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BARRICK GOLD CORPORATION

TECHNICAL REPORT ON THE CORTEZ JOINT VENTURE OPERATIONS, LANDER AND EUREKA COUNTIES, STATE OF NEVADA, U.S.A.

NI 43-101 Report

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FORWARD-LOOKING INFORMATION

This report contains forward-looking statements. All statements, other than statements of historical fact regarding Barrick or the Cortez Operation, are forward-looking statements. The words "believe", "expect", "anticipate", "contemplate", "target", "plan", "intend", "project", "continue", "budget", "estimate", "potential", "may", "will", "can", "could" and similar expressions identify forward-looking statements. In particular, this report contains forward-looking statements with respect to cash flow forecasts, projected capital, operating and exploration expenditure, targeted cost reductions, mine life and production rates, potential mineralization and metal or mineral recoveries, the Deep South expansion, the Barrick-Newmont Joint Venture, and information pertaining to potential improvements to financial and operating performance and mine life at the Cortez mine that may result. All forward-looking statements in this report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this report, where applicable. In addition to such assumptions, the forward-looking statements are inherently subject to significant business, economic and competitive uncertainties and contingencies. Known and unknown factors could cause actual results to differ materially from those projected in the forward-looking statements. Such factors include, but are not limited to: fluctuations in the spot and forward price of commodities (including gold, copper, silver, diesel fuel, natural gas and electricity); the speculative nature of mineral exploration and development; changes in mineral production performance, exploitation and exploration successes; diminishing quantities or grades of reserves; increased costs, delays, suspensions, and technical challenges associated with the construction of capital projects; operating or technical difficulties in connection with mining or development activities, including disruptions in the maintenance or provision of required infrastructure and information technology systems; damage to Barrick's or the Mine's reputation due to the actual or perceived occurrence of any number of events, including negative publicity with respect to the handling of environmental matters or dealings with community groups, whether true or not; risk of loss due to acts of war, terrorism, sabotage and civil disturbances; the impact of global liquidity and credit availability on the timing of cash flows and the values of assets and liabilities based on projected future cash flows; the impact of inflation; fluctuations in the currency markets; changes in interest rates; changes in national and local government legislation, taxation, controls or regulations and/or changes in the administration of laws, policies and practices, expropriation or nationalization of property and political or economic developments in the United States; failure to comply with environmental and health and safety laws and regulations; timing of receipt of, or failure to comply with, necessary permits and approvals; litigation; contests over title to properties or over access to water, power and other required infrastructure; increased costs and physical risks, including extreme weather events and resource shortages, related to climate change; and availability and increased costs associated with mining inputs and labor. In addition, there are risks and hazards associated with the business of mineral exploration, development and mining, including environmental hazards, industrial accidents, unusual or unexpected formations, pressures, cave-ins, flooding and gold bullion, copper cathode or gold or copper concentrate losses (and the risk of inadequate insurance, or inability to obtain insurance, to cover these risks).

Many of these uncertainties and contingencies can affect Barrick's actual results and could cause actual results to differ materially from those expressed or implied in any forward-looking statements made by, or on behalf of, Barrick. All of the forward-looking statements made in this report are qualified by these cautionary statements. Barrick and RPA and the Qualified Persons who authored this report undertake no obligation to update publicly or otherwise revise any forward-looking statements whether as a result of new information or future events or otherwise, except as may be required by law.

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1 SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Barrick Gold Corporation (Barrick) to prepare an independent Technical Report on the Cortez Open Pit and Underground Mine Operations (the Cortez Operations or the Mine), in Eureka and Lander Counties, Nevada, USA. The purpose of this report is to support the public disclosure of Mineral Resources and Mineral Reserves at Cortez as of December 31, 2018. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the site from January 5 to 9, 2019.

Barrick is a Canadian publicly traded mining company with a portfolio of operating mines and projects across five continents. The Cortez Operations are located in northeastern Nevada approximately 62 mi west and south of Elko.

