpile models were generally classified as an Indicated Mineral Resource. The following factors were considered for the classification:

  - Non-selective mining of the dumps.
  - Processing by heap leach.
  - Some uncertainty about the surveyed position of the base of some dumps.
  - Any dumps considered having some eventual potential for economic extraction have a minimum total stockpile grade of 0.3 g/t.

Kuranakh maintains active stockpiles for material to be treated by milling and heap leach.

7.2.4 Mineral Resource estimate

AMC prepared an estimate of the Kuranakh Mineral Resource as at 31 December 2016 of 186 Mt with an average grade of 1.3 g/t and containing 8.0 Moz of gold. This estimate is based on the resource model depleted by survey to 1 October 2016 pit topography, with a further deduction for mining in the last quarter of 2016.

Mineral Resources for Kuranakh have been classified and reported according to the JORC Code at a cut-off grade of 0.6 g/t. The estimates are for 11 deposits (Delbe, Dorozshnoye, Pervukhinskoye, Yuzhnoye, Bokovoye, Centralnoye, Kanavnoye, Novoye, Porfirovoye, Severnoye and Yakokutskoye) and 24 stockpiles. The Mineral Resource consists of an Indicated and Inferred Mineral Resource as shown in Table 7.3.

Table 7.3 Kuranakh - Mineral Resource - excluding stockpiles - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	0.6	86	1.5	4.2	129
	Inferred	0.6	100	1.2	3.8	118
Total			**186**	**1.3**	**8.0**	**248**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Depleted to 1 October 2016, adjusted for mining to 31 December 2016.
3. Excludes stockpile material.

The Mineral Resource for the stockpiles at Kuranakh is reported separately, as at 31 December 2016. The Mineral Resource consists of a total Indicated Mineral Resource of 62 Mt at 0.6 g/t as shown is Table 7.4.

Table 7.4 Kuranakh - Mineral Resource - stockpiles - as at 31 December 2016

Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Indicated	n/a	62	0.6	1.2	39
Total		**62**	**0.6**	**1.2**	**39**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Depleted to 1 October 2016.
3. In reporting the stockpiles, little or no mining selectivity is intended.

7.3 Mining and Ore Reserves

7.3.1 General

AMC understands that two main types of material are defined in the pit plans:

- Process plant feed Au>0.6 g/t.
- Waste Au<0.6 g/t.

Existing stockpiled ore will be processed both in the plant and leach pads.

No special ore types appear to be defined for high zinc material, although AMC understands that material from known high zinc areas is identified and blended with known low zinc ores for processing.

Grade control and mining block definition is by simple raw blasthole grade contouring on a bench basis, with mining block definition done manually using AutoCAD and Micromine software. Mining block definition is assisted by use of pit floor mapping of the basic rock types using the blasthole cuttings. AMC observed on plans of mining blocks that, while mining block sizes are variable, some blocks can be based on as few as two blastholes.

Mining blocks are marked out on the bench using pin flags. The mining block boundaries are marked by survey according to the grade control plans without adjustment for material movement during blasting. AMC is advised by management that mining occurs under geological supervision. Practical selectivity of the mining is relatively low, although mining of ore to the footwall contact is visual with the typical red clay-rich ore contrasting with the grey limestone.

Reconciliation of actual production is against the GKZ estimates.

Milling of ore from multiple deposits and pit areas makes reconciliation from production back to mine areas difficult without detailed tracking and/or batch processing of ore parcels.

Details of reconciliation studies conducted for periods 1997 to 2007 and 2008 to 2012 were provided by Kuranakh. These studies broadly summarized annual production from pits comparing expectations from models to mine production for tonnages, grade, and metal. The reports do not link mine production and mill production. The reports do not study the performance of the GKZ models apart from broad comment on the performance of the existing resource definition data at the time.

The following observations are made by AMC:

- Mining blocks are based on the blasthole data with some awareness of the general location of the GKZ polygons (based on the 50 m x 20 m spaced resource definition drilling data), although those polygons and associated drillhole data are not used in the design of the mining blocks.
- The 15 m x 15 m spaced infill RC drillhole data seems to be used as an important step to refine limits of mineralization and pit walls for mine planning. Sectional resources and reserves are updated using this data, although the data does not appear to be used in creating resource models or for definition of mining blocks, and seems to be done primarily for internal mine planning.

- The results from the various generations of drilling data (original 50 m x 20 m churn hole and test pit data, 15 m x 15 m infill RC drilling, and blasthole data) seem to produce quite variable and different outcomes regarding interpreted positions, shape, continuity and peripheral limits of mineralization.

7.3.2 Mine operations

The Kuranakh gold mineralization occurs as sub-horizontal lenses, generally following the stratigraphy and structural depressions. The mineralization is generally associated with reddish-brown sandy limonitic claystone that forms at the base of the Jurassic sandstone near the contact with the Cambrian limestone, and preferentially forms around depressions at the contacts.

Depth of mineralization ranges from near surface to greater than 100 m, with much of the production coming from ore that is 30 m to 60 m below surface. The ore thickness generally ranges from a few metres to tens of metres and the continuity is erratic. Mineralization is similar in character throughout the deposits at Kuranakh. The clay causes notable issues for grade control, mining and processing.

Gold appears to be fine grained and is not clearly associated with other minerals apart from the clay. Any sulphide minerals that once existed have been oxidized. Other metals occur in conjunction with the gold. Silver forms part of the GKZ estimate, and zinc is notable for causing issues with the RIP processing of ore. Fragments of quartz-feldspar-carbonate-pyrite are assumed to be remnants of the primary mineralization.

Five of the 11 deposits are currently being mined.

Mining is by shallow, conventional open pit methods. Material is loaded by diesel hydraulic face shovels and electric rope shovels. Waste and low-grade ore is hauled to nearby storage facilities and ore is hauled to the ROM pad.

Mining operations are conducted using one EKG-10 face shovels with a bucket capacity of 10 m^3, one EKG-8 face shovels with a bucket capacity of 8 m^3, two Hitachi EX1200 with a bucket capacity of 6.5 m^3, and one Komatsu PC-2000 with a bucket capacity of 10 m^3.

The mining truck fleet consists of BelAZ 7555 (55 t), BelAZ 75145 (120 t), of BelAZ 75131 (130 t) and Komatsu HD785 (90 t) trucks.

Most material is drilled and blasted before excavation. A fleet of ancillary equipment supports the main production equipment and performs other mine maintenance activities. The operation employs staff on two 12 hour shifts per day, 365 days per year.

Blastholes are sampled on 4 m intervals (three samples per 12 m hole) using a simple catch-pan placed near the collar of the hole during drilling. The material in the catch-pan is sub-sampled manually using a small scoop to produce a 1 kg to 2 kg sample. The samples are collected in calico sample bags and numbered according to pit, hole number, sample number and downhole depth interval. The third sample includes material from the 2 m sub-drill below base of bench.

Routine assaying is for gold using the on-site assay laboratory. While silver is noted as part of the GKZ estimate, it does not appear that there is routine assaying for silver. Assaying for zinc is not routine and areas requiring zinc assays are selected by the mine geologists. The selected blasthole samples are agglomerated and composited from pulp duplicates over entire mining blocks, with the composite sample managed internally at the laboratory.

Ore is either temporarily stockpiled near the pit, prior to being re-handled for hauling to the ROM, pad or it is hauled directly to the ROM pad. Ore can be hauled up to 25 km from the more remote deposits to the ROM pad located near the processing plant.

Existing pit designs show safety berms with widths of 8 m, 10 m, and 12 m. Ramps are designed to be 30 m to 35 m wide. No specific measures are employed to limit damage to final walls (such as trim blasting, drilling short holes, pre-split blasting).

Grade control plans are based on blasthole sampling results. Three samples representing the 12 m blasthole length are obtained from each drillhole using a sampler. This includes the 2 m of sub-drill. Ore mark-outs are based on a two-dimensional interpretation of grade produced using a CAD package.

Mining occurs on 10 m benches in both waste and ore. Drill-and-blast is required. Blastholes are drilled to 12 m depth, inclusive of 2 m sub-drill. Blasthole burdens and spacings are generally 6 m x 6 m, using a 245 mm blasthole producing a powder factor of 0.74 kg/bcm. Drill cuttings are used for stemming. Blasting does not appear to produce excessive material movement, although given the 10 m bench height, there is additional heave of 2 m to 4 m in parts of the blast area.

Although the standard bench height has been 10 m, recent approval has been obtained to reduce the bench height to 5 m. AMC concurs with this proposal as dilution is likely to be reduced significantly when mining flat lying orebodies such as these. One offsetting factor will be the sheeting on the benches with hard sandstone material to improve trafficability because halving the bench height will increase the total amount of sheeting used.

Material tracking appears to be simple, using radio communications.

Kuranakh personnel advise that survey of pit mining areas is conducted twice daily. Full pit surveys are completed twice per month.

Pit floor levels are observed to be variable and uneven. The sandstone and claystone is relatively soft. Machinery movement over the clay rich material appears to be problematic, and extensive sheeting using hard rock is required in some areas to gain access. Significant dilution can be introduced via the sheeting process. The clay is also sticky and can be difficult to handle.

The operation directly employs the operators, technical staff and maintenance staff. The open pit operation works two shifts of 12 hours per day, 365 days per annum.

Mine waste is hauled and dumped on waste dumps in close proximity to the pit. Resource definition drilling is used to sterilize waste storage areas in advance. Poor confidence in the historic churn hole drilling results can give cause to review the sterilization drilling results in areas used for stockpiling prior to the introduction of the in-fill drilling.

The operation uses electric rope shovels. A recent change to grid power sourced from hydroelectric plants means a significant reduction in power costs and relative improvement in the economics of electric shovels.

The pits at Kuranakh are spread over a wide area and maximum haul distances can reach approximately 25 km. Ore is transported to the ROM pad in 30 t or 50 t BelAZ rear dump trucks. Rear dump trucks are not designed for hauling over such long distances and review of the practice might show that a change to purpose-built, long-distance haulage units might improve productivity and reduce costs.

All ore is stockpiled at the ROM pad and rehandled for transport to the plant feed grizzly in Volvo tipper trucks. All trucks are weighed during the journey from the ROM to the plant. Bulldozers are stationed at both grizzlies to keep the chute free of oversize and assist feeding of the clayey ore. Oversize is crushed in a mobile crusher stationed at the plant, and then fed to the plant.

Kuranakh is currently commissioning a grizzly at the ROM pad to exclude oversize at the ROM and stack ore at the ROM before transport to the ROM. This provides the opportunity to reject oversize that is not mineralized.

Kuranakh is subject to extremely cold winter weather and all equipment is rated for the climate. The operation has had problems with hydraulic equipment operating at temperatures around -50^{0}C, and believes that electric shovels do not have the same level of problems.

The Kuranakh mine does not employ an equipment monitoring and dispatch system. Such systems can assist with maintaining equipment and tracking performance.

Equipment is maintained in a central facility. Shift changes have recently been established closer to the operating pits to reduce the down time of the equipment.

An allowance for the replacement of mining mobile equipment was included in the economic analysis. This analysis takes into account the equipment replacement schedule and the total capital expenditure required over the mine life.

7.3.3 Mining model

AMC prepared a LOM plan based on the resource models for the deposits and estimate of the stockpile resources.

Mine planning included pit optimization based on the resource models, pit design using the pit optimization shells as a guide, production scheduling of the resulting inventories and verification economic viability of the plan. Overall strategic analyses to optimize the value of the operation has not been undertaken.

For the 2016 Ore Reserve estimate, AMC used the existing process flowsheet for the plant and heap leaching.

The 2016 Ore Reserve estimates for the deposits are based on resource block models developed from geostatistical assessment of churn and core drillhole sample results. AMC used the Datamine regularization process to apply ore loss and mining dilution to the resource models to develop the corresponding Mining Models.

Gold grades were used as the weighting factor to aggregate subcells to a minimum SMU block size of 12.5 m (along strike), 10 m wide (across strike) and 5 m high. This SMU cell was selected to match with the ore loading equipment in the current mining fleet. The minimum SMU block size was applied to both ore blocks and internal waste blocks within ore zones.

Each Mining Model was then flagged for the Ore Reserve classification. The SMU blocks were classified by assessing the classifications of the constituent subcell blocks. Where more than 50% of the block volume is comprised of Measured Mineral Resource subcells, the SMU block was flagged as Proved Ore Reserve. Of the remaining blocks, where 50% of the block volume is comprised of Measured or Indicated Mineral Resource subcells, the SMU block was flagged as Probable Ore Reserve. Blocks not flagged as Proved or Probable Ore Reserve are not reportable as Ore Reserve. This method ensures that the dilutant material receives the same classification as the Mineral Resource it is diluting. The result is that ore loss, as reflected in the Mining Models, can have occurred due to a lack of sufficient grade in the diluted block to exceed the cut-off grade, or there is insufficient proportion of Indicated Mineral Resource in the diluted block to justify classification as Probable Ore Reserve.

The amount of dilution and ore loss varies for each deposit’s geometry and grade. The reblocking procedure combines smaller cells into the larger SMU cell. All values in the new cell are averages of the values from the smaller cell (weighted by tonnage or volume). Fields which have integer or descriptors are combined by finding the majority for the cells.

The Mining Models were then used as the basis for the pit optimization and Ore Reserve estimation for each deposit.

7.3.4 Geotechnical analysis

AMC completed a technical review of the geotechnical design for the Kuranakh open pits.

From the relict structures visible in the site photographs it is obvious that geology is quite complex in the area: varying lithological units, faults and folds. However, the bulk of the gold-bearing material is mined from saprolite, a deeply weathered rock, strength of which is a function of cohesion and internal friction angle of disintegrated material rather than the discrete geological structures. In this regard, there is no need to study the geological structures as the most probable pit wall failure mode in this material is a circular slip through the weak ground mass.

If mining is planned in the transition or fresh rock masses, AMC advises undertaking structural analysis in those areas to be mined to better understand the slope failure mechanisms.

Rock test results on bulk density, uniaxial compressive strength, tensile strength and Protodyakonov's coefficient have been reported. The number of tests, results range or specimen failure mode were not provided: only a single number is assigned against each rock type.

One of the most important rock mass properties for estimating the overall slope stability is triaxial compressive strength. No testwork was completed on any of three major rock classes defined by the degree of weathering: oxide, transition and fresh.

The pits are planned to be excavated predominantly within the oxide zone. The oxide material is reported to contain significant proportions of clay, especially in the Severnoye, Bokovoye and southern Centralnoye deposits, where clay content could be as high as 60%. No specific soil strength tests were, however, conducted on this material.

AMC concludes that, based on hydrogeological information that has been reported, ground water would have no effect on the pit wall stability because the water table is estimated to be at 330 mRL, which is significantly below the deepest planned pit base at 440 mRL.

Only runoff water is considered to affect the pits. A water inflow rate of 800 L/s to 9,000 L/s during the strongest storms was estimated, depending on the pit area. To prevent ingress of surface water to the pit (especially in the event of a seasonal storm), construction of windrows along the pit crest is recommended.

The likelihood of the impact of natural seismic events was not evaluated as part of the design process, although the mine licences are located in seismic zone 6 on the seismic intensity scale MSK-64 (Russian Academy of Sciences). Locations within the zone have a 10% probability of experiencing an occurrence of a seismic event of magnitude 6 within a 50-year period. The effect of the seismic loading of this magnitude can, however, be considered as significant.

Potentially, the number of open pits at Kuranakh could reach 180. An average pit depth ranges between 20 m and 55 m with the maximum depth of 65 m. Even though additional testing and analysis is required to develop a comprehensive model of geotechnical conditions at Kuranakh, mining has been in progress for the last 60 years and a significant body of the experience exists which can be used to assist development of pit slope assumptions.

The following weathering profile was established from visual observations of existing pits:

- Alluvial clayey gravels 0.5 m to 5 m.
- Oxide zone (consisting of highly to completely weathered clay-rich rocks) 10 m to 100 m.
- Transition zone (moderately weathered dolomitized limestone).
- Fresh rock (slightly weathered to unweathered strong dolomitized limestone).

Rock mass characterization has not been undertaken. Only the jointing intensity of the rock mass has been defined in qualitative terms. Around 75% of all rock masses where open pits will be excavated is classified as blocky (highly jointed), and 25% as moderately jointed.

During the 45-year history of open pit mining of the Kuranakh deposits, no notable large-scale failures have been observed. Based on this experience, it is postulated that the geotechnical conditions during the excavation of all planned open pits are expected to be favourable when using the same slope conditions used in pits mined to date. The current slope design parameters for all pits are presented in the Table 7.5.

Table 7.5 Kuranakh - slope design parameters

Slope Design Parameter	Value
Inter-ramp slope angle	32°
Working bench (flitch) height	5 m
Batter angle	63°
Safety berm width	6 m
Ramp width	26 m
Average total depth throughout all pits	20 m - 55 m

AMC is of the opinion that the slope design parameters are based largely on experience gained to date, rather than on any geotechnical engineering analyses. As the remaining deposits are likely to be excavated in similar geological conditions, AMC believes the current design parameters could be conservative, due to there being no notable failures recorded during the 45-year history of mining at Kuranakh, and there may be potential for optimizing the slope recommendations.

AMC has used a 5 m final bench height for the 2016 Ore Reserve slopes.

AMC recommends undertaking a detailed geotechnical study to quantify the risks of slope failure which will assist in optimizing the slope design parameters in order to realize possible economic benefits if found that steepening the wall angles, and hence decreasing the stripping ratio, is geotechnically justifiable.

In the absence of additional geotechnical studies, AMC recommends continuing to apply the slope design parameters as specified above. Additional slope design analyses will be required where the pits are planned to be below the existing waste dumps and next to the leaching pads.

7.3.5 Pit optimization - input parameters

The mining operating costs used as the basis for pit optimization and financial evaluation were taken from the 2017 operating budget for Kuranakh. Due to the shallow nature of the orebodies, a constant mining cost was used for all benches and all pits. The cost of hauling ore is allocated separately as it varies significantly across all deposits due to the varying distance to the processing plant.

The mine is expected to expand to meet the requirement of the higher throughput in the plant. The LOM plan targets process plant throughput of 5 Mtpa for the remainder of the mine life. As the pits all have similar depths and several deposits are mined at once, the stripping ratio is likely to stay relatively constant for the remainder of the life. Capital for mining equipment has been included to support an increase in the processing rate to 5 Mtpa and to relocate ore from stockpile to the ROM pad. This is additional to the allowance for the plant and heap leach capital costs. Mining expansion and sustaining capital costs are estimated as proportional to the mining rate, assuming a cost of US$24M per 10 Mt of mining capacity and an equipment life of 10 years. AMC recommends a more comprehensive LOM plan be developed that estimates the equipment replacement schedule over the remaining life.

The pit limits for Kuranakh were selected through analysis using Whittle software. The shells were developed by varying the gold price above or below that chosen as the base price for the pit optimization process of US$1,250/oz. AMC allows for mining equipment sustaining capital costs by including an allowance approximately equal to 10% of the mining operating cost when selecting the optimum shell. The mining equipment sustaining capital costs are, however, estimated and applied separately in economic modelling.

The Kuranakh mining operation is spread over a wide area with many pits. AMC considered the gold recovery, pit slope angles and pit-to-plant ore haulage cost for each pit separately to enable optimization of the production schedule.

The input assumptions and results of the optimizations are reported in the following report sub-sections. The optimization shells produced for the Reserve Case were then used as the basis for detailed pit design, in production scheduling and for subsequent financial analysis.

The parameters used in the pit optimization are derived from a combination of information provided by Polyus and AMC's determinations based on its technical assessments, and can be summarized as:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the recovered gold value ($75/oz) for cut-off grade calculation.
- Process plant gold recovery varies by deposit ranging from 87.1% to 88.9%.
- Heap leach gold recovery estimated at 72.3%.
- Overall pit slope angles with allowance for access ramps and minimum mining widths resulting in average pit slope angles for pit optimization of 21° to 23°.
- Mining costs derived from the Polyus 2017 budget for Kuranakh in RUB and reflect actual costs incurred in recent years. Average mining cost, excluding haulage, for all deposits is US$1.72/bcm mined.
- Average pit haulage cost, excluding ore pit to plant haulage cost, is US$0.44/t mined.

- Process plant operating cost of US$6.12/t processed ore.
- SG&A costs as a combination of general and administrative costs of US$1.20/t ore processed and selling costs of US$0.53/oz of recovered gold, based on Polyus 2017 budget.
- Heap leach processing cost US$5.84/t leached.
- Ore pit to plant haulage cost of US$0.15/t ore hauled/km hauled, which varies by deposit due to location from US$0.95/t to US$3.57/t.
- Process plant throughput rate of 5.0 Mtpa and heap leaching rate of 1.5 Mtpa.
- Refining and transportation costs of US$1.75/oz of recovered gold, based on Polyus 2017 budget.

All Inferred Mineral Resources were regarded as waste in the pit optimization and subsequent pit evaluations.

The processing plant variables of gold recovery, pit-to-plant ore haulage distance, and ore density by deposit are summarized in Table 7.6. Using these parameters and those listed above, a cut-off grade of 0.6 g/t was determined for use in the pit optimization, Ore Reserve estimation, and production scheduling presented in this CPR for Kuranakh.

Table 7.6 Kuranakh - variable input parameters for pit optimization

Deposit	Ore Haulage Distance (km)	Processing Recovery (%)	Ore Density (t/m^3)
Bokovoye	6.5	88.9	1.85
Centralnoye	14	88.9	1.80
Delbe	16.5	88.9	1.78
Dorozshnoye	19.5	88.9	1.83
Kanavnoye	14.5	88.9	1.70
Novoye	17	88.9	1.61
Pervukhinskoye	7.5	87.1	1.80
Porfirovoye	16	88.9	1.97
Severnoye	24.5	88.9	1.77
Yakokutskoye	10.5	87.14	1.80
Yuzhnoye	9.5	88.31	1.80

7.3.6 Pit design and contents

The Kuranakh mine has been in production for many years. The 2016 Ore Reserve estimate is based on the operation continuing to operate under similar conditions for the remainder of the mine life. Under these conditions, the confidence level of the modifying factors is generally at the feasibility study level.

The orebodies at Kuranakh are generally flat lying with a large lateral extent. There are 11 separate deposits. The pit designs are based on the results of the pit optimization work. In total there are more than 40 pits at Kuranakh. Each is based on an optimization shell.

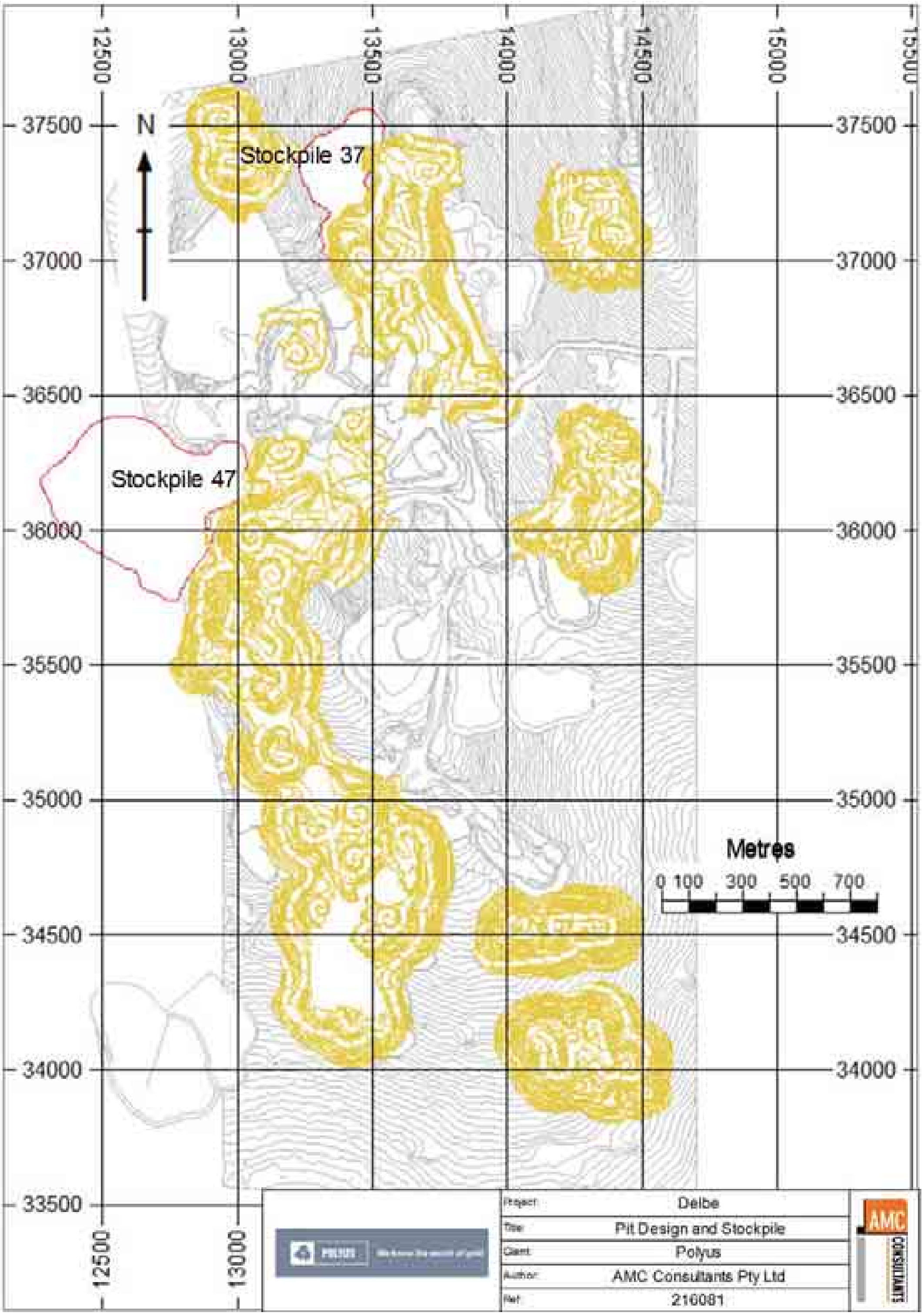
Parameters used in generating the ultimate pit designs are listed in Table 7.7.

Table 7.7 Kuranakh - pit design parameters

Item	Unit	Parameters
Inter-ramp slope angle	degrees	32
Batter slope angle	degrees	63
Safety berm width	m	6
Bench height	m	5
Vertical distance between safety berms	m	5
Ramp width	m	26
Ramp gradient	%	8

Typical pit designs for the Kuranakh deposits are shown in Figure 7.1 for the Delbe area.

Figure 7.1 Delbe pit designs



AMC considers that the economics of the pit designs can be improved with further mine planning work. The pit slope assumptions are based on historical performance of slopes and further work is necessary to understand the likely performance of future slopes. Given the shallow nature of the pits and apparent conservative nature of the current designs, this is not likely to significantly affect the project outcomes.

The contents of the Kuranakh pit design by stage are listed in Table 7.8.

Table 7.8 Kuranakh - contents of pit design stages

Item	Unit	Bokovoye	Centralnoye	Delbe	Dorozshnoye	Kanavnoye	Novoye	Pervukhinskoye, Yuzshnoye	Porfirovoye	Severnoye	Yakokutskoye	Total
Ore tonnes (>0.6 g/t)	Mt	4	10	19	10	10	0	2	1	12	7	75
Waste tonnes	Mt	8	48	79	30	45	2	5	4	31	36	288
Total rock tonnes	Mt	12	57	98	40	55	2	8	5	44	43	363
Strip ratio	W:O	2.1	4.9	4.3	2.8	4.7	14.0	2.1	3.7	2.6	5.3	3.9
Gold grade (ore >0.6 g/t)	g/t	1.9	1.4	1.3	1.3	1.2	1.5	1.1	2.1	1.4	1.1	1.3
Contained gold	t	7	14	25	13	12	0	3	2	17	7	100
Contained gold	Moz	0.2	0.4	0.8	0.4	0.4	0.0	0.1	0.1	0.6	0.2	3
Recovered gold	t	7	12	22	12	10	0	2	2	15	6	89
Recovered gold	Moz	0.2	0.4	0.7	0.4	0.3	0.0	0.1	0.1	0.5	0.2	3

Notes:
1. Topographic surface at 30 September 2016 used for evaluation. Ore Reserve estimate adjusted for depletion to 31 December 2016.
2. Ore tonnes and grade do not include existing stockpiles.

The pit designs were developed using the pit optimization shells generated using a gold price of US$1,250/oz, with a revenue factor (RF) = 1.0 as a guide. Other design parameters included:

- A minimum mining width 40 m.
- Ramp access to all benches.

Applying these criteria to create a practical pit design increased the waste mined, in some cases significantly. For the 2016 Ore Reserve estimate, the aim was to incorporate all ore from optimized pit shells, then to maintain maximum undiscounted operating cash flow at level within 10% of the optimized value for each deposit. At Novoye, the discounted cash flow target was not achieved and, for several deposits, there is more waste in the pit designs than in the pit optimization shells.

To more closely match the design criteria, AMC recommends further pit optimization work to adjust the overall pit slopes angles to enable the pit design targets to be achieved. Time limitations for reserve reporting for 31 December 2016 meant this additional iteration of mine planning was not possible.

In summary, the total amount of ore in the pit designs for all deposits is 3% less than in the pit optimization shells, and there is 8% more waste. Although AMC considers that there is potential for improvement in economics of the designs, it believes that the designs provide a reasonable basis for the estimation of the Ore Reserves for Kuranakh.

Cutback or stage designs were not developed for the Ore Reserve ultimate pit designs. AMC relied on pit optimizations shells to determine the location of stages for production scheduling. AMC recommends further mine planning to refine the pit shells and pit designs.

7.3.7 Ore Reserve estimate

The Kuranakh 2016 Ore Reserve is estimated to be 136 Mt grading 1.0 g/t containing 4.5 Moz as at 31 December 2016. The estimate is classified and reported according to the JORC Code and is listed in Table 7.9.

Table 7.9 Kuranakh - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Open Pit	-	-	-	-	-
Probable	Open Pit	0.6	74	1.4	3.2	100
	Stockpiles	n/a	62	0.6	1.2	39
Total Probable			**136**	**1.0**	**4.5**	**139**
Total			**136**	**1.0**	**4.5**	**139**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface as at 30 September 2016 with mining depletion to 31 December 2016.

The Ore Reserve estimate includes surface stockpiled ore totalling 62 Mt grading 0.6 g/t. This ore was mined over many years. The grade estimates are supported by assay results from drilling programmes covering the stockpiles. All samples were used in the estimate of the stockpile grades as it is anticipated that the entire stockpile will be recovered without selective mining.

The Probable Ore Reserve estimate is based on Mineral Resources classified as Indicated, after consideration of all mining, metallurgical, social, environmental, statutory and financial aspects of the project. There is no Proved Ore Reserve as there is no reported Measured Mineral Resource.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

7.4 Ore processing

7.4.1 Plant history, design, and operations

The basic plant has been in service since 1965 and has undergone multiple expansions and overhauls. Consequently, a mixture of equipment of various ages and in a range of conditions is to be seen. The plant historically treated ores with grades of approximately 2 g/t. However, the average head grade of ore feed has gradually declined in recent years to the current planned head grade of 1.3 g/t.

Table 7.10 includes a summary of recent historical performance of the Kuranakh plant. The circuit has operated in the same basic configuration since the expansion in 1974. Feed rate is currently 216 tph or higher, per operating grinding line. In the past, two of the three installed lines were usually run at any point in time, resulting in an annual throughput of approximately 3.7 Mtpa. Maintenance was performed on the idle line, resulting in very high overall plant availability, but low utilization. Targeted debottlenecking projects have allowed the plant to operate three grinding lines, resulting in an average throughput of 4.2 Mtpa in 2016. Throughput up to 5.0 Mtpa is possible at the existing feed rate per line, by increasing the mechanical availability of the grinding sections.

ROM ore is trucked to the static grizzly and screened at 400 mm. The -400 mm material is placed on two plant feed stockpiles using a rotary stacker. The stacker was designed with a rotary breaker however this unit was not able to reliably crush the unaltered limestone and sandstone rocks that occur in the feed from time to time, and was abandoned. A mobile crusher with 350 tph capacity has been added to the circuit to reduce the size of +400 mm material, which is then added to the new ROM material entering the plant. The nominal capacity of the ROM stockpiles is 25,000 t which provides approximately 48 hours of feed to the plant at maximum feed rates. The new ROM arrangement was implemented in 2015. The system produces blended stockpiles in close proximity to the plant feed grizzlies that are ready for use, decreasing the required rehandling of ROM material.

The three parallel grinding lines, each consisting of a fully autogenous grinding (FAG) mill followed by a ball mill in closed circuit with a classifier, are fed separately by reloading material from the ROM stockpiles via a 400 mm grizzly. A large stockpile of +400 mm oversize has built up adjacent to the ROM pad. This material is believed to be of low-grade, and Polyus has no plans to reprocess it at this time. The clay content of ROM feed presents significant operational issues for Kuranakh. Blinding of the grizzlies with clay causes plant feed interruption and increased operating costs to provide additional dozing capability and labour to open screens that have been blinded with clay. Operators are experimenting with various remediation schemes including sprays, heaters and modified grizzly-bar configurations.

The grinding circuit produces material nominally sized at 95% passing 160 µm. This fineness is required to minimize contamination of resin beads with coarse ore particles. Spiral classifiers used in the primary-grinding lines were replaced with modern hydrocyclone clusters. The hydrocyclones classify more efficiently and retain particles larger than the cut size in the primary ball mills which has alleviated the bottleneck in the secondary ball mills and increased overall capacity of the circuit. The hydrocyclone clusters also require significantly less maintenance than did the spiral classifiers. Continued improvement in maintenance will be required to achieve the overall time utilization needed to increase throughput beyond 4.5 Mtpa. Plant operators are also investigating the installation of slurry crossover connections between the lines to lessen the impact of unplanned stoppages of the primary grinding systems. At this time the primary mills are operated without grinding media (FAG), and under current conditions of feed rate and ore hardness, the plant can achieve the required fineness of grind. Operators have the option of adding some steel grinding media and operating in SAG mode should this be required in the future to increase grinding capacity.

A portion of the stream reporting to the secondary balls mills is diverted to a spiral classifier; with the coarse (sand) fraction discarded to tailings. Currently the fraction reporting to the spiral classifier is approximately 10%. Operators state that this sand carries negligible gold value, and that it probably originates from unaltered limestone and sandstone that was used to sheet benches in the mine to facilitate truck operations in muddy conditions. This raises the possibility of increasing gold production by rejecting a larger fraction of this sand component to permit the overall throughput to be increased.

Grinding circuit product is screened at 0.5 mm with the coarse fraction discarded to tailings and the fines thickened prior to gold extraction in the resin adsorption circuit. Four thickeners with a diameter of 50 m increase the density of feed to resin adsorption to 40% to 42%. The thickeners have been a source of downtime in the past due to operational difficulties with the management of solids settlement and stabilization of flows at higher feed rates. The units are also located in the open and are susceptible to warping during severe winter conditions which exacerbates the high maintenance requirement. Operators are aware that the thickeners could prove a significant bottleneck when the plant throughput is increased, and have been working on improvements in the circuit design. Use of a water recycle stream to thicken feed to facilitate feed density control has significantly improved the operational reliability of the circuit. However, it is acknowledged that a fifth thickener may be required to accommodate the higher throughputs being planned.

The Kuranakh ores are essentially completely oxidized, and most of the gold is readily available for leaching. Sodium cyanide leach solution is added in the secondary ball milling circuit and greater than 80% of contained gold is dissolved prior to solution entering the resin adsorption section. Slurry contacts resin beads in air-agitated adsorption columns (three lines of 10 columns each) in counter-current flow. A weakly basic, anion exchange resin manufactured by Bengbu Dengli (a Chinese supplier) is currently used. Bead size is 0.63 mm. This product has been selected because it has proved to be less susceptible to blinding by the zinc which is present in Kuranakh ore. Resin-stripping columns (two lines of nine columns) strip gold from the resin using thiourea with the strip solution reporting to a conventional electrowinning and doré smelting gold room where doré bars are produced. Stripped resin is returned to the adsorption circuit.

Operators acknowledge that gold recovery with an ion-exchange resin rather than activated carbon results in a decrease in gold recovery of approximately 1.5%. However, the plant is fully committed to the resin technology, and changing to activated carbon would entail significant capital expenditure and lost production.

7.4.2 Plant feed blend

The site currently uses three stockpiles to target a constant feed grade to the processing plant of 1.3 g/t.

Blending is also conducted to limit the concentration of zinc in the plant feed. The zinc affects the plant recovery by preferential absorption by the resin in the pulp. Some areas can have samples assays of 1.5% Zn, whereas the plant limit is set at 225 g/t Zn to prevent loss of gold recovery.

No regular sampling is conducted on samples for zinc. Selected samples are sent off site for analysis and those samples are used as representative for a particular area. Currently three stockpiles are used on the ROM pad to blend high zinc ore to acceptable zinc levels.

AMC recommends a comprehensive sampling and assaying programme to determine the occurrence of the zinc and the zinc grade variability. Results of the sampling and assay programme can then be used to determine the minimum sampling required to enable mine planning with confidence to maintain the zinc grade within the required tolerances.

A heap leach processing facility is currently being constructed at Kuranakh, with a target capacity of 1.5 Mtpa.

AMC recommends that the optimal strategy for treatment of all ores should be determined in a strategy study that compares the relative merits of processing the ores in the plant or on the leach pad. The outcomes of this study may impact on the revenues, operating costs or capital costs.

7.4.3 Future process plant upgrades

The Kuranakh processing facility has operated since 1965 and has undergone a series of expansions and upgrades to reach its current configuration. Polyus advises that the process plant operators have installed all key upgrades required to raise plant throughput capacity to 4.5 Mtpa. The plan to increase plant throughput to 5.0 Mtpa in 2018 is currently being implemented. Recent processing performance is shown in Table 7.10.

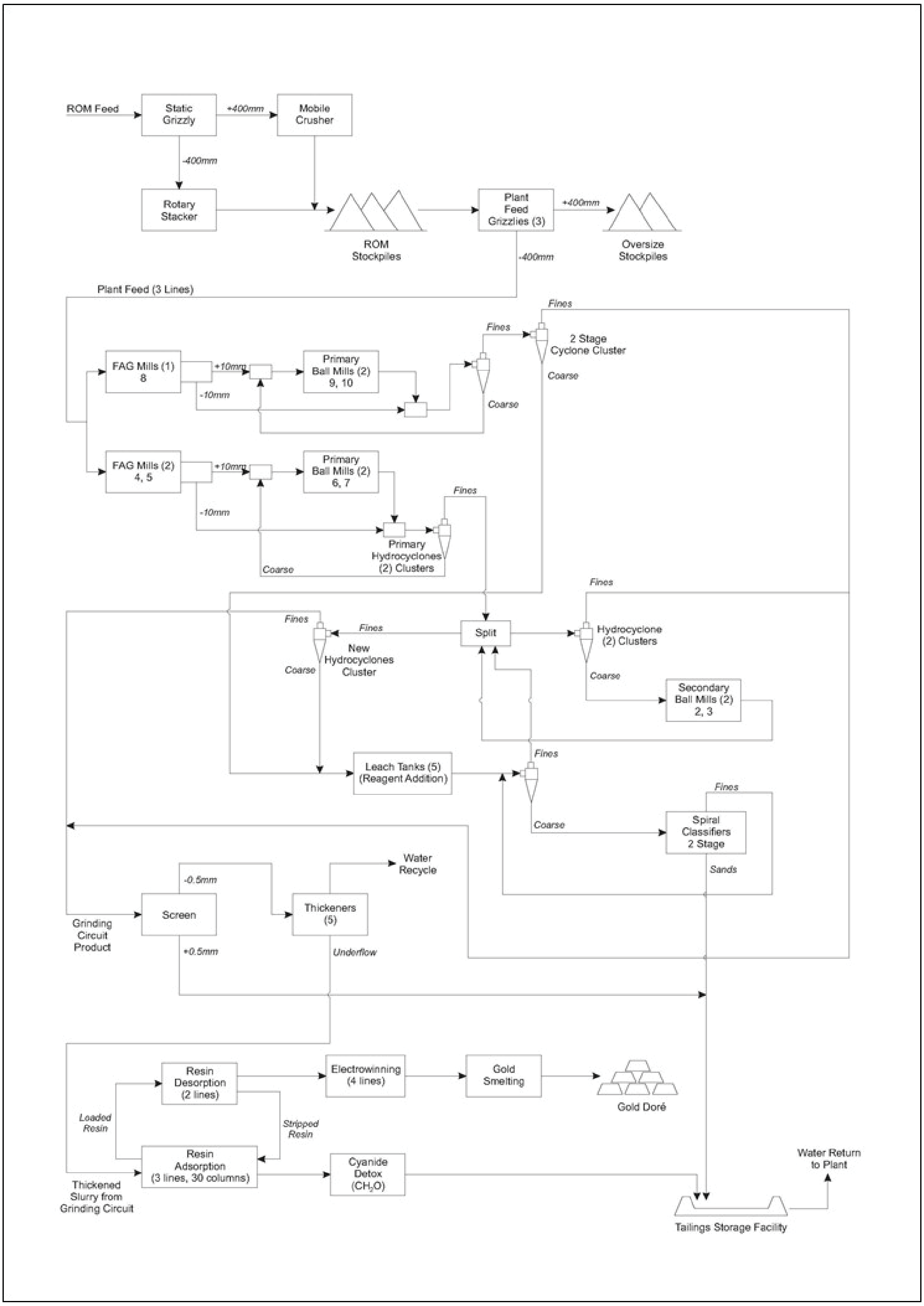
Gold recovery exceeded 88.0% throughout 2015 and 2016, reflecting the ongoing improvements targeting recovery that has been implemented by the operators of the plant.

Table 7.10 Kuranakh - historical processing performance

Description	Unit	2014		2015		2016 (YTD September)	
		Actual	Plan	Actual	Plan	Actual	Plan
Throughput	Mt	3.8	3,8	3.9	3.8	3.1	3.0
Processed gold grade	g/t	1.3	1.3	1.3	1.3	1.3	1.3
Gold recovery to doré - calculated feed grade	%	86.8	84.8	88.4	85.1	88.5	88.2

Detailed feasibility studies by Hatch Ltd (JSC Aldanzoloto GRK, Development Scoping Study, Kuranakh ore deposits, Rev.2, March 2015), and Irgiredmet (No.200/7-16, Irkutsk 2016) have been completed to investigate expansion to 5.0 Mtpa. An operative expansion plan is currently under way and due for completion in 2017. The general arrangement of the expanded circuit is shown in Figure 7.2.

Figure 7.2 Kuranakh - process plant block flow diagram - 5.0 Mtpa



In general, the programme will provide the ability to operate three grinding lines simultaneously at the nominal feed rate of 216 tph, with efficient hydrocyclone classification. Equipment will be installed to improve mill liner replacement in order to achieve 83% overall utilization of time which will be required to reach 5.0 Mtpa. Additional thickener capacity will be provided prior to leaching and adsorption, and the level of process automation throughout the plant will be increased.

Polyus has committed RUB 287 million in 2017 for projects to maintain the throughput rate of 4.5 Mtpa.

Table 7.11 summarises the capital expenditure of RUB 822 million planned for 2017 and 2018 to further expand the throughput rate to 5.0 Mtpa. Upgrading of the ROM area, including replacement of the primary crusher (not shown in Figure 7.2) has been included in the project scope.

Table 7.11 Kuranakh - expansion capital expenditure

Item	2017 (RUB,000s)	2018 (RUB,000s)	Total (RUB,000s)
Technical upgrading and re-equipping of the Mill (circuits)	256,211	3,000	259,211
Thickener No.5	262,357	0	262,357
Ore blending circuit (primary crusher, ROM stockpiling)	65,824	59,600	125,424
Automation of the Mill	98,939	60,700	159,639
Other	11,249	4,208	15,457
Total	**694,580**	**127,508**	**822,088**

The total planned capital expenditure for plant upgrades is approximately RUB 1.1 billion (US$17M).

AMC believes that the throughput ramp-up schedule (4.5 Mtpa in 2017 and 5.0 Mtpa thereafter) is reasonable and achievable, and has included this production level in the LOM plan. Gold recovery is currently stable above 88.5%, and detailed testing and planning has occurred to enable the plant to maintain and improve this level of performance as the feed rate is increased. AMC can support scheduling 88.4% in 2017, and 88.9% thereafter.

7.4.4 Process plant maintenance

The Kuranakh process plant is an old, complex plant that has been operated in two-line mode at 216 tph per line to end 2015. Polyus is executing a programme to expand the throughput of the plant to 5.0 Mtpa, with the main contributing change being operation of all three milling lines. Polyus identified many issues associated with three-line operation at feed rates significantly above 216 tph per line that require correction, either by replacement or repair of equipment, or by improved operational procedures.

At the end of 2016, the mill throughput rate has been increased to approximately 240 t/hr to 250 t/hr.

To reach the expansion goal, the plant is required to operate three-line plant at the new rates with a mechanical availability of 92%, coupled with operational utilization of available time ranging from 82% to 87%.

Progress has been made to improve plant reliability since 2014 with maintenance improvement being a key area of focus for the management team. A standardized Polyus maintenance management system is in use. The system is spreadsheet based and does not use proprietary software. At the time of the site visit, preparations were under way for a trial of three-line operation.

Changes to the grizzly configuration at the ROM are expected to assist maintenance at the feeders and front end of the plant. AMC believes that excluding any barren, but hard material from the feed would help this.

Lifter changes in the mills currently take approximately 10 days to complete. AMC believes that this is longer than at operations where AMC has experience. Once higher mechanical availabilities are required for each mill to meet the plan, this downtime will significantly decrease the mechanical availability of the plant. Polyus could consider seeking assistance from experts in the changing of liners.

7.4.5 Tailings storage facility

The TSF wall is 3.2 km from the plant. The facility is situated in an alluvium-filled valley. Tailings are pumped approximately 4 km.

The TSF is currently operating on its fifth lift and is permitted for a sixth, which will increase the dam height by a further 3 m. Polyus expects that this lift will provide storage for tailings until 2021, at which point a new facility will be required. Operators state that two sites are under consideration for a new TSF in addition to the possibility of designing and permitting a further lift on the existing dam. Increasing the height of the existing dam will require water dams to be moved and a trade-off study of the various options is required to identify the preferred option.

Cyanide detoxification using formaldehyde reduces the total cyanide concentration in the tailings stream that is discharged to the TSF to approximately 0.02 mg/L. AMC is unfamiliar with this method of reduction of cyanide in tailings, however a report entitled *Technological Parameters for Processing Kuranakh Ores*, by TOMS Ltd, dated 2012 states that the method was developed by Irgiredmet.

Water drains readily through the tailings and beneath the dam wall and is intercepted by a series of 23 submersible well pumps that gather this percolation water. Three pumps return percolation water to the plant. Approximately 0.9 Mm^3 is lost during recovery.

Return water is regularly sampled for cyanide content and is controlled below the required limit of 0.05 mg/L of total cyanide. Operation of the well pump/return pump system is monitored and controlled by operators at the TSF site. Samples are collected from all wells, with individual well pumps cycled on and off to control total volume and cyanide concentration. The 2012 TOMS report also states that operators may de-activate the detoxification circuit when the total cyanide level in return water is below the legal limit, especially in summer months when cyanide is decomposed in the TSF by sunlight. Water samples are also taken downstream of the wells at prescribed locations and from piezometers. Operators state that the plant has never recorded a reportable exceedance of the legal cyanide limit in waters exiting the Kuranakh property to the Bolshoi Kuranakh River. Operators report that penalties are payable if this water has cyanide concentration in excess of the permissible level.

Approximately 82% of water used in the plant is sourced from the TSF return water system. Overall the plant has a positive water balance and no additional water sources are required. Future options for water storage are to be considered as part of the TSF location investigations.

7.4.6 Heap leach project

Since 1974, the possibility of heap leaching Kuranakh ore to treat accumulated stockpiles of low-grade ore has been explored. Until recently, mineralization with gold content less than 1.0 g/t was not treated at the Kuranakh process plant. The cut-off grade has recently been reduced to 0.6 g/t. As of 30 November 2016, 62 Mt of stockpiled low-grade ore with an average grade of 0.6 g/t was available for heap leaching. Table 7.12 chronicles heap leaching test work completed by various partners and testing facilities that has been conducted on Kuranakh ore.

Table 7.12 Kuranakh - heap leach trials

No.	Date	Company	Trials Conducted	Feed Grade (g/t)	Feed Size (mm)	Cyanide Consumption (kg/t)	Cement Consumption (kg/t)
1	1974	Irgiredmet	Laboratory testing	3.0-3.5	-	-	-
	1974	Irgiredmet	Pilot testing	1.3-2.8	-100	0.4-0.9	-
2	1996	Echo Bay Mines Ltd, Irgiredmet	Vat leach trials	-	-	0.23	-
3	2004	Irgiredmet	300 t trial	1.1	-125	0.2	7
4	2003	Irgiredmet	Stockpile tests	-	coarse	-	-
	2003	Irgiredmet		-	fines	-	-
5	1995	Irgiredmet	Stockpile tests	1.2	-40	0.2	10
6	1992-96	Newmont Exploration, Hazen Research	Laboratory tests	-	-	-	-
7	1997	Aldanzoloto	Cyanide percolation trials, screened feed	0.4-1.1	various	0.18-0.19	-
8	2010	TOMS Ltd	Lab tests	0.78	-0.074	0.8	-
9	2011	TOMS Ltd	Disintegration, percolation, screened feed	0.47	-50	0.14	-
		TOMS Ltd	Disintegration, percolation, screened feed	0.44	120	0.12	0.03
10	-	Echo Bay Mines Ltd	Agitated leach	1 (approx.)	-150	-	-
	-	Echo Bay Mines Ltd	Percolation leach	1 (approx.)	-150	-	-
11	-	Newmont Exploration, Hazen Research	Agitated leach	0.4	-	-	-
	-	Newmont Exploration, Hazen Research	Percolation leach	0.4	-	-	-
12	-	Hazen Research	Percolation leach	-	-	-	-
13	2010	TOMS Ltd	Agitated leach, crushed fines	0.83	80%-0.074	0.3	-
14	2010	TOMS Ltd	Percolation, screened coarse	0.78	-120+2	0.15	2.0 + 0.3
15	2010	TOMS Ltd	Agitated leach, crushed fines	0.83	80%-0.074	0.3	2.4
16	2010	TOMS Ltd	Percolation, screened coarse	0.63	-50+2	0.12	2.0 + 0.3
17	2010	TOMS Ltd	Agitated leach, screened coarse	0.83	-2+0.2	0.3	2.4
18	2015	Aldanzoloto, Irgiredmet	2 x 25 t percolation trials	0.59-0.85	-125+40	0.15-0.20	10

Testing confirmed the general amenability of the ore to heap leaching using cyanide, with extraction rates greater than 90% achieved in laboratory conditions. In 1995, Irgiredmet recommended the following parameters to achieve 80% gold extraction from heap leaching:

- 0.2 kg/t to 0.3 kg/t cyanide addition.
- 100 L/m^2 to 120 L/m^2 solution application.
- Feed crushing to 100% minus 40 mm.
- 10 kg/t cement addition for agglomeration.
- 8 m lifts.

In 1996, Sibgiprozoloto (GRK), a Siberian research and design institute, confirmed the feasibility of an operational heap leaching design for 1.5 Mtpa. Additional tests were conducted to determine the effect of feed size distribution on gold extraction. The trials established an extraction range of 79.4% to 83.9% with ore crushed to -125 mm, and 84.6% to 87.1% when the feed was crushed to -60 mm. When the feed was agglomerated with 10 kg/t of cement, gold extraction was relatively constant at -150 mm, -60 mm, and -20 mm, indicating that gold extraction is relatively insensitive to feed top size. Crushing to -125 mm was therefore adopted for further process development testing.

The testing programme culminated with Irgiredmet conducting two large-scale, 25 t percolation trials in 2015 at the OK Nadezhniy leaching facility that is adjacent to the Kuranakh TSF. The parameters used were:

- Feed crushed to -125 mm.
- 0.17 kg/t cyanide addition.
- 0.002 kg/t NaOH.
- 10 kg/t cement.
- 10 m lifts.

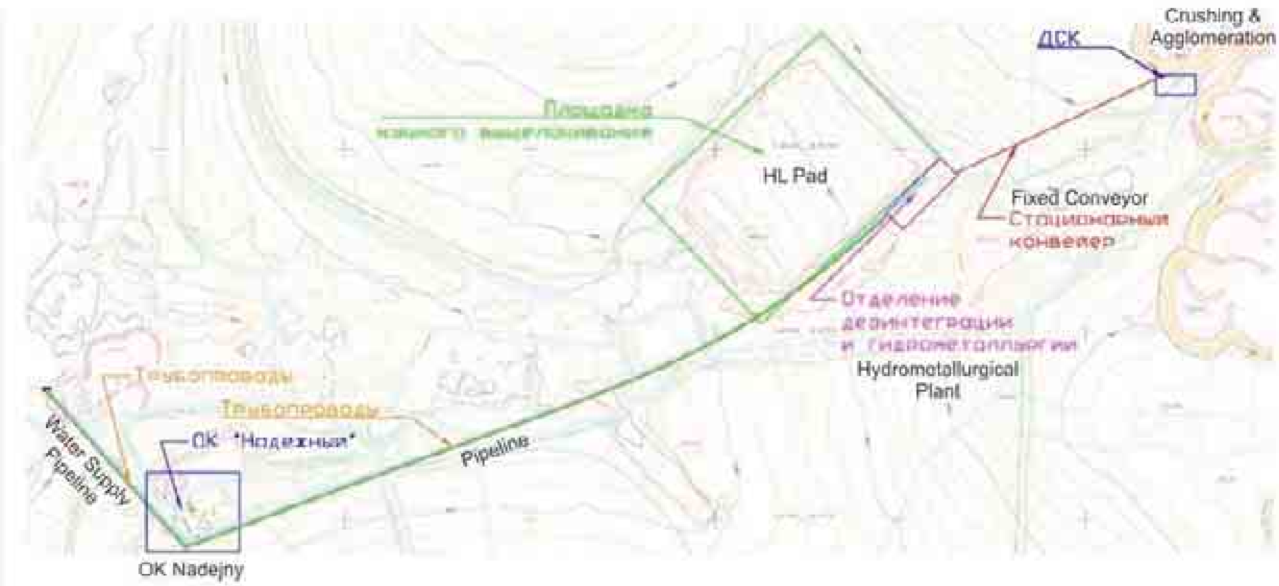
A scale-up factor was derived from the column/heap testing data under comparable leaching conditions. An additional 50% safety factor was applied to the scale-up. Use of this factor resulted in the adoption of an extraction of 72.28% rather than the approximate 80% extraction indicated from the test work. While AMC is unfamiliar with the scale-up procedure applied, the 10% reduction in extraction to 72.28% appears reasonable.

Multiple reports were generated as the testing and evaluation process progressed. AMC has referred primarily to the most current reports from Irgiredmet in 2016 (the 2016 Report) which summarise and document all previous test work, and the final results of the feasibility study conducted by Polyus and Irgiredmet:

- Technological Report No.200/7-16, Irkutsk 2016.
- Addendum to the Technological Report, Contract No.563/5-15, Irkutsk 2015.

Figure 7.3 shows the locations of elements of the heap leach plant that are recommended by Irgiredmet in the 2016 Report. Crushing and agglomeration will be located adjacent to stockpiles 23 and 26 in the Centralniy area. Prepared feed will be conveyed southwest to the first heap leach pad. Pregnant leach solution (PLS) will be pumped to the old OK Nadezhniy CIL plant where gold concentrate will be produced. Water for the process will be supplied from the decant pond of the Kuranakh TSF which lies close-by to the west of OK Nadezhniy.

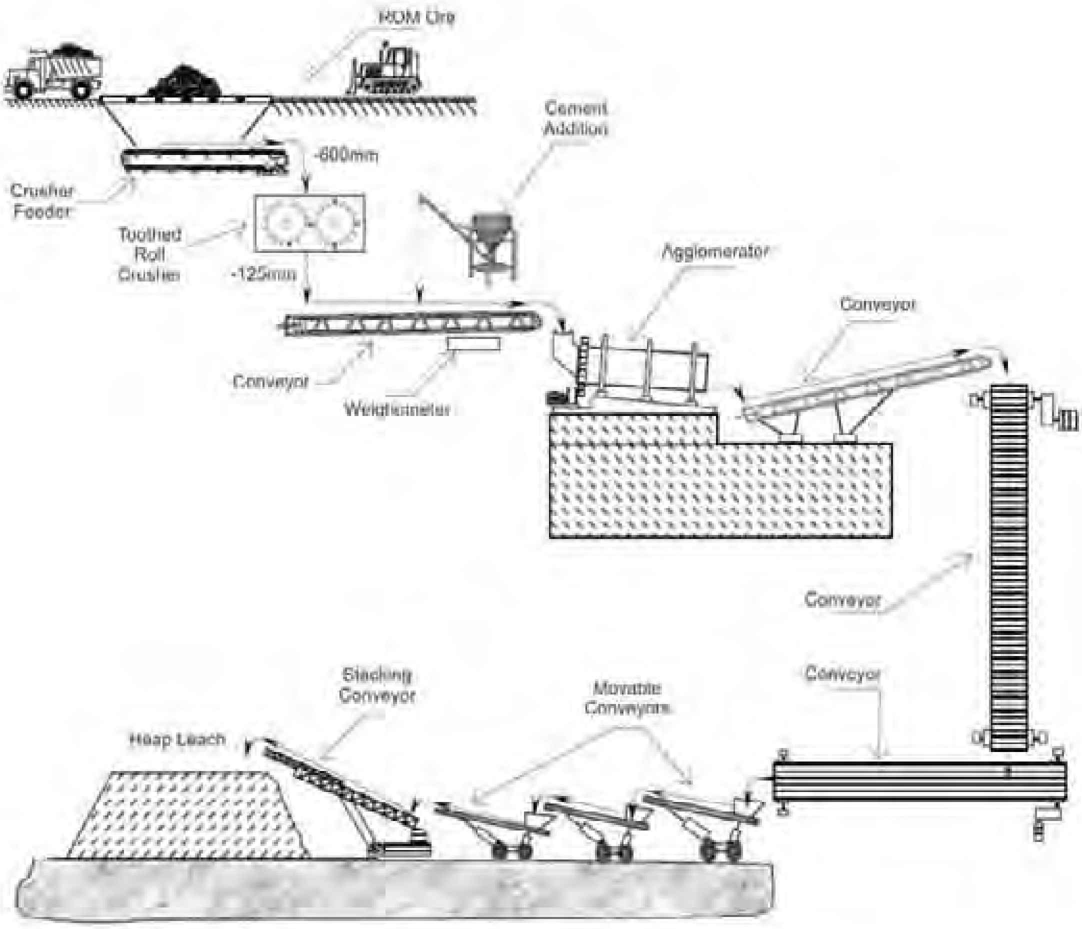
Figure 7.3 Kuranakh - location of heap leach facilities



The 2016 Report examined two options for heap leaching. Option 1 utilized trucks to transport prepared ore to the heap leach pad while Option 2 employed fixed conveying. Both options used the same heap leach pad design, hydrometallurgical plant, and upgraded OK Nadezhniy CIL plant. The 2016 Report showed a marginally higher value for Option 1, however Polyus staff state that capital expenditure requirements for the Option 2 fixed conveyor system will be reduced due to re-use of some components already on site, and so this option was selected.

The general arrangement for Option 2 is shown in Figure 7.4.

Figure 7.4 Kuranakh - heap leach schematic - fixed conveyor option



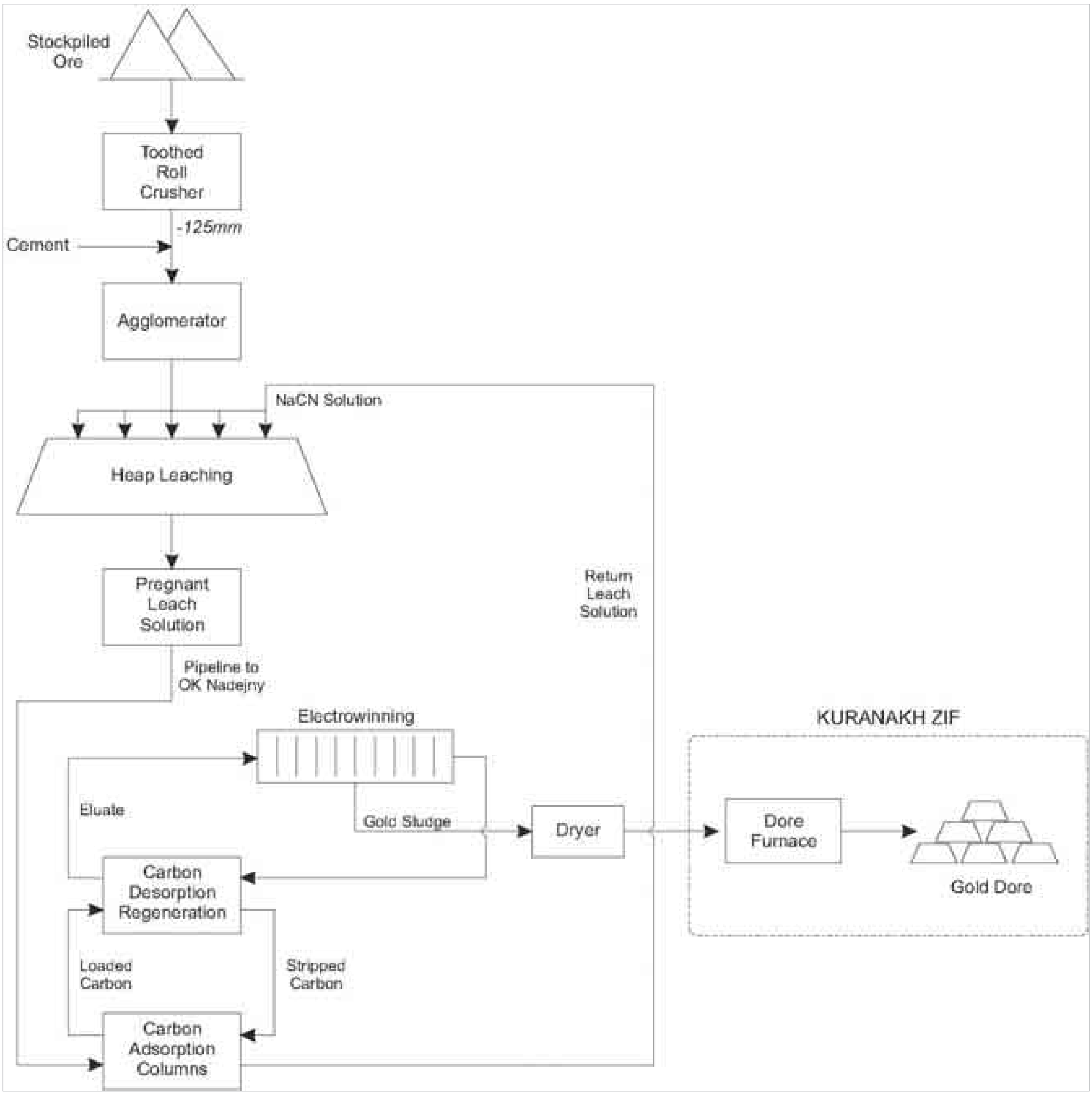
The selected heap leach pad design features two pads with a capacity of 7.5 Mtpa each. Each pad will provide five years of operating life. Pad No.1 is shown in Figure 7.3. A site for Pad No.2 in the Centralniy area has been selected. After ten years of operation, readily available ore in the area will be exhausted and a new plant will be required that is sited appropriately for available, leachable ore. This relocation will also include construction of a new CIL plant because OK Nadezhniy will be inundated as the level and extent of the Kuranakh TSF increase. Provision has been made in the capital plan for a new CIL plant after ten years, and additional 7.5 Mt leach pads every five years until 2027.

Each pad will be constructed in four, 10 m lifts. Each lift will consist of six panels, and each panel will consist of eight cells. A detailed feed preparation and placement schedule has been developed. 1.25 Mt of prepared ore will be placed in 123 days (25 May to 24 September) during the 2017 operating, summer season. In subsequent years, 1.5 Mtpa will be placed. Placement of the planned ore in 2017 is contingent on significant civil construction and equipment installation being completed during the 2016/2017 winter, and into the spring and summer of 2017. The project schedule required completion of all civil works beneath Pad No.1, and installation of the pad liner for panels 1 and 2 prior to the onset of winter so that placement of prepared ore can begin on schedule on 25 May 2017. The project team reports that these critical milestones were attained, and that non-temperature-dependant tasks are progressing to schedule during the winter.

PLS from the hydrometallurgical plant is pumped approximately 1.5 km to the CIL plant at OK Nadezhniy. As part of the project, the plant is being upgraded to match the capacity of the 1.5 Mtpa leaching operation, with an expected average recovery of 72.3%.

The block flow diagram for the OK Nadezhniy CIL plant is presented in Figure 7.5.

Figure 7.5 OK Nadezhniy - CIL plant - block flow diagram



The estimated capital expenditure requirement to complete the first pad of Option 2 is RUB2.1 billion (including capital already spent to 31 December 2016). This includes the construction cost of the processing facility, construction of pad 1, construction of pad 2 and sustaining costs for the first 5 years of operation.

RUB379 million of the estimated capital has been spent to 31 December 2016, and RUB1.2 billion (US$18.9M) is to be spent in 2017.

AMC assumed that capital expenditure of RUB440 million (US$6.8M) for construction of Pad No.2 is required in 2021, and every five years thereafter for additional pads.

Sustaining costs for the processing facilities of RUB10 million (US$0.15M) per annum are included from 2022.

The estimates are in reasonable agreement with the Irgiredmet processing facility estimate.

The operating cost estimate is presented in Table 7.13.

Table 7.13 Kuranakh - heap leach project - operating cost summary

Item	RUB/t
Mining and Transportation	58
Processing	277
Pads and Ponds	44
Total	**379**

AMC recommendation

AMC supports the capital expenditure and operating cost estimates from the 2016 Report, and these have been carried into the LOM schedule.

While the project plan is aggressive, with construction work continuing during the 2016/2017 winter, AMC supports the LOM plan which includes placement of 1.25 Mt in 2017, but leaching of 922,000 t. Gold extraction of 72.3% has been used in the LOM plan, which is supported by test work. AMC notes a risk that the extraction during commissioning and ramp-up of the leaching operations and CIL plant could be less than planned.

7.5 Planned production and costs

Production and costs - Reserve Case

A LOM plan was prepared using the Minemax schedule optimization software to provide a schedule that improves the overall value of the project. The results of the schedule were output to Microsoft Excel spreadsheets for review and analysis. The operating and capital cost estimates are based on the production schedule and technical and operating criteria described in this CPR.

A summary of the Kuranakh LOM production schedule is presented in Table 7.14 showing the mining, processing, and cost information. Annual mined tonnage and head grade were based on the Reserve Case mining schedule, process plant throughput and gold production rates with all Inferred Mineral Resources regarded as waste. The mining schedule and mining operating costs are based on the current equipment fleet, mining rate and the Polyus 2017 budget with appropriate allowances for expanded mining rate to accommodate increased production or haul distance changes.

The production schedule and operating costs are based on the following assumptions and qualifications:

- A gold price of US$1,250/oz.
- All RUB denominated costs were in real 2017 terms and converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on the Polyus 2017 budget, with AMC adjustments where appropriate. No provision was made for offsite corporate costs.

Capital cost estimates are included for:

- Plant expansion to achieve 5.0 Mtpa as described in the Kuranakh ore processing section of this CPR.
- Heap leach processing to achieve 1.5 Mtpa from 2017 as described in the ore processing section.
- A sustaining capital cost allowance of US$2M per annum for the plant and US$0.15M per annum for the heap leach project was included to allow for minor equipment replacement and for progressive tailings dam wall raising.
- Additional and replacement mining equipment. An equipment expenditure schedule was developed to allow for equipment replacement to maintain high availability to the operation.

Outcomes of strategy optimization studies at Kuranakh may result in changes to the capital cost estimates. In particular, a decision to increase the height of the existing TSF dam wall would trigger the need for a new CIL plant to replace the existing CIL plant at OK Nadezhniy, which would be inundated.

Closure costs were estimated by an independent consultant and were adjusted to 1 January 2017. These costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

Table 7.14 Kuranakh - planned production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25
Mined											
Ore mined - tonnes	Mt	74	4.5	5.0	5.0	5.0	5.0	25.0	22.9	1.4	-
Ore mined - contained gold	Moz	3.2	0.19	0.21	0.27	0.22	0.21	1.07	0.99	0.05	-
Waste mined - tonnes	Mt	285	29.4	25.6	19.4	19.5	19.5	96.8	71.8	3.3	-
Total material mined	**Mt**	**359**	34	31	24	24	24	122	95	5	-
Reclaimed from Stockpiles to Process Plant											
Ore reclaimed - tonnes	Mt	32	-	-	-	-	-	-	2.1	23.6	6.2
Ore reclaimed - contained gold	Moz	0.6	-	-	-	-	-	-	0.05	0.46	0.12
Processed											
Ore - Process Plant - tonnes	Mt	106	4.5	5.0	5.0	5.0	5.0	25.0	25.0	25.0	6.2
Ore - Process Plant - grade	g/t	1.1	1.3	1.3	1.7	1.4	1.3	1.3	1.3	0.6	0.6
Ore - Process Plant - contained gold	Moz	3.8	0.19	0.21	0.27	0.22	0.21	1.07	1.04	0.50	0.12
Process Plant - recovered gold	Moz	3.4	0.16	0.18	0.24	0.19	0.18	0.95	0.92	0.45	0.11
Ore - Heap Leach - tonnes	Mt	30	0.9	1.5	1.5	1.5	1.5	7.5	7.5	7.5	0.6
Ore - Heap Leach - grade	g/t	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
Ore - Heap Leach - contained gold	Moz	0.61	0.02	0.03	0.03	0.03	0.03	0.15	0.15	0.14	0.01
Heap Leach - recovered gold	Moz	0.44	0.02	0.02	0.02	0.02	0.02	0.11	0.11	0.10	0.01
Total Ore - Plant + Heap Leach - tonnes	Mt	136	5.4	6.5	6.5	6.5	6.5	32.5	32.5	32.5	6.8
Total Ore - Plant + Heap Leach - grade	g/t	1.0	1.2	1.2	1.5	1.2	1.2	1.2	1.1	0.6	0.6
Total Ore - Plant + Heap Leach - contained gold	Moz	4.4	0.21	0.24	0.30	0.25	0.24	1.21	1.20	0.65	0.13
Total - Plant + Heap Leach - recovered gold	Moz	3.8	0.18	0.21	0.27	0.22	0.21	1.05	1.04	0.55	0.12
Operating Costs											
Mining	US$/t mined	1.89	1.56	1.63	1.78	1.87	1.82	1.91	2.13	2.14	-
Stockpile reclaim and haulage costs	US$/t reclaimed	2.27	-	-	-	-	-	-	1.18	2.46	1.90
Process Plant	US$/t ore processed	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12
Heap Leach (including reclaim)	US$/t ore leached	5.95	8.10	5.95	5.95	5.95	5.95	5.95	5.95	5.95	2.51
Selling, general and administrative	US$/t ore total	1.22	1.45	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.15
Refining and transportation	US$/oz refined gold	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Initial Capital Costs											
Mining	US$M	18	18	-	-	-	-	-	-	-	-
Process Plant	US$M	17	15	2	-	-	-	-	-	-	-
Heap Leach	US$M	39	19	-	-	-	7	7	7	-	-
Closure	US$M	8	-	-	-	-	-	-	-	-	8
Total	**US$M**	**82**	**52**	**2**	**-**	**-**	**7**	**7**	**7**	**-**	**8**
Sustaining Capital Costs											
Mining	US$M	96	2	8	2	2	12	50	8	13	0
Process Plant	US$M	36	-	-	2	2	2	10	10	9	1
Heap Leach	US$M	2	-	-	-	-	-	1	1	1	-
Total	**US$M**	**134**	**2**	**8**	**4**	**4**	**14**	**60**	**19**	**23**	**1**

Note:

1. Any minor discrepancies for sums in the table are related to rounding.

Production and costs - Alternate Case

Table 7.15 shows the Alternate Case production schedule and costs. This case includes consideration of Inferred Mineral Resources from each of the modelled areas. The same scheduling parameters were used for this case as the Reserve Case.

Table 7.15 Kuranakh - planned production and costs - Alternate Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25
Mined											
Ore mined - tonnes	Mt	86	4.5	5.0	5.0	5.0	5.0	25.0	25.0	12.0	-
Ore mined - contained gold	Moz	3.6	0.2	0.2	0.3	0.2	0.2	1.1	1.0	0.4	-
Waste mined - tonnes	Mt	272	16.3	19.2	19.5	19.6	19.4	97.0	62.4	18.3	-
Total material mined	**Mt**	**358**	21	24	25	25	24	122	87	30	-
Reclaimed from Stockpiles to Process Plant											
Ore reclaimed - tonnes	Mt	33	-	-	-	-	-	-	-	13.0	20.1
Ore reclaimed - contained gold	Moz	0.6	-	-	-	-	-	-	-	0.25	0.40
Processed											
Ore - Process Plant - tonnes	Mt	120	4.5	5.0	5.0	5.0	5.0	25.0	25.0	25.0	20.1
Ore - Process Plant - grade	g/t	1.1	1.3	1.3	1.6	1.4	1.3	1.3	1.2	0.9	0.6
Ore - Process Plant - contained gold	Moz	4.2	0.19	0.21	0.26	0.22	0.21	1.06	0.97	0.69	0.40
Process Plant - recovered gold	Moz	3.7	0.17	0.18	0.24	0.19	0.19	0.94	0.86	0.61	0.35
Ore - Heap Leach - tonnes	Mt	30	0.9	1.5	1.5	1.5	1.5	7.5	7.5	7.5	0.6
Ore - Heap Leach - grade	g/t	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.7
Ore - Heap Leach - contained gold	Moz	0.62	0.02	0.03	0.03	0.03	0.03	0.15	0.16	0.15	0.01
Heap Leach - recovered gold	Moz	0.45	0.02	0.02	0.02	0.02	0.02	0.11	0.12	0.10	0.01
Total Ore - Plant + Heap Leach - tonnes	Mt	150	5.4	6.5	6.5	6.5	6.5	32.5	32.5	32.5	20.7
Total Ore - Plant + Heap Leach - grade	g/t	1.0	1.2	1.2	1.4	1.2	1.2	1.2	1.1	0.8	0.6
Total Ore - Plant + Heap Leach - contained gold	Moz	4.8	0.21	0.24	0.30	0.25	0.24	1.21	1.13	0.83	0.41
Total - Plant + Heap Leach - recovered gold	Moz	4.2	0.18	0.21	0.26	0.22	0.21	1.05	0.98	0.71	0.36
Operating Costs											
Mining	US$/t mined	1.98	1.65	1.86	1.87	1.83	1.91	2.00	2.07	2.25	-
Stockpile reclaim and haulage costs	US$/t reclaimed	2.30	-	-	-	-	-	-	-	2.45	2.21
Process Plant	US$/t ore processed	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12
Heap Leach (including reclaim)	US$/t ore leached	5.95	8.10	5.95	5.95	5.95	5.95	5.95	5.95	5.95	2.53
Selling, general and administrative	US$/t ore total	1.22	1.46	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.21
Refining and transportation	US$/oz refined gold	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Initial Capital Costs											
Mining	US$M	18	18	-	-	-	-	-	-	-	-
Process Plant	US$M	17	15	2	-	-	-	-	-	-	-
Heap Leach	US$M	39	19	-	-	-	7	7	7	-	-
Closure	US$M	8	-	-	-	-	-	-	-	-	8
Total	**US$M**	**82**	**52**	**2**	**-**	**-**	**7**	**7**	**7**	**-**	**8**
Sustaining Capital Costs											
Mining	US$M	102	2	8	2	2	24	54	7	3	1
Process Plant	US$M	44	-	-	2	2	2	10	10	10	8
Heap Leach	US$M	2	-	-	-	-	-	1	1	1	0
Total	**US$M**	**148**	**2**	**8**	**4**	**4**	**26**	**64**	**18**	**14**	**9**

Note:

1 Any minor discrepancies for sums in the table are related to rounding.

7.6 Permitting, environment, community, safety, and mine closure

7.6.1 Permitting

AMC has not sighted the permits and approvals register for the Kuranakh operations. Recent, independent audits of the environmental (ISO 14001) and health and safety (OHSAS 18001) systems for the Kuranakh operations noted that an approvals register is maintained as part of the system, and was observed to be kept up to date, and made available to relevant staff across the operation. Compliance with regulatory requirements was carried out with oversight through a system of inspections by internal and external parties.

The conditions and requirements of the various permits and approvals are managed across the organization though the IMS.

There were no reports of serious non-compliances with legislation and regulation.

7.6.2 Environment

The site operates in compliance with the ISO14001 Environmental Management System and OHSAS 18001 Health and Safety Management System.

AMC interviewed the Environmental Manager on the site visit and the following comments are relevant. Irgiredmet is the author of the Environmental Impact Assessment document. Polyus reports that the site follows the Environmental Impact Assessment and all works are conducted according to government regulations. Polyus reports that there are no exceedances of the mandated limits.

Cyanide is used on site as a critical part of the process flowsheet. Cyanide detoxification using formaldehyde reduces the cyanide concentration in the tailings stream. Polyus reports that a sampling regime is in place with an internal target for maximum cyanide content in released water of 0.02 mg/L. This is well below the limit for waters supporting fish populations of 0.05 mg/L.

The main risks identified for the site are dust and airborne contaminants. The coal plant has a monitoring regime in place to test for dust exposure.

From the start of 2016, the site expects to change to using grid power supplied from a hydroelectric station. Polyus reports plans to install a gas pipeline to replace the need for a coal-fired heat generating plant for the town and operations. Both improvements should significantly reduce the potential for safety and environmental issues.

7.6.3 Community

The operation is located in the Aldan District of the Republic of Sakha (Yakutia). The population of the district on 1 January 2009 was 46.9 thousand people. The bulk of the population is Russian (77.4%). The remainder of the population is formed of Sakha (3.6%), Evenk (3.0%) Evens (0.4%) and others (15.3%). The average age of the population was 33 years.

The administrative centre is Aldan, located 534 km from Yakutsk by road. There are 18 settlements: 13 rural, two cities of regional value, three settlements in the district.

The area offers a wide range of natural and economic resources: rich deposits of gold, platinum, mica, granite, marble. The natural landscape predisposes the development of tourism.

Mining is the primary economic activity of the district. Other developing industries include forest and wood production, jewellery and food production industries. Agricultural activity is predominantly meat and dairy production.

In the city of Aldan has two specialized secondary schools, Aldan polytechnic and medical school. In addition, there are 32 secondary schools in the region.

The operation is located approximately 1 km to 5 km to the east of the Lower Kuranakh village. The nearest large towns in close proximity to the operation are the cities of Aldan and Tommot. The distance to the administrative centre Aldan is 25 km and to Tommot about 60 km via sealed road.

7.6.4 Safety

The occupational health and safety statistics for the Yakutia business unit (including Kuranakh operations) in 2016 were:

- Injury rate (per 200,000 hours worked) of 0.93, which includes fatalities, lost time injuries and medical treatment injuries.
- Lost time injury frequency rate (per 200,000 hours worked) of 0.26.
- Fatality frequency rate (per 200,000 hours worked) of 0.07.

Kuranakh is accredited to safety system to OHSAS 18001. The operation did however, incur a fatality during 2016. Further commitment to the standards, together with the generally good safety performance indicated by the above statistics demonstrates that occupational health and safety does not appear to be a material risk to ongoing operations.

7.6.5 Mine closure

A closure cost estimate was originally prepared for the Kuranakh operation by independent consultants in 2012. The plan is due to be updated once the strategic plan is confirmed and the facilities to be included are known The mine has been in operation for many years and plans to conduct remediation throughout the remaining life of the project are likely to reduce the overall cost of closing the site. The strategic planning cycle is also the best opportunity to adjust the rehabilitation plans to accommodate changes to government policy and community expectations.

Version 1.4.1 Build 16 of the Standardized Reclamation Cost Estimator was used to prepare the estimates. Key assumptions and exclusions included:

- Exclusion of salvage costs.
- Inclusion of human resources, severance and outplacement costs.
- Inclusion of property holding costs.

Total closure costs (asset retirement obligation) for Kuranakh were updated as at 1 January 2017 were estimated to be approximately US$8M. The estimate does not include a contingency. Polyus is not required to pay an environmental security deposit and mine closure costs are included in the capital cost assessments for the operation.

7.7 Risks and opportunities

The following risks are identified for Kuranakh:

- The metallurgical performance of the ore results in reduced recovery or increased costs. Blending to control deleterious elements is based on information collected during mining. Three dimensional geological modelling inclusive of geology, lithology and metallurgical parameters has not been completed. Therefore, the understanding and predictability of ore types for future process plant feed could be improved. Noting. However, that the long history of the operation mitigates this risk.
- Plant expansions and upgrades, which are currently underway, are delayed resulting in deferred production and cost overruns.
- Heap leach processing facilities are delayed, resulting in deferred production, and cost overruns.
- The ore tonnage or grade deviates from the expected values. A comprehensive reconciliation system would assist in mitigating this risk. None of the Mineral Resource is classified as Measured. Best practice is that sufficient drilling has been completed to define a reasonable proportion of Measured Mineral Resource as part of the near term ore supply. This may result in higher than expected grade variability.
- The resource model is not representative of the orebody.
- The grade control blocks are not representative of the area to be mined.
- The anticipated grade is not achieved due to increased dilution from mining ore on 10 m benches which is not recommended for selective mining of the relatively flat-lying mineralization.

The following opportunities are identified for Kuranakh:

- Increase the process plant throughput using results from a debottlenecking study that is underway; this potentially would increase gold production and lower unit operating costs.
- Pit slopes may be made steeper if further geotechnical studies are undertaken, though pits are relatively shallow and limited benefit may be gained.
- Improved project value by optimizing the order in which the pits are mined and ore is processed in the plant and heap leach pads.
- AMC considers implementation of a maintenance management system to be a logical step for Polyus at the Kuranakh plant which will deliver additional cost-reduction and equipment-availability benefits.

8 Natalka

8.1 Introduction

8.1.1 Property location and description

Natalka is located near the town of Omchak in the Tenkinskiy district of the Magadan Region of northeast Russia (refer Figure 1.5), and approximately 400 km northwest of the city of Magadan and 130 km from the district centre of Ust-Omchug (population 5,000).

Gold is the Magadan region's main resource, although silver and tin deposits are also being developed. There are nearly 2000 placer gold deposits, 100 gold ore deposits, and 48 silver ore deposits in the region.

Magadan is a city and seaport on the Sea of Okhotsk, located in the northeastern part of Russia (the Far East) and provides convenient access for large-tonnage ships. The port is open for navigation all year round by resident icebreakers. Magadan has a small international airport.

The climate of the Natalka area is classed as sub-arctic. Winters are prolonged and very cold, with up to six months of sub-zero temperatures, so that the soil remains permanently frozen. Permafrost ranges to depths of 180 m to 350 m. In summer the surface thaws to depths from 1 m to 5 m.

The average annual temperature in the region is sub-zero with extreme temperatures at or below minus 50°C in January and February. Summers are cool and generally cloudy with rain and mist. Maximum summer temperatures vary from 10°C to 15°C.

Natalka can be accessed from Magadan via a relatively well maintained all-weather road.

The Tenkinskiy district covers the Chukchi highlands, which is characterized by a dendritic pattern of upland areas and deeply incised valleys. Valley bottoms range from 750 m to 1,000 m above sea level and the surrounding mountains range in height up to 1,600 m. Tundra covers most of the region.

The Natalka area is 600 km from the seismically active region of Kamchatka, and 200 seismic events have been recorded since 1967. Thirty events measured equal to or greater than three on the Richter scale, though none have exceeded a magnitude of five.

8.1.2 Mineral tenure

АО Рудник имени Матросова (RiM), a wholly owned subsidiary of Polyus, holds mining licence MAG 04658 BE pertaining to Natalka Gold Deposit. The lease area comprises 22.1 km^2.

The original mining licence MAG 00274 BE was granted to RiM on 16 December 1992. When the RiM was reformed into a public limited company RiM the licence was re-registered as MAG 01491 BE dated 7 December 1995. Later, the public limited company RiM, changed its name to OJSC RiM and licence MAG 01491 BE was re-registered as MAG 11478 BE. Two additional agreements were signed to licence MAG 11478 BE. The licence was updated for the first time on 28 September 2004, and for a second time on 17 August 2011.

The mining licence was re-issued as MAG 04658 BE on 21 June 2016 and expires on 31 December 2036, after which an extension can be requested until the deposit is exhausted.

The mining licence allows OJSC RiM to undertake open pit mining operations above an elevation of 450 mRL within the licence area. Licence MAG 04658 BE covers an area of 22.1 km^2.

Polyus advises that it is materially in compliance with the terms and conditions of the subsoil use agreements and land lease agreements.

AMC has not independently verified the standing of the mining licences.

8.1.3 Project background and status

The 2016 Mineral Resource estimate and 2016 Ore Reserve estimate for the Natalka gold project were prepared by AMC and Micromine Consulting Services (MCS). These estimates and supporting data were consolidated into this CPR by AMC and summarized in this section.

Natalka is located in the Magadan Region of Far Eastern Russia. Mining operations at Natalka have a long history, with underground operations starting in 1945 at the Matrosova mine. Operations focused on higher-grade mineralization in the central portion of the deposit. Underground operations ceased in 2004 when underground mining and minor open pit mining became uneconomic. The project was then reconfigured as the large Natalka open pit operation that encompasses the entire underground operation, with the remaining high-grade mineralization, and additional Mineral Resources of a lower-grade, suitable for open pit operations.

Construction of a new processing facility began in 2012, and the mining pre-strip began in December 2012. Ore was stockpiled during pre-strip mining. After the first year of mining, initial reconciliations indicated that the ore grade was not as expected, and plant construction was suspended in December 2013, while reviews of the geology and mining methods were conducted.

The 2014 Natalka Mineral Resource was estimated by MCS early in 2015 after an audit of the data and methods used in the previous estimate. An updated Ore Reserve estimate was prepared by AMC in 2015 using the MCS resource model, Mineral Resource estimate, and plant configuration without change. Both estimates were current as at 31 December 2014.

During 2016, Polyus conducted further testing and optimization of the plant configuration with the assistance of Hatch Ltd. This led to improved financial outcomes through changes in the plant flowsheet to remove the flotation circuit resulting in reduced capital expenditure and operating costs, albeit with reduced gold recovery. AMC then prepared a new mine plan, based on the 2014 MCS resource model, to suit the updated flowsheet and an updated the Ore Reserve was estimated as at 31 December 2016. The Mineral Resource estimate was updated to reflect the new limiting pit shell based on the 2016 mine planning assumptions.

Pit optimizations and the 2016 Ore Reserve estimate are based on a 10.1 Mtpa plant throughput rate scenario. The Mineral Resources and Ore Reserves were estimated at a process break-even cut-off grade of 0.6 g/t and depleted by the actual mine production as at 31 December 2016.

Mineralization below 0.6 g/t is estimated to be uneconomic at this time. Low-grade mineralization between 0.4 g/t and 0.6 g/t is planned to be stockpiled separately for treatment at the end of the mine life if required.

Both the Mineral Resource and Ore Reserve estimates include surface stockpiled material in the high-grade and medium-grade categories totalling 6.8 Mt at 1.3 g/t for 0.3 Moz.

The 2016 process flowsheet for Natalka consists of a conventional gravity separation circuit followed by high-intensity cyanidation and conventional CIL to produce gold-silver bullion.

At 31 December 2016, construction activities were on-going and mining activities recommenced in January 2017. Polyus advises that it now anticipates commissioning the Natalka project by the end of 2017.

8.2 Geology and Mineral Resources

The Natalka Mineral Resource was updated in 2015 to incorporate revised data inputs, interpretations, estimation process, parameters, and revised cut-off grades after it was determined that the incorporation of underground channel sample data was causing material bias issues in the previous model. The problematic data was excluded and the model updated by MCS. In 2016, cut-off grades for the open pit resource have again been marginally increased for the open pit material from 0.40 g/t to 0.60 g/t as a result of changed economic parameters. Similarly, the constraining US$1,500 optimization shell used for reporting the Mineral Resource has been revised and reduced in size due to changed mining cost parameters. This impacts on the quantum of material being reported as an underground Mineral Resource, reported at a constant 2.5 g/t.

8.2.1 Geology

Three gold deposits were discovered within the Omchak district: Natalka, Omchak and Pavlik. Gold mineralization is encountered in the low-sulphide quartz veins alternating with small veins of arsenopyrite and pyrite mineralization. Several gold placers were previously mined in the region around Natalka. Most of the large deposits in the valley of the Omchak River are already depleted.