The Mine is a joint venture between two wholly-owned subsidiaries of Barrick, Barrick Cortez Inc. (60%) and Barrick Gold Finance Inc. (40%). The Cortez Hills Project is 100% owned by Barrick Cortez Inc. The Cortez Operations consist of the Pipeline, Crossroads, and Cortez Hills (CHOP) open pits; the Cortez Hills underground (CHUG) mine; a 15,000 short ton per day (stpd), carbon-in-leach (CIL) gold plant and heap leach pads and heap leach processing plants; with additional Mineral Resources contained in the Cortez and Gold Acres open pits.

On March 10, 2019, Barrick and Newmont Mining Corporation entered into an implementation agreement (Implementation Agreement) to create a joint venture combining their respective mining operations, assets, reserves, and talent in Nevada (Barrick-Newmont Joint Venture). In connection with the completion of the transactions contemplated by the Implementation Agreement expected later this year, the Mine will be contributed to the Barrick-Newmont Joint Venture. This Technical Report provides estimates as of December 31, 2018, for Mineral Resources, Mineral Reserves, production schedules, and cost projections. These estimates do not take into account any changes or benefits that might arise from the commencement of Barrick-Newmont Joint Venture operations.

The open pits use a conventional truck and shovel fleet mining approximately 400,000 stpd of ore and waste. Mining operations move between the various pits over the Life of Mine (LOM) plan. The underground mine is a 5,000 stpd mechanized mine. Ore from the mines is treated

at an oxide mill at the site and on leach pads, while refractory ore is shipped to Barrick's Goldstrike operation for processing.

Table 1-1 summarizes the total Mineral Resources, exclusive of Mineral Reserves, at the Mine as of December 31, 2018 (EOY2018). Measured and Indicated Mineral Resources total 62.53 million tons grading 0.051 oz/st Au and contain 3.17 million ounces of gold. In addition, Inferred Mineral Resources total 14.5 million tons grading 0.049 oz/st Au and contain 705,000 ounces of gold.

In metric units (Table 1-2), the Measured and Indicated Mineral Resources total 56.73 million tonnes grading 1.74 g/t Au, containing 3.17 million ounces of gold. In addition, Inferred Mineral Resources total 13.16 million tonnes grading 1.67 g/t Au, containing 705,000 ounces of gold.

This Technical Report does not include information on the Goldrush and Fourmile deposits, located adjacent to the Mine, except where expressly indicated.

Table 1-3 summarizes the Cortez Mineral Reserves as of December 31, 2018. These Mineral Reserves are a combination of open pit and underground reserves and stockpiles. Proven and Probable Mineral Reserves total 159.89 million tons grading 0.055 oz/st Au and contain 8.74 million ounces of gold.

In metric units (Table 1-4), the Proven and Probable Mineral Reserves total 145.05 million tonnes grading 1.87 g/t Au and contain 8.74 million ounces of gold.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions) were used for the Mineral Resource and Mineral Reserve estimates.

RPA is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource and Mineral Reserve estimates.

**TABLE 1-1 MINERAL RESOURCE SUMMARY: US CUSTOMARY UNITS –
DECEMBER 31, 2018**

Barrick Gold Corporation – Cortez Operations

Mine & Process Type	Total Measured			Total Indicated			Total Measured and Indicated			Total Inferred		
	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)
Open Pit												
Mill	367	0.065	24	4,538	0.081	369	4,905	0.080	392	458	0.079	36
Heap Leach	2,097	0.005	11	35,803	0.008	301	37,900	0.008	312	10,418	0.009	92
Refractory	1,040	0.098	102	15,343	0.092	1,406	16,383	0.092	1,508	1,211	0.083	101
Open Pit Total	3,505	0.039	137	55,684	0.037	2,075	59,189	0.037	2,212	12,087	0.019	229
Underground												
Mill	170	0.324	55	936	0.286	268	1,106	0.292	323	363	0.190	69
Refractory	21	0.286	6	2,214	0.284	628	2,236	0.284	634	2,054	0.199	408
Underground Total	191	0.319	61	3,150	0.284	896	3,341	0.286	957	2,417	0.197	477
Total Open Pit & Underground	3,696	0.054	198	58,834	0.051	2,971	62,530	0.051	3,169	14,504	0.049	705