The Natalka mineralization is hosted in Upper Permian carbonaceous sediments, principally black shales. The main mineralization zone is developed within the volcanogenic-sedimentary sequence (Nerruchenskaya and Atkanskaya suites). The mineralization zones extend for approximately 4.5 km along strike with continuity down dip to 700 m below surface. Gold mineralization zones have a north-west to south-east trend with a vertical to steep north-east dip. Thickness of the host varies from 50 m to more than 400 m.

The mineralized zone width increases towards the south-east, after which the orebody is divided into three branches: west, central and east. In the south-east the mineralized zone wraps around the hinge and centre line of the Natalka syncline and pinches out in the north-east limb.

The inner core zone of the deposit is characterized by presence of several mineralized structures mainly confined to the large tectonic faults. These mineralized structures are represented by contiguous tectonic zones and quartz/quartz-carbonate veinlets. The main faults are accompanied by zones of lower-order structures branching out south-eastward in a fan-like configuration

Gold-quartz-arsenopyrite mineralization is associated with quartz veinlets. The internal structure of the mineralized zone is most likely determined by the density of quartz veinlets and by diagonal crosscut faults within the mineralization zone. The gold occurs as relatively coarse (0.1 mm to 2 mm) particles (free gold proportion of total can be 87.3%) or finely disseminated particles in a sulphide host (arsenopyrite).

The grade of gold mineralization is correlated with the intensity of veining and brecciation and the quartz and sulphide content. Major sulphides are arsenopyrite and pyrite occurring in quartz veins and as disseminations within the host rocks. The sulphide content of the mineralization does not exceed 5%. Gold demonstrates a complex distribution. Gold grade gradually diminishes from the core of the deposit towards its flanks.

8.2.2 Exploration

The Natalka gold deposit has been explored since 1942 by underground channel sampling, trenching and drilling. Underground production commenced in 1945 at the Matrosova mine. Exploration was completed in parallel with mine development.

High-grade zones were selectively mined, using conventional underground stoping methods. Mining followed vein zones using visual grade control, and assays from channel samples. Vein zones were generally traced by underground drifts along strike and by crosscuts across strike.

After underground mining stopped in 2003, the project geology was revised in order to estimate the full Mineral Resource potential of the deposit. Exploration programmes conducted between 2004 and 2006 were designed to evaluate low-grade bulk stockwork mineralization. The programme included underground development and inclined diamond drilling at Level 600, surface trenching, inclined surface diamond drillholes and reverse circulation (RC) drilling.

A second major phase of drilling commenced in 2010 to identify high-grade material for selective mining. 773 diamond and 236 RC holes were drilled on a 50 m x 25 m to 30 m grid in the central part of Natalka. Holes were drilled at azimuths 240° to 223° and dip 58° to 62° with an average depth of 58 m, ranging from 12 m to 159 m.

In early 2014, the stockpiles of the ore which was mined in 2013 were reconciled with the block model tonnes and grades based on by drilling and bulk sampling. The reconciliation demonstrated poor results and Polyus decided to conduct a full scale review of the reasons for such poor results.

The key outcome from this study was the decision that the existing resource model did not represent the geology, the ore tonnage and the ore grade of the ore body, and was not suitable for the mine planning purposes. A new resource model was generated and tested by further drilling and pilot mining.

To provide greater confidence in the 2014 resource model, a verification drilling programme was designed and completed in 2014. Three test areas, each containing approximately 125,000 m^3 of material, were densely drilled. The drill area was selected so as not to intersect old voids. Two 50 m x 50 m test areas, drilled to 50 m depth, were designed to test the likely occurrence of low-grade and medium-grade mineralization, and the third at 100 m x 25 m drilled to 50 m depth was designed to test an area of high-grade mineralization. Blocks were aligned with the existing drilling grid. Each of the verification drillholes was drilled with an azimuth of 240° and a dip of –60°, essentially parallel to the existing holes.

For the purposes of resource model verification, forty-one drillholes were drilled at each of the verification test areas at 7 m x 7 m spacing. The new samples were compared to the resource model estimates in order to check the reliability of the grade estimates. Verification drilling holes were drilled with HQ (64 mm) diameter core. Drilling results provided good support to the 2014 resource model.

8.2.3 Mineral Resource estimation parameters

The Mineral Resource estimate for Natalka was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- The original Mineral Resource estimate was carried out with an effective date of December 2014. An update was carried out to reflect mining depletion and a new limiting pit shell based on the new mine planning assumptions.
- Sample database – the drillhole database is comprised of diamond holes (both surface and underground) and RC holes completed since 2004. Early drillholes were excluded in part due to poor sample recoveries. Project drilling consists of a total of 1,472 holes for a combined total of 183 km of drilling, of which 1347 holes were in the immediate resource area. Data was also used from underground channel sampling completed from 2004 to 2006. Historic channel samples were excluded due to poor validation results.
- Mineralized zone interpretation – no mineralized zones were defined for what was previously interpreted as bulk stockwork mineralization. Mineralization is assumed to be semi-tabular in line with previous underground stope outlines, but with gradational contacts. The geometry of historic underground stope voids was used to control dynamic and variable directions for highly anisotropic search and variogram model parameters used in the resource model. Unconstrained data was used, with a cut-off grade of 0.4 g/t defining the mineralization of interest for the resource estimate.
- Geostatistics – with much of the raw sample data already on 2.5 m to 3.5 m intervals, the raw data intervals were used for estimation rather than composites. Top-cuts were applied to the mineralization domain data.
- Block model – with a block size 2 m x 2 m x 2.5 m rotated 30^0 clockwise in XY plane.
- Grade estimation – gold grades were estimated by ordinary kriging with dynamic, anisotropic search ellipsoid used. Isolated small blocks with grade above cut-off were removed.
- Density – a dry bulk density of 2.58 t/m^3 was applied for bedrock, and a dry bulk density of 2.00 t/m^3 used for collapsed zones and surficial colluvium.
- Mineral Resource classification – categories of classification used are based on JORC Code classification: Measured, Indicated and Inferred Mineral Resources.
- Measured – blocks with the average geostatistical distance of 0.33 (33% of the anisotropic search radius) or less, and incorporating a minimum of eight different holes.
- Indicated – blocks with the average geostatistical distance of 0.67 (67% of the anisotropic search radius) or less, and incorporating a minimum of four different holes.
- All other blocks with grade estimates were classified as Inferred.
- Final classification reflects the quality and quantity of data, geostatistical analysis of correlation and relationship between mineralized samples and Competent Person’s view of the deposit.
- Mineral Resource evaluation – the final block model was used as the basis for resource evaluation; the block model was limited by an optimized pit shell based on a gold price of US$1,500/oz. The Mineral Resource includes stockpile material, and an underground Mineral Resource reported above a 2.5 g/t cut-off grade.

8.2.4 Mineral Resource estimate

The Natalka 2016 Mineral Resource estimate combined Measured, Indicated and Inferred Mineral Resource as at 31 December 2016 totals 561 Mt with an average grade of 1.9 g/t and contained gold of 34 Moz as shown in Table 8.1, reported at various cut-off grades of 0.6 g/t for the open pit, and 2.5 g/t for the underground.

The Natalka 2016 Mineral Resource estimate was developed primarily to enable consideration of open pit mining on 7.5 m benches using drill-and-blast methods. Portions are also considered for potential underground mining by conventional underground stoping methods.

Table 8.1 Natalka - Mineral Resource - as at 31 December 2016

Mineral Resource Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Measured	Open Pit	0.6	142	1.7	7.9	243
	Underground	2.5	0.7	5.4	0.1	4
	Stockpiled	n/a	6.8	1.3	0.28	8.6
Total Measured			**150**	**1.7**	**8.2**	**256**
Indicated	Open Pit	0.6	251	1.7	14	437
	Underground	2.5	10	4.8	1.5	45
	Stockpiled	n/a	0.0	0.0	0.0	0
Total Indicated			**261**	**1.8**	**16**	**482**
Inferred	Open Pit	0.6	127	1.7	6.8	211
	Underground	2.5	21	4.6	3.1	97
	Stockpiled	n/a	0.0	0.0	0.0	0
Total Inferred			**148**	**2.1**	**9.9**	**309**
Total			**558**	**1.9**	**34**	**1,047**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface as at 31 December 2015. No mining activity during 2016.

There have been no material changes to the resource model or active mining since the Mineral resource was last estimated as at 31 December 2014 by MCS. Changes between the 2014 and 2016 estimates relate to a revised mining parameters and cut-off grade for the open pit which impacted on the nominal US$1,500 constraining optimization shell used for reporting the open pit resource. Material now omitted from the open pit Mineral Resource was considered as having potential for an underground Mineral Resource providing the 2.5 g/t cut-off grade is met. The stockpile resource remains static.

8.3 Mining and Ore Reserves

8.3.1 General

The Natalka Gold Mine is based on a Mineral Resource that has previously been mined by underground mining methods. Gold demonstrates a complex distribution. The grade of gold in the mineralization is correlated with the intensity of veining and brecciation, the quartz content and the sulphide content. Gold grades gradually diminish from the core of the deposit towards its flanks.

Mining is scheduled to produce sufficient ore for the plant designed to process 10.1 Mtpa of ore (Reserve Case).

8.3.2 Mining model

The mine plan is designed to accommodate the complex and disseminated nature of the orebody. This nature will produce multiple contacts between ore and waste materials across the strike of the orebody. The conventional truck and shovel mining method, mining equipment specification, orebody dilution and planning systems are designed to reduce the dilution and ore loss incurred during mining, and to improve the ore grade to the plant, wherever possible, to improve the overall value of the project.

Modelling the dilution effectively is an important part of creating the mine plan. Dilution was applied to the resource model by including 2 m of dilution to every ore to waste contact across the strike of the resource model. An SMU of 10 m x 10 m x 7.5 m, matched to the loading equipment size, was used to define the minimum ore mining block and waste mining block to be defined for mining, and thereby develop the Mining Model.

The amount of dilution and ore loss varies with the orebody geometry and grade. When compared with the resource model, the Mining Model shows a net increase of 3% in tonnage and a decrease of 4% in contained gold (above a cut-off grade of 0.6 g/t), resulting in an overall decrease in the ore grade of 7% within the ultimate pit design.

The analysis shows that applying the skin dilution process mainly affects the lower-grade zones where they do not have sufficient grade to support the additional dilution. After excluding these zones, the grade of the remaining zones is increased.

8.3.3 Geotechnical analysis

The rock mass at Natalka comprises a very complex tectonically distorted discontinuity network that has been considerably weakened by graphitic, slickensided foliation. As a result, AMC considers a deep-seated circular slip on an inter-ramp or overall slope scale is a potential failure mechanism. The adversely oriented foliation has a negative effect on slope stability, yet the primary cause for a deep-seated circular slip is the overall fracture intensity of the rock mass, which is high at Natalka.

Based on the data reviewed and analysed, AMC recommended the following slope design specifications, and these have been incorporated in the pit designs:

- Inter-ramp angles for an inter-ramp slope height of 150 m as shown in Table 8.2.
- The maximum inter-ramp slope height should not exceed 150 m. Where ramps are not required for operational purposes, a geotechnical berm of 30 m width should be designed to separate the 150 m high bench stacks.
- The pit slope design should not exceed the minimum foliation dip angle of 60^0. Berm widths should be used to meet the inter ramp angle criteria, while not exceeding the batter slope angle.
- The overall slope angles should not exceed 32° for the North-East Wall and 35° for the South-West Wall.

Table 8.2 Natalka - preliminary specification of inter-ramp angles

Inter-Ramp Angles	North-East Wall	South-West Wall
Basic	42°	43°
With permafrost accounted for	43°	44.5°
AMC recommended for design	42°	44°

8.3.4 Pit optimization - input parameters

The pit limits for Natalka were selected through analysis using Whittle software. The shells were developed by varying the gold price above or below that chosen as the base price for the pit optimization process of US$1,250/oz. AMC allows for mining equipment sustaining capital costs by including an allowance approximately equal to 20% of the mining operating cost when selecting the optimum shell. The mining equipment sustaining capital costs are, however, estimated and applied separately in economic modelling.

The input assumptions and results of the pit optimization are reported in the following report sub-sections. The optimization shells produced for the Reserve Case were then used as the basis for detailed pit design, in production scheduling and for subsequent economic analysis.

The parameters used in the pit optimization are derived from a combination of information provided by Polyus and AMC's determinations based on its technical assessments, and can be summarized as:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the recovered gold value for cut-off grade calculation.
- Gold recovery dependent on head grade to the process plant and is estimated according to a recovery versus head grade algorithm. Average gold recovery is estimated to be 77% for an average blended head grade of 1.7 g/t.
- Overall pit slope angles:
  - 32° for the north-east wall.

- 35° for the south-west wall.
- Mining operating costs of US$2.34/t mined for both ore and waste, and an additional US$0.04/t for every 10 m bench below the elevation of 820 mRL.
- Process plant operating cost of US$6.39/t processed, based on the costs developed for the 2016 Ore Reserve estimate prepared by AMC and Polyus.
- SG&A cost of US$5.50/t ore processed.
- Process plant throughput rate of 10.1 Mtpa.
- Refining and transportation costs of US$2.20/oz of recovered gold, based on Polyus 2017 budget.

Based on these parameters, a cut-off grade of 0.6 g/t was determined for use in the pit optimization, Ore Reserve estimation, and production scheduling presented in this CPR for Natalka.

All Inferred Mineral Resources were regarded as waste in the pit optimization and subsequent pit evaluations.

8.3.5 Pit design and contents

The Whittle software was used to develop a series of concentric (or nested) pit optimization shells by varying the gold price above or below that chosen as the base price for the pit optimization process of US$1,250/oz.

The pit optimization is based on Measured and Indicated Mineral Resources only, to enable reporting according to the JORC Code. The Inferred Mineral Resources were regarded as waste in the pit optimization and later pit evaluations. An optimum pit shell was selected as the basis for the pit design.

The ultimate pit design is shown in Figure 8.1. In order to provide continuity of ore supply, while deferring the mining of waste, a series of five staged pits were designed to focus on areas of high value ore that should be included in early in the mine life. Figure 8.2 shows a long section through the pit together with the stage designs.

The stages also maintain workable mining widths, generally 80 m, in all cutbacks and provide continuity of access through the development of the pits. In some short segments of the pit wall, the widths were reduced to 45 m for equipment access.

The final pit is designed with a minimum level of 450 mRL. This equates to a pit depth of 375 m from the pit crest, at ramp exit, of 825 mRL. The pit bottom is also at the base of the mining licence.

Figure 8.1 Natalka - ultimate pit design

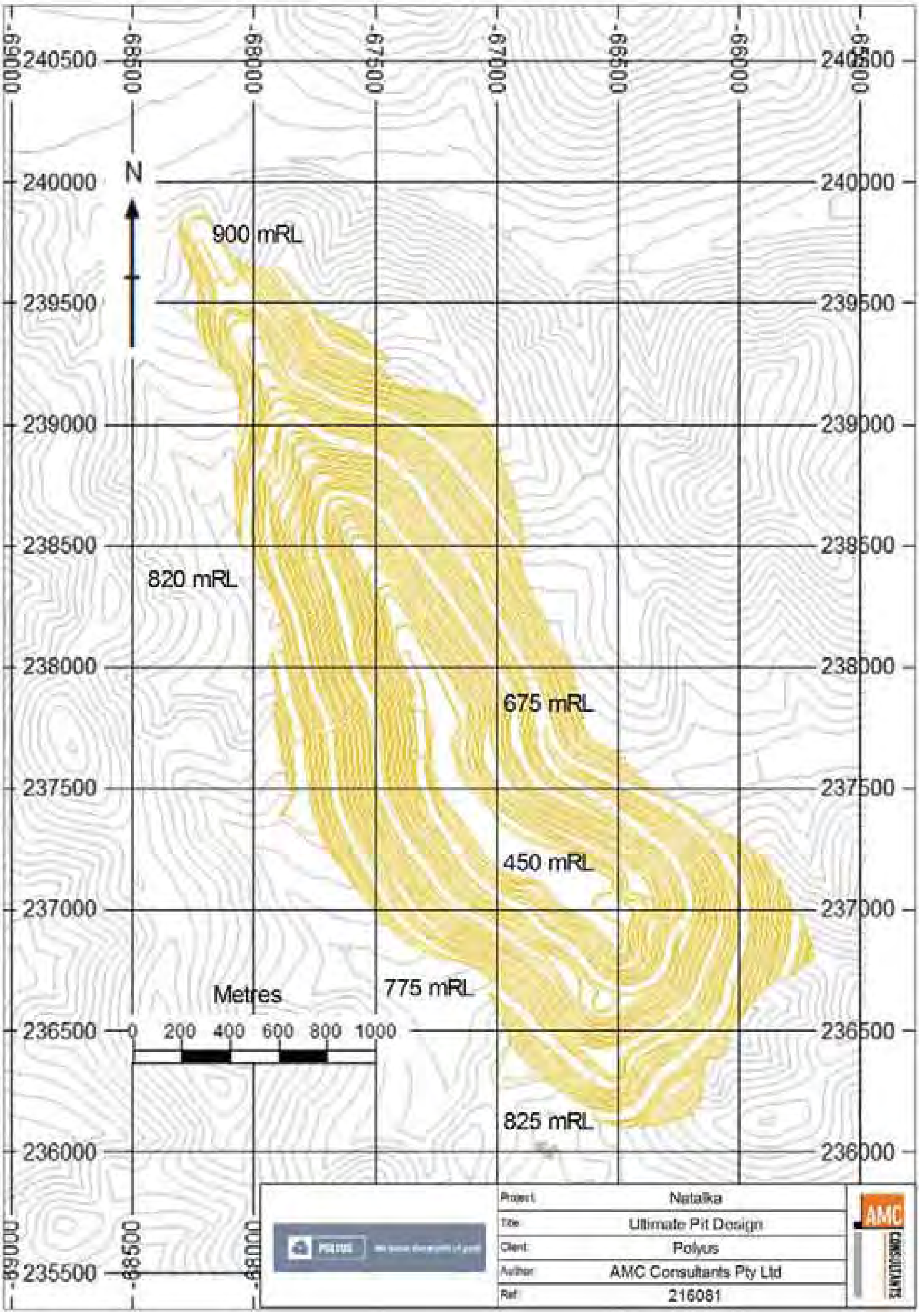
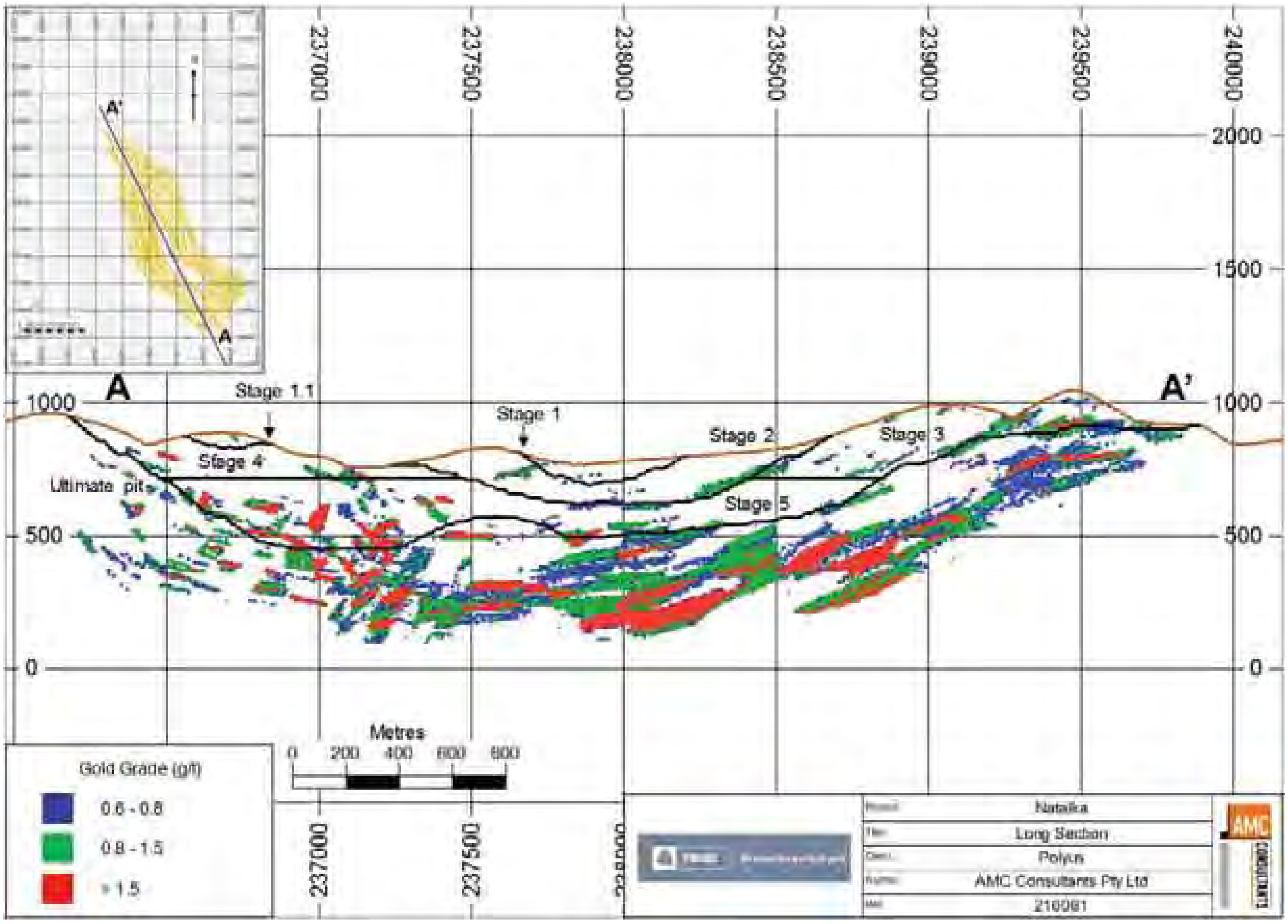


Figure 8.2 Natalka - long section with stage designs



The content of each detailed stage design was determined by evaluating the Mining Model within each successively larger pit design. Table 8.3 shows the inventory of each stage design. The pit inventories were evaluated at a cut-off grade of 0.6 g/t and depleted by the actual mine production as at 31 December 2016.

Table 8.3 Natalka - contents of pit design

Item	Unit	Stage 1	Stage 1.1	Stage 2	Stage 3	Stage 4	Stage 5	Total
Ore tonnes (>0.6 g/t)	Mt	37	2	76	37	13	121	286
Mineralized material tonnes (0.4 - 0.6 g/t)	Mt	11	0	17	13	5	27	73
Waste tonnes	Mt	98	18	294	236	255	417	1,317
Total rock tonnes	Mt	145	20	387	286	273	565	1,676
Strip ratio	W:O	2.9	10.2	4.1	6.8	20.8	3.7	4.9
Gold grade (ore >0.6 g/t)	g/t	1.6	7.2	1.6	1.3	1.6	1.8	1.7
Contained gold	t	58	13	122	48	20	221	482
Contained gold	Moz	1.9	0.4	3.9	1.5	0.7	7.1	16
Recovered gold	t	44	10	94	35	15	171	369
Recovered gold	Moz	1.4	0.3	3.0	1.1	0.5	5.5	12
Ore tonnes low-grade (0.6 g/t - 0.8 g/t)	Mt	9	0	13	10	5	23	59
Grade low-grade (0.6 g/t - 0.8 g/t)	g/t	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Ore tonnes medium-grade (0.8 g/t - 1.5 g/t)	Mt	12	0	22	16	5	37	92
Grade medium-grade (0.8 g/t - 1.5 g/t)	g/t	1.1	1.2	1.2	1.1	1.1	1.2	1.2
Ore tonnes high-grade (> 1.5 g/t)	Mt	16	1	42	11	3	61	134
Grade high-grade (> 1.5 g/t)	g/t	2.3	11.9	2.1	2.1	3.7	2.6	2.5

Notes:

1. Topographic surface at 24 March 2016 used for evaluation. There was negligible mining to 31 December 2016.
2. Ore tonnes and grade do not include existing stockpiles.
3. Waste material for scheduling purposes is the combination of both mineralized material and waste.

Mineralization below 0.6 g/t is calculated to be uneconomic at this time. Low-grade material between 0.4 g/t and 0.6 g/t is not included in the Mineral Resource and is included as waste in the production schedule. It is however stockpiled separately.

8.3.6 Mining equipment and bench height selection

AMC assessed numerous combinations of equipment size and SMU size and several mining studies. Based on the findings of the study, AMC recommends:

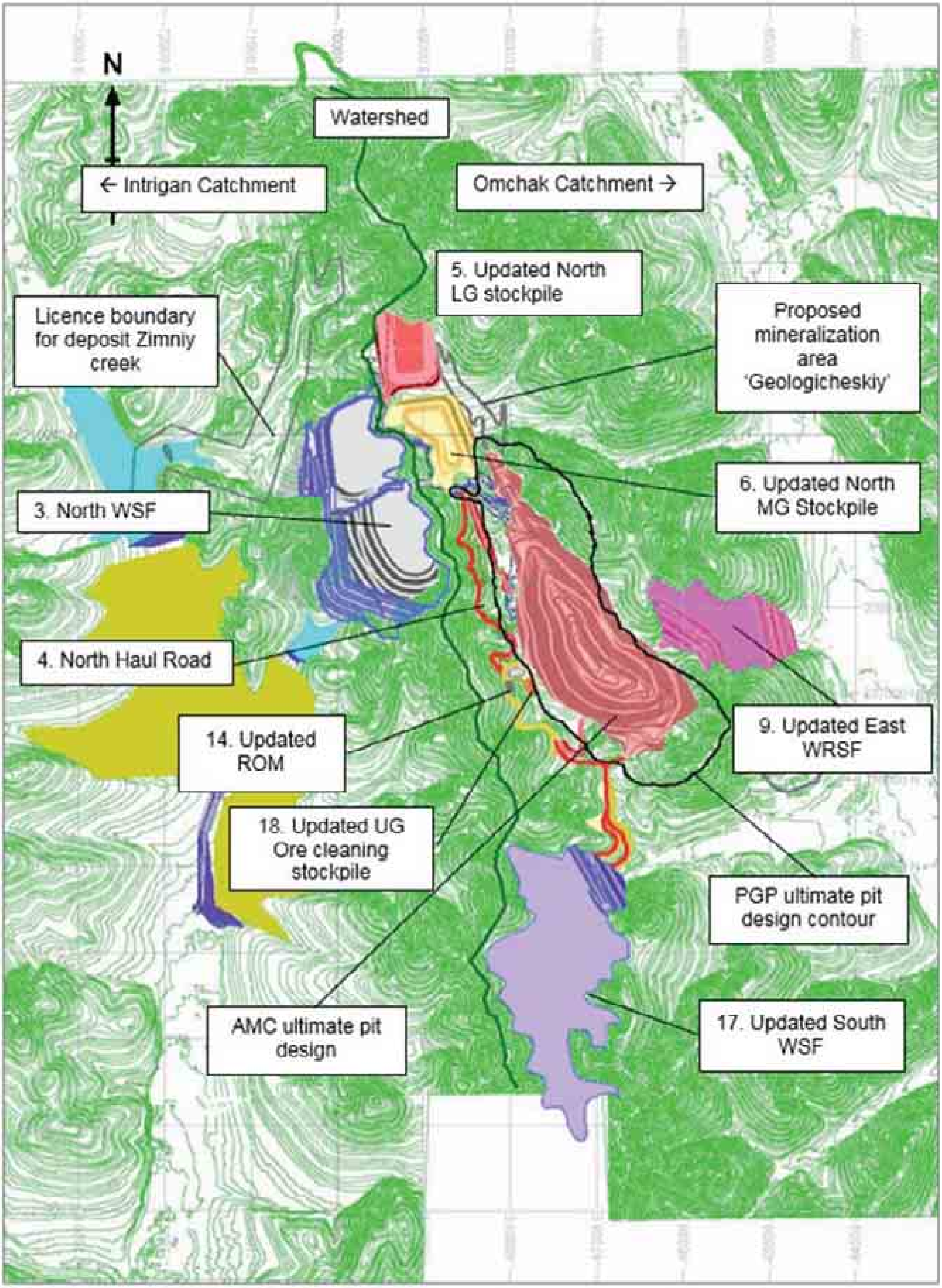
- Using an SMU size of 10 m along strike, 10 m across strike, 7.5 m high.
- Using 7.5 m benches for both blasting and mining.
- Using 2 m "skins" for dilution across the strike at each ore to waste, or waste to ore contact (until reconciliation can identify more accurate estimates).
- Using 22 m^3 class shovels to mine both ore and waste.
- Using matched 190 t class dump trucks.
- Using 127 mm drillholes for blasting for mining areas containing ore.
- Identifying opportunities for waste only blasting parameters where there is no ore.
- That there is insufficient bulk waste to justify a dedicated mining fleet.

An allowance for the purchase and replacement of mining mobile equipment was included in the economic analysis. This analysis takes into account the equipment replacement schedule and the total capital expenditure required over the project life.

8.3.7 Waste storage and ore stockpiles

The Natalka waste rock storage facilities (WRSF), stockpile locations and connecting haul roads are shown in Figure 8.3. The as-built site layout as at 31 December 2015 was provided by Polyus Project.

Figure 8.3 Natalka - WRSF and Stockpile locations



8.3.8 Mine mobile equipment requirements

The scope of the mining mobile equipment estimates includes the mining and support mobile equipment, fleet control systems, and drainage control work necessary for the establishment of mining operations at Natalka. Estimates exclude fuel storage facilities, radio and phone communications systems, computer networking/services, maintenance workshop, fixed dewatering distribution system, warehousing, mining offices and bathhouse/muster area, general mine site access roads and lay down areas, as these items are deemed to be included in the overall project infrastructure capital estimate.

Polyus currently has a range of mining and support equipment at Natalka that was involved in early mining works during 2013 and 2014. AMC included this equipment in the proposed mining fleet, including:

- Atlas Copco D65 down-the-hole hammer drill rig, 6 current units.
- Atlas Copco DML down-the-hole hammer drill rig, constrained to 12 units.
- Komatsu WA900 FEL, with a 11.5 m^3 bucket, constrained to 7 units.
- CAT 994G FEL, with a high lift boom and a 17 m^3 bucket, constrained to 2 units.
- Komatsu HM400 truck, with a 22.3 m^3/36.5 t dump body, constrained to 10 units.
- Komatsu HD1500 truck, with a 78 m^3/144 t dump body, constrained to 12 units.

The life of the listed equipment is estimated as at June 2016 and the remaining life is included in the equipment schedule, together with the cost of refurbishment.

Polyus production staff believe that the existing fleet is capable of mining 21.3 Mtpa in 2017. AMC concurs with this assessment provided the operation quickly ramps up to average productivities. Mining recommenced in January 2017.

The selection of additional drilling, loading and hauling equipment required to meet the schedule was based on an equipment selection study and includes:

- Komatsu PC4000 hydraulic shovel, with 22 m^3 bucket.
- Komatsu 730E truck, with a 111 m^3/181 t dump body.
- Atlas Copco D65 class drill rig.

Annual operating hours for primary mining equipment were estimated as:

- Drills: 5,258 hours per annum.
- Loading units: 5,736 hours per annum.
- Trucks: 6,285 hours per annum.

8.3.9 Ore Reserve estimate

The Natalka 2016 Ore Reserve is estimated at 293 Mt grading 1.7 g/t containing 16 Moz as at 31 December 2016, as shown in Table 8.4 with classifications. The Ore Reserve statement is reported in accordance with the JORC Code, using a gold price of US$1,250/oz.

Table 8.4 Natalka - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Open Pit	0.6	139	1.6	7.0	218
	Stockpile	0.0	6.8	1.3	0.3	8.6
Total Proved			**146**	**1.6**	**7.3**	**227**
Probable	Open Pit	0.6	147	1.8	8.5	263
Total			**293**	**1.7**	**16**	**490**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Mining surface as at 24 March 2016 with negligible mining to 31 December 2016.

The Natalka project was extensively studied, and is in construction. The confidence level of most modifying factors is at the feasibility study level, however, some areas of study are considered to be at pre-feasibility stage.

The Ore Reserve estimate includes surface stockpiled ore totalling 6.8 Mt at 1.3 g/t for 0.3 Moz. This ore was mined in the period December 2012 to December 2015, following mining block outlines developed from blasthole drilling sample assays. Those stockpiles with a grade above the Ore Reserve cut-off grade of 0.6 g/t are classified as Proved Ore Reserve.

The Natalka Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Natalka Ore Reserves that can be economically mined by open pit mining methods.

Resource model blocks were depleted where underground openings were recorded from previous workings or encountered during resource drilling. The depleted blocks were given a barren grade and a density of 1.0 t/m^3 to recognize that most openings are now filled with ice, which will need to be removed from the pit with the surrounding ore and waste.

After consideration of all mining, metallurgical, social, environmental, statutory and financial aspects of the project, the Proved Ore Reserve estimate is based on Mineral Resources classified as Measured, while the Probable Ore Reserve estimate is based on Mineral Resources classified as Indicated.

Dilution of the resource model and an allowance for ore loss are included in the Ore Reserve estimate, and were introduced through applying a 2 m thick skin of dilution at each ore to waste contact. Within the Ore Reserve pit design, the application of “skin” dilution resulted in the inclusion of 19% dilution at a grade of 0.32 g/t, and ore loss of 15% at a grade of 0.85 g/t, for a net increase of 3% in ore tonnes and 4% decrease in the contained gold.

The pit limits for the open pit were selected through optimization using computer software to implement the Lerchs-Grossmann algorithm. The optimization considered Measured and Indicated Mineral Resources only. Pit designs followed the optimization shell outline that generated the largest undiscounted operating cash flow for the set of evaluation parameters used.

The Proved Ore Reserve estimate is based on Measured Mineral Resources and the Probable Ore Reserve estimate is based on Indicated Mineral Resources, after consideration of all mining, metallurgical, social, environmental, statutory and financial aspects of the project.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

8.4 Ore processing

8.4.1 Process description

The Natalka process plant gold concentration and cyanidation plant is designed to process more than 10 Mtpa of ore. The plant’s main process areas include primary crushing, coarse ore storage, SAG and ball milling circuits, three stages of gravity separation, intensive cyanidation, CIL circuit, conventional carbon treatment circuit, electrowinning, smelting, cyanide destruction/arsenic removal and tailings. The other areas supporting the main process areas include reagent preparation, storage and distribution, fresh water supply and distribution, process water distribution and general utilities.

8.4.2 Status of plant and equipment as at January 2016

The following is a description of the partially constructed process plant as it was in January 2016. Significant capital was spent to on engineering, procurement and construction, and these “sunk costs” represents considerable asset value.

An optimization study identified changes in the process that will realize improved project economics. Specific process changes include the elimination of the flotation circuit and modifications to the gravity separation circuits. In addition, the crushed ore storage area design was optimized to reduce capital costs.

Other process areas will not differ from the original design. These areas include primary crushing, SAG milling, CIL, carbon handling and electrowinning.

As a result, the development status of the Natalka process plant varies significantly.

8.4.3 Process plant design

Primary crushing and overland conveying

The primary crushing facility will include a gyratory crusher, rock breaker and an apron feeder with two belt conveyors in series to convey crushed ore to the ore stockpile.

ROM ore with a top size of approximately 1200 mm will be delivered via rear-dump haulage trucks to the gyratory crusher. The hopper layout will allow trucks to dump from two sides to the gyratory crusher. Ore will be dumped into a 450 m^3 capacity hopper directly over a 750 kW gyratory crusher 60 in. x 110 in., 1524 mm diameter by 2794 mm long.

The gyratory crusher will crush ROM to a product size of P_{80} 152 mm and the crushed ore will discharge into a 450 m^3 live capacity dump pocket.

The primary crusher discharge conveyor will receive apron feeder discharge and transfer it to the crushed ore stockpile overland conveyor. The overland conveyor, will be installed underground and will transfer crushed ore approximately 1200 m to the crushed ore stockpile feed conveyor.

Crushed ore stacking, storage and reclamation

The ore storage facility will consist of a crushed ore stockpile fed by a fixed stacker with four in-line apron feeders located in a tunnel under the stockpile. The apron feeders will transfer ore from the stockpile to the conveyor feeding the SAG mill.

The stockpile will have a live capacity that can support process plant operation for about 24 hours when the gyratory crusher is not operating. Dead ore will be recovered by a bulldozer and front-end loader and will be pushed to the apron feeders, if the gyratory crusher is unavailable for extended periods. The total capacity of the stockpile, including the dead ore, is approximately 62,000 t or 48 hours.

Milling

The milling circuit will consist of a SAG mill and one ball mill operating in closed circuit with a hydrocyclone cluster. The ball mill and SAG mill will share a common pump box and will be arranged in an in-line configuration with adjacent discharges to the common pumpbox.

The grinding circuit will operate at a nominal throughput of 1,227 t/h of fresh feed, and produce a particle size of 80% passing 74 µm.

Grinding will be performed by a 10.4 m diameter by 6.10 m long, dual pinion drive, 15,000 kW SAG mill and an 8.2 m diameter by 14.0 m long (EGL), dual pinion, 18,000 kW overflow discharge ball mill. Ore from the stockpile will be fed to the SAG mill via the stockpile reclaim conveyor. Crushed pebbles from the pebble crushing plant also will be added to the stockpile reclaim conveyor.

Gravity separation and intensive leach circuits

The gravity separation and intensive leach circuits will consist of three stages of centrifugal gravity concentrators and five skid-mounted intensive leach units located adjacent to the milling area.

One hundred percent of the SAG and ball mill pumpbox slurry from the milling area will be pumped to a series of eleven safety screens to remove coarse (+2 mm) particles, preventing them from entering the Stage I Gravity Concentrator units. Safety screen undersize will be collected and directed via a launder to a common pumpbox where it is then pumped to eighteen Stage I Gravity Concentrator units operating at nominal loading of 88 t/h solids each.

Safety screen oversize will be directed back into the ball mill for further grinding via belt conveyors located under the safety screens.

The screened gravity separation Stage I concentrate will gravity flow to one of five ILRs. Oxygen, sodium hydroxide and sodium cyanide will be added to ILRs in order maintain established leach conditions. The obtained PLS will be pumped to gravity concentrate ILR PLS tanks. The ILR cake will be washed to recover residual soluble gold. The wash solution will be collected in the ILR wash water tank and pumped to the CIL circuit via transfer pumps. The washed ILR cake will be advanced to the ILR cake regrind area.

Fifteen Stage II Gravity Separators will receive hydrocyclone overflow. The Stage II Gravity Concentrators will operate as described above. Tailings will be directed via gravity directly into a series of Stage III Gravity Concentrators operating in a one to one arrangement for further gold recovery. Stage II and III concentrate is directed to a common concentrate pumpbox and pumped to a concentrate thickener. Stage III tailings are directed to the tailings thickener outside the process plan via a gravity tailings line.

Cyanidation, thickening and filtration

The CIL circuit will consist of ten agitated tanks equipped with inter-stage screens and carbon advance pumps. The CIL circuit will receive reground ILR cake, combined Stage II and III gravity concentrate as well as ILR cake wash solution. The CIL circuit will operate at 40 wt.% solids with the slurry residence time being 374 hours based on CIL tank sizing as per PGP design.

Leached CIL slurry will report to the CIL thickener to be thickened to 50 wt.% solids. The thickener underflow will be advanced by the concentrate thickener underflow pump to the agitated CIL tails filter press feed tank. The overflow will report to the CIL thickener. From the overflow tank a required quantity of the solution will be returned to the CIL circuit to maintain slurry solids content, the excess will be pumped to the cyanide destruction circuit.

The thickened CIL slurry will be pumped to one of three membrane squeeze filter presses (two on duty, one on standby) where the CIL slurry will be dewatered from 50 to 90 wt.% solids and washed with process to reduce residual cyanide concentration. The washed cake will be transported to the CIL cake loading station to be loaded onto dump trucks and transported to the CIL TSF.

Electrowinning and smelting

Pregnant eluent solution from the CIL circuit will be pumped to a two-way electrowinning distributor where it will be fed to a pair of CIL electrowinning (EW) cells. The resulting barren solution after gold recovery will flow by gravity to the barren EW solution tank in the carbon treatment plant. Upon completion of the CIL EW cycle, the gold plated on the cathodes will be washed from the cathodes by a high-pressure spray and collected in the EW Gold Sludge Tank.

PLS from each ILR will be delivered to a single ILR PLS EW Cell. EW discharge solution from each cell will be returned to the associated ILR for reprocessing. Upon completion of the electrowinning cycle, the gold and silver plated on the cathodes will be washed from the cathodes by a high-pressure spray and collected in the EW Gold Sludge Tank.

EW Sludge collected from the two CIL EW and five Gravity Concentrate ILR PLS EW Cells will be pumped to the EW Gold Sludge Filter Press for dewatering. The resulting cake will be transferred to cathode smelting for doré production.

After filtering and drying, the sludge will be mixed with flux and smelted in a cathode smelting furnace. The resulting doré bars will be sampled, weighed, and then stored in an ingots safe.

8.5 Project infrastructure

8.5.1 Maintenance

The project envisages construction of maintenance and garage facilities with car wash designed for routine maintenance and repair of cars, trucks, general service vehicles, machinery and open pit vehicles, as well as for maintenance and upkeep of the roads within storage sites, and all kinds of maintenance (daily, 1st, 2nd) and routine repair of vehicles.

The maintenance facilities at the Natalka mine and processing plant will be arranged as follows:

- A repair shop to be designed with account for operation of up-to-date domestic and world-class equipment at the mine site, ensuring high degree of availability.
- Maintenance and scheduled repair of equipment will be performed by the repair shop with the assistance of equipment manufacturers and specialized dealer firms for repair and maintenance.
- Major repair of transportable equipment and its components, manufacture of some of repair parts is supposed to be assigned to contractors — suppliers of equipment or specialized companies. Part of major repair amount will be performed in the machinery repair shop on the construction equipment maintenance site.
- Major and medium repair of non-transportable equipment, its installation and adjustment will be performed in field by on-site maintenance crews both from the repair service of the plant and from service teams of equipment manufacturers.
- Equipment repair will be performed entirely using ready spare parts and assemblies. No provision is made for repair of original units and components on the mine site.
- The main maintenance station of the plant will be the machinery repair shop at the construction equipment maintenance site which will perform current and part of major repairs of equipment, manufacture of spare parts and non-standard equipment.
- Operating units will have their dedicated maintenance areas (stations) and repair and assembly areas.
- Support bases of equipment manufacturers will be arranged in repair services and involved in repair.
- Twenty-four hour maintenance crews for emergency response will be arranged.
- Service life of equipment and units will be determined according to manufacturers’ recommendations, and decisions with regard to major repair or retirement of equipment will be made depending on economic feasibility of repair.
- Equipment repairs will imply a high-level of cooperation with specialized companies.
- All repair operations will be provided with high-level technical means.
- Use of computers for planning of repairs and maintenance of equipment, for equipment diagnostics and other.

8.5.2 Rotation camps

Two camps will be provided for Natalka operations personnel: a ration camp and the Omchak camp. The total accommodation beds in the rotation camp and the Omchak camp is 2,064.

Functional purpose of the constructed rotation camp is to provide sanitary-amenity conditions for contractors' personnel involved in the construction of the Natalka mine and processing plant on a rotational basis, and for operating personnel to work after commissioning, in compliance with the standards and requirements applicable in the Russian Federation. The rotation camp will be provided with facilities for accommodation and feeding of 1,492 persons, including engineers and workers; offices and utility rooms for workers; engineering facilities. Reduction of energy costs at the zero cycle stage and during operation is provided by rapidly erected buildings designed to be constructed using demountable container units.

Omchak camp includes: dormitory for 100 beds for engineering personnel, dormitory No.1 for 1,236 beds and dormitory No.2 for 236 beds, Polyus Logistics living quarters, mess hall, double and single living modules area, security gatehouse. Heating is supplied by the boiler station of the “old” process plant; water is supplied from existing wells.

8.5.3 Transport

The design provides for construction of an on-site road network ensuring the required amount of transportation as well as interconnection of all the facilities within the mine and process plant site.

According to their intended purpose the following groups of roads are defined:

- Production roads located within the pit, waste dumps, between the pit and dumps, intended for heavy-duty dump trucks and providing mining operations.
- Inter-site road interconnecting separate areas of the Natalka mine and processing plant, forming a transport network of the industrial area and providing both transportation of goods and passengers.

- Service roads located along utility lines as well as at entrances to buildings, providing transportation of auxiliary and general goods, access for fire equipment, repair and emergency vehicles.
- Intra-site roads running immediately within the sites and providing service transportation of auxiliary and general goods, access for fire equipment, repair and emergency vehicles.

8.5.4 Non-process solid domestic waste landfills

Production and consumption waste will be disposed in a landfill for solid domestic and industrial waste arranged in overburden rock dumps. The landfill has a capacity of 42 kt (60,000 m^3) and a storage capacity of up to 746,000 t (1,066 km^3). The landfill capacity is designed for disposal of waste produced during the entire period of construction and operation of the mine and processing plant. The bulk of the landfill is for waste of Hazard Class 4 and 5 - up to 38,000 t/year (90%), the storage space for waste of Hazard Class 3 is up to 4,000 t/year (less than 10%). The project of landfill construction in overburden rock was approved by the state ecological expert panel in 2015.

The landfill is located in the Severniy ("Northern") overburden (waste) rock dump. The waste storage technology was adapted to the mining method in the formation of overburden dumps and does not affect their safety or stability.

8.5.5 Office and service facilities

Administrative services and amenities will be accommodated in three administrative buildings. Process plant administration building and mine administration building are located at the plant site, pit administration building is located at the auxiliary services site. The process plant administration building houses administrative offices and utility rooms. The mine administration building houses administrative offices and utility rooms for the mine services. The pit administration building accommodates geologists all related services including the repair service.

8.5.6 Electrical power supply and distribution

The Natalka power supply system connects to the power transmission grid in the Tenkinskiy District. The main sources of power for this district are the Kolyma hydro power plant, the Arkagala coal power plant and the Magadan Heat and Power Plant. These generating stations are part of the Central Electrical Power Unit of the Magadan Electrical Power System. The Central Electrical Power Unit works independently from other power units of this system and from the Eastern Consolidated Power System.

Gross installed capacity of the Central Electrical Power Unit power plants by the end of 2012 was 1220 MW, including:

- 900 MW - Kolyma hydro power plant (JSC "Kolymaenergo").
- 320 MW - two coal power plants (JSC "Magadanenergo"), including: Arkagala coal power plant (224 MW) and Magadan heat and power plant (96 MW).

The expected increase in load connected to the Magadan electrical power system will happen in stages. In the first stage, the Natalka mine will be commissioned in 2017 with a power requirement of approximately 58 MW. In the second stage (2019), the power requirement will increase by another 9 MW due to the commissioning of auxiliary pit and mine facilities. In the third stage (2020), and fourth stage (2021), the combined increase in load will be 1.7 MW. The power for the second and subsequent stages will be provided by the construction of a new Ust Omchug-Omchak power line, which is to be funded by a Russian state programme.

In accordance with the Contract for utility connection the supply voltage of GPP-1 substation is 110 kV.

At the process plant site, where process machinery is equipped with 10 kV motors, medium distribution voltage is 10 kV. The adopted voltage is 6 kV which is defined by the specifications of the 6 kV motor drives installed in the machinery (main conveyor and crusher No.1), and also by the fact that 6 kV is the main voltage for the Omchak village facilities.

Low-voltage power consumers of substations will use voltage of 380 V; power supply for lighting, electrical heating and other low-power consumers of substations is 220 V.

Voltage levels 660 (690) V are used only as supply voltage for electric motors with a power of over 320 kW used in transformer-VSD (soft starter)-electric motor units.

The calculations of the plant's electrical loads indicate that at the first stage of construction it would be advisable to arrange in load concentration points the following electrical facilities:

- Supply substation GPP-1 (110/10/10 kV) for 110 kV voltage – for power supply for the process plant site: process building No.1, slurry pump, recirculation water pump station, thickener, plant site boiler house, fuel and lubricants storage, repair and garage station, fire station, area for tanks and other.
- Substation 1PS-1 (10/6 kV) at the process plant site for 6 kV with power from GPP-1 – for power supply of the crushed ore stockpile, handling area, main conveyor and ore crushing and transportation area.

Construction of a new 35/6 kV substation ("Old Plant") connected by tapping from the existing 35 kV HV overhead line Omchak-Kulu – for power supply of 2nd and 3rd lift pump stations, field camp, Omchak village, pilot plant, main entrance, chemical agents plant, boiler house.

8.5.7 Plant heating system

The process plant heating supply will be provided by the plant boiler house.

KEB-25.0-14 boilers (Biysk Boiler Plant) will be installed in the boiler house, with mechanical furnace TCHZM-2-2.7/5.6 working on solid fuel.

Two KEV-25.0-14 boilers with nominal capacity of 17.4 MW each will be installed for heat supply of the industrial site facilities in accordance with the boiler house thermal loads. Two boilers will be in operation, and one on standby. A smaller capacity KV-R 3.5 TLPH5 (3.5 MW) will be installed to cover the hot water supply load for the warm season.

8.5.8 Telephone and telecommunications

One of the primary elements of efficient operation of a modern company is a powerful IT infrastructure with an advanced communication system with high data transmission quality maintaining performance capabilities at various unavoidable circumstances, as well as involving minimum operating costs for maintenance and development.

Currently available IT infrastructure at the Natalka project construction sites are:

- A mobile data storage and processing centre in a container configuration with IBM server equipment and Cisco network equipment.
- Production automatic telephone network equipment (Avaya).
- A wireless broadband access system based on Motorola Canopy equipment.
- Digital radio communication system TETRA – Motorola Dimetra IP Compact.
- Radio relay system.
- Video conferencing system.

Further development of the IT infrastructure to have an up-to-date corporate IT environment will be provided by deploying the following subsystems:

- Main fibre-optic communication lines.
- Structured cabling systems.
- Operational dispatching and loudspeaker communication.
- Local alarm system.
- Industrial closed-circuit television.
- Radio broadcast system and master clock system.
- MESH broadband wireless communication network.

8.5.9 Assay laboratory

The assay laboratory will be arranged at the process plant site.

The process control division and assay laboratory are designed for analysis of solid and liquid samples of mineral products produced in the following types of control:

- Sampling to develop a product balance and a process flow balance.
- Study of material composition of ore and produced concentrates to track any changes in the feed material composition.
- Prompt adjustment of the process flow.

Depending on the requirements for assay results and nature of samples as such (phase state, gold content, etc.), gold grade and content of other metals are determined by the following methods:

- Fire assay (the main method for solid products).
- Atomic absorption analysis (the main method for gold in the liquid phase).
- Optical emission with inductively coupled plasma (icp-oes, multi-element analysis to study the material composition of products).
- Volumetric titrimetry to determine compound concentration in solutions (for CaO, CN, NaOH, pH).

8.6 Tailings management facility description

8.6.1 Temporary tailings storage facility

Final tails are the processing plant process waste material. They are then transported as a slurry into the temporary tailings storage facility reservoir. Clarified water from the temporary tailings storage facility retention pond is transferred back to the processing plant and used in the process.

Construction of the tail facilities is scheduled to end during the operation of the temporary tailings storage facility.

Temporary tailings storage facility serves as a reservoir for safe disposal of 29 Mt of tailings during three years of operation.

Tailings storage facility is a valley-type unit located 500 m to the west from the processing plant currently being designed in the Intrigan river valley 200 m to the south of the Zimniy creek offing with absolute ground elevation ranging between 668 mRL to 705 mRL.

The pond is created by damming up the topography area with a diverging dam and construction of a dividing dam which divides the storage facility into two disposal areas (lower and upper ones) located at different ground elevation points.

With two disposal reservoirs (pits), sequential storage of final processing plant tailings is possible making tailing sediments on the beach more cemented.

Moreover, disposal of tailings from the dividing dam is also anticipated allowing for more efficient use of the tailings storage facility reservoir and improving the reservoir usage ratio by increasing the shore deposition length.

Primary dams ridge elevation (diverging and dividing dam) on the upper pit is 695 mRL; elevation of the primary diverging dam ridge on the lower pit is 690 mRL.

Initial upper and lower TSF pits capacity will ensure tailings disposal equivalent to 12 Mt during 1.2 years of processing plant operation at processing capacity of 10 Mtpa. Tailings disposal above the primary dam elevation points is suggested to be carried out by hydraulic fill method and creating a beach area consisting of tailings with further sequential filling of the diversion dykes onto the washed beach.

Project-defined TSF diverging dam final elevation point of 750 mRL will provide an opportunity of tailings disposal during three years of operation.

Total surface area of the TSF is 1.065 km^2, the upper pit area at the elevation point of 695 m is 0.455 km^2, the lower pit area at the elevation point of 690 mRL is 0.610 km^2, and the TSF area at the final operating elevation point of 705 mRL will make 1.395 km^2.

8.6.2 Main TSF

TSF pond is located approximately 500 m away from the processing plant site in the Intrigan river valley upper the surface topography of the temporary TSF pond.

Anticipated main TSF is erected by blocking the Intrigan river course section with primary dams – upper, lower and Zimniy creek.

The required TSF storage capacity is defined based on the scheduled tailings output during the designed operational lifetime.

Total amount of material deposited will be 319 Mt. Given the temporary TSF tailings storage capacity of 29 Mt (during the first 3.5 years of operation), storage capacity of the main TSF shall be able to accommodate 290 Mt of final tailings.

Tailings mineral particle density (solids specific gravity) is ρ_s = 2.70 t/m³. Volumetric density of the tailings sediments in the TSF (soil skeleton bulk density) is agreed to be ρ_d = 1.40 t/m³. A TSF fill factor of 0.8 has been agreed, given the topography configuration and a capability of filling along the length the Intrigan river wall. The required main TSF storage capacity will then amount to: 289.8/(0.8 ×1.4) = 259 Mm³. It consists of the volume of the tailings stockpiled, air volume between the groundwater elevation point and beach elevation point and pond storage capacity which amounts to 25 Mm^3 by the last year of the operational lifetime.

Initial storage capacity of the anticipated main TSF is ensured by erecting a lower primary dam with a ridge elevation point of 710 m.

Lower primary dam axis starts at the first ramp of the Intrigan river valley and continues in northeast direction along the creek valley, crosses the Intrigan river course, the temporary TSF diverging dam filled with tailings up to the design elevation point (705 m), goes parallel to the temporary TSF diverging dam axis and ends at the left ramp of the valley. At the construction site of the lower primary dam across the temporary TSF area washed beach zone tailings serve as a foundation.

To ensure zero discharge TSF operation design documentation provides for erection of the runoff discharge of the Intrigan river and its left inflow — Zimniy creek from the TSF area. Diverging dam control points are selected based on receiving conditions of the surface inflow onto the TSF surface area and providing a zero water balance across the TSF, that is, without water discharge from the retention pond onto the surface.

The TSF upper primary dam with a ridge elevation point of 737 m is located in the river valley 3.1 km upper from the TSF lower primary dam control point and 3.0 km to the south-east of the processing plant site being erected. At the beginning of operations, the upper primary dam serves as TSF water retaining dam. During operation, the beach is washed from the dam and it is then built-up by backfilling No.1 of the diversion dykes onto the washed tailings by subsequent washing of another layer. Tailings are stored layer-by-layer until the final elevation of 772 m is reached.

Water diversion from the TSF No.1 reservoir shall be carried out using drainage facilities in pressurized gravity-flowing mode.

8.6.3 CIL (Sorption) TSF

Storage is intended for receiving and stacking the processing plant leaching cake. Cyanidation tailings in the form of dewatered cake are stacked medium dry onto the dedicated area. Cake storage area is located in the southern part of the plant production site, below the overburden rock stockpile.

Among the facilities located directly at the cake storage area there are:

- Storage area.
- Protective dam.
- Drainage facilities.
- Interception ditches.

At the foundation of the cake stockpile a toe drain is installed to filter the seepage water and to prevent lower stockpile layers from washing. Toe drain is backfilled with crushed rock, and protection dam is backfilled with overburden soils. Between the cake stockpile and protective dam, a containment pond is built. Seepage from the containment pond, should it accumulate, are is transferred to the processing plant recirculating water supply system.

In order to prevent contamination of ground and surface water a solid watertight screen is laid made of polymeric geomembrane. For safe cake storage operation control a monitoring system is provided.

Activities associated with erection of the cake storage watertight foundation are still underway – 39,000 m^2 of polymeric material is laid so far.

Leaching cake storage is located 7 km to the south-east from the gold recovery plant. The storage is intended to be used for stacking of 723,000 m^3 of leaching cake with maximum water content of 15%. Storage capacity is 1.1 Mt.

8.7 Planned production and costs

Production and costs - Reserve Case

A LOM plan was prepared using the Minemax schedule optimization software to provide a schedule that improves the overall value of the project. The results of the schedule were output to Microsoft Excel spreadsheets for review and analysis. The operating and capital cost estimates are based on the production schedule and technical and operating criteria described in this CPR.

A summary of the Natalka LOM production schedule is presented in Table 8.5, showing the mining, processing, and cost information. Annual mined tonnage and head grade were based on the Reserve Case mining schedule, process plant throughput and gold production rates with all Inferred Mineral Resources regarded as waste. The mining schedule and mining operating costs are based on AMC's preliminary assessments.

The production schedules assume the process plant will start in November 2017 and ramp-up to 6 Mtpa in 2018, and then to the nameplate capacity from 2019 onwards. During the ramp-up period both plant throughput and gold recovery are expected to be below design capacity. The recovery ramp-up is expected to take 18 months to reach design rate.

The mining schedule is developed with no allowance for additional equipment requirement during 2017 and total mining to December 2017 of 13.8 Mtpa. Additional equipment procurement from late in 2017 until 2019 aims to achieve mining rates of 27.5 Mtpa (in 2018), 77.2 Mtpa (in 2019) and 79.5 Mtpa (in 2020). Further increases occur in 2023 (81.3 Mtpa) and 2030 (86 Mtpa). The mining rate is then scheduled to begin declining from 2032.

The production schedule and operating costs are based on the following assumptions and qualifications:

- A gold price of US$1,250/oz.
- All RUB denominated costs were in real 2017 terms and converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on those developed for the 2016 Ore Reserve estimate prepared by AMC and Polyus. No provision was made for offsite corporate costs.

Capital cost estimates are included for:

- Plant construction and commissioning 10.13 Mtpa as described in the Natalka ore processing section of this CPR.
- A sustaining capital cost allowance of US$1M per annum for the plant was included for the first three years to allow for minor equipment replacement and for progressive tailings dam wall raising. This allowance increases to US$5M per annum from 2020.
- Additional and replacement mining equipment. An equipment expenditure schedule was developed to allow for equipment replacement to maintain high availability to the operation.

Closure costs were estimated by an independent consultant and adjusted to 1 January 2017. These costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

Table 8.5 Natalka - planned production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25	2042-2046 Y26-30	2047-2051 Y31-35
Mined													
Ore mined - tonnes	Mt	286	0.3	2.4	9.5	12.8	13.3	64.1	60.4	49.4	60.4	13.1	-
Ore mined - contained gold	Moz	15	0.01	0.13	0.72	0.57	0.62	3.05	3.19	2.67	3.79	0.73	-
Waste mined - tonnes	Mt	1,390	13.6	25.1	67.7	66.7	66.2	343.7	364.0	351.1	84.3	7.7	-
Total material mined	**Mt**	**1,676**	**14**	**28**	**77**	**80**	**79**	**408**	**424**	**401**	**145**	**21**	**-**
Processed													
Ore - Process Plant - tonnes	Mt	292	0.5	6.0	10.1	10.1	10.1	50.7	50.7	50.7	50.7	50.7	2.2
Ore - Process Plant - grade	g/t	1.7	0.7	1.5	2.4	1.6	1.7	1.7	1.8	1.7	2.2	1.0	0.7
Ore - Process Plant - contained gold	Moz	16	0.01	0.29	0.78	0.52	0.55	2.75	2.97	2.70	3.57	1.57	0.05
Process Plant - recovered gold	Moz	12	0.01	0.17	0.61	0.39	0.43	2.15	2.36	2.06	2.86	1.00	0.03
Operating Costs													
Mining	US$/t mined	2.37	2.75	2.12	2.22	2.07	2.13	2.24	2.25	2.54	2.91	3.08	-
Process Plant (including reclaim)	US$/t ore processed	6.42	11.29	6.92	6.54	6.39	6.39	6.39	6.39	6.39	6.39	6.43	6.45
Selling, general and administrative	US$/t ore processed	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
Refining and transportation	US$/oz refined gold	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Initial Capital Costs													
Mining	US$M	201	4	105	60	-	-	32	-	-	-	-	-
Process Plant (including TSF)	US$M	334	242	41	30	21	-	-	-	-	-	-	-
Closure	US$M	10	-	-	-	-	-	-	-	-	-	-	10
Total	**US$M**	**545**	**246**	**146**	**90**	**21**	**-**	**32**	**-**	**-**	**-**	**-**	**10**
Sustaining Capital Costs													
Mining	US$M	499	2	2	7	19	15	100	261	73	17	3	0
Process Plant (including TSF)	US$M	136	1	1	1	5	5	25	25	25	25	23	-
Total	**US$M**	**634**	**3**	**3**	**8**	**24**	**20**	**125**	**286**	**98**	**42**	**25**	**0**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

Production and costs - Alternate Case

There are several limitations on the Natalka operation that, if resolved, offer the potential for significant upside in the value of this mineral asset. AMC identified these as:

- A limit on the vertical extent of the mine at 450 mRL. This is a licence restriction and there is potential to remove this by application to the State authorities. The optimum pit limit, using current input parameters, would extend beyond this level if no restriction is applied.
- There is significant Inferred Mineral Resources within the optimum pit limit. This is a result of removing the channel sampling information from the database. Further drilling will improve the confidence of estimates in the area affected and therefore is likely to result in an increase in the Ore Reserve.
- Polyus indicates the possibility of a reduction in the unit power cost. If implemented, this would lead to reduced processing costs for the operation.
- The recent plant optimization study identified that the throughput rate might be increased to 11.1 Mtpa by some debottlenecking in the process plant. This has the potential to reduce the processing unit costs and to increase the gold production rate.

To enable assessment of the potential value of resolution of the limitations, AMC developed an alternate set of pit optimization parameters to reflect such resolution. The other pit optimization parameters were kept constant.

AMC then assessed the potential increase in value that could be derived from alternate ultimate pit shells, pit stage configurations, and low-grade stockpiling alternatives.

From that assessment, AMC found that selection of a pit shell as the basis for the ultimate pit that is significantly larger than that used for the Reserve Case, would add value relative to the Reserve Case, assuming resolution of the limitations as referred to above.

It should be noted that the Natalka pit is large enough for discounting of cash flows to have a significant impact on the selection of the maximum value pit shell, and AMC took this into account in its assessment.

The resulting inventory was then incorporated into a production schedule to form the Alternate Case, where only the last cut-back includes Inferred Resource.

It should also be noted that pit designs were not generated for the Alternate Case. However, for this case, AMC selected pit shells that provide sufficient width to allow practical mining. Detailed mine planning may yield additional value as the pit design and production schedule are refined.

Table 8.6 summarizes the planned production and costs for the Alternate Case.

The Alternate Case features a larger inventory, higher gold output, longer mine life, and lower total unit operating costs, which would lead to increased project value relative to the Reserve Case, if the limitations can be resolved.

Table 8.6 Natalka - planned production and costs - Alternate Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25	2042-2046 Y26-30	2047-2051 Y31-35	2052-2056 Y36-40	2057-2062 Y41-45
Mined															
Ore mined - tonnes	Mt	422	0.3	4.2	11.4	11.4	14.4	69.4	70.2	69.1	38.5	60.3	66.8	6.3	-
Ore mined - contained gold	Moz	22	0.0	0.3	0.8	0.5	0.7	3.7	3.9	3.9	1.9	3.3	3.3	0.3	-
Waste mined - tonnes	Mt	1,983	13.4	24.4	66.9	66.4	65.0	339.4	348.5	348.4	364.3	282.1	61.6	2.4	-
Total material mined	**Mt**	**2,405**	**14**	**29**	**78**	**78**	**79**	**409**	**419**	**418**	**403**	**342**	**128**	**9**	**-**
Processed															
Ore - Process Plant - tonnes	Mt	429	0.5	6.0	11.1	11.1	11.1	55.6	55.6	55.6	55.6	55.6	55.6	55.6	0.1
Ore - Process Plant - grade	g/t	1.6	0.7	1.5	2.3	1.7	1.8	1.9	2.0	2.0	1.3	1.8	1.7	0.8	1.3
Ore - Process Plant - contained gold	Moz	23	0.01	0.29	0.81	0.61	0.65	3.36	3.60	3.58	2.24	3.17	3.02	1.40	0.00
Process Plant - recovered gold	Moz	17	0.01	0.17	0.63	0.48	0.51	2.67	2.86	2.85	1.61	2.46	2.38	0.79	0.00
Operating Costs															
Mining	US$/t mined	2.46	2.78	2.23	2.04	2.05	2.10	2.30	2.44	2.31	2.41	2.81	3.34	3.86	-
Process Plant (including reclaim)	US$/t ore processed	5.03	10.23	5.33	5.10	5.16	5.01	5.00	5.00	5.00	5.02	5.01	5.00	5.06	5.10
Selling, general and administrative	US$/t ore processed	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01
Refining and transportation	US$/oz refined gold	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Initial Capital Costs															
Mining	US$M	202	4	105	60	-	-	33	-	-	-	-	-	-	-
Process Plant (including TSF)	US$M	334	242	41	30	21	-	-	-	-	-	-	-	-	-
Closure	US$M	10	-	-	-	-	-	-	-	-	-	-	-	-	10
Total	**US$M**	**546**	**246**	**146**	**90**	**21**	**-**	**33**	**-**	**-**	**-**	**-**	**-**	**-**	**10**
Sustaining Capital Costs															
Mining	US$M	878	2	3	6	19	15	103	269	137	268	38	17	1	-
Process Plant (including TSF)	US$M	182	1	1	1	1	5	25	25	25	25	25	25	23	-
Total	**US$M**	**1,060**	**3**	**4**	**7**	**20**	**20**	**128**	**294**	**162**	**293**	**63**	**42**	**24**	**-**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

8.8 Permitting, environment, community, safety, and mine closure

8.8.1 Permitting

An Environmental and Social Impact Assessment (ESIA) was completed by Environmental Resources Management (ERM) to international standards in 2012 based on project design at that time. The ESIA was revised in 2016 to include project design changes since 2012.

Environmental permits were obtained for the 2012 project design. All activities from 2012 to 2016 were performed under the appropriate permits and regulations. Some of these approvals will remain valid for the revised project design, while others will require amendment to reflect changes in project design.

The North and South waste rock storage facilities were designed at locations which had been already approved by the government authorities. The approval procedure for construction of the East waste rock storage facilities is currently in progress as part of the current revision of approvals and permits.

The detailed design of the revised project will consider the conditions and requirements of the ESIA and updated approvals and permits.

The current permits and approvals include:

- License Management of Hazardous Substances No.BX-76-004510 (2014).
- License waste management № 04900033 (2015).
- Expert Commission of the State ecological examination of materials No.33. Construction of mining and processing enterprise based on the Natalka gold deposit Waste disposal facilities (2015).
- Expert Commission of the State ecological examination of materials No.180. Project landfill for household and industrial waste under construction mining and processing enterprise on the basis of the Natalka Gold ore deposit (2013).
- Document dated 8 September 2016 No.17/16 - waste generation standards and waste placement limits - valid through 7 September 2021.
- Air emissions permit dated 1 March 2016 No.18/16 valid through 17 January 2018.
- Air emissions permit dated 5 July 2016 No.43/16 valid through 1 June 2018.

8.8.2 Environment

Environmental Design Criteria have been derived from Russian legislation, International Finance Corporation/World Bank guidelines, Polyus's standards, as well as, mining industry best practices (i.e. Cyanide Management Code) to guide the project engineering team in their design activities for project components.

There are no areas with particular conservation status within the project area and immediate surrounds. All forest areas within the Project area are classified as commercial forests. The forests within the Project Area do not have a status of specially protected forests according to paragraph 3 of Article 102 of the Forest Code.

Studies conducted in 2009 indicated low potential for ARD and a high neutralizing potential of waste rock from the ore deposit. However, if future test results indicate a potential for acid rock drainage, enhanced management of waste rock would need to address the potential for acid generation and the leaching of metals or other constituents of concern.

Initial studies indicate that As, Mo, Al, Mn, Mg, and Sr may be present at higher levels in the future dump leachate. Significant concentrations of Cu, Ni, and Zn in the dump leachate and water, contacting with the open pit walls, are likely to be observed for the first years of the formation of the dumps and open pit walls.

The historical “Omchak” and “Glukhar” tailings storage facilities and former waste rock dumps/alluvial mining areas fall under the category of high pollution level with regard to the arsenic concentrations. Those facilities constitute sources of chronic contamination of groundwater and surface waters. The Omchak River has lost its fishery significance as a result. However, Polyus advises that it does not carry any liabilities associated with these historical mining operations.

An integrated mine water management system, including probabilistic modelling of various climatic scenarios and various mine development stages, will be required to ensure mine water management at the site, and to meet discharge requirements for the project.

The vegetation cover is typically low and typical of the mountainous tundra region. There are no nationally protected flora species. The fauna is similarly of relatively low diversity and none of the species recorded are officially classed as rare, threatened or protected in the Project area. None of the project activities are located within nationally or internationally protected areas.

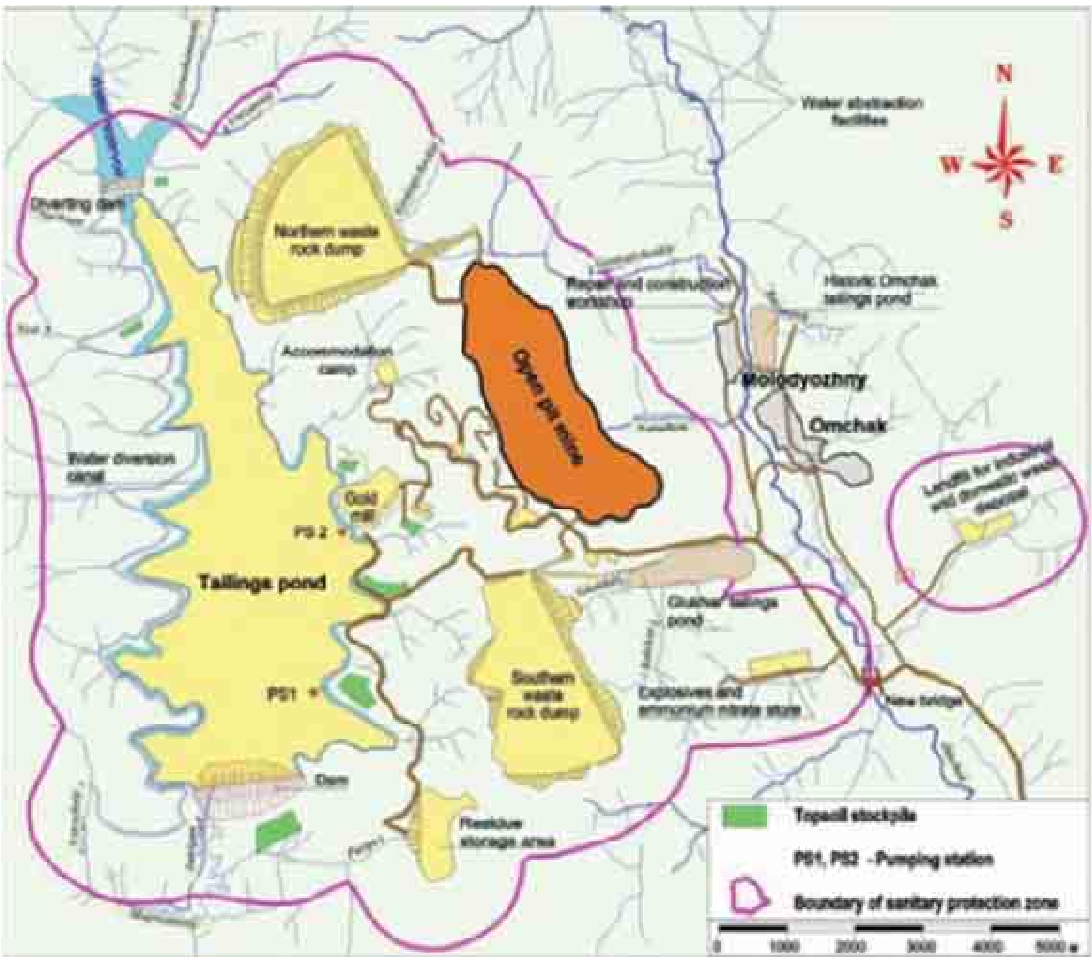
Seasonal migrations of waterfowl and wading bird species take place along the Intrigan River valley. The following bird species (reported to occur or could potentially within the project area) are rated as rare and endangered and listed in the Russian and Magadan Oblast Red Data Books:

- Nesting bird species: northern goshawk, kestrel, great gray owl, Eurasian wryneck.
- Migrating bird species: whooper swan, Bewick's swan, lesser white-fronted goose, teal (Anas formosa), falcated teal, smew, gyrfalcon and peregrine falcon.

No protected mammal species were identified within the project area and surrounds. The animal population in the project area and surrounds is significantly depleted and mostly limited to synanthropic species in close proximity to residential areas.

Air quality impacts and noise and vibrations impacts are anticipated to be substantial issues requirement careful management. A sanitary protection zone has been proposed around the operation (refer Figure 8.4). The initial size of the regulatory sanitary protection zones is proposed to be 1,000 m. The nearest residential areas (some residential blocks of Molodyozhny and Omchak) are located more than 1.8 km from the boundary of the future main facilities of the mine.

Figure 8.4 Natalka - sanitary protection zone



Source: Natalka ESIA (ERM Eurasia 2012)

Initial cultural and historical reviews and surveys did not find objects of cultural heritage within the project area. However, the Information Center of the Magadan Oblast Department of Internal Affairs, advised that the Matrosov mine belonged historically to the camp division No.3 of the Special Coastal Camp of DalStroy (Ministry of Internal Affairs) during the period from 1948 to 1955. In the official records it is stated that 48 prisoners had been buried in that area. Specific procedures will need to be developed to manage the risk of disturbing burial grounds or other ‘chance find’ cultural heritage features. These are routine cultural heritage management procedures and they are implemented as part of mine development.

The Natalka EMS will be developed and refined based on the updated 2016 ESIA studies, to encompass all environmental aspects to ensure that the new or altered facilities, infrastructure, processes and operations are managed to avoid adverse environmental impacts. Environmental and social management and monitoring plans will also be developed. An environmental and social action plan may also be required to the requirements of financiers and regulators.

8.8.3 Community

Land use at the project site has been for mining since late 1930’s, based on available records. Land use in the surrounding area is limited to occasional fishing, hunting and gathering by local resident families and by tourists.

The project is in close proximity to the Omchak and Medvezhy settlements, located approximately 1.8 km to the east of the pit, which is likely to have been sustained over time by the mining operations at Natalka.

Indigenous ethnic minorities of the north do not have any ancestral land areas and ritual sites within the project area and do not use it for seasonal nomadic migrations. The indigenous ethnic minorities of the north are located over a distance of 150 km to 200 km from the project. Polyus advises that there are no legal requirements to establish a treaty or agreements with the indigenous peoples, and there are no existing liabilities to the indigenous peoples. Polyus advises that it will give due consideration to any potential effects on indigenous peoples, in accordance with its commitments under ICMM membership.

No archaeological findings are expected in the project area, however, it is highly probable that unregistered burial sites dating back to the 1940s to 1950s will be discovered, as prisoners worked in the underground mines during this period.

The project site area will be fenced to provide site security and prevent unauthorized access. The scale of the project, together with proximity to the nearest settlements, infers that air quality, noise, vibration, lighting and visual amenity issues will require careful management.

Social impact management plans will be required to help mitigate potential adverse social impacts from the project, and enhance opportunities for the surrounding population and stakeholders. Unemployment and low commercial activity in the area are current issues, particularly with the mine in care and maintenance. The Project can be considered to have positive socioeconomic benefits for local communities, provided that potential adverse effects and opportunities for local communities are managed appropriately.

Polyus has developed stakeholder relationships and goodwill in the community over the past several years. Those relationships will form the basis for the project. The local economic impact will be significant. The local administration has reported that stable operations and steady growth of the gold mining industry is considered as a highly important condition for the future development and economic prosperity of the Tenkinskiy district.

A community relations strategy will be developed taking into account the results of ongoing field studies and public consultation. The strategy will be based on local content policies (transparent recruitment/procurement policies to encourage the use of local labour/suppliers), community engagement (to facilitate open communication about the project and community issues) and community investments (to enable long-term benefits that are self-sustaining).

8.8.4 Safety

The Natalka project had the following occupational health and safety statistics for 2016:

- Injury rate (per 200,000 hours worked) of 0.26, which includes fatalities, lost time injuries and medical treatment injuries.
- Lost time injury frequency rate (per 200,000 hours worked) of 0.26.
- Fatality frequency rate (per 200,000 hours worked) of zero.

The accreditation of the Natalka safety system to OHSAS 18001, together with the good safety performance indicated by the above statistics demonstrates that occupational health and safety does not appear to be a material risk to ongoing development and operations.

8.8.5 Mine closure

A closure plan was developed in 2012 in accordance with the requirements of national and international policies and guidelines (including Polyus's corporate policies) to ensure an environmentally and physically stable and safe closure of the mine at the cessation of operations.

Closure cost estimates were calculated using the Standardized Reclamation Cost Estimator. The estimates included provisions for human resources costs, monitoring and land holding costs, and in accordance with international standards, did not include the potential proceeds from salvage. The mine closure cost as at 1 January 2017 was estimated to approximately US$10M.

Polyus is not required to pay an environmental security deposit and mine closure costs are included in the capital cost assessments for the operation.

8.9 Risks and opportunities

8.9.1 Risks

Natalka is not yet in operation so many risks cannot be mitigated by observation of an existing operation. The following major risks are identified for Natalka:

Mineral Resource/Ore Reserve estimation (including mine planning)

The resource model is the key input to all mine planning activities and remains a significant risk to achieving the project goals until processing commences and reconciliations of actual production against estimates can be undertaken. Accuracy of modelling remains a risk until the plant is commissioned and reconciliations of actual production against estimates can be undertaken.

Failure of pit slopes can lead to significant disruption of production as well as increased cost to the project for reclamation, aside from the obvious safety risks. A geotechnical drilling and sample analysis programme was devised and should begin on approval of the project. All slope recommendations are based on limited data and previous experience; so other measures are also required once mining starts.

Early mining activities are required to prepare the mine for full scale operations. These include removal of infrastructure, building roads and pads, and mobilizing equipment. Any delays in these activities can lead to slower mining and a lack of ore tonnage or grade supply to the plant.

Finding experienced staff to work in remote and difficult environments can be difficult. This is a significant risk to the project.

Operations staff should be employed well ahead of their mobilization to ensure sufficient time for orientation and training. Approximately 700 operators are required in peak years and need to be trained appropriately to mitigate safety and operations risks.

Design/process

The Natalka process flowsheet is based on proven technologies. Extensive test work completed to date, at both laboratory and pilot plant scale, supports the flowsheet, so the process risks for this project are relatively low.

The metallurgical performance of the ore results in reduced recovery or increased costs. There is no blending system included in the current mine configuration. Three dimensional geological modelling inclusive of geology, lithology and metallurgical parameters has not been completed. Therefore, the understanding and predictability of ore types for future process plant feed could be improved. Noting, however, the long history of the operation mitigates this risk.

Instrumentation, control, and automation

Detailed engineering was completed for the original design configuration (circa 2012) for all disciplines with the exception of instrumentation, control and automation. Considerably more work must be completed to integrate the systems or else production ramp-up will be impacted.

Tailings storage facility design

Further engineering design is required to mitigated key risks associated with the gravity TSF design including:

- Dam overtopping as a result of snow melt from the large undiverted upstream catchment.
- Potential for instability and catastrophic failure of the upstream raises under seismic loading due to strain softening or liquefaction of the hydraulically placed tailings beach.
- Potential for instability resulting from excess pore pressure build up within the tailings foundations below the upstream raises as a result of rapid rates of rise and high phreatic levels within the tailings beaches.

Power supply

To meet power requirements Polyus has contracted additional power to be supplied via a new double circuit 220 kV transmission line and substation to be installed in 2018 and financed by the Russian government. Failure to meet the timeframe for commissioning will result in higher operating costs.

Project execution (construction, testing, and commissioning)

Failure to develop and affect an integrated execution plan could result in increased capital costs, quality issues (necessitating rework), construction schedule overruns and an extended commissioning/ramp-up schedule.

8.9.2 Opportunities

The following opportunities are identified for Natalka:

Resource/Reserve estimation and mine planning

There are some areas within the pit that are classified as Inferred Mineral Resource. This mineralization cannot be included in the Ore Reserve estimate. Additional drilling to improve the confidence in this mineralization could lead to upgrade to Measured or Indicated Mineral Resource and hence become available for conversion to Ore Reserve.

Haulage is 45% of the overall mining cost. Opportunities may be available to reduce this cost through trolley-assist electrical power for the trucks when travelling outside the pit.

Improved blasting performance can lead to significant improvement in throughput rate and reductions in cost at the milling stage. AMC recommends a mine-to-mill analysis should be conducted to determine the relative benefits of optimized blasting.

Project execution (construction, testing, and commissioning)

A large percentage of the Natalka capital expenditure is attributable to construction labour. If a well thought out Project Execution Plan is developed and implemented, site labour productivity could be improved considerably. This would result in significant capital expenditure savings.

9 Sukhoi Log

9.1 Introduction

9.1.1 Property location and description

Sukhoi Log is located close to the Verninskoye mine in the northern part of the Bodaybo administrative district, Irkutsk region (refer Figure 9.1).

Polyus acquired its interest in the Sukhoi Log development project on 21 February 2017.

The Sukhoi Log licence area abuts the Polyus Zapadnoye deposit licence area which lies to the west and is 6 km to the northwest of the Polyus Verninskoye licence area. The Verninskoye deposit is mined by Polyus, and the mine is located centrally in the Lena goldfield region, 6 km from the closest settlement of Kropotkin.

The Zapadnoye deposit was mined by Polyus from 2003 to 2008. Mining is currently suspended, however Polyus indicates that it plans to reactivate mining at some time in the future.

The closeness of Sukhoi Log to the other Polyus mineral assets provides opportunities to benefit from consolidated infrastructure and services when developing and operating any future mine and processing facilities.

Figure 9.1 Sukhoi Log - location and licence area

Sukhoi Log lies 140 km to the northeast of the town and district centre of Bodaybo, an established community of approximately 22,000 people. Bodaybo has a long history as the centre for placer gold mining in the area and is now a base for several mining companies, including Polyus, with well-established support services. There is a regular scheduled air service to Bodaybo from the regional capital of Irkutsk which is located 900 km by air, and 1,440 km by road from Sukhoi Log. Bodaybo is also accessible from the south by a 220 km all-weather, but poor quality, gravel road from Taksimo on the Baikal-Amur railway.

The Sukhoi Log deposit was discovered in 1961. An exploration programme followed which was aimed at developing the full mineral resource potential of the deposit. An extensive exploration programme was conducted between 1971 and 1977, including 210,000 m of diamond core drilling, three large bulk samples and over 80,000 gold assays. In 1977, reserves for Sukhoi were approved by the GKZ, referencing a classified TEO (Technical Economical Estimation) conducted by the Irkutsk Geological Department.

In 1978 and 1979, exploration programmes focused on the Sukhoi Log flanks, which led to the north-western section of the Sukhoi Log deposit being identified and assessed to contain additional reserves. The Zapadnoye gravity-processing plant was commissioned in 2003 to treat ore from the western flanks of the Sukhoi Log deposit. The circuit configuration was upgraded in 2005. The plant continued to operate until 2008. A total of 2.3 Mt of ore grading 2.1 g/t was treated, with an estimated gold recovery of 76.9%.

A further Sukhoi Log feasibility study was completed using the results of previous work (1962 to 1977) and new test work conducted by internal Polyus facilities, together with several external laboratories, including Alex Steward Geo Analytical Ltd. A report by FSUE TsNIGRI entitled "Comprehensive technological and geological and economic re-evaluation of the Sukhoi Log deposit through the development of innovative technologies", specified under a state contract with the Rosnedra, and numbered WB-04-34 / 38 was produced. It was dated 21 June 2006. This led to the approval of updated reserves by the GKZ in 2007.

AMC has estimated an Inferred Mineral Resource for Sukhoi Log, but not an Ore Reserve, however it should be noted that the evaluation of Sukhoi Log is on-going.

9.1.2 Mineral tenure

Polyus acquired its interest in the Sukhoi Log development project when Rosnedra issued the licence (IRK 16325 BE) for the development of Sukhoi Log on 21 February 2017. The licence expires on 23 February 2037.

The Sukhoi Log licence lower limit is +290 meters above sea level. The lower limit of the Sukhoi Log Mineral Resource estimate (refer section 9.2.4 of this CPR) is +320 meters above sea level, that is, 30 m above the licence limit.

The area of the Sukhoi Log property is 7.94 km^2. The property area is shown in Figure 9.1. The top edge of the property is set by the lower bound of the topsoil and, in its absence, by the boundary of the earth's surface and the bottom of water bodies and watercourses within the licence area.

The Sukhoi Log licence excludes mineral tenure IRK 03269 BR, which encompasses the Zapadnoye deposit also held by Polyus. Licence IRK 03269 BR is limited to an upper bound of +730 metres above the sea level, and the lower bound of the tenure is set to +290 meters above sea level.

AMC has not independently verified the standing of the mining licences.

9.2 Geology and Mineral Resources

Polyus is reporting the Sukhoi Log Mineral Resource for the first time in 2017.

9.2.1 Geology

The Sukhoi Log gold deposit is located centrally within the Lena gold field. It is reported as being the largest undeveloped gold deposit in Russia with total historical placer production from the goldfield to date of 1,500 tonnes of gold. There is some silver associated with the gold mineralization.

Sukhoi Log sits within a complicated regional structure known as the Bodaybo synclinorium, which corresponds geographically to the Baikal Platform Highland. The Sukhoi Log deposits are structurally controlled by a shear zone along the axis of an anticline, with veinlet, stringer, porphyry, quartz, gold and sulphide mineralization associated with the richest carbon-bearing layers.

Gold mineralization occurs both within the pyritic shales and in thin bedding-parallel pyrite-quartz veins, which have been folded by the main deformation. The mineralization covers an area of 3,000 m along strike and 1,500 m across strike. The depth of mineralization ranges from near the surface to between 1,000 m to 1,500 m in depth.

The gold mineralization at Sukhoi Log is controlled by a tectonic zone along the axis of the overturned anticline where it intersects metamorphosed carbon-bearing lithologies of the Neoproterozoic Khomolkho Formation sediments. The immediate host comprises alternating 0.1 m to 3 m thick beds of carbonaceous and calcareous siltstone, argillites, shales and sandstones. Organic compounds within these sediments have been carbonatised by hydrothermal fluids.

The mineralized zone forms a shallowly dipping tabular body, parallel to the axial plane of the fold, extending for >2,000 m along strike and 700 m down dip, forming a centro-symmetric zoning about the axis of the tight, overturned synclinorium. Dip of mineralization is approximately 30° to 45° towards the north, but is slightly shallower and more variable in the western end. Structural and stratigraphic indicators suggest the deposit is generally but not strictly located along the axial surface of the south-verging anticline, with the envelope of the deposit discordant to stratigraphic units, spanning a stratigraphic interval of nearly 1,000 m. In detail, the mineralization is not uniformly distributed within the deposit-scale envelope along the axial plane of the fold. The best developed and thickest ore zones are in two black shale units (the upper and lower Khomolho subformations), reflecting a second order stratigraphic control of mineralization, while gold mineralization also forms "wings" extending out along specific units away from the axial surface of the fold.

The central zone in the core of the fold contains abundant quartz-sulphide veinlets with complex shapes inherited from the small-scale folding of the host shales. This central zone passes out into an intermediate zone with few sulphides or quartz-sulphide veinlets, while the outer zone on the flanks of the synclinorium is characterized by disseminated fine grained pyrite, large granoblastic pyrite crystals as well as quartz-pyrite aggregates. Sulphide poor quartz veins up to 2 m thick are found in the veinlet stockwork and in the disseminated zones, while separate post-ore gold poor quartz veins are encountered at depth (300 m to 400 m).