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at cut-off grades ranging from 0.004 oz/st Au to 0.124 oz/st Au depending on deposit, mining method, and process type.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 10 ft was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk density ranges from 0.052 st/ft³ to 0.091 st/ft³.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

TABLE 1-2 MINERAL RESOURCE SUMMARY: METRIC UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

Mine & Process Type	Total Measured			Total Indicated			Total Measured and Indicated			Total Inferred		
	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)
Open Pit												
Mill	333	2.23	24	4,117	2.78	369	4,450	2.74	392	416	2.71	36
Heap Leach	1,902	0.17	11	32,480	0.27	301	34,382	0.27	312	9,451	0.31	92
Refractory	943	3.36	102	13,919	3.15	1,406	14,862	3.15	1,508	1,099	2.85	101
Open Pit Total	3,180	1.34	137	50,515	1.27	2,075	53,694	1.27	2,212	10,965	0.65	229
Underground												
Mill	154	11.11	55	849	9.81	268	1,003	10.01	323	329	6.51	69
Refractory	19	9.81	6	2,009	9.74	628	2,028	9.74	634	1,863	6.82	408
Underground Total	173	10.94	61	2,858	9.74	896	3,032	9.81	957	2,193	6.75	477
Total Open Pit & Underground	3,353	1.84	198	53,374	1.73	2,971	56,726	1.75	3,169	13,158	1.67	705

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at cut-off grades ranging from 0.14 g/t Au to 4.25 g/t Au depending on deposit, mining method, and process type.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 3.05 m was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk density ranges from 1.67 t/m³ to 2.92 t/m³.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

TABLE 1-3 MINERAL RESERVES: US CUSTOMARY UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

Zone	Proven			Probable			Total Proven + Probable		
	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)
Open Pit									
Pipeline	1,299	0.024	31	13,180	0.021	270	14,479	0.021	302
Crossroads	9,699	0.031	299	112,992	0.030	3,336	122,690	0.030	3,634
Cortez Hills				1,721	0.059	102	1,721	0.059	102
Open Pit Subtotals	10,997	0.030	330	127,892	0.029	3,708	138,890	0.029	4,038
Underground									
Middle Zone				2,450	0.348	852	2,450	0.348	852
Lower Zone				3,513	0.281	986	3,513	0.281	986
Deep South				6,591	0.312	2,054	6,591	0.312	2,054
Underground Subtotals				12,554	0.310	3,892	12,554	0.310	3,892
Stockpiles									
Mill Stockpiles	1,137	0.066	75				1,137	0.066	75
Leach Stockpiles	2,219	0.009	19				2,219	0.009	19
Refractory Stockpiles	5,092	0.140	713				5,092	0.140	713
Stockpile Subtotals	8,449	0.096	808				8,449	0.096	808
Total	19,446	0.059	1,138	140,446	0.054	7,599	159,892	0.055	8,737

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at cut-off grades that range from 0.004 oz/st Au to 0.142 oz/st Au depending on deposit, mining method, and process type.
3. Mineral Reserves are estimated using an average gold price of US\$1,200 per ounce.
4. A minimum mining width of 25 ft was used.
5. Bulk density varies from 0.052 st/ft³ to 0.091 st/ft³, depending on material type.
6. Numbers may not add due to rounding.