The main gold occurrences are connected with veinlet-disseminated quartz-sulphide mineralization and are found in three zones, namely: i). the upper outer disseminated zone; ii). the intermediate and central zone and iii). the lower outer disseminated zone.

Nearly 90 minerals occur at Sukhoi Log including native metals, intermetallic alloys, sulphosalts, phosphates, tungstates, and oxides. Native gold is the main mineral of commercial interest. Platinum group minerals have been identified but not at grades that are economically significant. The mineral assemblage also includes trace levels of native Fe, Cr, Cu, Ni, Sn, W, Ti, and Te, as well as alloys of these metals.

9.2.2 Exploration

The Sukholozhskaya team of the Bodaybinskaya Exploration Company was prospecting for gold mineralization in the Sukhoi Log area between 1959 and 1963, and discovered the Sukhoi Log gold deposit. An exploration drilling programme was completed between 1967 and 1970; with further advanced exploration stage drilling completed between 1971 and 1977. A GKZ estimate was declared. The drilling was extended towards the northwest between 1977 and 1979 resulting in increases in the GKZ estimates.

Two underground adits were driven into the deposit to trace the mineralization along strike and down dip. The adits were done to review the structure of the mineralization, verify drilling results, and provide bulk samples for metallurgical testing. Approximately 11.8 km of underground workings were completed.

From late 1987 to 1991, the Kropotkinskaya team of the Bodaybinskaya Exploration Company of Irkutsk Geological Unit completed drilling to test the western and southern extension of the deposit. The programme also specifically targeted the quartz vein zones of Central and Western areas of the deposit.

Drilling continued on the Western portion of the deposit during 1992 and 1993, resulting in an updated GKZ estimate.

The Zapadnoye gravity-processing plant was commissioned in 2003 to treat ore from the western area of the Sukhoi Log deposit. The circuit configuration was upgraded in 2005. The plant continued to operate until 2008. A total of 2.27 Mt of ore with a grade of 2.1 g/t was treated, yielding an estimated gold recovery of 77%. The down dip extension of western area mineralization was drilled during 2007 and 2008.

Independent exploration work was completed in 1998 by Placer Dome Eurasia and Barrick Exploration International. With government permission, the companies were conducting validation work in the process of trying to acquire the licence for Sukhoi Log. The Placer Dome Eurasia exploration programme at Sukhoi Log included underground channel sampling and diamond core drilling. About 600 channel samples were taken in adit 2, A total of nine diamond drillholes were completed on four lines, resulting in approximately 2 km of completed drilling. Barrick Exploration International completed 13 drillholes having a total length of 3.6 km. Barrick also completed metallurgy testing on a bulk sample.

FSUE TsNIGRI re-estimated Sukhoi Log deposit in 2006 and 2007 under the state contract № WB-04-34 / 38 from 21 July 2006 with the Federal Agency of Mineral Resources (Rosnedra). A report by FSUE TsNIGRI entitled "Comprehensive technological and geological and economic re-evaluation of the Sukhoi Log deposit through the development of innovative technologies" was produced in 2007. This report provides a substantial amount of historical information on the project.

Historically, the Sukhoi Log deposit has been divided into four main areas: Sukholozhskiy, Central, North-Western, and Western Areas.

The prospecting drilling completed between 1961 and 1963 was non-diamond core drilling, and utilized a ZIF-300 drilling rig. Drilling diameter was 110 mm. Average core recovery was between 63% and 73% in mineralization.

Exploration diamond drilling completed between 1969 and 1971 utilized ZIF-300 and ZIF-650 drilling rigs using a drilling diameter of 76 mm. Average core recovery ranged between 76% and 82% in mineralization.

Between 1971 and 1979, the advanced exploration diamond drillholes were drilled with ZIF – 650M drilling rigs using a drilling diameter of 76 mm. Average core recovery ranged from 76% to 81% in mineralization.

From 1987 and 1993, diamond drilling was completed using ZIF – 650M, SKB-4 and UKB 200/300 drilling rigs with double tube and a drilling diameter of 76 mm. Average core recovery was between 77% and 80% in mineralization.

Deeper drilling in the Western Area has been completed using an Onram 1500 H rig with WL76/57 и WL59/47 Hagby drill bit in 2007 and 2008. Average core recovery was substantially improved with average recoveries better than 98% in mineralization.

Topographic surface survey was completed in 1973 by the survey department of Bodaybo Exploration Company. The Western Area affected with open pit mining has been re-surveyed by survey department during 2007-2008.

Collar coordinates have all been surveyed using theodolites. Coordinates utilize a local grid system.

Validation of the historic drillhole data is in progress. Azimuths and dips from downhole surveys have been methodically recorded on paper logs. An initial data check shows that the digital database contains a mix of magnetic and true azimuths, where the magnetic declination at Sukhoi Log is approximately 10°. Historically, downhole surveying became more common as the project progressed (between 1961 and 1963, none were downhole surveyed; between 1969 and 1971, 22% of holes were downhole surveyed; between 1971 and 1979, 80% of holes were downhole surveyed; from 1987, 100% of holes were downhole surveyed).

Assay data was acquired from core, underground channel and surface trench samples. Only core samples have been used directly for the Mineral Resource estimate.

Much of the core sampling has targeted long intervals with visible quartz-sulphide mineralization identified during logging. Later drillholes from 2007 tended to sample and assay the entire hole. Drillholes completed prior to 1973 were sampled with 1 m intervals. After 1973, this was increased to 2 m. From 2007, drilling in the Western Area reverted to 1 m intervals. All considered lithological boundaries identified during logging. Core was generally cut for sampling, where 2/3 of core was sampled from 1 m intervals, and half core from 2 m intervals. Where core recovery was less than 70%, whole core was sampled.

Core samples from all exploration periods were processed in the Bodaybinskaya Exploration Company laboratory, except late exploration stages related to the Western Area. In 2007 and 2008 samples were processed and assayed in the laboratories of LLC Lengeo and JSC GRK Sukhoi Log. Typically, samples were jaw crushed to 5 mm, then to 1 mm, riffle split to 1 kg to 1.5 kg, and then pulverized to 0.074 mm. Samples were assayed for gold using a 50 g charge fire assay with gravimetric finish (FA-GR). The lower detection limit of the FA-GR method was 0.2 g/t. The procedure was that, if the initial two assays showed gold grade above 2 g/t, then an addition two to four assays from the pulp would be completed.

The QAQC programme followed the Russian regulatory requirements. It included internal and external laboratory control where pulp duplicates were selected from the prescribed gold grade ranges and submitted to the original laboratory and to an umpire laboratory. Assays for sample pairs were assessed for variance in the grade classes. The Central Laboratory of Buryat and Irkutsk Geological Management Company acted as a second laboratory between 1968 and 1972; Irgiredmet was used as the second umpire laboratory between 1968 and 1990. No information on the laboratory coarse duplicates, blanks and Certified Reference Material (CRM) is currently available. Field duplicates (core halves) were submitted for assay to check the sampling representivity. QAQC data is not a part of the current electronic database.

All information was logged methodically and compiled in paper log books.

FSUE TsNIGRI has created the digital database for the Sukhoi Log as part of the state contract for re-estimate of Sukhoi Log deposit in 2007. Collar coordinates, survey, assay and geological data were entered from paper logs into Excel spread sheets.

The FSUE TsNIGRI TEO report states that bulk density was measured using different methods for a variety of different rock types. Results were reported to be similar for the different lithological varieties. A single dry bulk density of 2.7 t/m^3 was used for the Sukhoi Log GKZ estimates.

9.2.3 Mineral Resource estimation parameters

The Sukhoi Log Mineral Resource estimate as at 31 December 2016 was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- The AMC Mineral Resource estimate is a probability-based model that defines anomalous populations of gold mineralization (not defined by an economic cut-off grade). An appropriate mineralization threshold grade (0.3 g/t) was selected.
- Wireframe surfaces were modelled that reflect the continuity of grade in three dimensions. The surfaces took into account the geological interpretation of mineralization and the varying orientation of mineralized structures.
- The wireframes were used to calculate dip and dip direction of the surfaces, which were then used to develop a block model estimating the probability that a model cell was above a mineralization threshold (not an economic cut-off grade).
- The estimation process involved:
  - Compositing assay data to five-metre lengths.
  - Application of the mineralization threshold grade (0.3 g/t) to define indicator variable.
  - Generate a variogram model for the indicator variable.
  - Estimate the indicator using ordinary kriging and dynamic anisotropic search parameters.
  - Select a nominal probability threshold (0.4) from the estimated indicator value to define a mineralization envelope that is used to select and flag both blocks and composite data.
- Statistical analysis of the data allowed a high-grade cap or top-cut to be applied to the composite gold data.
- A variogram model for the gold data from the mineralization envelope was generated.
- Gold grade was estimated using ordinary kriging and dynamic anisotropic search parameters.
- A single density of 2.7 tm^3 was assigned to the model per previous GKZ estimates.
- The estimate was classified as Inferred Mineral Resource pending further data and geology review and verification. The classification has been in consideration of potential mining by open pit methods with selectivity indicated by drill-and-blast methods and mining possibly on 10 m benches.

9.2.4 Mineral Resource estimate

AMC prepared an Inferred Mineral Resource estimate for Sukhoi Log as at 21 February 2017 of 887 Mt with an average grade of 2.0 g/t and containing 58 Moz of gold.

The Sukhoi Log Mineral Resource estimate as at 21 February 2017 has been classified as an Inferred Mineral Resource.

The Mineral Resource estimate (Table 9.1) was reported above a cut-off grade of 1.0 g/t (based on ore being treated in a process plant) within a notional constraining shell developed from pit optimization using a gold price of US$1,500 per ounce as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. The pit optimization work indicates that the total material (including the 887 Mt of Inferred Mineral Resource) contained within that notional constraining shell is approximately 6 billion tonnes.

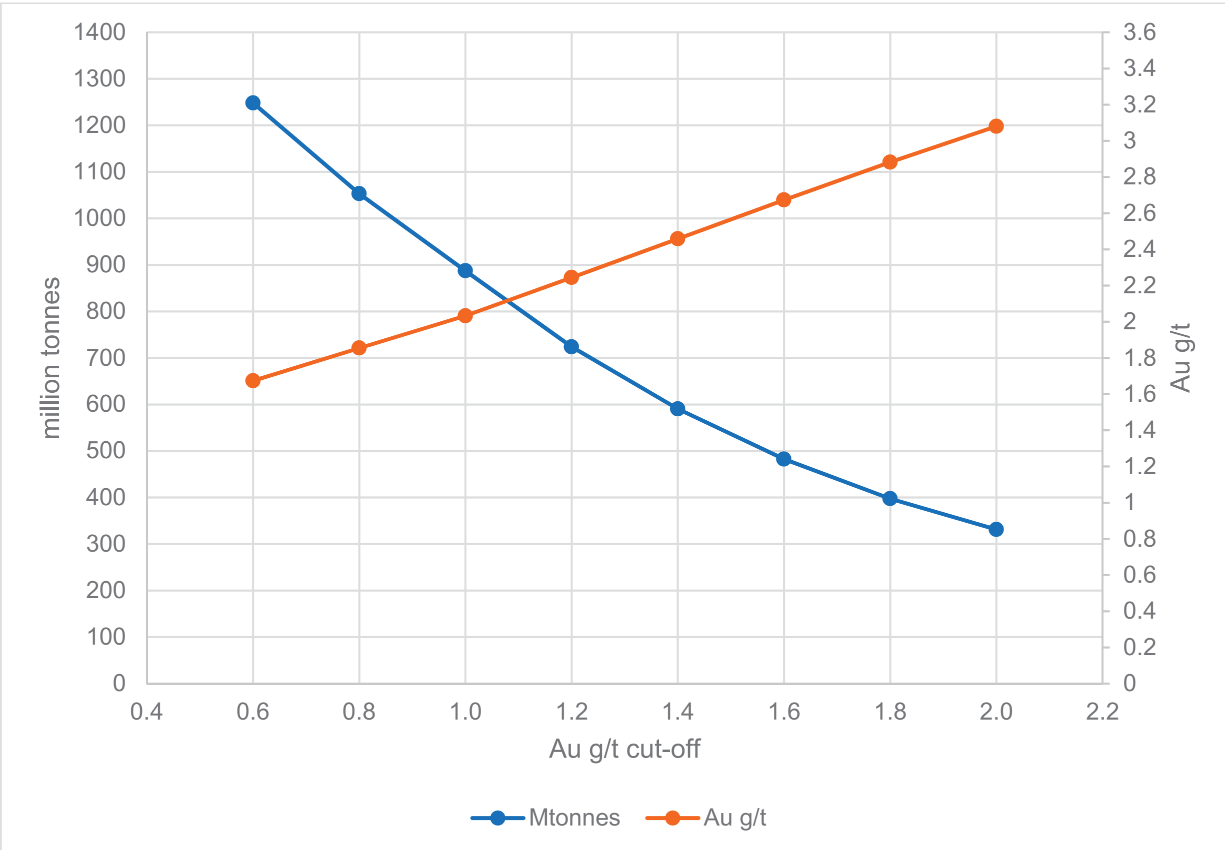
Table 9.1 Sukhoi Log - Mineral Resource - as at 21 February 2017

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Inferred	1.0	887	2.0	58	1,804
Total			**887**	**2.0**	**58**	**1,804**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. The topographic surface is current as of 21 February 2017.

The grade-tonnage curve for the Sukhoi Log Mineral Resource, which is contained within the notional constraining shell generated using a gold price of US$1,500 per ounce, is shown in Figure 9.2.

Figure 9.2 Sukhoi Log - 2017 Mineral Resource grade/tonnage curve



Parameters used in the pit optimization are shown in Table 9.2. A gold price of US$1,500 per ounce was used for the constraining shell. This price is 20% higher than the gold price of US$1,250 per ounce used for estimating Ore Reserves for other Polyus deposits. Dilution was incorporated into the optimization process by regularizing the resource block model to a cell size of 12.5 m x 25 m x 10 m. The optimization parameters are presented in Table 9.2.

Table 9.2 Sukhoi Log - optimization parameters for Mineral Resource estimation

Parameter	Unit	Value
Gold price	US$/oz	1,500
Gold recovery	%	90
Processing cost[1]	US$/t processed	15.61 (processing, SG&A, ore mining differential cost)
Royalty for COG calculation	% of revenue	6
Realization cost	US$/g recovered gold	0.114
Overall pit slope angle	degrees	45 degrees (max.)
Mining method	-	Truck and Shovel
Reference mining cost	US$/t mined	Reference – 1.20 (at 1,100 mRL)
Incremental mining cost[2]	US$/t mined/m depth	Increment – 0.0013
Cut-off grade	g/t gold	1.0

Notes:
1. This includes the assumed Refining and transportation charge is US$2.04/oz refined gold.
2. Mining cost increases with depth from the reference cost at surface due to additional haulage distance. Mining cost is calculated by adding the reference mining cost and the incremental mining cost at the required depth.

The Competent Person has had limited time to review the available data for Sukhoi Log. To reflect the uncertainty that remains until reviews of the resource data and modifying factors are complete, the estimate has classified and reported according to the JORC Code as an Inferred Mineral Resource. AMC recommends further review of the data used to develop the resource model grade estimates.

9.2.5 Previous estimate - GKZ

Sukhoi Log has a long history of exploration and evaluation, resulting in numerous estimates of mineral resources and reserves.

An estimate for Sukhoi Log was prepared in 2007 according to the GKZ guidelines and the estimate is recorded on the State Balance as summarized in Table 9.3. Polyus expects an update of the estimate once a new licence is issued and the licence boundaries are confirmed.

Information on the quantum and grade in respect of the GKZ estimate for Sukhoi Log is publicly available. Such information has not been prepared or verified by the Competent Person. Resources and reserves reported under the GKZ system may differ materially from Mineral Resources and Ore Reserves, which are classified and reported in accordance with the JORC Code.

Table 9.3 Sukhoi Log - GKZ estimate - 2007[1]

Classification	Cut-off Grade (g/t Au)	Tonnes (Mt)	Gold Grade (g/t Au)	Contained Gold (kg Au)	Silver Grade (g/t Ag)	Contained Silver (kg Ag)
On-Balance Open Pit						
B	0.5	59.7	3.18	189,929	-	-
C1	0.5	604.1	1.97	1,188,972	-	-
C2	0.5	160.7	1.73	277,782	1.59	1,313,831
Total On-Balance Open Pit	**0.5**	**824.3**	**2.01**	**1,656,682**	**1.59**	**1,313,831**
Off-Balance Open Pit	**0.2**	**508.0**	**0.47**	**236,608**	**-**	**-**
On-Balance Underground	**1.5 (Central Zone)** **1.2 (Other Zones)**	**106.0**	**2.79**	**296,233**	**2.15**	**227,447**
Off-Balance Underground	**0.2**	**1,035.1**	**0.54**	**562,175**	**-**	**-**

Notes:
1. Reserves of gold and silver in the subsoil approved protocols, the State Commission for Mineral Reserves of 19 December 2007 number 1529.
2. The silver estimate is all classified as C2, even if associated with gold mineralization of class B or C1.
3. Silver grade calculated using a relationship with the gold grade determined by metallurgical testwork of bulk samples.
4. Silver is reported for blocks which meet the gold grade cut-off (no silver cut-off applied).

9.3 Mining

The Sukhoi Log project is very close to the Polyus-owned Verninskoye pit and mining conditions are expected to be similar to those encountered at the Verninskoye operation. This operation uses conventional drill, blast, and truck and shovel loading mining methods.

Resource definition and grade control activities are likely to be required during the mining process. Data acquisition drilling should be conducted to gather information about the geotechnical conditions at the expected pit slopes and the geometallurgical parameters that will form the basis of plant design studies.

Previous studies envisaged an ore processing rate of 30 Mtpa after a ramp-up period of five to ten years. TsNIGRI indicated that a mining rate of approximately 100 Mtpa was likely to be required to strip ore and waste to maintain continuous feed to the plant, once the mine reaches nameplate capacity and for a period of approximately 15 years thereafter. AMC anticipates that a pit design which contains 15 years of plant feed is likely to have an average depth of approximately 180 m, with an associated average mining cost of US$1.43/t mined. Mining costs for larger pits will increase as the depth increases. For a pit producing sufficient ore feed to the plant for around 30 years, the average depth may increase to approximately 280 m and the associated average mining cost to approximately US$1.56/t mined.

Any mining schedule will be dependent on the plant throughput rate, pit size, cut-off grade chosen and stockpiling strategies employed. In generating the Mineral Resource estimate, AMC observed that the Mineral Resource may support a mine life in excess of 15 years with an associated pit shell that is larger than those envisaged by the previous studies, with potential for higher average mining costs over the longer mine life.

To supply ore for a plant throughput rate of 30 Mtpa, a high capacity, low cost operation will be utilized.

The power line servicing the Verninskoye operations is close to Sukhoi Log and is expected to supplied grid power to the site. There is potential for use of electric-powered mining equipment in areas of bulk waste or continuous ore, which should contribute to low mining costs. More mobile and flexible hydraulic loading units may also be useful in mining at the boundaries of the ore zones and to exclude deleterious elements.

The mineralization is expected to be associated with pyrite and there are indications that shale units are present. Care will be required to exclude as much carbon-bearing material as possible from the plant feed. The presence of significant pyrite indicates that acid mine drainage may need to be mitigated and testwork to gather information about sulphide mineralization should be conducted.

9.4 Metallurgy and processing

9.4.1 Irkutsk Geological Department - 1977

Following discovery of the Sukhoi Log deposit in 1961, exploration continued with the aim of developing the full mineral resource potential of the deposit. Extensive exploration was conducted between 1971 and 1977, including 210,000 m of diamond core drilling, three large bulk samples, and over 80,000 gold assays. The Irkutsk Geological Department conducted a study, initially using VNIIProzoloto Institute (VNIIProzoloto), a Russian research and design institute to conduct the test work. Some 15 samples were tested including three of pilot-scale size. Gold recoveries ranging from 84.0% to 86.7% were obtained using the following basic circuit:

- SAG milling.
- Gravity separation.
- De-slimed flotation of gravity tails.
- Cyanide leaching of flotation concentrate.

In 1975, GKZ commented that the projected gold recovery was too low. A new testing programme was conducted by Irgiredmet using five new bulk samples. Irgiredmet confirmed the homogeneous distribution of gold throughout the deposit that was noted by VNIIProzoloto.

Irgiredmet achieved gold recoveries from 91% to 92% using the following processing conditions which include a relatively fine grind:

- Grinding to 85% -74 µm.
- Gravity separation.
- Cyanide leaching of gravity tails.

Irgiredmet also obtained gold recoveries of 86.0% to 86.8% using the following processing flowsheet including a relatively coarse grind:

- Crushing and grinding to 97% to 98% -150 µm.
- Gravity separation in the grinding closed circuit.
- Flotation of gravity separation tails.
- Cyanide leach and sorption of flotation concentrate.
- Resin sorption/desorption/regeneration.
- Gold electrowinning and doré production.

Irgiredmet concluded that while recoveries up to 92% were possible with whole-ore grinding and leaching and a relatively fine grind, high operating costs that would be incurred with this approach would most likely preclude its use.

9.4.2 Sukhoi Log Mining Company - 2000

In 1978 and 1979, exploration programmes focused on the Sukhoi Log flanks, which led to the north-western section of the Sukhoi Log deposit being identified and assessed to contain additional reserves. Multiple small-sample, testing programmes were conducted by Irgiredmet and others from 1991 to 2001. All samples in this period were drawn from Ore Body 1. The scoping study and reserves were approved in 2000.

In 2005, four bulk samples from Ore Body 2 were selected for detailed testing to evaluate a circuit designed to treat ore from the western flanks of Sukhoi Log:

- Irgiredmet - 16,000 kg.
- TOMS Ltd - 6,000 kg.
- Intertek - 500 kg.
- Bateman Minerals - 2,500 kg.

9.4.3 Sukhoi Log Mining Company - 2010

The Zapadnoye gravity-processing plant was commissioned in 2003 to treat ore from the western flanks of the Sukhoi Log deposit. The circuit configuration was upgraded in 2005. The plant continued to operate until 2008. A total of 2.23 Mt of ore grading 2.1 g/t was treated, yielding an estimated gold recovery of 76.9%.

The Sukhoi Log Mining Company assembled a study report in 2010 which incorporated the work of the following contractors:

- OJSC Lengeo - a geological contractor.
- Irgiredmet.
- LZPK.
- PRDC.

The study estimated a gold recovery to doré of 79.3%, using the following gravity only processing flowsheet:

- -700 mm ROM feed.
- Jaw crusher and rotary crusher to produce -20 mm.
- Rotary scrubber and trommel screen to produce -10 mm.
- High Pressure Grinding Rolls and screening to produce -1.5 mm.
- Ball milling and hydrocyclone classification.
- Knelson centrifugal separators in grinding closed circuit.
- Jigs and shaking tables to recovery gravity gold in fine size fractions.
- Retention of circuit tailings for future cyanide leach treatment.

9.4.4 FSUE TsNIGRI - 2007 and 2008

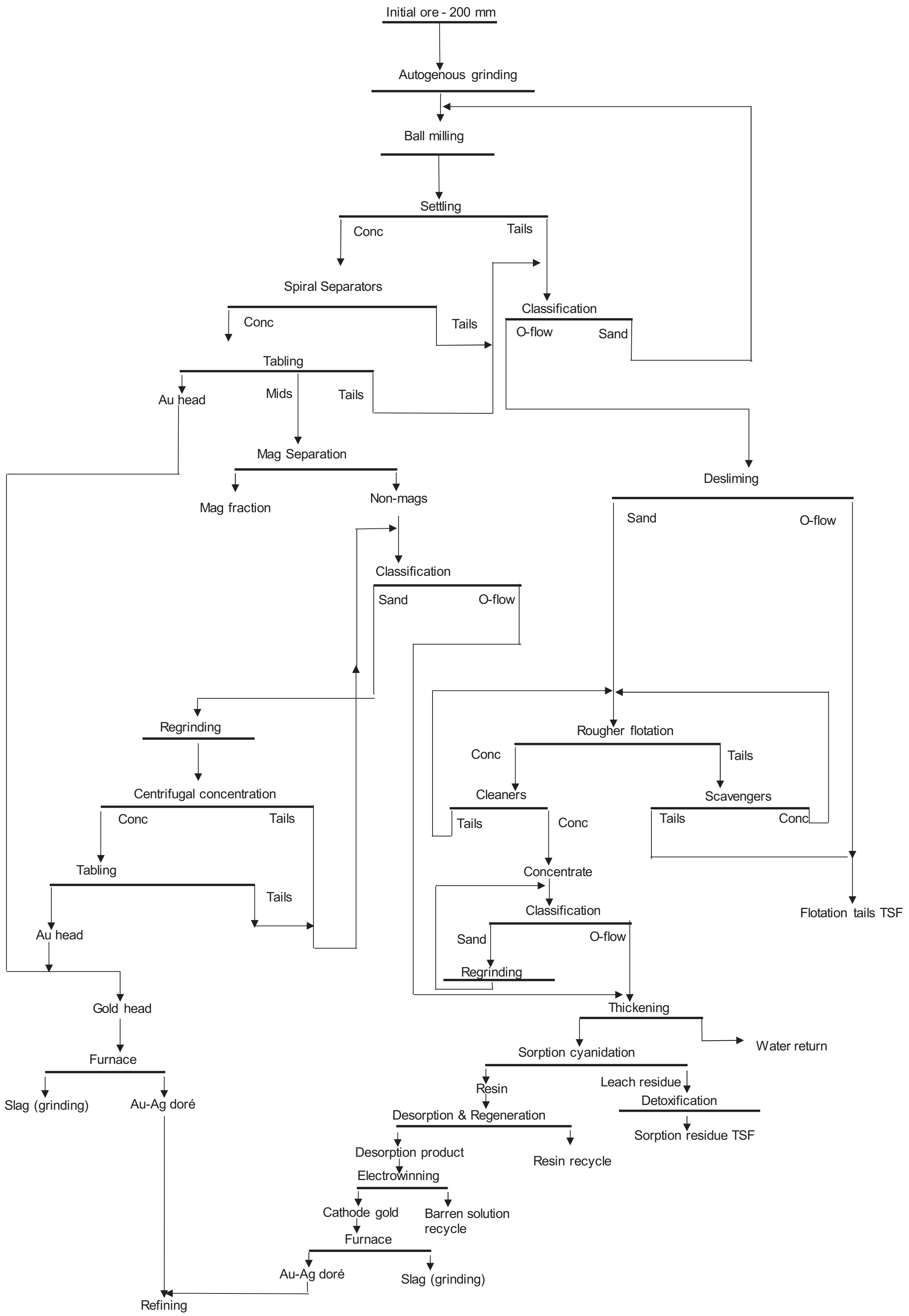
Two other Sukhoi Log studies were completed using the results of previous work (1962 to 1977) and new test work conducted by internal facilities, together with several external laboratories (Alex Steward Geo Analytical Ltd, 2007, Placer Dome Inc., 1999). FSUE TsNIGRI prepared the following reports on studies:

- "Comprehensive technological and geological and economic re-evaluation of the Sukhoi Log deposit through the development of innovative technologies", specified under a state contract with the Federal Agency for Subsoil Use (Rosnedra), numbered WB-04-34 / 38 and dated 21 July 2006. This led to the approval of updated estimates by the GKZ in 2007.
- Geological report on the results of works for the development “Conceptual Pre-Feasibility Study of industrial development of the gold mine Sukhoi Log with the definition of licensing conditions” specified under a state contract with the Federal Agency for Subsoil Use (Rosnedra), numbered #111-13 and dated 1 July 2008.

The study developed a direct processing flowsheet similar to other arrangements used for treating ores from the Verninskoye/Zapadnoye/Sukhoi Log region. The flowsheet is shown in Figure 9.3. The basic circuits are as follows:

- Crushing to -200 mm.
- Autogenous grinding.
- Ball milling.
- Gravity separation (spiral separators).
- Tabling of spiral con.
- High-grade table con to gold recovery furnace and Au-Ag doré production.
- Magnetic separation of table middlings, with discard of magnetic fraction.
- Classification of spiral and tabling tails, with recycle of coarse fraction.
- Flotation of de-slimed classification fines.
- Cyanide leaching of flotation concentrate.
- CIL recovery of gold and silver from solution and Au-Ag doré production.

Figure 9.3 Sukhoi Log - direct processing flowsheet



A detailed examination of optical sorting to raise the grade of ore feed to the processing circuit was undertaken. Upgrade factors from 1.7 to 2.1 were achieved, however significant gold recovery is sacrificed in this additional processing step and significant additional test work will be required to establish the technical viability of the process over the whole size range of ROM ore, and the economic impact of its use.

Gold recoveries ranging from 84.6% (with feed grade of 1.02 g/t) to 93.4% (with feed grade of 3.48 g/t) were achieved using ROM feed samples, and optically-upgraded samples. AMC estimates a gold recovery of approximately 90% using direct processing only, for an estimated head grade of 2.0 g/t.

Polyus reports the presence of carbonaceous materials in Sukhoi Log ore in the range from 2% to 10%. This is similar to the level of carbonaceous material at Verninskoye where the gold recovery achieved is approximately 87% to 88%. Significant work will be required to understand the distribution of this impurity throughout the deposit, and its impact on the performance of the plant.

AMC has estimated the operating costs of the direct processing plant in the range from US$11/t processed (at 30 Mtpa processing rate) to US$13/t processed (at 15 Mtpa processing rate). AMC used the current operating costs for the Verninskoye plant, and throughput rate versus operating costs relationships from the 2016 Australian Metal Cost Guide to calculate the estimates.

9.5 Infrastructure

The main freight transportation to Sukhoi Log could be carried out by minor extension of the existing Verninskoye supply system. The system includes a year-round road from Taksimo railway station, a part of the Baikal-Amur rail line, to Bodaybo, and the year-round regional road from Bodaybo to Kropotkin and to the Verninskoye mine and plant site. While this system is not fully sealed, the roads appear to be basically sound, and with appropriate upgrading, can be expected to have sufficient capacity to cover the early phases of implementation of the Sukhoi Log project.

There is an unsealed airstrip at Bodaybo, and regular passenger air services to Irkutsk which is two hours flying time to the south.

A significant capital programme will be required to supply power for Sukhoi Log. Polyus estimates that 120 MW to 200 MW will be required in total for the mine, plant, and township. In 2016, the Verninskoye operation was connected to the Irkutsk federal grid (Peleduy-Mamakan grid line) which supplies 51 MW. The line is located adjacent to the Sukhoi Log leases. Polyus is evaluating two options to supply power for Sukhoi Log:

- Option 1 – expand the capacity of the Peleduy to Sukhoi Log transmission line.
- Option 2 – construct a new line from Taksimo sub-station on the Baikal-Amur main-line to Mamakan sub-station, and then to Sukhoi Log.

There is abundant power in the region, and both options are technically feasible, so the investment decision will be made on economic grounds.

Water supply and water management systems used at Verninskoye should provide usable templates for Sukhoi Log. Design of systems for tailings storage should also benefit from the experience at Verninskoye. No issues beyond those normally expected from operation in the harsh Siberian winter weather are anticipated.

9.6 Permitting, environment, community, safety, and mine closure

9.6.1 Permitting

Since the Sukhoi Log deposit was discovered in 1961, there have been several phases of additional exploration, and feasibility studies.

Following grant of a subsoil use licence for the deposit, Polyus indicates that it plans to continue with exploration activities and development of a feasibility study and environmental impact study as a basis for securing mining and environmental approvals for the project.

9.6.2 Environment

The climate of the area is continental, with long winters with temperatures down to -55°C, and short summers with temperatures up to +39°C. The average annual temperature is -6.5°C. The area is above freezing for a period of 78 to 125 days per annum.

Rivers are ice covered from October-November through to May. Snow cover in the valleys lasts from October to June, with extended snow cover on surrounding peaks. Permafrost is common, mainly on the northern slopes of mountains.

The average annual rainfall is 390 mm to 550 mm, with 60% to 70% in the summer months. Most of the winter is overcast with light winds and low precipitation. Westerly and south-westerly winds are most common. The mean speed of 3 m/s.

The vegetation of the area is characterized as mountain taiga, with differentiation depending on the altitude and slope exposure. Mountain peaks are often bare of woody vegetation, and the northern and southern slopes of the upper part are covered with thickets of dwarf Siberian pine, dwarf birch and larch. The species composition of vegetation in lower areas is greatly increased and includes coniferous, deciduous and mixed forests arrays.

The fauna of the area is typical of the mountain taiga conditions of Siberia. Depending on the season, there are migratory and passing birds. Fish in the area are likely to be typical of Siberian species.

Land cover in the Bodaybo district is approximately 82.6% forest land. The eastern part of the Bodaybo district contains the Vitimskiy nature reserve. The reserve covers an area of 585,838 ha and includes the upper reaches of the Vitim River, a left tributary of the Lena River. The reserve protects a wide variety high-altitude, continental climate flora and fauna complexes: larch taiga, cedar thickets, mountain tundra, and sub-alpine meadows of the Kodar Mountains. The reserve is located approximately 140 km northeast of the regional city of Bodaybo and is remote from, and upstream of the Sukhoi Log project location.

Forests located in Bodaybo area are of little commercial interest. Forests are typically located in rocky areas, have large areas of bushes, glades and wetlands, and are located a considerable distance from the nearest railway. Harvested timber is typically used for the manufacture of lumber, millwork, poles and firewood for use in the local district.

The project area lies towards the upper parts of a local catchment (adjacent 1^{st} and 2^{nd} order streams). Many of the drainage lines and rivers in the surrounding area (including at the project site) have been mined via alluvial gold mining methods, with little rehabilitation. Many drainage lines and rivers remain heavily disturbed.

A slight increase observed in the general background of elements such as arsenic, silver, lead, copper, zinc, nickel, cobalt, and strontium has been observed in the area of the deposit.

Waste rock and tailings environmental geo-characterization studies have not commenced. The shale host rock is likely to contain pyrites and waste rock and tailings management may need to consider acid and metalliferous drainage as part of the design process.

In summary, the project lies in an area remote from dense population centres, within an ecological area that is extensive and unlikely to be unique to the project area. Nearby alluvial mining is the major land use in the area, and has resulted in existing disturbances to land and surface water systems. There does not appear to be any immediately obvious environmental constraints to the project.

9.6.3 Community

The nearest major city is Bodaybo, located approximately 140 km to the southwest, at the confluence of the Vitim and Bodaybo rivers. The nearest settlement is the village of Kropotkin, located approximately 6 km to the south.

The main industries of the project area are mining, manufacturing, trade and technical services, with some agricultural and forest activities, however, the economy of the Bodaybo district is largely based on gold mining with approximately 30 significant gold producers.

Up to date employment data were not available. A substantial workforce has already been established by Polyus and other operators in the area. The need for additional workforce will be considered as part of project planning.

Polyus indicates that social impact assessments and community development and management plans will be developed as part of the project's environmental impact assessment or in response to the terms and conditions of the subsoil used agreement.

9.6.4 Safety

Polyus plans to extend its existing occupational health and safety systems to the exploration, development, and operational phases of the project.

9.6.5 Mine closure

Mine closure plans will be prepared as part of the environmental impact assessment for the project, or subsequent to, and as required by the usual terms of a subsoil use agreement to be issued for the project.

9.7 Risks and opportunities

The following risks are identified for Sukhoi Log:

- The Sukhoi Log project has recently been and acquired. Significant verification work is planned in the areas of resource development, mine planning, processing, and environment. Until all verification work is complete, uncertainty will be present in the estimates of Mineral Resources and Ore Reserves.
- The geology and mineralization is potentially very complex.
- The Zapadnoye deposit on the western flank of Sukhoi Log was mined by Polyus from 2003 to 2010. Mining is currently suspended, and AMC notes that the mine underperformed against the resource model.

The following opportunities are identified for the Sukhoi Log:

- The Mineral Resource base demonstrates a significant gold deposit with potential to produce significant quantities of gold in an active mining region. The potential of the project is great.
- Polyus is well placed to develop the project leveraging its existing infrastructure and local knowledge.
- The close proximity of Sukhoi Log with other Polyus mineral assets provides opportunities to benefit from consolidated infrastructure and services when developing and operating any future mine and processing facilities and the existing facilities.
- An Ore Reserve has not been estimated for the project but should follow based on additional technical work.

10 Development and exploration projects

10.1 Panimba

10.1.1 Introduction

The Panimba project is located within the Severo-Yeniseysk district of the Krasnoyarsk region.

The Krasnoyarsk Mineral Company holds subsoil use licence number KRR 01710 BR for the Panimba deposit. The licence was granted on 2 January 2007 and expires on 1 November 2029. AMC has not independently verified the standing of the mining licence.

The Mineral Resource estimate for Panimba was prepared by Kazakhstan Mineral Company – Russia (KMC-RU) in 2012. Polyus reviewed the Mineral Resource estimates in 2015. This estimate and supporting data were consolidated into a report by AMC and are summarized in this CPR. There has been no material change to the project since that time.

Panimba is an advanced stage exploration project located on the main highway between Severo-Eniseysk and Krasnoyarsk, some 115 km south of the former. From 2007 to 2010, work was concentrated on the Mikhailovsky and Zolotoye zones and, in 2010, field work at Panimba was undertaken and a feasibility study was submitted to Russia regulators, which presented a mineral reserve statement and an economic analysis of the project.

The Panimba Mineral Resource was originally reported according to JORC Code 2004[9], being the applicable code at that time, but no JORC Code Table 1 was prepared.

Polyus does not state an Ore Reserve estimate for Panimba.

10.1.2 Geology and Mineral Resources

There is no material change to the Panimba Mineral Resource reported previously in 2015.

Geology

Geologically, the Panimba deposit occurs in an area of complex folding and five distinct mineralized zones were identified. Of these zones, the Mikhailovsky and Zolotoye zones are considered to be the most important. The Tavlik and Shalokit zones, which are more recent discoveries, are currently the least explored.

The Mikhailovsky Zone was divided into three orebodies (M1 to M3) which are mostly composed of mylonitised and cataclastic finely nodular carbonaceous-quartz-sericite schist, heavily silicified, and with up to 10% sulphide content. Mineralization tends to be disseminated, although there are quartz stringers that are typically thin (1 mm to 15 mm), sinuous and oriented in various directions. The stringers commonly carry sulphide mineralization comprising of pyrite, pyrrhotite and arsenopyrite and finely disseminated gold. Ore zones tend to be sinuous and vary in strike length (tens to hundreds of metres), thickness (up to 50 m) and dip extent. Grades average between 2 g/t and 3.5 g/t in the different zones.

The Zolotoye zone is an assemblage of cross-cutting quartz veins and stringers which are generally concordant with the main structural elements in the area. The mineralization has been likened to a linear stockwork deposit, although with a complex morphology. Mineralization was traced to over 600 m depth. In total, some six ore zones and 33 lenses have been identified to date. Relative to the Mikhailovsky zone, the gold distribution is far more irregular and extreme, with barren and outlier values closely juxtaposed, and individual samples grading from trace amounts to 883 g/t.

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9 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2004 Edition, Effective December 2004, Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC).

Mineral Resource estimation parameters

The current estimate of the Mineral Resource for Panimba was completed in July 2011. It was classified and reported in accordance with the JORC Code 2004, being the applicable code at the time. The material assumptions and technical inputs and parameters underpinning the estimate continue to apply and have not materially changed.

The Mineral Resource estimation parameters can be summarized as follows:

- The resource estimates for the Mikhailovsky and Zolotoye zones were combined for reporting.
- The resource models were designed assuming an open pit mining scenario.
- The cut-off grade has been maintained in-line with those for other deposits within the region, namely Olimpiada and Poputninskoye.
- Mineral Resource Evaluation – the final block model was used as the basis for resource evaluation; the block model was reported using a cut-off grade of 0.7 g/t, in line with the economic analysis.

Mineral Resource estimate

The combined Measured, Indicated and Inferred Mineral Resource for Panimba as at 31 December 2016 totals 40 Mt with an average grade of 2.0 g/t and contained gold of 2.6 Moz as shown in Table 10.1, reported at a cut-off grade of 0.7 g/t.

Table 10.1 Panimba - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Measured	0.7	5	2.3	0.36	11
	Indicated	0.7	11	2.3	0.83	26
	Inferred	0.7	24	1.8	1.4	44
Total			**40**	**2.0**	**2.6**	**81**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

10.2 Poputninskoye

10.2.1 Introduction

Property location and description

The Poputninskoye deposit is located in the Motygin district, Krasnoyarsk region in Russia, and 20 km from the Motygino settlement (Figure 1.1 and Figure 1.2). Access to the project is by road and the project is approximately 400 km from Krasnoyarsk. The road crosses three rivers – Enisey, Taseeva and Angara. Access across the rivers is available by ferry during summer months, and by road during winter period. Site is not accessible up to several weeks between seasons.

Poputninskoye deposit is located about 240 km to the south-east of the Olimpiada gold mine.

Mineral tenure

The Poputninskoye project is located within the Razdolinskoye mineralization area, which hosts eight additional prospects and exploration areas. These additional prospects and exploration areas are Antoninovskoye, Rudnichnoye, Svetloye, Zmeinoye, Ust-Bogolubovskoye, Perevalnoye, Osinovoye and Zapadnoye. However, the scope of this CPR is limited to Poputninskoye and Zmeinoye.

The exploration licence and operation permit KRR 14146 BR for Razdolinskoye mineralization area is granted to Krasnoyarsk Exploration Company. The licence was registered on 4 July 2007 and is valid until 1 November 2025. The licence area is limited to a depth of 1,000 m from the surface.

AMC has not independently verified the standing of the mining licences.

10.2.2 Geology and Mineral Resources

The Poputninskoye Mineral Resource was updated in 2016 to incorporate additional drilling data, revised interpretations, and a revised estimation method. Cut-off grades for the open pit resource have changed from 0.50 g/t to 0.8 g/t for oxide and 0.7 g/t for fresh material as a result changed economic and project evaluation parameters.

Geology

A description of the regional geology relevant to the Olimpiada, Blagodatnoye, Poputninskoye and Titimukhta deposits is presented in section 2.2 of this CPR.

Poputninskoye deposit area is predominantly composed of Proterozoic, Early Riphean middle subformation of Kordinskaya formation (R_1kd) which is a part of the Panimba volcanic-sedimentary unit. A sub meridional chain of metamorphic mafic–ultramafic bodies related to Poputninsky and Isakovsky complexes are located in the Central part of Razdolinskaya area. The subvolcanic intrusives of the Poputninskoye complex are composed of amphibolite, and amphibole-chlorite schists. Ultramafic rocks are represented by talc-chlorite, talc-carbonate-chlorite and actinolite-chlorite schists in the Poputninskoye deposit area. The genesis of these rocks is unclear. The Poputninsky intrusive has a 150 m to 300 m wide U-shape that strikes for 2 km. The intrusive has high-angle contacts dipping at 60° to 70° towards the North, West, West and North at the edges, and shallow dipping contacts under the carbonaceous schists in the folded/deformed portion of the complex.

The Razdolinskoye mineralization has been regionally metamorphosed to green-schist facies. The gold mineralization of Poputninskoye deposit is related to sericite (muscovite)–chlorite schists of a low-temperature metamorphic stage that is common for the gold mineralization along the Yenisey Ridge.

Beresite and listvenite types of metasomatic alteration are developed within boudinaged mafic and ultramafic propylites. This alteration has a direct correlation with quartz-carbonate stockwork and gold mineralization.

Mineralization is localized in:

- Thick boudinaged and brecciated material within shear zones developed along the hangingwall contacts between schists, ultramafic rocks and carbonaceous phyllic schists, tuff schists and diabase.
- Blind, asymmetric ridge-like protrusion of ultramafic schists into host rocks where mineralization occurs on both sides.
- Linear shear and breccia zones in the diabase with overprinted metasomatic alteration.
- En echelon veins along dip and strike. These structures host high-grade mineralization.
- Mineralization zones are represented by disseminated, vein disseminated sulphide mineralization in mica- carbonate-quartz, fuchsite-quartz-carbonate and carbonate -chlorite-quartz-plagioclase metasomatic rocks. Sulphide amounts range from 2% to 3% up to 20% to 30%. Two types – pyrite and spicular arsenopyrite-pyrite are known at Poputninskoye deposit. Pyrite is often enriched in arsenic, may have quartz edging, sometimes forming pyrite-quartz aggregates.

Gold mineralization is associated with:

- Mica-quartz-carbonate, listvenite-beresite alteration zones.
- Quartz-carbonate stockwork mineralization in metasomatic rocks.
- Linear relicts of carbonaceous schists. May host high-grade gold mineralization.
- Sulphide zones in carbonaceous schists and tuff schists at the contact with intrusion.

Gold has a very strong correlation with arsenic, and to a lesser degree with antimony.

Intensive karst features related to faults are developed at the NE part of the deposit within the Kordinskaya dolomite rocks. They form asymmetric depressions, 100 m to 150 m in depth and are filled with clay-sand clastic material. The karst features do not impact the current resource estimate.

Intensive oxidation due to weathering generally occurs to a depth of 50 m to 80 m.

Exploration

Drilling by Polyus or Polyus owned entities began in 2007 and continues in 2016.

The drilling grid is complex and represents two independent grids with different alignments designed to conform to the orientations of the two groups of mineralized bodies. The originally exploration grid orientation has an azimuth of 140° and was orthogonal to the expected strike of the mineralization. In 2009, geologists revised the interpretation and suggested that the mineralization could be divided into two groups of mineralized bodies with different orientations. As a result, a second drilling grid was introduced on an Azimuth 50°. One drilling line was oriented at Azimuth 115°.

A total of 1,027 drillholes have been completed for a total of approximately 109,141 m.

A significant portion of the exploration area is covered with overburden of between 3 m to 5 m in thickness. Mapping through the use of shallow drilling and surface trenching was used to trace mineralization at surface. Few trenches were completed to bedrock due to the thick overburden and significant ground and surface water. Drilling depths range from 4 m to 80 m, but average 20 m in depth.

The Angarsk Exploration Company completed exploration drilling using a ZIF-650 (ЗИФ-650) rig before 2009. In 2009, exploration drilling was completing using a UKB-5STE (УКБ-5СТЭ), a Christensen CS-14, and a Boart Longyear LF70 drilling rig. Exploration diamond drillholes were drilled using double tube and a HQ (96 mm) diamond bit in 3 m drilling runs. Overburden and oxide zone were drilled dry with 112 mm or 93 mm tungsten bits. Drilling within fault zones used a reduced drilling run of 0.5 m to 1.0 m and special Atlas Copco hard outer tube to prevent drillhole deviation. Core recovery was good and ranged from 95% to 100%, averaging 99%.

Nine verification drillholes were drilled to validate the existing drilling results.

There has also been special hydrogeological and metallurgy test drilling completed on the project.

Exploration infill drilling was in progress during the November 2016 site visit. Two drill rigs, a Christensen CS-14 and a URB-2A2 were in use.

Prior to 2009, the collar coordinates and start points of surface trench coordinates were surveyed by the geodetic survey department of Polyus Exploration Company. Geodetic surveys were completed using a Nikon NPL-352 Total Station and Trimble 4600 LS GPS system. From 2009, all surface survey work was completed by the Geocomp survey department using a Leica TCR 407 Total Station. A local coordinate system №167 and Baltic elevation system has been used for all survey data.

Downhole surveys are surveyed by a digital continuous MIR-36 (ИММН 36) magnetic tool. The downhole survey measurements are entered into the database every 10 m. The magnetic azimuth is logged and then a true azimuth is calculated. The total magnetic declination for the region is 2.06° (2016).

A topographic surface, for an area totaling 2.37 km^2 was surveyed in by Geocomp survey department in 2009 using a Leica TCR 407 Total Station and a Sokkia Stratus GPS.

The geologist logs lithology, colour, vein type, secondary alteration and sulphide presence information on to paper logs. Information is logged as a text description only. All information from paper logs and data sheets is entered in to Excel tables and an Access database. Paper files containing all the information as required by GKZ are compiled for every drillhole.

All drilling samples (including the grade control diamond drilling) is processed at the site sample preparation laboratory (prep lab). The prep lab is equipped with Rocklab supplied equipment. All exploration and verification drillholes were sampled the full length of the hole. Mapping drillholes were only sampled within oxide zone and in bedrock. Core was sampled on standard 1 m intervals while considering lithological boundaries. Sample length varies from 0.5 m to 2.0 m. In non-mineralized or host rocks, the sampling length ranges from 1 m to 2.0 m. Intact or hard rock core was split using a diamond saw, with one half sent as a sample and the other half returned to the core box for storage. Loose oxide material was sub-sampled with the scoop. Sampling ‘quality’ was checked by comparing actual weight with a theoretical weight. The weight data was recorded but not supplied to AMC as part of the digital data.

Prior to 2009, core samples were processed in the Angarsk Exploration Company sample preparation laboratory. Samples were crushed to 1 mm, reduced to 0.5 kg to 0.6 kg and pulverized to 0.074 mm. Between 2009 and 2010 core samples were processed at the Geocomp on-site sample preparation laboratory.

Sample preparation process comprises:

- Manual sample registering and weighing.
- Core splitting. Hard rock core is sawed on two halves. One half goes to sample, second half returned to the core tray for storage; while loose oxidized material is sub-sampled with a scoop.
- Bulk density measurements are performed on every sample by hydrostatic weighting.
- Samples are dried at 60°C for 24 hours.
- The entire sample is then jaw crushed to 5 mm and roller crushed to 1 mm.
- All samples are sieved to control crushing quality with the oversize crushed again to achieve desired particle size.
- The 1 mm sample material is riffle split on a 50\50 riffle splitter to produce a nominal 800 g primary sample and coarse duplicate.
- The 800 g sample is ring milled to 0.074 mm.
- Pulverized material is riffle split into a 400 g laboratory sample and a pulp duplicate.

ILAMS as the primary laboratory assayed the routine samples in 2007, 2008 and 2009. ILAMS was used as a quality control referee laboratory for ALS assay results in 2009 and 2010. The routine analytical method used was MA ИАЦ-43-2004. This is standard fire assay with gravimetric finish (FA-GR). PAL OGOK was used as a primary laboratory in the first half of 2009. The routine analytical method is a fire assay with gravimetric finish MA ИАЦ-43-2004. ALS became the primary laboratory from the second quarter of 2009. The routine analytical method is Au4-50 / Au-AA26 – fire assay with atomic absorption spectroscopy (AAS; FA-AAS) finish with over limit samples re-assayed by fire assay with gravimetric finish. Lower detection limits are 0.2 g/t for the FA-GR processes and range from 0.005 to 0.01 for the FA-AAS processes.

QAQC procedures at Poputninskoye gold project follow GKZ requirements. QAQC samples for Poputninskoye exploration drilling programme consist of laboratory repeats (pulp) (internal laboratory control), field duplicates, pulp re-assay (external laboratory control), CRM and blanks. Coarse duplicates are not included.

Mineral Resource estimation parameters

Incorporating additional data and revised interpretations, AMC has updated the resource model for the complex and discontinuous gold mineralization at Poputninskoye using a non-linear technique known as Localized Multiple Indicator Kriging (LMIK). This allows for the generation of a resource model using large scale stable panel estimates and a change of support process that will more accurately represent the grade-tonnage characteristics at the scale of mining. The general estimation process can be summarized as follows:

- The three main lithologies and metasomatic alteration were modelled and wireframed based on complex three-dimensional interpretations from digitized sectional interpretations. These interpretations were used to guide and validate the subsequent mineralization envelopes used for resource estimation.
- The oxidation boundary was interpreted from the cross-sections and checked against the drilling data. The final oxidation zone boundary was interpreted from lithology (visual limonite in logs) and generally relates to the top of fresh material.
- A base of alluvium digital terrain model was created from the sections based on logging.
- Faults were digitized from sectional interpretations, and then wireframed them to produce the following three-dimensional fault models. These faults were used to guide the orientation and extents of the mineralized shells that were used for the data selection and grade model constraints.
- Mineralization envelopes were constructed to accommodate both the anticipated estimation method (multiple indicator kriging and local multiple indicator kriging--MIK and LMIK respectively) and to overcome the complex and problematic geological and grade continuity of mineralization. The mineralization envelopes were based primarily on the grade distribution but used the alteration, structure and lithology solids as a basis to guide and inform the final shapes. The grade shells are “soft” interpretations as they are intended to generally capture most of the mineralization in a reasonable manner while minimizing the large volumes of low-grade/waste samples incorporated into the shapes. The soft interpreted mineralization envelope approach is needed to allow for effective estimation of the grade through MIK and to minimize edge-effects that would result from a stricter, more constrained interpretation. In total there were five mineralized domains constructed, which were then regrouped four key domains for estimation.

- Drilling data was compiled from information provided by Polyus. Desurveyed samples were flagged using the new mineralization, oxidation and alluvium wireframes.
- The samples were composited downhole to 2 m intervals.
- Statistics were evaluated for the raw and composite data. Boundary tests were conducted for the oxide/primary ore domains with the conclusion that the distributions were very similar, and therefore were combined for grade estimation. No high-grade capping or cutting was applied due to the manner in which high-grade samples are managed during the MIK/LMIK estimation method.
- For each of the four key mineralization domains, indicator thresholds for the MIK process were selected based on the shape of the distributions. Dependent on the domain, 14 to 17 indicator thresholds were selected for each.
- For each of the four key mineralization domains, Gaussian variogram models were generated for Au data. Key indicator variogram models were generated for each of the domains.
- A block model was generated to enable grade estimation via MIK and ordinary kriging with subsequent conversion to LMIK. The initial MIK model was constructed using 25 m x 25 m x 10 m blocks on a rotated grid. A nominal SMU dimension of 12.5 m x 5 m x 5 m was used for the final LMIK model.
- All the estimates are done for each mineralized domain using ordinary kriging and the 2 m composites with hard boundaries between domains. Search ellipse and variogram model orientations are consistent with the general strike and dip of mineralization in any given domain.
- The MIK technique was used, incorporating SMU modelling to emulate selective mining units with dimensions of 12.5 m x 5 m x 5 m. An indirect lognormal change of support was applied using variance adjustment factors ranging from 0.075 to 0.25 for the domains. The MIK SMU model was then localised to generate the final LMIK model. The factors and results were validated extensively, both geostatistically, against coincident and alternative estimates, and visually.
- Bulk density measurements were assigned as 1.67 t/m^3 for oxide material and 2.77 t/m^3 for primary material.
- The criteria used to categorize a Mineral Resource include the robustness of the input data, the confidence in the geological interpretation including the predictability of both structures and grades within the mineralized zones, the distance from data, and amount of data available for block estimates within the mineralized zone as well as other considerations. A combination of Indicated and Inferred Mineral Resources have been defined.

Mineral Resource estimate

The Poputninskoye resource model has been developed considering mining by open pit methods with selectivity indicated by blasthole sampling for grade control and mining possibly on 5 m to 10 m benches. The model is not suitable for assessment of underground mining. The Mineral Resource estimate has been reported within in notional constraining shell developed using pit optimization as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell.

The Mineral Resource is reported (Table 10.2) at 0.8 g/t cut-off grade for oxide material and 0.7 g/t cut-off grade for primary/fresh material, in line with economic analysis. The pit topographic surface available for Mineral Resource reporting was current as at 31 December 2016.

Table 10.2 Poputninskoye - Mineral Resource - as at 31 December 2016

Material type	Cut-off Grade	Measured			Indicated			Inferred			Total		
		Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)	Tonnes (Mt)	Gold (g/t)	Gold (Moz)
Oxide	0.8	0	0.0	0	0.9	4.1	0.1	0	0	0	0.9	4.1	0.12
Primary	0.7	0	0.0	0	36	3.2	3.7	4.4	2.9	0.42	41	3.2	4.2
Total	**mixed**	**0**	**0.0**	**0**	**37**	**3.2**	**3.9**	**4.4**	**2.9**	**0.42**	**42**	**3.2**	**4.3**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Depleted to 31 December 2016.

10.3 Zmeinoye

10.3.1 Introduction

Zmeinoye is located within the larger Razdolinskoye exploration project located in the Motyginsky district of the Krasnoyarsk region, about 200 km to the south-east of the Olimpiada gold mine (refer Figure 1.2). The concession contains numerous other individual gold prospects. These additional prospects and exploration areas are Antoninovskoye, Rudnichnoye, Svetloye, Poputninskoye, Ust-Bogolubovskoye, Perevalnoye, Osinovoye and Zapadnoye. However, the scope of this CPR is limited to Poputninskoye and Zmeinoye.

The exploration licence and operation permit KRR 14146 BR for the Razdolinskoye exploration project are held by LLC Krasnoyarsk Exploration. The concession area also partly surrounds the Bogolyubovskoye gold deposit which is held under title by CJSC ZDK Zolotaya Zvezda.

The exploration licence was registered on 4 July 2007 and is valid until 1 November 2025. The licence is limited to a depth of 1,000 m from the surface. AMC has not, however, independently verified the standing of the licence.

The Razdolinskaya area has a long history of gold exploration. Since Polyus acquired the project in November 2005, a major exploration programme was undertaken. The programme was completed in 2010. This work identified the Poputninskoye deposit and an additional eight distinct mineralized zones within the Razdolinskaya concession area, namely the Svetloye, Antoninovskoye, Zmeinoye, Rudnichnoye, Ust-Bogolubovskoye, Perevalnoye, Osinovoye and Zapadnoye prospects. Of these latter zones, the Svetloye, Antoninovskoye and Zmeinoye zones are considered to be significant.

A Mineral Resource estimate for Zmeinoye was prepared by KMC-RU in 2012, and independently audited by an external consulting group. There has been no material change to the project since that time.

Polyus does not state an Ore Reserve estimate for Zmeinoye.

10.3.2 Geology and Mineral Resources

While it has now been separated from the previous grouping of Razdolinskaya projects as a result of the 2016 remodelling of Poputninskoye, there is no material change to the Zmeinoye Mineral Resource reported previously in 2015.

Geology

The Zmeinoye deposit is located 1.2 km south-east of the central section of the Bogolyubovskoye deposit (of which it is a part), and comprises quartz vein and stringer type gold and sulphide mineralization. Mineralization is localized in the quartz-sericite, quartz-sericite-chlorite and quartz-mica schist exposed in varying degrees of hydrothermal-metasomatic alteration. Primary sulphides are mainly pyrite and arsenopyrite. The main zone is approximately 50 m thick, dipping 80^0 to 85^0 to the south and strikes east-west in sideritic shales of the Udereyskaya suite. Mineralization was traced over a distance of 800 m on the surface, based on litho-geochemistry and geophysical data and is known to extend to a depth of more than 100 m.

All of the Razdolinskaya projects demonstrate a refractory nature which is likely to lead to higher processing costs via complex flowsheets and may also impact gold recovery.

Mineral Resource estimation parameters

KMC-RU reports that the Mineral Resource estimate for Zmeinoye was classified and reported in accordance with the JORC Code 2004 and that:

- The resource has been modelled based on the assumption of an open pit mining scenario.
- Mineral Resource evaluation – the block model was used as the basis for resource evaluation was reported using a cut-off grade of 1.0 g/t, in line with the economic analysis.

Mineral Resource estimate

The combined Indicated and Inferred Mineral Resource for Zmeinoye as at 31 December 2016 is 2.9 Mt with an average grade of 4.6 g/t and contained gold of 0.43 Moz as shown in Table 10.3, reported at a cut-off grade of 1.0 g/t.

Table 10.3 Zmeinoye - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	1.0	0.93	5.0	0.15	4.7
	Inferred	1.0	2.0	4.5	0.28	8.8
Total			**2.9**	**4.6**	**0.43**	**13**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

10.4 Chertovo Koryto

10.4.1 Introduction

Property location and description

The Chertovo Koryto gold deposit is located in the northern part of the Bodaybinskiy administrative district, Irkutsk Region approximately 200 km north of Bodaybo (refer Figure 10.1 and Figure 10.2). Access to the property is via gravel roads to the placer gold mining centre of Marakan, 75 km west of Verninskoye, then access to the site is limited to all-terrain vehicles or by winter road. The road to the site follows a number of stream valleys and rises over a number of passes. Access is limited during the spring thaw period and most of the heavy goods and equipment are hauled in during the winter.

The area of the deposit has limited infrastructure. The area lacks an adequate transportation network and there is no connection to a power grid. All water supplies come from surface water courses. The project site is located some 35 km east of a tributary of the Lena River and there is good potential to improve transportation of heavy goods to site using the river.

Topographical relief in the area ranges from 500 m to 600 m to more than 1,500 m on the highest peaks. The climate is typically continental with an annual average temperature of -7°C with winter temperatures down to -50°C and hot dry summers with temperatures up to +30°C.

Figure 10.1 Chertovo Koryto - location

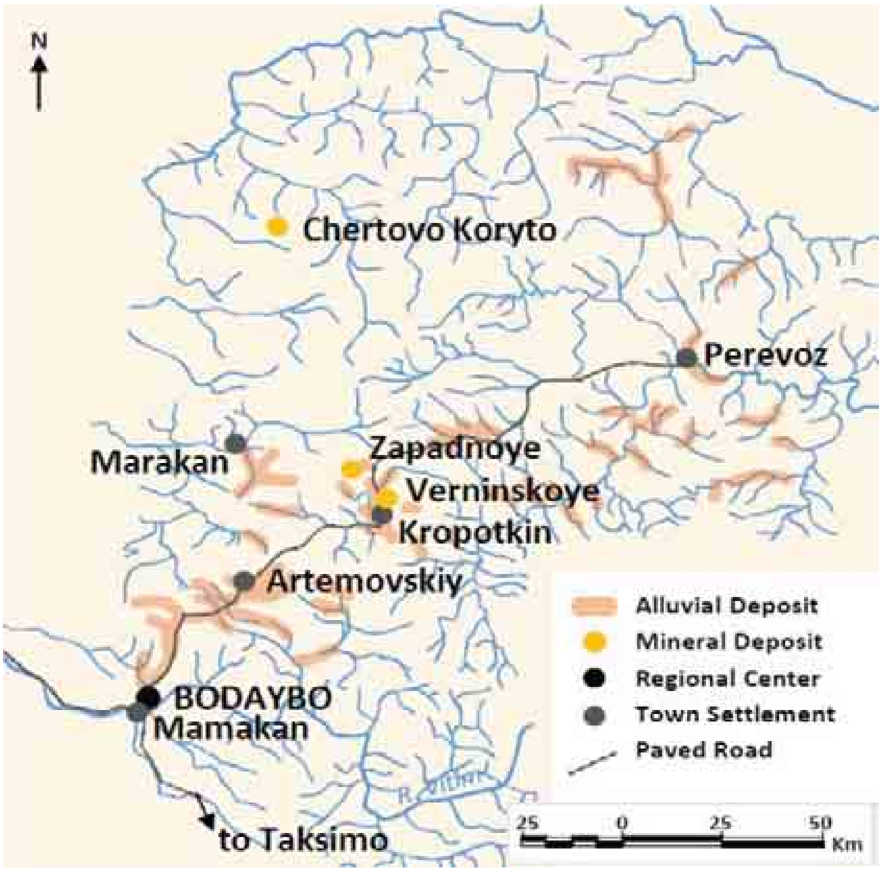
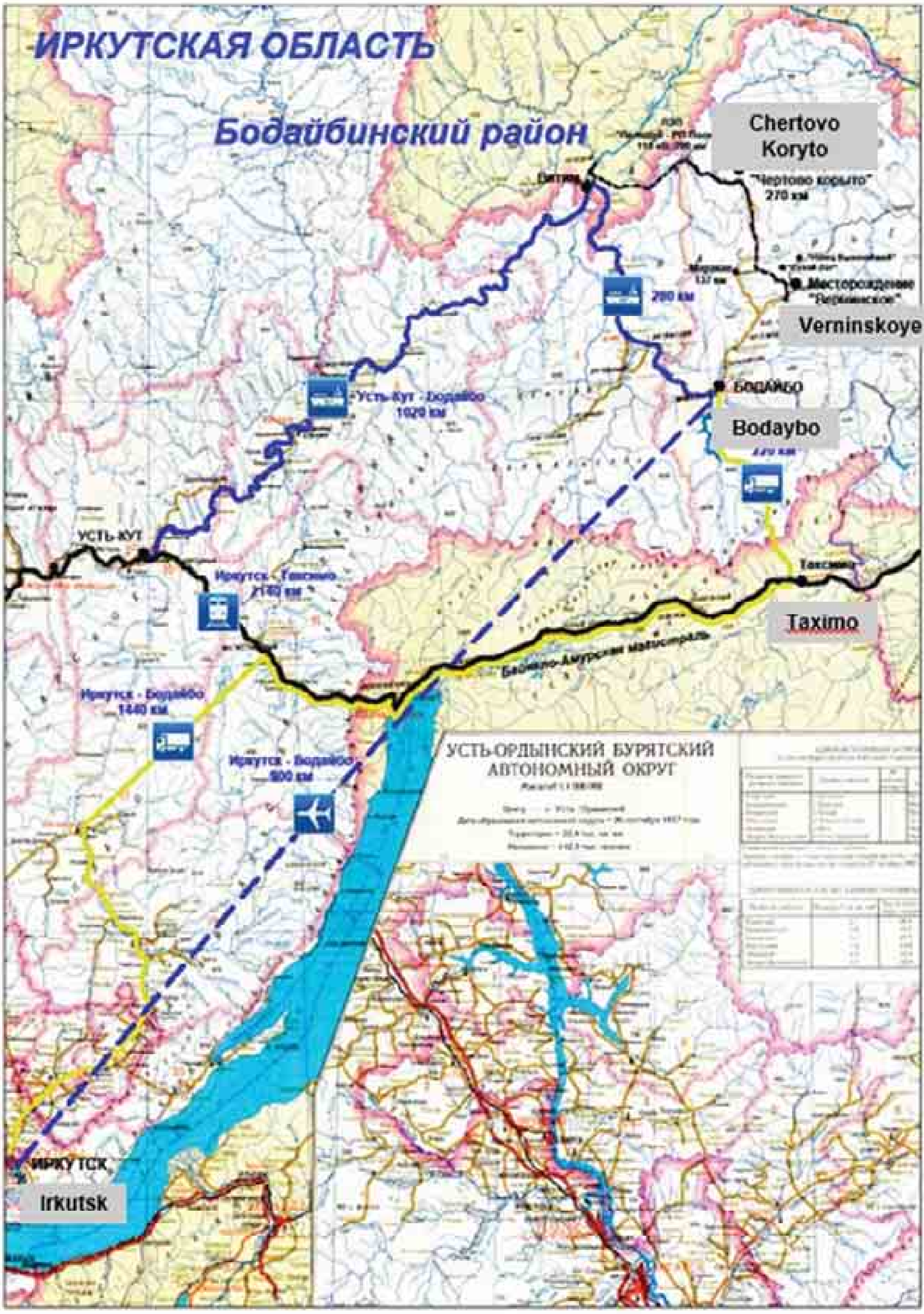


Figure 10.2 Chertovo Koryto - access



10.4.2 Mineral tenure

A subsidiary of Polyus, JSC Tonoda (AO "Тонода") holds two subsoil use agreements (Mining Licences) for the Chertovo Koryto project. These include a hard rock mining licence and a placer mining licence as listed in Table 10.4.

Table 10.4 Chertovo Koryto - tenements

Type	Number and Series of Licence	Grant Date	Licence Expiration Date
Hard rock mining	IRK 03289 BR	29 April 2016	1 January 2020
Placer mining	IRK 02813 BR	20 September 2011	20 September 2019

The placer licence, IRK 02813 BR is expected to be relinquished by Polyus as the alluvial inventories have been written off and the area is covered by licence IRK 03289 BR.

AMC has not independently verified the standing of the mining licences.

Operation background

There are no current operations at Chertovo Koryto. Alluvial mining has been conducted in the area since the 1860's, but has virtually finished at Chertovo Koryto. Excavation of a small test pit at Chertovo Koryto that was started in 2001 by the previous owners has been completed. No other mining has occurred at the site to date.

10.4.3 Geology and Mineral Resources

Geology

The Chertovo Koryto gold deposit is hosted by the lower Proterozoic black shale strata of the Mikhailovsk Formation. Metamorphic grade is greenschist facies, with local amphibolite facies, and localized migmatites. The local geology is dominated by meta-sandstone, meta-siltstone and black shale sequences dipping shallowly from 10° to 20° towards the south and southwest, but with evidence of parasitic folding and fault disruption.

Gold mineralization occurs in gold-bearing quartz-sulphide veins and associated with disseminated sulphide minerals (pyrite, pyrrhotite and arsenopyrite) within the sedimentary rocks. Minor chalcopyrite, sphalerite, galena and bornite sulphides are also recorded. The overall mineralized zone dips generally 10° to 20° towards the west, with many drillhole intercepts of 80 m to over 100 m in thickness. All mineralization is considered to be fresh or primary from near-surface, below a thin layer of soil or alluvial material.

Exploration

Chertovo Koryto has a total of 317 drillholes and trenches for sampling, which comprises 281 drillholes and 36 trenches for a total of 49,250.3 m sampled. All drilling is diamond drilling and appears to be mostly NQ-sized. Trench samples have not been used in AMC's resource estimate.

Most of the main area of mineralization has been drilled at 50 m x 50 m spacing to a depth of 100 m to 150 m below surface. In the northern area, where the topography dips northwards, the depths are commonly 110 m to 150 m and increase to 150 m to 180 m in the south where the drilling has occurred on a hilltop. Drillhole spacing is very sparse below that depth, with only a few holes of 200 m to 300 m in length. One area in the centre of the deposit is drilled to 25 m x 25 m spacing.

Drill core was generally sampled at 1 m intervals and considered lithological boundaries. The shortest sample length allowed was 0.3 m.

Drill core was comprehensively logged in a text format recording details of rock type, alteration, structure and mineralogy. This information is not readily available in a format that can be used in a relational database. AMC used a list of major rock type codes to assist the geological interpretation in the resource model.

Coordinates for all drillhole collars and start points for surface trenches were surveyed by geodetic surveying methods. Drillholes completed in the 1980s had collars re-surveyed during the exploration drilling programme of 2001 to 2006.

Drillholes were surveyed downhole at 10 m intervals using magnetic survey tools

No bulk density data was available apart from that documented in previous resource estimates. Mineralized and unmineralized material returned a range of values from 2.70 t/m^3 to 2.79 t/m^3. In consideration of voids and natural porosity, a general bulk density of 2.6 t/m^3 was applied to all mineralization and waste. AMC applied the same bulk density to the model.

The QAQC protocols for the resource definition drilling were as prescribed by GKZ and largely managed by the primary assay laboratories. QAQC data is not compiled in a way that it can be independently reviewed and related readily to individual drillholes or batches of assays. AMC understands that Certified Reference Material, blanks and field duplicates were used as part of the QAQC process.

There is limited information in relation to drilling core recovery. Given the limited information available, AMC could not determine if there was any relationship between core recovery and gold grade. No core photography was available. AMC understands that some drill core has been stored by Polyus in Bodaybo.

Of the total 281 diamond holes in the Chertovo Koryto database, 232 holes with assays were used for the Mineral Resource estimate comprising a total of 32,340 m.

Mineral Resource estimation

The mineralized envelope for the Chertovo Koryto Mineral Resource estimate was a probability-based model that defines anomalous populations of gold mineralization (not defined by an economic cut-off grade. The general estimation process can be summarized as follows:

- An appropriate mineralization threshold grade (0.4 g/t) was selected.
- A block model was developed estimating the probability that a model cell was above a mineralization threshold (not an economic cut-off grade). The process involved:
  - Compositing assay data to one-metre lengths.
  - Application of the mineralization threshold grade (0.3 g/t) to define indicator variable.
  - Generate a variogram models for the indicator variable for each orientation domain.
  - Estimate the indicator using ordinary kriging.
  - Use of a nominal probability threshold from the estimated indicator value (0.30) to define a mineralization envelope that is used to select and flag both blocks and composite data.
- Re-composite the flagged assay data to two-metre composites for use in grade estimation.
- Statistical analysis of the two-metre composite data allowed a high-grade cap or top-cut to be applied to the composite gold data. A high-grade cut was applied to composite data only to limit the influence of statistical outliers for variography and for validation processes related to the change of support.
- For each of the mineralization domains, 12 indicator thresholds for the MIK process were selected based on the shape of the distributions.
- Grade and key indicator variogram models were generated for the mineralized domain.
- A block model was generated to enable grade estimation via MIK and ordinary kriging with subsequent conversion to LMIK. The initial MIK model was constructed using 25 m x 25 m x 10 m blocks. A nominal SMU dimension of 12.5 m x 12.5 m x 5 m was used for the final LMIK model.
- All the estimates are done using ordinary kriging and the 2 m composites with hard boundaries between domains. Search ellipse and variogram model orientations are consistent with the general strike and dip of mineralization in any given domain.
- The MIK technique is implemented by completing a series of ordinary kriging estimates of binary transformed data as described for Poputninskoye (section 10.2). The SMU modelling emulated selective mining units with dimensions of 12.5 m x 12.5 m x 5 m. An indirect lognormal change of support was applied using a variance adjustment factor of 0.11 for the mineralized domain. The MIK SMU model was then localised to generate the final LMIK model. The factor and results were validated extensively both geostatistically, against coincident and alternative estimates, and visually.
- The model is depleted to the current topographic surface.
- Bulk density was assigned as 2.60 t/m^3 all material.
- The criteria used to categorize a Mineral Resource include the robustness of the input data, the confidence in the geological interpretation including the predictability of both structures and grades

within the mineralized zones, the distance from data, and amount of data available for block estimates within the mineralized zone as well as other considerations. A combination of Indicated and Inferred Mineral Resources have been defined.

Mineral Resource estimate

The Mineral Resource has been reported within a constraining shell developed using pit optimization as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction. A gold price of US$1,500 per ounce was used for the constraining shell.

The Mineral Resource is reported at a cut-off grade of 0.6 g/t (refer Table 10.5) in line with economic analysis and parameters. The topographic surface available for Mineral Resource reporting was current at 31 December 2016.

The Chertovo Koryto Mineral Resource estimate was developed with a view to open pit mining on 5 m benches using drill-and-blast methods. Variations in mineralization grades and extents are likely to occur and therefore grade control drilling will be required.

Table 10.5 Chertovo Koryto - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	0.6	67	1.5	3.3	102
	Inferred	0.6	7.8	1.3	0.33	10
Total			**75**	**1.5**	**3.6**	**112**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. Model MDCK2016.dm.
3. The model is an LMIK SMU model designed to represent mining selectivity at a nominal 12.5 m x 12.5 m x 5 m SMU dimension.
4. Model is depleted for topographic surface current as at 31 December 2016.

10.4.4 Mining and Ore Reserves

General

Mine planning included pit optimization based on the diluted resource model, design of pits using the pit optimizations shells as a guide, production scheduling of the resulting inventories and economic analysis to verify economic viability of the overall project.

AMC based the Chertovo Koryto 2016 Ore Reserve estimate on the proposed development of a 3.5 Mtpa gold processing facility to be located at the site. The flowsheet will be modelled on the Verninskoye flowsheet but simplified to include only crushing, grinding and gravity separation to produce a gold concentrate. The gold concentrate will be transported to Verninskoye for further processing. Metallurgical test work to date indicates a high gravity gold recovery such that this flowsheet represents the preferred option based on consideration of both capital and operating costs.

Infrastructure to support the operations including water and power supply, tailings storage, access road and an accommodation facility will also be established at Chertovo Koryto.

A number of inputs to the process of estimating the Ore Reserves are based on a 2016 AMC project which reviewed options for the development of the Polyus assets in the Irkutsk region.

Mining model

The resource model used as the basis for mine planning is named: md ck2016.dm, dated 2016.

This resource model was developed by AMC for Chertovo Koryto. There is no Measured Mineral Resource estimated for Chertovo Koryto.

The resource model was converted by AMC to the Mining Model by reblocking, or regularizing, the resource model at a SMU size suitable for the equipment that is considered to be appropriate for the operation. A minimum block size of 12.5 m in both easting and northing directions and 5 m vertically was used to suit the orebody configuration and 10 m^3 face shovels expected to be utilized for the operation. The resulting Mining Model ("mdck2016r.dm", dated 2016) was used as the basis for the pit optimization and Ore Reserve estimation.

In the reblocking process, all materials within a defined cell size are combined to create one overall grade and tonnage for the cell.

The combined effect of the dilution and ore loss that results from the reblocking is a nil effect on ore tonnes and a decrease in contained metal of 0.6%. The local amount of dilution and ore loss varies with the local geometry and grade. These dilution and ore loss statistics relate to the portion of the resource model within the ultimate pit design.

Geotechnical analysis

The current slope design parameters for the pits are presented in the Table 10.6.

Detailed geotechnical assessments of pit slope and waste dump stability are presented within a Polyus Project report entitled Study of physical and mechanical qualities of rock mass and estimation of pit wall stability at Chertovo Koryto, 2014 (2014 CK Geotechnical report).

The 2014 CK Geotechnical report presents the results of detailed geotechnical investigations, discussion of expected hydrogeological conditions, the impact of freeze-thaw cycles on pit stability, and analyses of pit slope and waste dump design parameters. In AMC's opinion, the level of detail and assessment methodology presented, are generally consistent with industry standards and to a pre-feasibility study level of confidence. The key findings from the report are:

- Analyses of overall slope stability indicate relatively high factors of safety for each pit sector, with values ranging from 2.98 to 1.91. Analyses were conducted for overall slope angles ranging from 39° to 44°, and a maximum slope height of 207 m. The lowest factor of safety (1.91), was for the maximum slope height. Factors of safety are significantly higher than are typically applied (factor of safety >= 1.35) to open pit slopes within the mining industry (Read and Stacey, 2009).
- Overall slope angles at Chertovo Koryto are controlled by batter-berm stability, rather than overall slope stability. Detailed batter-scale stability assessments are presented within the 2014 CK Geotechnical report for varying batter heights and angles, to determine achievable batter face angles, and required berm widths. The results indicate that batter face angles of up to 60° for 20 m high batters, and 70° for 20 m high batters can be achieved. The minimum recommended berm width is 8 m.

With consideration of the above findings, and previous mine design work, AMC selected pit slope parameters for mine optimization and pit design, as summarized in Table 10.6.

Table 10.6 Chertovo Koryto - pit slope design parameters adopted by AMC

Pit Slope Design Parameter	Value
Inter-ramp slope angle	44°
Working bench (flitch) height	5 m
Batter angle	58°
Safety berm width	8 m
Final bench height	20 m
Ramp width	26 m
Average total depth throughout all pits	varies to 200 m

*inter-ramp angle measured "toe to toe"

Based on these pit optimization and design parameters, AMC's pit design corresponds closely to that analysed within the 2014 CK Geotechnical report, incorporating a maximum overall slope angle of approximately 44° and a maximum slope height (vertical) of approximately 195 m.

Mine operations

There are no current operations at Chertovo Koryto and planned mining operations are generally modelled on activities at the nearby Verninskoye operation.

Mining is proposed to be undertaken by an owner-operated and maintained mining fleet. The fleet will comprise conventional open pit equipment including; 10 m^3 class electric rope shovels and a fleet of 90 t class dump trucks. Waste and low-grade ore are hauled to nearby storage facilities and ore is hauled to the ROM pad. Ore and waste are drilled and blasted on 10 m high benches. Ore mining selectivity could be achieved by mining on 5 m benches for ore. A fleet of ancillary equipment supports the main production equipment and performs other mine maintenance activities. The operation would operate on two 12-hour shifts per day, 365 days per year.

An allowance for the purchase and replacement of mining mobile equipment over the project life was included in the planned production schedule.

Pit optimization - input parameters

The pit limits for Chertovo Koryto were selected through analysis using Whittle software. The shells were developed by varying the commodity price above or below the base gold price chosen for the pit optimization process of US$1,250/oz. AMC allows for mining equipment sustaining capital costs by including an allowance approximately equal to 10% of the mining operating cost when selecting the optimum shell. The mining equipment sustaining capital costs are, however, estimated and applied separately in economic modelling.

The optimization shells produced for the Reserve Case were used as the basis for detailed pit design, in production scheduling and for subsequent economic analysis.

The parameters used in the pit optimization are derived from a combination of information provided by Polyus and AMC's determinations based on its technical assessments, and can be summarized as:

- Gold price of US$1,250/oz.
- Exchange rate of RUB65 to US$1.00.
- Royalty of 6% of the recovered gold value for cut-off grade calculation
- Gold recovery dependent on head grade to the process plant and is estimated according to a recovery versus head grade algorithm. Average gold recovery is estimated to be 75%.
- Overall pit slope angles of 43°.
- Mining operating costs of US$1.51/t mined for both ore and waste, and an additional US$0.05/t for every 5 m bench below the elevation of 1335 mRL.
- Process plant operating cost of US$8.58/t processed, based on the AMC Ore Reserve estimate.
- Process plant throughput rate of 3.5 Mtpa.
- SG&A cost based on the AMC Ore Reserve estimate as a combination of general and administrative costs of US$6.15/t ore processed and selling costs of US$1.29/oz of recovered gold.
- Refining and transport costs of US$2.13/oz of recovered gold, based on the AMC Ore Reserve estimate.

Based on these parameters, a cut-off grade of 0.6 g/t was adopted for use in the pit optimization, Ore Reserve estimation, and production scheduling presented in this CPR for Chertovo Koryto.

All Inferred Mineral Resources were regarded as waste in the pit optimization and subsequent pit evaluations.

The optimum pit shell generated using RF=1.0 contains 66 Mt of ore and 70 Mt of waste. The RF=0.7 shell contains 61 Mt of ore and only 59 Mt of waste. This shell was selected as the basis for the pit designs in consultation with Polyus to satisfy its operational objectives.

Resources outside the pit design based on the optimum pit shell were not reported as for estimation of Ore Reserve, and underground mining of those resources was not considered for this CPR.

Pit design and contents

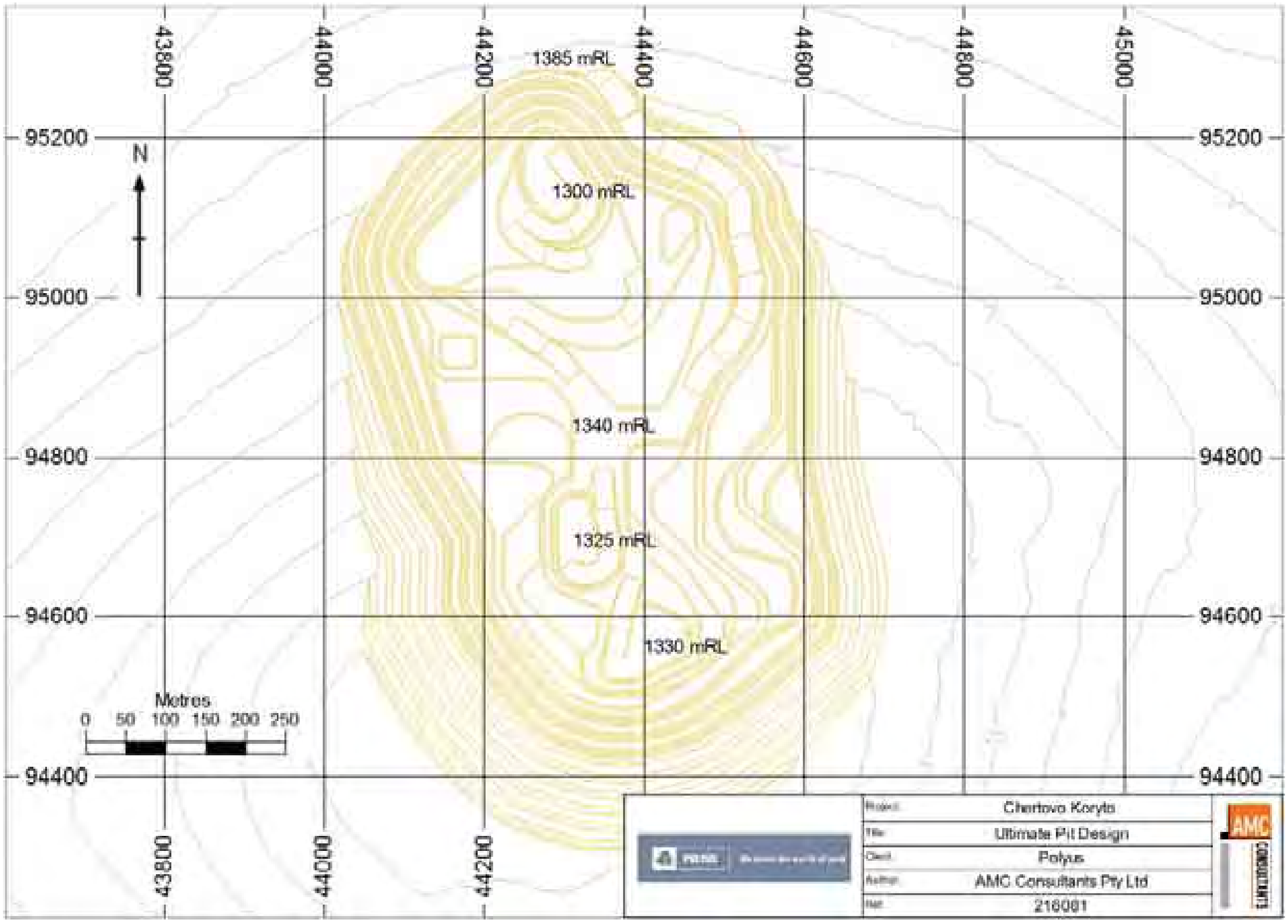
The pit design is based on the results of the pit optimization work.

Parameters used in generating the ultimate pit designs are listed in Table 10.7. The ultimate pit design is shown in Figure 10.3. The AMC pit design includes a maximum ramp gradient of 10%, and includes 50 m horizontal ramp segments at 600 m intervals along the ramp length as required by Russian regulations. AMC applied these design requirements using similar parameters to those used in Polyus pit design.

Table 10.7 Chertovo Koryto - pit design parameters

Item	Unit	Parameters
Inter-ramp slope angle	degrees	46
Batter slope angle	degrees	58
Safety berm width	m	8
Bench height	m	5-10
Vertical distance between safety berms	m	20
Ramp width 2-way	m	31
Ramp width 1-way	m	24
Ramp gradient	%	10

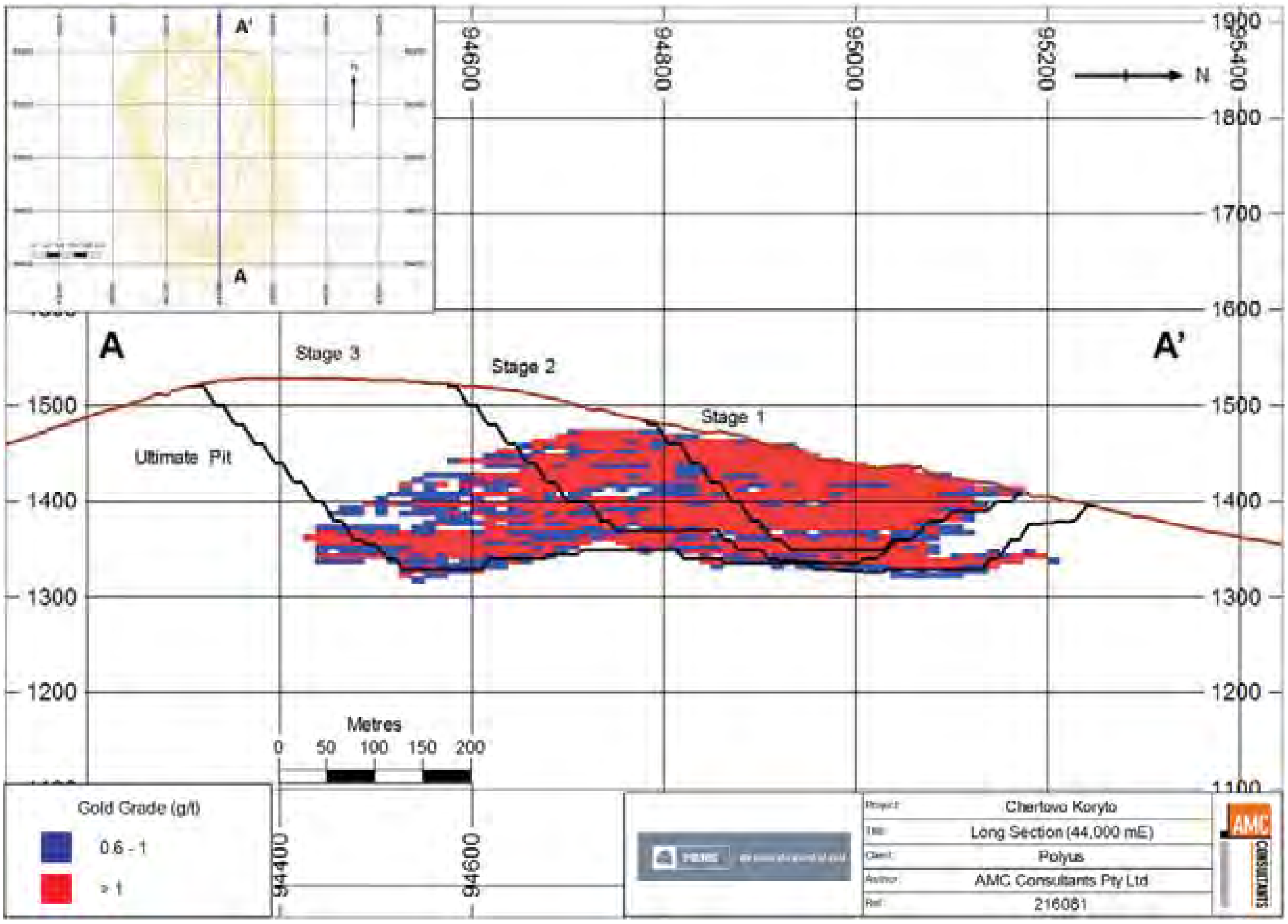
Figure 10.3 Chertovo Koryto - final pit design - plan view



Three pit stages are planned to defer waste mining while providing continuous ore supply to the process plant. AMC selected two pit optimization shells as the basis for interim pit stages. The stages are designed with ramp access and satisfy the minimum workable mining width considerations, generally 40 m to 50 m.