TABLE 1-4 MINERAL RESERVES: METRIC UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

Zone	Proven			Probable			Total Proven + Probable		
	Tonnes (000)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000)	Grade (g/t Au)	Contained Gold (000 oz)
Open Pit									
Pipeline	1,178	0.83	31	11,957	0.70	270	13,135	0.71	302
Crossroads	8,799	1.06	299	102,505	1.01	3,336	111,304	1.02	3,634
Cortez Hills				1,561	2.03	102	1,561	2.03	102
Pediment									
Open Pit Subtotals	9,977	1.03	330	116,023	0.99	3,708	126,000	1.00	4,038
Underground									
Middle Zone				2,223	11.93	852	2,223	11.93	852
Lower Zone				3,187	9.62	986	3,187	9.62	986
Deep South				5,979	10.68	2,054	5,979	10.68	2,054
Underground Subtotals				11,389	10.63	3,892	11,389	10.63	3,892
Stockpiles									
Mill Stockpiles	1,032	2.27	75				1,032	2.27	75
Leach Stockpiles	2,013	0.30	19				2,013	0.30	19
Refractory Stockpiles	4,620	4.80	713				4,620	4.80	713
Stockpile Subtotals	7,665	3.28	808				7,665	3.28	808
Total	17,642	2.01	1,138	127,412	1.86	7,599	145,054	1.87	8,737

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at cut-off grades that range from 0.14 g/t Au to 4.9 g/t Au depending on deposit, mining method, and process type.
3. Mineral Reserves are estimated using an average gold price of US\$1,200 per ounce.
4. A minimum mining width of 7.62 m was used.
5. Bulk density varies from 1.67 t/m³ to 2.92 t/m³, depending on material type.
6. Numbers may not add due to rounding.

CONCLUSIONS

Based on the site visit and review of the documentation available, RPA offers the following interpretation and conclusions:

GEOLOGY AND MINERAL RESOURCES

- The Cortez deposits are Carlin-type deposits hosted by sedimentary rocks.
- The drilling, sampling, sample preparation, analyses, security, and data verification meet or exceed industry standards and are appropriate for Mineral Resource estimation.
- The parameters, assumptions, and methodology used for Mineral Resource estimation are appropriate for the style of mineralization.
- Mineral Resource estimates have been prepared using acceptable interpolation strategies. The classification of Measured, Indicated, and Inferred Resources conform to CIM (2014) definitions.
- The documentation for the Mineral Resource models meets or exceeds industry standards.
- The Mineral Resource estimates were completed by the Cortez Mine Technical Group and were reviewed and accepted by RPA.
- Mineral Resources are reported exclusive of Mineral Reserves and are estimated effective December 31, 2018.
- Total Mineral Resources at the Cortez Operations are:
 - Measured - 3.70 million tons, grading 0.054 oz/st Au, containing 198,000 ounces of gold.
 - Indicated – 58.83 million tons, grading 0.051 oz/st Au, containing 2,971,000 ounces of gold.
 - Measured + Indicated – 62.53 million tons, grading 0.051 oz/st Au, containing 3,169,000 ounces of gold.
 - Inferred – 14.5 million tons, grading 0.049 oz/st Au, containing 705,000 ounces of gold.
- Open Pit Mineral Resources at the Cortez Operations are:
 - Measured – 3.51 million tons, grading 0.039 oz/st Au, containing 137,000 ounces of gold.
 - Indicated – 55.68 million tons, grading 0.037 oz/st Au, containing 2,075,000 ounces of gold.
 - Measured + Indicated – 59.19 million tons, grading 0.037 oz/st Au, containing 2,212,000 ounces of gold.
 - Inferred – 12.1 million tons, grading 0.019 oz/st Au, containing 229,000 ounces of gold.

- Underground Mineral Resources at the Cortez Operations are:
 - Measured – 0.19 million tons, grading 0.319 oz/st Au, containing 61,000 ounces of gold.
 - Indicated – 3.15 million tons, grading 0.284 oz/st Au, containing 896,000 ounces of gold.
 - Measured + Indicated – 3.34 million tons, grading 0.286 oz/st Au, containing 957,000 ounces of gold.
 - Inferred – 2.42 million tons, grading 0.197 oz/st Au, containing 477,000 ounces of gold.
- RPA is of the opinion that the Mineral Resource estimate has been completed to industry standard and is suitable to support the disclosure of Mineral Resources and Mineral Reserves.
- RPA concurs with the new dynamic anisotropy modelling approach at Cortez and recommends its application across all deposits at Cortez where appropriate.
- RPA agrees with Barrick's ongoing review and modification of classification criteria at the Pipeline Complex, and is of the opinion that in general, classification of blocks is acceptable.

MINING AND MINERAL RESERVES

- The Mineral Reserves are contained within three open pit deposits, three zones in one underground deposit, and surface stockpiles.
- EOY2018 Mineral Reserves as stated by Cortez are estimated in a manner consistent with industry practices.
- Total Mineral Reserves at the Cortez Operations are:
 - Proven: 19.4 million tons, grading 0.059 oz/st Au, containing 1.14 million ounces of gold.
 - Probable: 140.4 million tons, grading 0.054 oz/st Au, containing 7.60 million ounces of gold.
- Open Pit Mineral Reserves at the Cortez Operations are:
 - Proven: 11.00 million tons, grading 0.030 oz/st Au, containing 0.33 million ounces of gold.
 - Probable: 127.9 million tons, grading 0.029 oz/st Au, containing 3.71 million ounces of gold.
- Underground Mineral Reserves at the Cortez Operations are:
 - Probable: 12.55 million tons, grading 0.310 oz/st Au, containing 3.89 million ounces of gold.
- The open pit mine is a conventional operation that currently has 400 st and 345 st class off-highway haul trucks which are loaded by one 35 yd³ hydraulic shovel and five 48 yd³ to 77 yd³ size electric shovels.
- CHUG is a mechanized decline access underground mine operating at approximately 5,000 stpd of ore and waste.

- The Middle Zone of the underground mine is being exploited using drift and fill mining methods and minor amounts of longhole stoping.
- The Lower and Deep South Zones are planned to be mined by longhole stoping.
- Longhole stope design for the Mineral Reserves is based upon stope optimizer software and may benefit from further detailed planning.
- The external and backfill dilution estimates for the longhole stoping do not include material beyond the stope limits, nor do the dilution estimates incorporate the differences between primary and secondary stopes.
- The extraction of the longhole stopes is unlikely to be 100%.
- The stope reconciliation data is based on annual production from the underground as opposed to a stope by stope reconciliation to the Mineral Reserve estimate.
- Development of the Range Front Declines (RFD) for access to the Lower and Deep South Zones is underway. After completion of the RFDs, rock will be transported to surface by conveyor.
- Mining below the 3,800 ft level (the bulk of the Deep South Zone) requires approval of APO 4.
- The mining methods and equipment are considered to be suitable for the deposits.
- The Deep South Zone has the potential to be a standalone expansion of the CHUG.

PROCESS

- RPA is of the opinion that the metallurgical accounting and evaluation of operating data by the technical staff are consistent with industry standards.
- RPA is of the opinion that metallurgical test work completed for the Mine and areas of potential production in the future has been appropriate to establish optimal processing routes for the different mineralization styles encountered in the deposits and that the gold recovery estimates for the processing options are currently appropriate to estimate the amount of gold that will be recovered over the LOM.
- A team has been established to develop a more detailed geometallurgical understanding of the deposits at Cortez. RPA is of the opinion that continuing to understand more details about the geology and the metallurgy and their relationships will result in better predictions for mill throughput and gold recovery as well as ultimate improvements in the operation.
- The mill and heap leach operations at Cortez are well run, cost effective processing facilities for oxide ore.

- There are no appropriate processes for single and double refractory ore at Cortez. Therefore, these ore types are shipped to Goldstrike for processing. Current limits to the transportation rates imposed by environmental permits restrict the amount of ore that can be shipped to 1.8 million tons per year (stpa). If additional refractory ore is mined, it must be stockpiled.