A typical section through the ultimate pit design is shown in Figure 10.4, which also indicates the relativity between the pit stages.

Figure 10.4 Chertovo Koryto - ultimate pit design - long section with pit stages



The content of each stage design was determined by evaluating the contents of the Mining Model within each successively larger pit increment.

Table 10.8 lists the contents of each stage design. The pit contents were evaluated at a cut-off of 0.6 g/t and is current as at 31 December 2016. The grade ranges used in the evaluation are:

- High-grade: greater than 1.0 g/t.
- Low-grade: less than 1.0 g/t and greater than 0.6 g/t.

Table 10.8 Chertovo Koryto - contents of pit design stages

Item	Unit	Stage 1	Stage 2	Stage 3	Total
Ore tonnes (>0.6 g/t)	Mt	13	18	32	62
Waste tonnes	Mt	1	9	55	65
Total rock tonnes	Mt	14	27	86	127
Strip ratio	W:O	0.1	0.5	1.7	1.0
Gold grade (ore >0.6 g/t)	g/t	1.9	1.6	1.3	1.5
Contained gold	t	24	29	43	95
Contained gold	Moz	0.8	0.9	1.4	3
Recovered gold	t	18	22	32	72
Recovered gold	Moz	0.6	0.7	1.0	2

Note:
1. There has been negligible mining to 31 December 2016.

Ore Reserve estimate

The estimate of the Chertovo Koryto Ore Reserve as at 31 December 2016 presented in this CPR is based on an update of the resource model completed by AMC during 2016. The Ore Reserve estimates were:

- Prepared and reported under the direction of the Competent Person using accepted industry practice.
- Classified in accordance with the JORC Code.
- Based on a gold price (US$1,250/oz), foreign exchange rate (RUB65 to US$1.00), cost assumptions, and mining and metallurgy performance to inform cut-off grades and physical mining parameters.

The Chertovo Koryto 2016 Ore Reserve is estimated to be 62 Mt grading 1.5 g/t and containing 3.1 Moz gold as at 31 December 2016, as summarized in Table 10.9.

Table 10.9 Chertovo Koryto - Ore Reserve - as at 31 December 2016

Classification	Source	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Proved	Open Pit	-	-	-	-	-
Probable	Open Pit	0.6	62	1.5	3.1	95
Total		**0.6**	**62**	**1.5**	**3.1**	**95**

Notes:

1. Any minor discrepancies for sums in the table are related to rounding.
2. Topographic surface as at 31 December 2016.

Economic analysis shows that, at 31 December 2016, the future revenues to be derived and costs incurred to access those revenues indicate that the operation is economically viable according to the assumptions presented in this CPR.

10.4.5 Ore processing

The Chertovo Koryto process plant design was developed for an optimization and development study and consists of a mineral processing concentrator with associated services and ancillaries. The plant has been designed to process ROM ore and recover the gold to concentrate using only the gravity processes to simplify the flowsheet with the gravity tailing being stockpiled for potential future reclaim. The gold from the gravity concentrate is to be hauled by secure road transport to Verninskoye for treatment.

The new plant has been designed in accordance with accepted industry practice. The following sections describe the 3.5 Mtpa plant process steps in detail.

Plant history, design, and operations

The gravity plus flotation process flowsheet adopted for the 3.5 Mtpa plant for Chertovo Koryto will comprise:

- Single stage open circuit primary crushing to produce a crushed product size of 80% passing (P80) 152 mm.
- A crushed ore surge bin with a nominal capacity of 250 t. Surge bin overflow will be conveyed to a dead stockpile of 20,000 t. Ore from the dead stockpile will be reclaimed by front end loader to feed the mill via the surge bin during periods when the crushing circuit is off-line.
- Grinding of the ore in a SABC milling circuit in closed circuit with hydrocyclones to produce a P80 grind size of 75 µm.
- Primary and scavenging gravity concentration circuits within the mill circuits to maximize gravity recovery from the ore.

The processing operating cost estimates are based on the Verninskoye operating costs for 2016. The operating costs were estimated from first principles in the areas where the costs were well defined.

With Chertovo Koryto being a greenfields site, all infrastructure will need to be developed and the project execution approach will take significant planning to make the best use of the warmer months. Key infrastructure to be established that is included in the capital cost estimate are:

- A new 134 km access road will be built to link Chertovo Koryto with Verninskoye as the operations hub, management and maintenance centre. Detailed surveys of the road route, testing of geotechnical conditions and assessment of the suitability of local materials for construction will be required to improve the accuracy of the estimate for the road.
- The new Peleduy-Mamakan power line from the Yakutia grid has a tee to feed a short spur line to the Chertovo Koryto site. The 110 kV supply will be stepped down to 11 kV to suit the mill and site distribution. Most of the proposed options are within the 55 MW supply limit.
- All site office buildings in the administration complex will be constructed using prefabricated transportable modules. This will minimize cost and site installation time whilst also affording a reasonable fit for purpose standard of finish.
- The on-site accommodation will be pre-fabricated modular flats that can readily be flown in to site for early establishment with catering and recreational facilities.

At Chertovo Koryto, it is proposed to construct a raw water catchment dam in the Tatarskiy stream adjacent to the tails storage site.

Raw water at Chertovo Koryto will be used to feed the treatment plant for potable use which will require only filtration and chlorination. A potable water tank will be located adjacent to the potable water treatment plant at the site accommodation. A second potable water treatment plant with storage will be located at the plant site. Potable water will be distributed to points of use within the plant and the main buildings, ablutions and safety showers. Potable water will also be supplied to the mine services buildings.

Sewage at Chertovo Koryto will be treated in a low maintenance biological contactor packaged waste water treatment plant at the accommodation site. Sewage from the offices and plant site ablutions will be forwarded to the treatment facility. The treated effluent will be returned to the plant tails hopper.

Plant feed blend

No specific material or lithological blend is proposed for the project. All ore material in the resource model is identified as fresh. Ore grade bending is proposed to maintain a higher ore feed grade in early years of the mine schedule.

Plant maintenance

Plant maintenance will be undertaken by Polyus employees. Manning establishment and maintenance operating costs are based on the experience gained at Verninskoye and adjusted to reflect the simplification of the Chertovo Koryto flowsheet.

Tailings storage facility

As part of the scope of works for the optimization and development study, Knight Piésold Pty Limited was commissioned to conduct an evaluation of the tailings management for Chertovo Koryto site based on the life of mine ore processing schedules developed by AMC. The tailings storage requirements for the preferred processing option was considered with possible solutions being proposed to provide a basis for the tails storage capital and operating cost estimates.

10.4.6 Planned production and costs

Production and costs - Reserve Case

A LOM plan was prepared using the Minemax schedule optimization software to provide a schedule that improves the overall value of the project. The results of the schedule were output to Microsoft Excel spreadsheets for review and analysis. The operating and capital cost estimates are based on the production schedule and technical and operating criteria described in this CPR.

A summary of the Chertovo Koryto LOM production schedule is presented in Table 10.10 showing the mining, processing, and cost information. Annual mined tonnage and head grade were based on the Reserve Case mining schedule, process plant throughput and gold production rates with all Inferred Mineral Resources regarded as waste.

The schedule is based on a process plant throughput rate of 3.5 Mtpa in a proposed gravity processing plant to be built at Chertovo Koryto.

A total material movement rate limit of up to 12 Mt per annum was applied to the schedule. This mining rate is consistent with a smooth logical development of the open pit in a proposed three stage mining sequence. The Chertovo Koryto project presents a low stripping ratio of 1.04:1.

A maximum vertical advance rate of 10 benches per year was applied in the schedule. Ore is defined above a cut-off of 0.6 g/t. Ore is further subdivided to low-grade and high-grade (+1.0 g/t). The mine schedule includes the use of stockpiling to deliver a smooth ore supply and also to improve overall project value by feeding high-grade ore early in the project life and deferring low-grade ore processing.

While the mining rate in this schedule remains constant for the LOM, the pit depth and haul distances increase requiring an increasing number of haul trucks during the LOM. Through strategic planning, there is an opportunity to improve the value of the operation by determining the optimum pit stage limits, cut-off grade, stockpiling strategy, and sequence of mining.

Table 10.10 presents the schedule of production and costs for the Reserve Case. It should be noted that the development strategy and actual timeline for Chertovo Koryto will be dependent on Sukhoi Log development timing and strategy. Based on the estimated Ore Reserves as at 31 December 2016, the scheduled LOM for the Chertovo Koryto development project is 18 years (from the commissioning date).

Table 10.10 Chertovo Koryto - planned production and costs - Reserve Case

Item	Units	Total	2017 Y1	2018 Y2	2019 Y3	2020 Y4	2021 Y5	2022-2026 Y6-10	2027-2031 Y11-15	2032-2036 Y16-20	2037-2041 Y21-25
Mined											
Ore mined - tonnes	Mt	62	-	-	-	-	-	24.8	21.4	16.0	-
Ore mined - contained gold	Moz	3.1	-	-	-	-	-	1.39	0.97	0.70	-
Waste mined - tonnes	Mt	65	-	-	-	-	-	25.2	34.1	5.4	-
Total material mined	**Mt**	**127**	**-**	**-**	**-**	**-**	**-**	**50**	**55**	**21**	**-**
Processed											
Ore - Process Plant - tonnes	Mt	62	-	-	-	-	-	16.8	17.5	17.5	10.5
Ore - Process Plant - grade	g/t	1.5	-	-	-	-	-	2.1	1.6	1.4	0.8
Ore - Process Plant - contained gold	Moz	3.1	-	-	-	-	-	1.16	0.89	0.76	0.25
Process Plant - recovered gold	Moz	2.3	-	-	-	-	-	0.89	0.66	0.56	0.17
Operating Costs											
Mining	US$/t mined	1.51	-	-	-	-	-	1.51	1.51	1.51	-
Process Plant (including reclaim)	US$/t ore processed	8.76	-	-	-	-	-	8.58	8.63	8.69	9.35
Selling, general and administrative	US$/t ore processed	6.20	-	-	-	-	-	6.22	6.20	6.19	6.17
Refining and transportation	US$/oz refined gold	2.13	-	-	-	-	-	2.13	2.13	2.13	2.13
Initial Capital Costs											
Mining	US$M	22	-	-	-	-	-	22	-	-	-
Process Plant	US$M	280	2	5	10	88	176	-	-	-	-
Closure	US$M	8	-	-	-	-	-	-	-	-	8
Total	**US$M**	**310**	**2**	**5**	**10**	**88**	**176**	**22**	**-**	**-**	**8**
Sustaining Capital Costs											
Mining	US$M	19	-	-	-	-	-	3	3	12	0
Process Plant	US$M	45	-	-	-	-	-	13	13	13	5
Total	**US$M**	**64**	**-**	**-**	**-**	**-**	**-**	**16**	**17**	**25**	**6**

Note:
1. Any minor discrepancies for sums in the table are related to rounding.

The production schedule and operating costs are based on the following assumptions and qualifications:

- A gold price of US$1,250/oz.
- All RUB denominated costs were in real 2017 terms and converted to US$ at the exchange rate of RUB65 to US$1.00.
- Operating and SG&A costs are based on the AMC 2016 Ore Reserve estimates. No provision was made for offsite corporate costs.

Capital cost estimates are included for:

- Plant construction and commissioning to achieve 3.5 Mtpa as described in the Chertovo Koryto ore processing section in this CPR.
- Sustaining capital for the plant of US$2.6M per annum was included to allow for minor equipment replacement in the plant and for progressive tailings dam wall raising.
- Additional and replacement mining equipment. An equipment expenditure schedule was developed to allow for equipment replace to maintain high availability to the operation.

Closure costs were assumed to be the same as those for Verninskoye, on the basis that the type and scale of the operations are similar. The closure costs were included as a lump sum in the last year of the production schedule, even though they are likely to be spread over several years following completion of the operation.

10.4.7 Permitting, environment, community, safety, and mine closure

Permitting

Since the Chertovo Kyoto deposit was discovered, there have been several phases of additional exploration, and feasibility studies.

Polyus will continue with exploration activities and development of a feasibility study and environmental impact study as a basis for securing mining and environmental approvals for the project.

Environment and community

The deposit is located in the Bodaybo district of the Irkutsk region in the northwestern part of Patom highlands. The local relief is hilly to mountainous, with peaks at 1,100 m to 1,500 m, typically rising 500 m to 600 m above valley floors. Valleys are typically steep sided and deeply incised with a V-shaped profile.

The location is within the mountain taiga zone of Eastern Siberia. The mountain tundra soils are mostly unsuitable for agriculture because of their shallowness, scarcity and incidence of stone. The fertile layer in the valleys and watercourses are typically 0.10 m to 0.15 m thick, and on the slopes and rock slides, fertile soil is limited to the first few centimeters.

The surrounding areas are under the management of the state forest department. An area of approximately 185 ha of forest land has been leased to JSC Tonoda for the exploration and mining of the first stage of the deposit. The lease agreements include obligations to pay for loss of forest and fisheries resources and requires reforestation post mining.

The distribution of vegetation occurs in distinct vertical zonation. The valleys of the major watercourses comprise coniferous forests of low productivity (larch, spruce, fir, birch, and aspen). The sides of the valleys feature thickets of cedar. The upper slopes are covered with patches of tundra woodlands.

Rare and endangered plants of Siberia, as listed in Russia’s Red Book, do not occur in the area. There are occasional occurrences of endemic alpine and tundra-alpine plant species.

The fauna is typical of northern taiga and tundra. Species of note include sable and squirrel, there are brown bear, caribou, moose, musk deer, grouse, partridge, and migratory birds. Animals listed in the Red Book, do not occur in the project area.

The climate is continental with severe long winters and short hot summers. Climate characteristics observed at the Bodaybo weather station indicate an average annual temperature of -6°C, ranging from -55°C to +35°C. The average annual precipitation is about 400 mm, although anecdotal observations at the project area appear to be greater. The majority of precipitation occurs during the summer months.

The project area is remote from settlements and industrial centers and prior to the start of exploration, the local watersheds, valley slopes and streams had not been affected by economic activity. Placer mining in the surrounding area had historically occurred, resulting in disturbance to riparian lands, fisheries habitats and water quality.

Based on the preliminary studies summarized above, there does not appear to be any immediately obvious environmental and community constraints to the development of the Chertovo Koryto project. Further studies for the project will examine environmental and community impacts in more detail, as the project progresses through the planning stages.

Safety

Polyus plans to extend its existing occupational health and safety systems to the exploration and development of the project.

Mine closure

Mine closure plans will be prepared as part of the environmental impact assessment for the project, or subsequent to, and as required by the usual terms of a subsoil use agreement to be issued for the project.

10.4.8 Risks and opportunities

The following risks are identified for Chertovo Koryto:

- Access to the project site is difficult, this may result in delays to site based studies and activities such as drilling required to develop the project. Delays will result project deferral and higher studies costs.
- The capital provision for the road to Chertovo Koryto should be adequate, but design parameters are yet to be defined and the cost estimate represents a significant percentage of the overall project capital. The road development and maintenance for all season access is critical to the success of the project.
- The metallurgical performance of the ore results in reduced recovery or increased costs. The amount of metallurgical testwork completed for the project is minimal which presents a risk to the metallurgical recovery assumptions. Three dimensional geological modelling inclusive of geology, lithology and metallurgical parameters has not been completed. Therefore, the understanding and predictability of ore types for future process plant feed could be improved. AMC understands that further testwork is proposed for 2017.
- None of the Mineral Resource is classified as Measured. Best practice is that sufficient drilling has been completed to define a reasonable proportion of Measured Mineral Resource as part of the early years ore supply. This may result in unexpected local variations in grade relative to the estimated grade.
- Operating cost assumptions are developed for the project based on experience gained at the nearby Verninskoye project, there is risk costs might be higher.
- The gravity gold content of the ore may decrease with depth reducing gold recoveries. This could be a risk given the process flowsheet chosen. The geometallurgical characteristics are not defined in the resource models.
- There is uncertainty around the slope design parameters, however the overall project is not very sensitive to slope angle.
- A tailings storage location is identified however site investigation studies have not been completed with possible increase in capital costs if the location changes or significant design changes are required.

The following opportunities are identified for the Chertovo Koryto:

- Additional metallurgical testwork may show higher recoveries.
- Process operating costs may be improved, compared to the current assumptions due to an overall improved flowsheet based on lessons learnt from Verninskoye.
- Further geotechnical studies will increase confidence in the projects slope design inputs and may lead to a steeper open pit walls reducing waste stripping volumes.
- Studies into site access and transport options may reduce capital and operating costs.

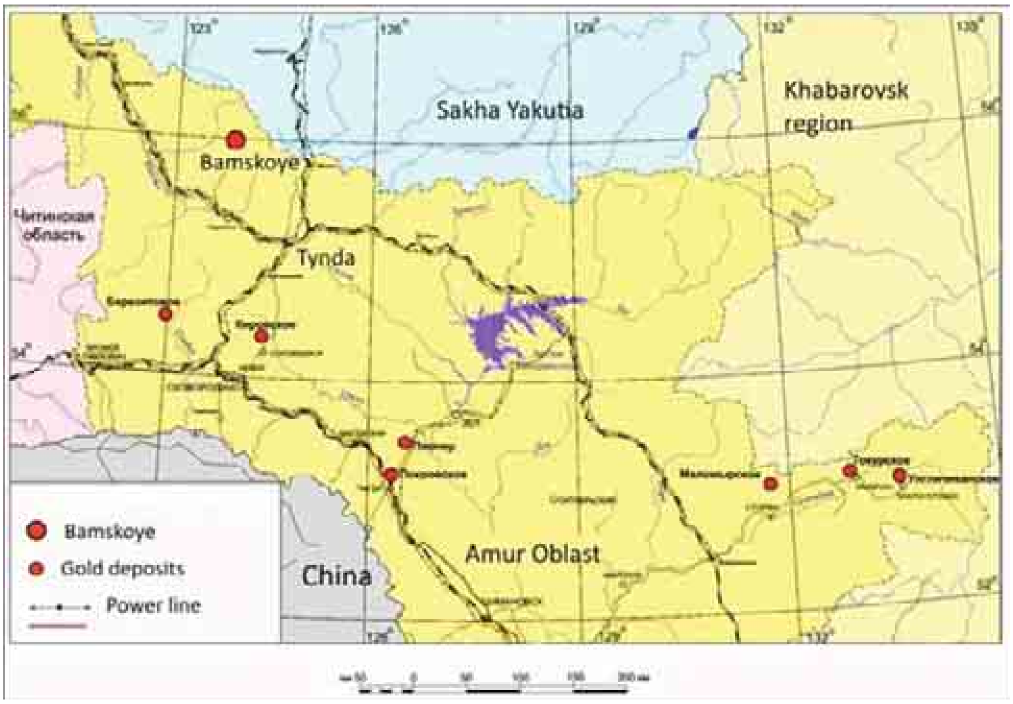
10.5 Bamskoye

10.5.1 Introduction

Property location and description

The Bamskoye project is located in the north of the Amur region of East Russia (refer Figure 10.5). Access to the project is by 80 km of unformed and unsealed road suitable for four-wheel drive vehicles connecting the exploration site to the nearest railway station at Khorogochi. From Khorogochi, it is a further 100 km along an unsealed road adjacent to the Baikal Amur Mainline to the regional centre of Tynda.

Figure 10.5 Bamskoye - location



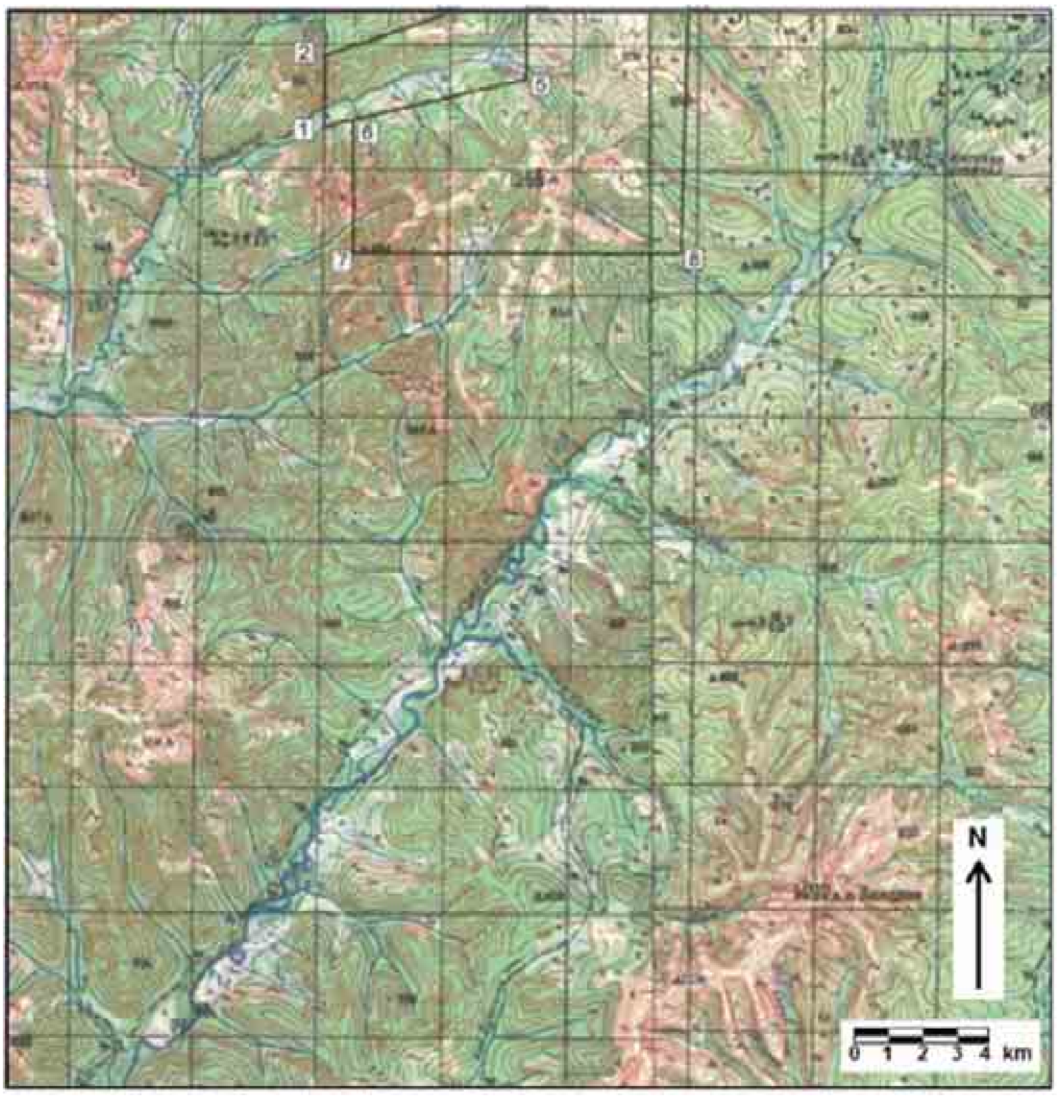
10.5.2 Mineral tenure

Polyus acquired an exploration and development licence for the Bamskoye gold deposit in 2005. Subsequently, in 2008, Polyus transferred the licence to its subsidiary company OJSC Amurskoe GRP (ООО Амурское ГРП). In 2010, the deposit was listed as a Reserve of Federal Importance by the Russian government which requires government approval for deposit development. Amurskoe GRP completed a mining study in 2006 to 2009 and applied for development approval. In 2014 the approval was granted. The current licence for Bamskoye development expires in 2030.

The Bamskoye project consists of a single combined subsoil licence (BLG 01989 BR) issued by the Federal Agency for Subsoil Use within the Ministry of Natural Resources to cover the subsoil mineral entitlement and the surface and access rights provided by and agreed with the Administration of Amur Region.

The licence covers an area of 82 km^2 (Figure 10.6) and is held by LLC Amur Exploration Enterprise which is a 100%-owned subsidiary of Polyus. The licence is for the exploration, assessment and production of hard rock gold to a depth of 1,000 m. AMC has not independently verified the standing of the licence.

Figure 10.6 Bamskoye - licence area



10.5.3 Geology and Mineral Resources

Exploration

Gold mineralization was discovered at Bamskoye in 1979 during a regional soil survey programme. Initial exploration work started in 1981. Historical exploration activity is documented in a 2009 TEO report prepared by UranGeo in 2009 and exploration completed in 2010 by UranGeo is documented in separate report.

Historical exploration at the Bamskoye project was completed by different companies in different periods. The main exploration campaigns were:

- Severo-Amursk Exploration Company completed exploration work between 1990 and 1995.
- Apsakan completed exploration work and a trial pit between 1997 and 2003.
- Tukuringra completed exploration on the flanks of Bamskoye deposit between 1998 and 2001.
- UranGeo was contracted by Polyus to complete an exploration and verification programme between 2006 and 2009 and continued exploration drilling in 2010 and 2015.

The Bamskoye deposit was explored by geological mapping, trenching and drilling. All drilling was diamond core drilling. The drilling grid was initially 100 m by 100 m in the central part of the mineralized zone and 200 m x 200 m on the flanks. Mineralization was traced across strike by surface trenches spaced at 40 m to 50 m spacing. The drilling grid was closed to 50 m x 50 m and 25 m x 25 m in the near surface, higher-grade area.

Before 2003, diamond drilling used core diameters of 35.4 mm and 34 mm (approximately BQ diameter). Average core recovery varied from 81% to 92% within mineralized zones. Between 2006 and 2008 most drilling used core diameter of 76 mm (NQ diameter). Average core recovery was 91.5%.

A local coordinate system and Baltic elevation system has been used for all survey data. Drillhole collars were mainly surveyed by theodolite and elevation measured with height measurement survey tool.

Downhole surveys were undertaken during all exploration periods. Some drillholes indicate downhole surveys at 10 m intervals and others at 20 m or 30 m intervals.

Core was sampled considering lithological boundaries and drilling runs. Sample length ranges from 0.7 m to 1.0 m. Before 2010, samples were collected as whole-core intervals.

In 2010, UranGeo sampled core considering lithological boundaries. Not less than two samples were taken outside the boundary with non-mineralized rocks. Core samples were 0.9 m to 1 m in length. Core was split in half with a diamond saw with reference sample material retained.

Severo-Amursk (TGR) assayed exploration samples for gold and silver in the laboratory of Amursk Exploration Company between 1990 and 1995. Samples were assayed by express X-ray fluorescence method (RFA). If an assay retuned a value of greater than 0.2 g/t it was re-assayed by fire-assay with gravimetric determination. The RFA method leaches the pulverized sample in acid with adsorption onto a solid granular extractor. Gold grade is determined by X-ray fluorescence. The X-ray fluorescence method has a detection limit of 0.001 g/t, fire assay with gravimetric determination lower detection limit is 0.1 g/t.

Apsakan assayed samples for gold and silver at a laboratory in Tynda that was part of Tukuringra of JSC "Oka" and after 2000 became Central Fire Assay Laboratory of LLC Apsakan. Assay methods were atomic absorption spectroscopy (AAS) and fire assay with gravity determination.

UranGeo used a two-step approach for assays between 2006 and 2008. All samples were tested by RFA and AAS express semi-quantitative methods at the UranGeo North-West laboratory St Petersburg, the Baikal laboratory in Irkutsk and Siberian laboratory in Novosibirsk. Samples with visible quartz-sulphide mineralization were sent to fire assay. The second stage involved all samples with gold grade greater than 0.2 g/t by the first assay were sent to the laboratory IRGIRIDMET in Irkutsk for fire assay with gravity determination and silver by AAS. From 2008 samples were assayed for gold only.

From 2010, all samples were assayed by fire assay with AAS determination in laboratory ALS in Moscow.

Drilling, sampling and sample dispatch were undertaken by geological contractors with standard measures in place for sample security.

Drillholes were geologically logged onto paper logs. All information for each drillhole was compiled in a booklet according to GKZ requirements.

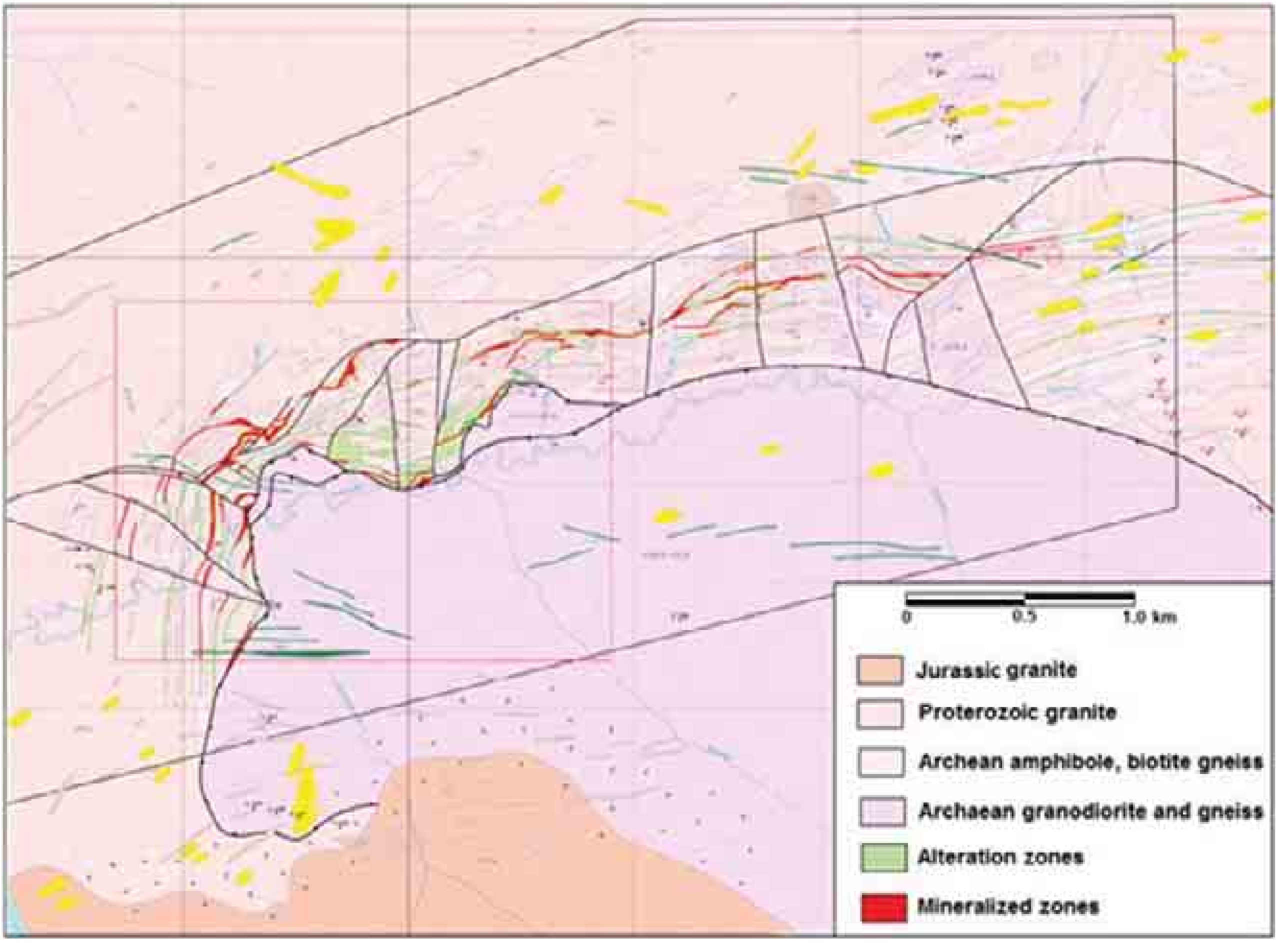
No significant mining has been carried out at Bamskoye. A small exploration pit produced a sample of oxide mineralization for heap leach test work.

Geology

The Bamskoye deposit is located within the central part of Apsakan ore cluster in the north-west part of the late Archaean Ilikan block of the Dzugjur-Stanovoi system. The block consists of intrusive granites and amphibolite facies metamorphic rocks. The Bamskoye deposit is close to the contact between the Chubachinskiy granite massif (early Proterozoic) and overthrusted late Archaean metamorphic rocks.

Structure in the Bamskoye area is complex folding, shallow pre-mineralization shear zones, and post-mineralization faults (Figure 10.7). The major structure is the thrust fault that places Archaean granodiorite and granodioritic gneiss in the hangingwall of the thrust over Proterozoic granite (biotite granite, amphibole-biotite granite, granodiorite) and Archaean gneiss (amphibole-biotite gneiss, biotite gneiss, amphibole gneiss) in the footwall. The thrust fault dips to the south at between 30° and 50°.

Figure 10.7 Bamskoye - geology



Shears in the footwall rocks are sympathetic to the orientation of the thrust and control the orientation of mineralized zones. The structural control leads to narrow planar zones of gold mineralization.

Alteration of the footwall granite and gneiss accompanied the structurally-controlled gold mineralization. Silicification, quartz veining, carbonate veining, hydrothermal alteration to sericite and chlorite and sulphidation (pyrite and chalcopyrite) are broadly associated with gold mineralization.

Gold mineralization occurs:

- As disseminations.
- Associated with quartz-chlorite-carbonate stringers which are typically thin, sinuous and oriented in various directions. The stringers commonly carry sulphide minerals (pyrite and lesser chalcopyrite).
- In breccias in altered host rock.

Mineral Resources

AMC prepared a Mineral Resource estimate with drillhole data available at 31 March 2016.

The Bamskoye Mineral Resource estimate as at 31 December 2016 was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- The AMC Mineral Resource estimate is a probability-based model that defines anomalous populations of gold mineralization (not defined by an economic cut-off grade). An appropriate mineralization threshold grade (0.3 g/t) was selected.
- Three orientation domains were identified so that the variable strike and dip of mineralized structures could be modelled.
- A block model was developed estimating the probability that a model cell was above a mineralization threshold (not an economic cut-off grade). The process involved:

- Compositing assay data to two-metre lengths.
- Application of the mineralization threshold grade (0.3 g/t) to define indicator variable.
- Generate a variogram models for the indicator variable for each orientation domain.
- Estimate the indicator using ordinary kriging and the different search parameters in each orientation domain.
- Use of a nominal probability threshold from the estimated indicator value (0.35) to define a mineralization envelope that is used to select and flag both blocks and composite data.
- Statistical analysis of the data allowed a high-grade cap or top-cut to be applied to the composite gold data.
- Variograms were modelled for gold grade composites within the mineralization envelope.
- Gold grade was estimated using ordinary kriging and the different search parameters in each orientation domain.

- A single density of 2.67 tm^3 was assigned to the model based on the mean of density determinations.

The resource estimate has been developed considering mining by open pit methods with selectivity indicated by blasthole sampling for grade control and mining possibly on 5 m benches.

The estimate was classified as Indicated and Inferred Mineral Resource based on confidence in the continuity and estimated grade largely reflecting the drillhole spacing.

The Bamskoye Mineral Resource as at 31 December 2016 is 20 Mt with an average grade of 1.8 g/t and containing 1.1 Moz of gold.

The Mineral Resource estimate as presented in Table 10.11 was reported above a 0.6 g/t cut-off grade within a notional constraining shell developed using pit optimization using a gold price of US$1,500 per ounce of gold as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction.

Table 10.11 Bamskoye - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Indicated	0.6	15	1.8	0.87	27
	Inferred	0.6	5.1	1.6	0.26	8.0
Total			**20**	**1.8**	**1.1**	**35**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. The topographic surface is current as of 31 December 2016.

10.6 Medvezhy

The Medvezhy deposit is located on the Medvezhy-Zapadniy licence adjacent to the operating Verninskoye open pit mine.

The deposit is located on the southern limb of the fold hosting the Verninskoye deposit and is hosted by the same sequence of black shale, siltstone and limestone. Gold occurs in auriferous quartz-sulphide veins and is associated with disseminated sulphide minerals within the sedimentary rocks. Sheeted and stockwork quartz-carbonate vein mineralization and disseminated mineralization occur both sub-parallel to and cross-cutting stratigraphy which include local quartz and sericite alteration overprinting primary sedimentary features.

Mineralization forms an eastern and a western lode.

No mining has been conducted at Medvezhy. Any mining of Medvezhy mineralization is likely to be a satellite pit with treatment at the Verninskoye plant.

The Medvezhy drillhole data consisted of 140 drillholes with sample intervals ranging from 0.5 m to 5.5 m in length. Drillholes are in a pattern of approximately 90 m north-south (along strike) by 50 m east-west (across strike). The eastern and western lodes are nominally drilled at this spacing, with sections to the east and west of the core areas expanding to 100 m to 150 m and wider along strike.

Drilling, sampling and assaying protocols follow the established procedure for Verninskoye data. Assay quality control procedures were the same as those applied to Verninskoye data.

Drill core was logged in a text format recording details of rock type, alteration, structure and mineralogy. Drill core was photographed before sampling. Drillhole collars were surveyed in a local orthogonal grid aligned with true north using a theodolite or tacheometer. Drillholes were surveyed downhole mainly at 10 m intervals.

AMC developed a lithological model that was used to assign densitied by rock type.

The Medvezhy Mineral Resource estimate as at 31 December 2016 was classified and reported in accordance with the guidelines of the JORC Code and its estimation parameters can be summarized as follows:

- The AMC Mineral Resource estimate is a probability-based model that defines anomalous populations of gold mineralization (not defined by an economic cut-off grade). An appropriate mineralization threshold grade (0.3 g/t) was selected.
- A block model was developed estimating the probability that a model cell was above a mineralization threshold (not an economic cut-off grade). The process involved:
  - Compositing assay data to two-metre lengths.
  - Application of the mineralization threshold grade (0.3 g/t) to define indicator variable.
  - Generate a variogram model for the indicator variable.
  - Estimate the indicator using ordinary kriging.
  - Use of a nominal probability threshold from the estimated indicator value (0.35) to define a mineralization envelope that is used to select and flag both blocks and composite data.
  - Statistical analysis of the data allowed a high-grade cap or top-cut to be applied to the composite gold data.
  - A variogram model for the gold data from the mineralization envelope was generated.
  - Gold grade was estimated using ordinary kriging.
- A single density of 2.7 tm^3 was assigned to the model per previous GKZ estimates.
- The estimate was classified as Inferred Mineral Resource considering the confidence in the estimate largely based on drillhole spacing.

AMC prepared an Inferred Mineral Resource estimate for Medvezhy as at 30 December 2016 of 6.5 Mt with an average grade of 1.9 g/t and containing 0.39 Moz of gold.

The Mineral Resource estimate (refer to Table 10.12 was reported above a 0.75 g/t cut-off grade within a notional constraining shell developed using pit optimization at US$1,500 per ounce of gold as a test of the JORC Code requirement of the Mineral Resource having reasonable prospects for eventual economic extraction.

Table 10.12 Medvezhy - Mineral Resource - as at 31 December 2016

Mining Method	Classification	Cut-off Grade (g/t)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)	Contained Gold (t)
Open pit	Inferred	0.75	6.5	1.8	0.38	12
Total			**6.5**	**1.8**	**0.38**	**12**

Notes:
1. Any minor discrepancies for sums in the table are related to rounding.
2. The topographic surface is current as of 31 December 2016.

10.7 Burgakhchany

10.7.1 Introduction

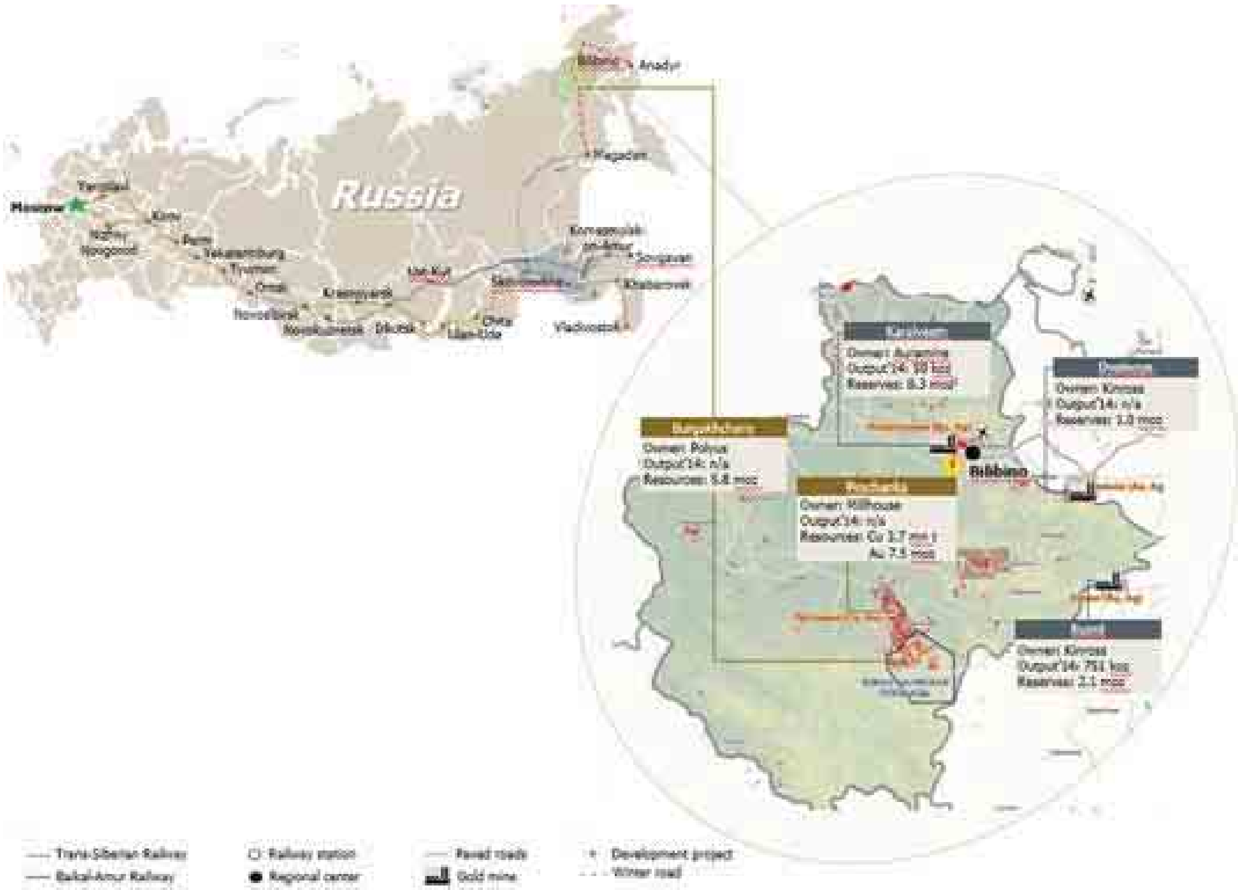
Burgakhchany is a copper-gold exploration project located in the Chukotka region, in Russia's Far East. The project is approximately 250 km west of the regional centre of Bilibino, connected by a winter road. The Chukotka region hosts a number of gold-copper projects and operating mines (refer to Figure 10.8).

The exploration licences cover a total area of 1,847 km^2 comprising:

- Vostochno-Burgakhchanskaya area - AND 01184 BR
- Zapadno-Burgakhchanskaya area - AND 01185 BR
- Centralno-Burgakhchanskaya area - AND 01186 BR

The licences are reported by Polyus to be valid until 2036.

Figure 10.8 Burgakhchany - location

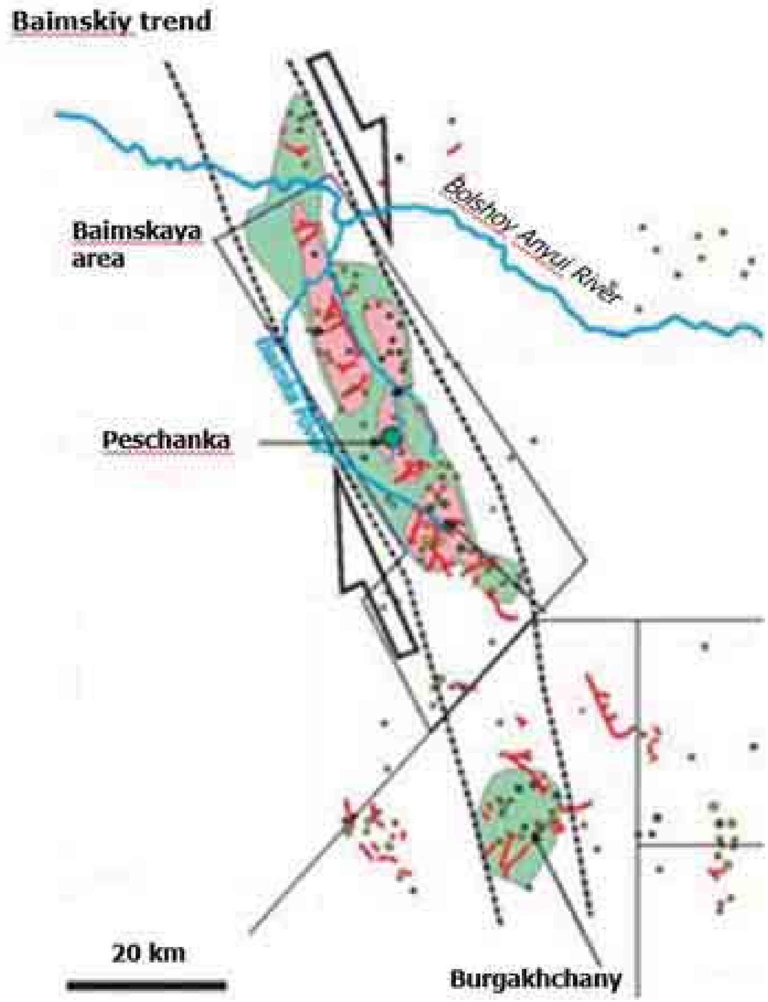


10.7.2 Geology

The licence areas of Burgakhchany are located along the extension of Baimskaya geological structure which hosts the large Peschanka copper-porphyry deposit.

The results of early exploration at Burgakhchany demonstrate similarity with the geological setting of Peschanka deposit, thus providing good potential for copper-porphyry and gold mineralization styles (refer to Figure 10.9).

Figure 10.9 Burgakhchany - regional geology



The project area is divided into three areas: Western, Central, and Eastern. Each area is considered to have geological potential to host economic mineralization.

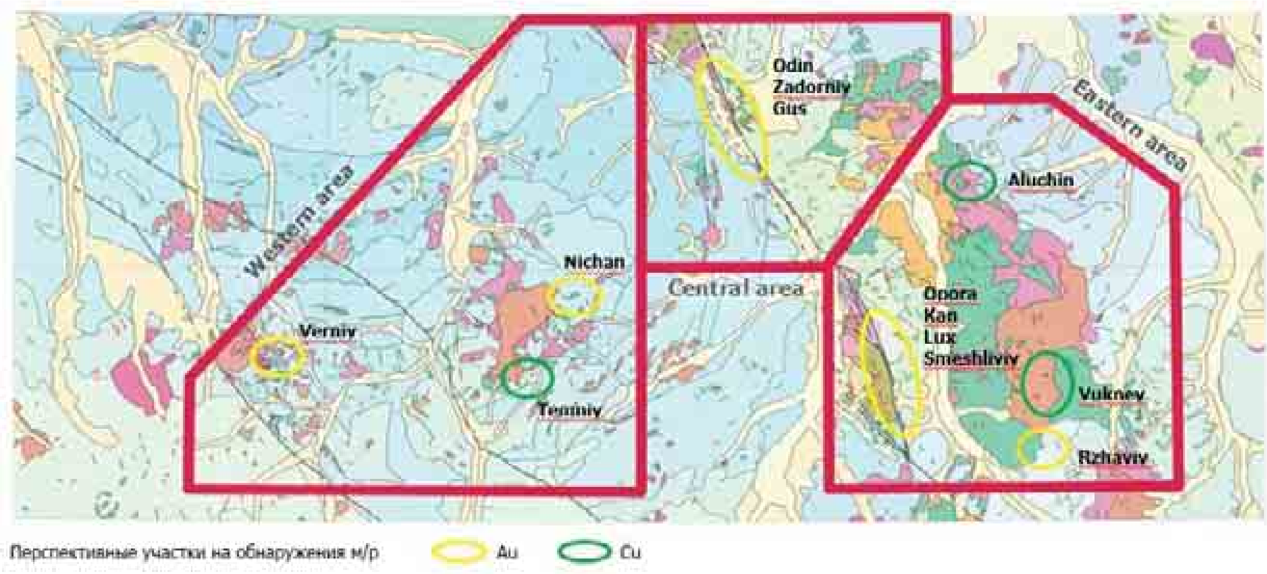
A reconnaissance survey together with exploration and trenching programmes have been completed in 2011 to 2015 to cover the Verniy, Temniy, Nichan, Gus, Lux, Vukney, and Rzhaviy sections. Airborne geophysics were carried out over the entire area. Based on the results of the early exploration field programmes, a broad understanding of the regional geology is proposed. The strata bound formations are represented by Devonian volcanic rocks and by Jurassic-Cretaceous terrigenous and volcanic sediments. All rocks are intruded by numerous intrusive and sub-volcanic bodies of Late Palaeozoic and Late Cretaceous age (seven igneous complex).

More than 60 mineralization occurrences of Au, Au-Ag, Au-Cu are identified within the three areas.

Copper-porphyry and gold-polymetallic mineralization have genetic links with the development of Early Cretaceous intrusions: Nenkansky trachytic-andesitic, Veseninsky granite-dioritic, and Egdekichsky gabbro-monzonite-syenitic.

The Western area is considered most prospective and has been the subject of the most exploration activity. Sub-areas with the most potential are Verniy and Temniy (refer to Figure 10.10).

Figure 10.10 Burgakhchany - project areas



Within the Verniy sub-area, trenching and geophysical surveys have been completed, including 3,200 m of trenching and 8 km of induced polarization profiling. Results from that work include:

- Identification of zone of mineralization with a thickness up to 50 m.
- Identification of a lateral extent of up to 2 km.
- Initial gold grades reported of up to 98 g/t and silver up to 760 g/t.

Within the Temniy sub-area, trenching and geophysical surveys have been completed including 1,200 m of trenching, 1,591 m diamond drilling and 6 km of induced polarization profiling. Results from that work include:

- The drillhole core observed 4.5 m intersections with quartz-sulphide and sulphide (chalcopyrite) mineralization.
- Multi-metal (Mo-Cu-Au) geochemical anomaly has been outlined by exploration and geochemical survey.
- Initial grades reported were gold of 0.5 g/t to 1.0 g/t, Cu of more than 1%, Ag of 26 g/t to 165 g/t, and Mo of 0.07%.

Mineral Resources (per the JORC Code) have not been classified and reported for the areas.

10.8 Degdekan

10.8.1 Introduction

The Degdekan gold exploration project is located in the Magadan region, approximately 70 km from the Natalka mine. The deposit is approximately 9 km from the Natalka power line.

The rivers in the Degdekan area were mined as alluvial deposits in the 1930s, with some prospecting to identify the primary source of the ore. In the 1980s and 1990s more systematic exploration was conducted that included geophysical and litho-geochemistry, profile geophysics, trenching and some core drilling.

In 2005, Polyus acquired the Degdekan licence and deposit (licence number MAG 14155 BR). Exploration activities are on-going.

10.8.2 Geology

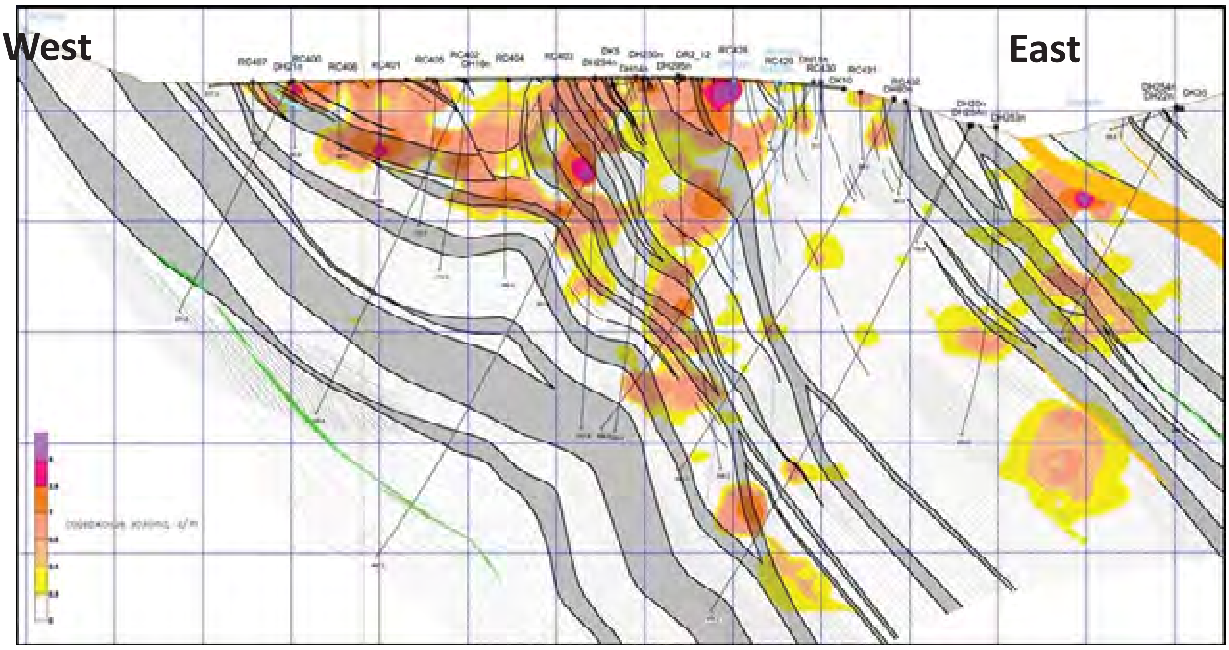
Polyus reports that Degdekan is in the southeast part of Yana-Kolyma folded system, which is in turn in the northeast part of Ayana-Uryakh anticlinorium zone, and on the flank of the Adycha-Bakhapcha anticline. The area is in the Tenkinskiy regional thrust tectonic zone.

The deposit comprises a thick sequence of highly carbonaceous clastic sediments at the core of the Tenkinskaya anticline that is composed of terrigenous and volcano-sedimentary rocks striking generally northwest. The mineralized area generally has an east to west orientation.

Host rocks are an assemblage of argillites, siltstones and sandy siltstones intercalated with subordinate sandstone layers and lenses. There are multiple stages of small I-type intrusions and dykes.

Figure 10.11 shows a typical cross-section through the deposit. The mineralization type is a quartz-sulphide vein and stringer stockwork system with an east to west strike, parallel to the Tenkinskaya anticline. Mineralized bodies 1 and 2 are approximately 1.8 km long, 450 m extent down-dip, and 250 m to 300 m thick.

Figure 10.11 Degdekan - typical cross-section



Mineralized bodies 3 and 4 are less explored, and the mineralisation is believed to extend over a strike length of 2 km and to a depth of 350 m.

The mineralization is characterised by arsenopyrite disseminations, intense pyritisation and minor galena. The sulphide grades are between 0.5% and 5% of the total, with strong oxidation at the surface.

Gold occurs in native form, or with sulphides, or intergrown with quartz. Each forms belongs to a different mineral episode. There is a large proportion of ‘nuggetty’ coarse grained gold in the -6 mm to +2 mm particle size fraction with fineness of 780 to 930.

10.8.3 Exploration

Polyus reports that between 2008 and 2010, its exploration activities included:

- 106,000 m of diamond drilling.
- 1,376 m of underground development.
- Collection 55,705 geology samples.
- Collection of 16,900 geochemistry samples.
- 68,800 fire assays.
- 39,800 spectral assays.
- Analysis of seven metallurgical samples.

Analysis of the collected data allowed preparation of a GKZ estimate, pilot testing of the metallurgy and development of a process plant flowsheet. In 2015, GKZ approved the pre-feasibility study conditions and Polyus advises that it has applied for approval of further resource definition drilling and mining.

Mineral Resources have not been classified and reported for Degdekan in accordance with the JORC Code.

11 Abbreviations, units, and sources of information

11.1 Abbreviations

2008 PRDC Report	The Engineering Geological Properties of rocks and pit slope stability assessments, dated 2008
2014 PRDC Report	Stability Monitoring and Ongoing Optimization of Sloping Structure Parameters of Vostochniy, Titimukhta and Blagodatnoye Open Pits, dated 2014
3D	three-dimensional
AAS	atomic absorption spectroscopy
Al	aluminium
AMC	AMC Consultants Pty Ltd
ARD	acid rock drainage
As	arsenic
Au	gold
BHL	Blagodatnoye Heap Leach Project
C	carbon
$Ca(HCl)_2$	calcium hypochlorite
CAT	Caterpillar
CIL	carbon-in-leach
CN	cyanide
CPR	Competent Person's Report
Cr	chromium
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
CRL	Central Research Laboratory
CRM	Certified Reference Material
Cu	copper
ERM	Environmental Resources Management
ESIA	Environmental and Social Impact Assessment
ESMA	European Securities and Markets Authority
ESMA Recommendations	The European Securities and Markets Authority – "ESMA update of the CESR recommendations – The consistent implementation of Commission Regulation (EC) No 809/2004 implementing the Prospectus Directive, 20 March 2013, ESMA/2013/319"
EW	electrowinning
FAG	fully autogenous grinding
FCA	Financial Conduct Authority
Fe	iron
FSUE TsNIGRI	Federal State Unitary Enterprise Central Research Institute of Geological Prospecting for Base and Precious Metals
SG&A	Selling, general and administrative
GKZ	State Commission on Mineral Reserves
ICMM	International Council on Mining and Metals
ILR	intensive leach reactor
IMS	Integrated Management System
Irgiredmet	OJSC Irgiredmet, a well-known Russian mining and metallurgical research institute
ISO	International Organization for Standardization
JORC	Joint Ore Reserves Committee
JORC Code	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2012 Edition. Effective 20 December 2012 and mandatory from 1 December 2013. Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australasian Institute of Geoscientists and Minerals Council of Australia (JORC).
JORC Code 2004	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2004 Edition, Effective December 2004, Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC)
LHOS	long-hole open stoping
LMIK	Localized Multiple Indicator Kriging
LOM	life-of-mine
MCS	Micromine Consulting Services
Mentore	Mentore Pty Ltd
Mg	magnesium
MIK	multiple indicator kriging
Mining Model	A Mining Model is the result of AMC's conversion of a resource model to a mining model suitable for either open pit or underground mine

	planning by reblocking, or regularizing, the resource model at a selective mining unit (SMU) size suitable for the mining method and equipment that is considered to be appropriate for the operation.
Mineral Assets	Mineral Assets as referred to in this CPR are as defined in the VALMIN Code. Polyus has an interest in the Mineral Assets that are considered in this CPR.
Mn	manganese
Mo	molybdenum
NaOH	Sodium hydroxide
Ni	nickel
NPV	net present value
OERN	the Society of Russian Experts on Subsoil Use
Offering	A possible offering of shares and global depositary shares in Polyus
OHSAS	Occupational Health and Safety Assessment Specification
pH	solvated hydrogen ion activity
PLS	pregnant leach solution
Polyus	PJSC Polyus
PRDC	Polyus Research and Design Centre
Prospectus	Prospectus issued in connection with the Offering.
Prospectus Directive	The United Kingdom Financial Conduct Authority which is the United Kingdom competent authority for the purposes of Directive 2003/71/EC, as amended
QAQC	Quality assurance and quality control
RC	reverse circulation
RF	revenue factor
RFA	express X-ray fluorescence
RiM or OJSC RiM	АО Рудник имени Матросова, a wholly owned subsidiary of Polyus, which later changed its name to OJSC RiM
RIP	resin-in-pulp
ROM	run-of-mine
RUB	Russian rouble
Russia	Russian Federation
SAG	semi-autogenous grinding
Sb	antimony
SLC	sublevel caving
SMU	selective mining unit
Sn	tin
Sr	strontium
Te	tellurium
Ti	titanium
TSF	tailings storage facility
UK	United Kingdom
UKLA	United Kingdom Listing Authority
US$	United States dollar
VALMIN Code	Australasian Code for Public Reporting of Technical Assessments and Valuations of Mineral Assets The VALMIN Code 2015 Edition, Prepared by the VALMIN Committee, a joint committee of the Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists
W	tungsten
Whittle	Geovia Whittle™
WRSF	waste rock storage facilities
XRF	X-ray fluorescence
YTD	year-to-date
Yakutia	Republic of Sakha
Zn	zinc

11.2 Units

%	percent
<	less than
>	greater than
°	degrees of arc
°C	degrees Celsius
µ	micron or denoting a factor of 10^{-6}
µg/L	microgram per litre
µg/L	microgram per litre
g	gram
g/m^3	grams per cubic metre
g/t	grams of gold per tonne unless otherwise stated
ha	hectare
km	kilometres
km^2	square kilometres
koz	thousand ounces
kt	thousand tonnes
kV	kilovolt
kW	kilowatt
L/s	litres per second
M	million
m	metre
m^2	square metre
m^3	cubic metre
m^3/h	cubic metres per hour
mg	milligram
mg/L	milligrams per litre
mm	millimetre
Mm^3	million cubic metres
Moz	million ounces
mRL	meters reduced level
Mt	million tonnes
Mtpa	million tonnes per annum
MW	megawatt
oz	ounce
t	tonnes
t/m^3	tonne per cubic meter
tpa	tonnes per annum
tph	tonnes per hour
ρ_d	soil skeleton bulk density
ρs	particle density (solids specific gravity)

11.3 Sources of Information

Principal sources of information considered by AMC in the preparation of this CPR include the following. This list is not exhaustive and does not include numerous technical files such as drillhole databases and topography files pertaining to the Mineral Assets.

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Olimpiada:

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AMC216081 M1 Site Visit Report 161130.pdf

AMC216081 Olimpiada data review report 20161221.pdf

AMC216081 M2 Olimpiada deposit Resource Data Review and Open Pit Resource modelling.pdf

AMC216081 M6 Olimpiada deposit Modifying Factor Review and Open Pit Mine Planning.pdf

AMC216081 M7 Olimpiada deposit Modifying Factor Review and Underground Mine Planning.pdf

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Assessment of current liabilities for reclamation and closure m / p Blagodatnoe JSC "Polyus" on 01/01/2017 (Оценка текущих обязательств по рекультивации и закрытию объектов м/р Благодатное АО «Полюс» на 01.01.2017)

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61-1502 Olimpiada, Titimukhta, Blago_Ore reserve report - Final V1.0.pdf

Assessment of current liabilities for reclamation and closure m / p Titimukhta JSC "Polyus" on 01/01/2017 (Оценка текущих обязательств по рекультивации и закрытию объектов м/р Титимухта АО «Полюс» на 01.01.2017)

Verninskoye:

AMC215075V_2 MV2 Verninskoye Site Visit 160226.pdf

AMC215075V MV3 Verninskoye Resource Estimate 160419.pdf

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TÜV SÜD 2016, Verninskoye ISO14001, OHSAS18001 audit report

The Alluvials:

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AMC216081 Sukhoi Log data review report 20170110.docx

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Comprehensive technological and geological and economic re-evaluation of the Sukhoi Log deposit through the development of innovative technologies, numbered WB-04-34 / 38, 21 July 2006.

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AMC216081 M13 Poputninskoye Mineral Resource 170108.pdf

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Chertovo Koryto:

JSC Tonoda, 2008. Devil's Trough Gold Deposit (Report of JSC "Tonoda" of exploration for 1996-2007 with the estimated reserves as of 01.09.2007), Report to GKZ Rosnedra.

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Bamskoye:

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Medvezhy:

AMC215075V_2 MV2 Verninskoye Site Visit 160226.pdf

AMC215075V MV3 Medvezhy Mineral Resource Estimate 160419.pdf

Appendix
Qualifications and Experience of the Contributors to the Competent Person's Report

The key contributors to the Competent Person's Report (CPR) and their responsibilities include:

Name	Qualifications	Affiliations	Responsibility
Mark Chesher	Bachelor of Engineering (Mining) (Hons)	AMC Open Pit Manager and Principal Mining Engineer	Project director.
Alex Virisheff	Bachelor of Science in Geology Honours	AMC Principal Geologist	Geology and Mineral Resource estimation – Blagodatnoye.
Brad Watson	Bachelor of Engineering in Mining Engineering with Honours	AMC Principal Mining Engineer	Olimpiada underground Ore Reserve estimation, mine planning, and scheduling.
David Varcoe	Bachelor of Engineering (Mining) (Hons)	AMC Principal Mining Engineer	Assistance with preparation of the CPR.
Dean Carville	Bachelor of Science with Honours (Geology)	AMC Practice Leader – Exploration Valuation and Principal Geologist	Geology and Mineral Resource estimation – Olimpiada open pit and underground, Verninskoye open pit, Sukhoi Log open pit, Bamskoye open pit.
Koray Gundem	Bachelor of Science (Mining Engineering)	AMC Principal Mining Engineer	Peer review of open pit optimization, dilution modelling, and pit design for estimation of Ore Reserves by AMC - Olimpiada, Verninskoye, Kuranakh, Blagodatnoye, Natalka and Chertovo Koryto.
Ingvar Kirchner	Bachelor of Science in Geology with Honours	AMC Geology and Corporate Manager, Perth	Overall coordination and management of AMC's work on geology and Mineral Resource estimation.
John Tyrrell	Bachelor of Arts, Moderatorship in Geology (Honours) Graduate Diploma in Information Technology	AMC Senior Geologist	Geology and Mineral Resource estimation for Chertovo Koryto open pit, Medvezhy open pit.
Jon Dray	Bachelor of Engineering (Mining), University of Auckland Graduate Diploma of Applied Finance and Investment (GDipAppFin (Finsia))	AMC Principal Mining Engineer	Project coordinator; open pit capital expenditure estimation; summary of Ore Reserve estimates.
Justin Glanvill	Master of Science in Engineering Graduate Diploma in Engineering Bachelor of Science in Geology and Applied Geology (Honours) Citation in Advanced Geostatistics	AMC Geology Manager/Principal Geologist	Geology and Mineral Resource estimation – Poputninskoye.
Lawrie Gillett	Bachelor of Engineering (Mining)	AMC Practice Leader – Corporate Consulting – Australia	CPR coordination and peer review.
Mike Sandy	Master of Science in Engineering Rock Mechanics DIC Bachelor of Science in Mining Geology with Honours ARSM	AMC Principal Geotechnical Engineer	Olimpiada underground geotechnical aspects and overall geotechnical inputs.
Owen Watson	Bachelor of Engineering (Geological) (Honours) Master of Engineering Science (Mining Geomechanics)	AMC Geotechnical Manager and Principal Geotechnical Engineer	Review of geotechnical aspects - Blagodatnoye, Olimpiada, Chertovo Koryto.
Peter Allen	Bachelor of Engineering (Environmental)	AMC Principal Environmental Engineer	Mineral tenure, environment, community, safety, and mine closure.
Peter Cunningham	Bachelor of Engineering in Mining Engineering Honours	AMC Principal Mining Engineer	Olimpiada underground Ore Reserves and costs estimation, and development strategy.
Peter Stoker	Bachelor of Science	AMC Principal Geologist	CPR peer review.
Rob Chesher	Bachelor of Science (Metallurgy) (Honours) Executive Development Program	AMC General Manager, Brisbane and Principal Consultant	Metallurgy, processing, and non-mining infrastructure.

Name	Qualifications	Affiliations	Responsibility
Yevgeniy Antonov	Bachelor of Mining Engineering	AMC Senior Mining Engineer	Open pit Ore Reserves - basis of design, estimation and scheduling. Open pit operating cost estimation, coordination of open pit work by AMC, and combined open pit and underground scheduling.
Mikhail Satarov	Bachelor of Science in Geology, Bachelor of Engineering (Mining),	PJSC Polyus	Estimation of Mineral Resources and Ore Reserves for ore stockpiles. Geology and Mineral Resource estimation for Titimukhta, Panimba, and Zmeinoye.
Olga Almendinger	Master of Science in Geology with Honours Bachelor of Science in Geology	AMC Subconsultant – Micromine Consulting Manager	Coordination of Micromine team for geological data review and QAQC as input to Mineral Resource estimation by AMC. Exploration and QAQC data analyses for the Poputninskoye, Olimpiada and Sukhoi Log
Sergey Drozdov	Bachelor of Science in Geology	AMC Subconsultant – Micromine Senior Geologist	Database review for the Olimpiada
Anna Zhivulko	Master of Science in Geology Bachelor of Science	AMC Subconsultant – Micromine Resource Geologist	Exploration and QAQC data analyses and reporting for the Blagodatnoye and Chertovo Koryto
Victor Osipov	Bachelor of Science in Geology	AMC Subconsultant – Micromine Senior Geologist	Database review and lithological modelling for the Poputninskoye deposit.
Dean O'Keefe	Bachelor of Science (Geology)	AMC Subconsultant - Mentore	Coordination of Mentore team for all Alluvial aspects including estimation of Mineral Resources and Ore Reserves and costs, and scheduling.

The professional qualifications and experience of the key contributors to the Competent Person's Report are summarized as follows:

Mark Chesher: Project director

Bachelor of Engineering (Mining) (Hons) Class 2, University of Queensland; Fellow and Chartered Professional (Mining) of The Australasian Institute of Mining and Metallurgy; Registered Professional Engineer of Queensland.

Mark has 31 years of experience in gold and base metal (aluminium, nickel) operations in both planning and management roles. He has managed feasibility studies in Australia and internationally and has conducted operational reviews and valuations at a number of operations. Mark is a Competent/Qualified Person under the requirements of both the JORC Code and National Instrument 43-101 – Standards of Disclosure for Mineral Projects (NI 43-101).

Alex Virisheff: Geology and Mineral Resources

Bachelor of Science in Geology (Hons), University of Queensland; Fellow of The Australian Institute of Mining and Metallurgy; Member of the Geological Society of Australia.

With more than 40 years of experience in the minerals industry, Alex is experienced in geological modelling, resource estimation and geostatistics. He is proficient in technical audits, reviews and due diligence studies over a wide of range of commodities including iron ore, gold, silver, base metals, tungsten, vanadium and mineral sands. Alex is a Competent Person under the requirements of the JORC Code and is qualified under NI 43-101.

Brad Watson: Ore Reserves

Bachelor of Engineering in Mining Engineering with Honours, *Western Australian School of Mines;* Bachelor of Commerce in Finance, *Curtin Business School;* Member of the Australasian Institute of Mining and Metallurgy, First Class Mine Manager's Certificate (WA), Underground Shift Supervisor Certificate (WA).

With 16 years of experience, Brad has skills in underground mine design, mine development, mine production, scheduling, ventilation, costing, valuation, and due diligence. Brad has also been involved in the preparation of valuations, target statements, mining inventory statements, budget reviews and cost model development. He has also reviewed and evaluated a number of materials handling options for underground operations.

David Varcoe

Bachelor of Engineering (Mining) (Hons), University of Melbourne, Victoria; Member of The Australasian Institute of Mining and Metallurgy; Member of the Australian Institute of Company Directors; WA Quarry Managers Certificate.

David has more than 25 years of experience in the mining industry. He has extensive mine technical and managerial experience across a number of commodities working in Australia, Africa, the USA, Vietnam and Iran. He is experienced in executive, general and mine management as well as project management and contract management. He is a Competent Person under the JORC Code for a variety of deposit types.

Dean Carville: Geology and Mineral Resources

Bachelor of Science with Honours (Geology), University of Western Australia; Member of The Australasian Institute of Mining and Metallurgy, Member of Geological Society of Australia.

Dean's primary areas of expertise are exploration and resource geology, and resource estimation. He is a Competent Person under the JORC Code for a variety of deposit types.

Koray Gundem: Ore Reserves

Bachelor of Science (Mining Engineering); Member of The Australasian Institute of Mining and Metallurgy.

Koray's primary expertise is in computer-assisted mine planning for open-pit and underground mines. He has broad experience in gold, nickel, copper, zinc and uranium studies, pit optimization, mine design, evaluation, scheduling and mine planning support to established operations.

Ingvar Kirchner: Geology and Mineral Resources

Bachelor of Science in Geology with Honours, Monash University; Fellow of The Australasian Institute of Mining and Metallurgy; Member of the Australian Institute of Geoscientists.

Ingvar's career spans more than 30 years, He is a highly experienced consultant, manager and geologist, skilled in geological modelling, geostatistics, linear and non-linear resource estimation mods and resource classification. He is also skilled in public reporting is a Competent/Qualified Person under the requirements of both the JORC Code and NI 43-101.

John Tyrrell: Geology and Mineral Resources

Bachelor of Arts, Moderatorship in Geology (Honours), Trinity College, Dublin, Ireland; Graduate Diploma in Information Technology, Edith Cowan University, Perth; Member of The Australasian Institute of Mining and Metallurgy.

With 30 years of experience, John's primary area of expertise is in resource estimation, and resource and mine geology. He is a Competent Person under the requirements of the JORC Code.

Jon Dray: Ore Reserves (Open Pit)

Bachelor of Engineering (Mining), *University of Auckland;* Graduate Diploma of Applied Finance and Investment (GDipAppFin (Finsia)); Member of The Australasian Institute of Mining and Metallurgy; WA Quarry Manager’s Certificate.

Jon has 21 years of experience as a mining engineer and has worked in Australia and internationally with exposure to nickel, gold, zinc/lead, iron ore, phosphate, rare earths and molybdenum/tungsten in planning production, management and project management roles.

Justin Glanvill: Geology and Mineral Resources

Master of Science in Engineering University of the Witwatersrand; Graduate Diploma in Engineering University of Witwatersrand; Bachelor of Science in Geology and Applied Geology (Honours) University of Natal, Durban Campus; Citation in Advanced Geostatistics University of Alberta; Professional Scientist, South African Council for Natural Scientific Professionals; Member of the Geological Association of South Africa; Member of the Geostatistical Association of South Africa.

Justin has 17 years of experience in the areas of geology, deposit modelling, geostatistics, resource estimation and technical systems development. He has worked on gold, base metals and mineral sands deposits, in exploration and production environments, and for resource evaluation.

Lawrie Gillett: CPR Reporting

Bachelor of Engineering (Mining) University of Melbourne; Diploma in Geoscience (Mineral Economics) Macquarie University; Diploma - AICD Company Directors Course' Fellow of The Australasian Institute of Mining and Metallurgy (CP); Member of The Society of Mining Engineers of AIME; Graduate Member of Australian Institute of Company Directors; Mine Manager's Certificate of Competency (NSW); First Class Mine Manager's Certificate of Competency (WA).

With more than 40 years of experience, Lawrie's primary expertise is in technical audits, due diligence reviews, public reports and mine feasibility studies. His broad experience within the mining industry includes open-pit design, scheduling and management, selection and specification of mining equipment, underground and open-pit operations and ore reserve estimation. He is a Competent/Qualified Person under the requirements of both the JORC Code and NI 43-101.

Mike Sandy: Geotechnical

Master of Science in Engineering Rock Mechanics DIC, Imperial College, London, Bachelor of Science in Mining Geology with Honours ARSM, Royal School of Mines, London, Fellow and Chartered Professional Geotechnical (Mining) of The Australasian Institute of Mining and Metallurgy; Member of the Institute of Materials, Minerals and Mining (UK); Registered Professional Engineer of Queensland.

Mike has almost 40 years of experience in the mining industry. His primary expertise is in rock mechanics (underground operations) including ground support design, rock mass characterization, mining method selection and optimization, extraction sequencing and applied numerical modelling. Mike also has extensive experience in underground mine planning and feasibility studies, mine geology, dewatering, diamond drilling strategies and management of mining technical research.

Owen Watson: Geotechnical

Bachelor of Engineering (Geological) (Hons) RMIT University; Master of Engineering Science (Mining Geomechanics) University of New South Wales; Member of The Australasian Institute of Mining and Metallurgy; Member of The Canadian Institute of Mining, Metallurgy and Petroleum.

Owen has 18 years of experience. His primary expertise is in geomechanics in hard-rock underground and surface mining and includes operations reviews, stability assessment of underground excavations and pit slopes, rock mass characterization, numerical modelling, design of ground support, and the collection, interpretation and reporting of geotechnical data for mining studies. His underground experience includes a variety of mining methods, including sublevel and block caving, sublevel open stoping, narrow-vein stoping and handheld mining. Owen is a Competent Person under the requirements of the JORC Code.

Peter Allen: Environment

Bachelor of Engineering (Environmental) University of Queensland; Member of Environment Institute of Australia and New Zealand (EIANZ).

With 22 years of experience, Peter's expertise lies in the preparation of environmental impact assessments and environmental management plans with professional experience in Australia (New South Wales and Queensland), the United Kingdom, Nigeria, Palestine, Jordan and Tajikistan. He has extensive experience in the water, transport, energy, and mining sectors.

Peter Cunningham: Ore Reserves (Underground)

Bachelor of Engineering in Mining Engineering Honours Class 2, Division 2 *University of New South Wales;* Member of The Australasian Institute of Mining and Metallurgy; Metalliferous, Below Ground Mine Manager's Certificate (NSW).

Peter has 40 years of experience in a range of mining methods, mine-planning and capital projects, and underground materials handling systems and infrastructure. His expertise is in mine planning, technical evaluations, due diligence reviews, and feasibility studies. He has worked for major resource companies, in the corporate environment in Melbourne, at operating mines in Broken Hill, and in both in-house and independent consulting roles in Perth. Peter is a Competent Person under the requirements of the JORC Code.

Peter Stoker: **CPR Reporting**

Bachelor of Science, *University of Melbourne;* Diploma in Education, *University of Melbourne;* Management Development Programme, *Australian Staff College, Mount Eliza;* Exploration Management *Australian Mineral Foundation;* Honorary Fellow of The Australasian Institute of Mining and Metallurgy (Chartered Professional); Deputy Chairman of the Joint Ore Reserves Committee (JORC); JORC Representative on the Committee for Mineral Reserves International Reporting Standards (CRIRSCO).

Peter has more than 40 years of experience in mine geology, mineral resource and ore reserve estimation, feasibility studies, project evaluation, and mineral exploration. His extensive commodity experience includes base metals (copper, lead-zinc-silver, nickel), gold, copper-gold (porphyry and iron oxide), bauxite, and sedimentary uranium. He is an expert in mine geology standards, minerals investment return, and audits and due diligence studies of Mineral Resources and Ore Reserves. He is a Competent/Qualified Person under the requirements of both the JORC Code and NI 43-101.

Rob Chesher: **Metallurgy**

Bachelor of Science (Metallurgy) (Honours), University of Queensland; Executive Development Program Kellogg Business School, Northwestern University; Member of The Australasian Institute of Mining and Metallurgy.

Rob has more than 40 years of experience in the mining, oil and gas, and manufacturing sectors. His expertise is in corporate and technical (metallurgical) consulting, focusing on operational and performance reviews, improvements, and optimization. In his roles he has been involved in studies and reviews at all levels in copper, gold, platinum, coal, nickel, and other base metals. He has a record of achieving significant and sustainable operational improvements across the mining, oil and gas, and manufacturing sectors.

Yevgeniy Antonov: **Ore Reserves (Open Pit)**

Bachelor of Mining Engineering, East Kazakhstan State University; Member of The Australasian Institute of Mining and Metallurgy.

Yevgeniy has 16 years of mining experience. His primary expertise lies in open pit and underground mine planning. He is competent in the use of Datamine, Mine 2-4D, AutoCAD and MS Project software, Whittle, NPV Scheduler, MineSched, Minemax and Microsoft applications. He has broad experience in gold, silver, copper, zinc, lead and iron ore studies.

Mikhail Satarov: **Mineral Resources and Ore Reserves**

Bachelor of Science in Geology, Bachelor of Engineering (Mining), Kyrgyz Mining & Metallurgy Institute; Member of the Australian Institute of Geoscientists.

Mikhail has over 21 years of experience in the gold mining industry and exploration geology gained in Kumtor Operating Company (Centerra Gold Inc., Kyrgyz republic), Vasilkovsky Mine (Kazzinc, Kazakhstan), Polyus Gold Mining Company (Russia) and many other companies. He worked as exploration and mining geologist, mine engineer and mine manager. Mikhail is highly skilled in geological modelling, geostatistics, resource and reserve estimation, mine planning and project management.

He has signed-off numerous reports as Competent Person in accordance with the JORC Code.

Olga Almendinger (Micromine Consulting): **Mineral Resources**

Master of Science with Honours (Geology), Moscow State University; Bachelor of Science (Geology), Moscow State University; Member of the Australian Institute of Geoscientists.

Olga has more than 15 years of experience in geology, starting as an exploration geologist in large gold mining companies such as Barrick and Highland Gold and extending her expertise in mineral resource estimation area after joining the Micromine Consulting team as a Resource Consultant in 2010. Olga has headed Micromine Consulting’s Russian team since 2013, and she has completed and managed resource estimation project in Russia and internationally.

Sergey Drozdov (Micromine Consulting): **Mineral Resources**

Bachelor of Science (Geology), Novosibirsk State University; Member of the Australian Institute of Geoscientists.

Sergey has more than 20 years of experience in geology, including nine years of experience in resource estimation. His expertise includes statistical analysis, geostatistical analysis (including variography), wireframing, block modelling and resource estimation, as well as reporting in accordance with the JORC Code, and NI 43-101 standards. Sergey joined the Micromine Consulting team in 2009 and has completed numerous resource estimation projects for gold and other commodities.

Anna Zhivulko (Micromine Consulting): Mineral Resources

Masters of Science (Geology), Peoples' Friendship University of Russia, Moscow; Bachelor of Geology, Peoples' Friendship University of Russia, Moscow.

Anna is a Resource Geologist with ten years' experience in the mining industry. Anna worked as a geologist for large companies (Barrick Gold, Highland Gold, Russkaya Platina, and Uranium One) and worked as a geologist consultant for SRK Consulting before joining Micromine. She specializes in processing and analyzing geological exploration data, developing databases, solids and block models of deposits.

Victor Osipov (Micromine Consulting): Mineral Resources

Bachelor of Science (Geology), Tomsk Polytechnic University. Member of the Australian Institute of Geoscientists; Member of the NAEN (Russia).

Victor has more than 20 years of experience in geology, including seven years in mineral resource estimation. Victor has extensive expertise in exploration, mining geology and grade control. He has strong skills in geological modelling, geostatistics and classification. Victor has been a member of the Micromine Consulting team since 2011 and has completed resource estimation for numerous gold projects.

Dean O'Keefe: Alluvial Mineral Resources

Bachelor of Science (Geology), PGS (Geostatistics, Member of The Australasian Institute of Mining and Metallurgy.

Dean, a Director of Mentore Pty Ltd, has more than 25 years of experience in management, business development, sales, exploration and mining; including mine geology department management and international consulting group management, together with expert skills in mining and geological computer applications, for data management, resource estimation, pit optimization, simulation, and mine design. Dean resided in Beijing for more than 10 years and developed the Micromine China and Mongolia businesses from inception, including market assessment; development of business partnerships and then a successful sales regime for mining consulting and software provision. Dean has designed and managed exploration programmes for precious and base metals and has run the mine departments for gold, copper and Manganese operations. He has signed off on reports in accordance with the JORC Code and NI 43-101 and is qualified to run all surface operations as unrestricted mine manager and all blasting operations. Dean has evaluated more than 100 advanced resource and reserve mineral projects, including sign off as competent person for stock exchanges. Dean has been Director of several exploration and service Companies in Australia and China. Specific alluvials experience includes:

- 2014 to present: Good News Bay Platinum Gold project; Alaska
- 2013: Arsari Tin, Bangka Island Indonesia
- 2008: PT Tambang Timah, Bangka Island Indonesia
- Other more minor alluvial projects include projects in Australia, Mongolia and New Zealand.

Our offices

Australia

Adelaide
Level 1, 4 Greenhill Road
Wayville SA 5034 Australia
T +61 8 8201 1800
E adelaide@amcconsultants.com

Brisbane
Level 21, 179 Turbot Street
Brisbane Qld 4000 Australia
T +61 7 3230 9000
E brisbane@amcconsultants.com

Melbourne
Level 19, 114 William Street
Melbourne Vic 3000 Australia
T +61 3 8601 3300
E melbourne@amcconsultants.com

Perth
Level 1, 1100 Hay Street
West Perth WA 6005 Australia
T +61 8 6330 1100
E perth@amcconsultants.com

Canada

Toronto
Suite 300, 90 Adelaide Street West
Toronto, Ontario M5H 3V9 Canada
T +1 416 640 1212
E toronto@amcconsultants.com

Vancouver
Suite 202, 200 Granville Street
Vancouver BC V6C 1S4 Canada
T +1 604 669 0044
E vancouver@amcconsultants.com

Singapore

Singapore
Registered Office
16 Raffles Quay, #33-03 Hong Leong Building
Singapore 048581
T +65 8620 9268
E singapore@amcconsultants.com

United Kingdom

Maidenhead
Registered in England and Wales
Company No. 3688365

Level 7, Nicholsons House
Nicholsons Walk, Maidenhead
Berkshire SL6 1LD United Kingdom
T +44 1628 778 256
E maidenhead@amcconsultants.com

Registered Office: Ground Floor,
Unit 501 Centennial Park
Centennial Avenue
Elstree, Borehamwood
Hertfordshire, WD6 3FG United Kingdom

REGISTERED OFFICE OF THE COMPANY

Public Joint Stock Company Polyus
15/1 Tverskoy Boulevard
Moscow 123104
Russian Federation

JOINT GLOBAL COORDINATORS

Goldman Sachs International
Peterborough Court, 133 Fleet Street
London
EC4A 2BB
United Kingdom

J.P. Morgan Securities plc
25 Bank Street, Canary Wharf
London
E14 5JP
United Kingdom

SIB (Cyprus) Limited
Arch. Makarios III Ave.
2-4, Capital Center, 9th Floor
CY-1505, Nicosia
Cyprus

VTB Capital plc
14 Cornhill
London
EC3V 3ND
United Kingdom

JOINT BOOKRUNNERS

Bank GPB International S.A.
15, rue Bender
L-1229 Luxembourg
Société anonyme
R.C.S. Luxembourg B178974

BMO Capital Markets Limited
95 Queen Victoria Street
London
EC4V 4HG
United Kingdom

Goldman Sachs International
Peterborough Court, 133 Fleet Street
London
EC4A 2BB
United Kingdom

J.P. Morgan Securities plc
25 Bank Street, Canary Wharf
London
E14 5JP
United Kingdom

Morgan Stanley & Co. International plc
25 Cabot Square, Canary Wharf
London
E14 4QA
United Kingdom

SIB (Cyprus) Limited
Arch. Makarios III Ave.
2-4, Capital Center, 9th Floor
CY-1505, Nicosia
Cyprus

VTB Capital plc
14 Cornhill
London
EC3V 3ND
United Kingdom

LEGAL ADVISORS

To the Company
as to English and U.S. law
Debevoise & Plimpton LLP
65 Gresham Street
London
EC2V 7NQ
United Kingdom

To the Joint Bookrunners as to
English and U.S. law
Clifford Chance LLP
10 Upper Bank Street
London
E14 5JJ
United Kingdom

To the Company as to Russian law
(other than as to Russian tax matters)
Debevoise & Plimpton LLP
Business Center Mokhovaya
Ul. Vozdvizhenka, 4/7 Stroyeniye 2
Moscow, 125009
Russian Federation

To the Joint Bookrunners as to
Russian law
Clifford Chance CIS Limited
Ulitsa Gasheka 6
Moscow, 125047
Russian Federation

INDEPENDENT AUDITORS

ZAO Deloitte & Touche CIS
5 Lesnaya Street
Moscow 125047
Russian Federation

DEPOSITARY

The Bank of New York Mellon
101 Barclay Street
New York, NY 10286
United States of America

POLYUS

sterling 169454