ENVIRONMENTAL CONSIDERATIONS

- Cortez is diligent in managing its permitting and all environmental requirements for the property.
- Receipt of approval to increase haulage of refractory ore from Cortez to Goldstrike in 2018 facilitated an increase in refractory ore processing from 1.2 million stpa to 1.8 million stpa.
- Submission of the proposed modifications to the Plan of Operations (PoO) and anticipated approval of the proposal in Q3 2019 will allow an additional increase in ore haulage to significantly expand the operation at Cortez, including:
 - Increase haulage from Cortez to Goldstrike to 2.5 million stpa
 - Deepen the Crossroads Pit at the Pipeline Complex
 - Add Stage 11 to the Pipeline Pit
 - Expand the existing Gold Acres Pit and expand the waste rock facility (WRF)
 - Expand the CHUG mine by increasing the depth of mining to 2,500 ft
 - Revise dewatering rates and continue dewatering to allow underground mining at CHUG to beneath the currently authorized floor
 - Expand the Pediment portion of the CHOP and shift the plan boundary to the east by 800 ft
 - Potentially backfill the CHOP
 - Construct an additional water treatment plant in the Cortez Hills Complex
 - Expand the existing CHOP and WRF
 - Add Rapid Infiltration Basins (RIBs) and surface pipeline on private land outside of the Plan boundary in Crescent Valley
 - Construct additional RIBs and surface pipeline in Grass Valley and Pine Valley
 - Change the Grass Valley production wells to injection wells and add monitoring wells
 - Construct additional water management facilities, if necessary, including a water reservoir and pipelines
 - Add and/or revise existing facilities and disturbances
- RPA is not aware of any environmental issues that could materially impact Barrick's ability to extract the Mineral Resources or Mineral Reserves at this time.

RECOMMENDATIONS

Based upon its work, RPA provides the following recommendations.

GEOLOGY AND MINERAL RESOURCES

- The reason for the high failure rate of Certified Reference Standard samples in 2017 should be investigated and explained.

- The duplicate sample and outside check assay protocols should be implemented.
- The screen checks should be re-implemented in new areas with atypical mineralization or coarse gold.
- For the Pipeline Complex, a strong northeastern mineralization trend was visually observed by RPA in the composites and resultant block model. RPA is of the opinion that this trend may be discernible using directional variography in unfolded space, which would yield more precise variogram models to inform search ellipse dimensions in future updates. RPA also recommends updating the variogram models to fit with raw data.
- Perform validation by ordinary kriging as part of the next model update at the Cortez Hills Complex.
- To streamline workflow and simplify reporting, RPA recommends updating all of the models at year-end, each year, with one drill hole and sample database export from Acquire. Models with no new information should be re-run for year end against the new database export and checked for changes.
- To augment communication of key modelling information and procedures, facilitate correct and up to date information transfer, and improve on the clarity of the information to third parties, RPA recommends the following:
 - Add a tab to the master spreadsheet for each model which summarizes the contextual information usually included in Technical Reports e.g. database cut-off dates, software and version, cut-off grades for mineralized domain wireframes, reporting cut-off grades, etc.
 - Add supporting documentation describing the Mineral Resource procedures, workflows, and checks in the master spreadsheets.
 - Develop a standard procedure where final data and documentation supporting final Mineral Resource and Mineral Reserve estimate are pedantically archived to a separate, isolated set of folders containing only those files used in the estimate and reserve.

MINING AND MINERAL RESERVES

- Prepare and evaluate the stope by stope reconciliation between the stope production and the Mineral Reserve estimate to identify and report the causes of any large changes on a monthly basis.
- Present the reconciliation results showing the percentage differences and not the absolute differences.
- Use the reconciliation results to assess and revise the stope planning parameters.
- Undertake more detailed stope planning for the stopes in the three to five year time frame.

- Review the dilution assumptions related to external and backfill dilution in the longhole stoping including consideration of the primary and secondary stopes.
- Review the stope extraction estimates for the longhole stopes.
- Review the small amounts of Inferred material within stope designs with a view to changing the classification of these small areas so that Inferred Mineral Resources are not included in the stope plans.

PROCESSING

- Continue to evaluate new ore types and to optimize the processes to increase recovery and/or to decrease costs as related to improved geometallurgical understanding of the deposits.
- Continue to work collaboratively with the Goldstrike staff to maintain and improve the metallurgical accounting for treatment of Cortez ore in the roaster.

ENVIRONMENTAL CONSIDERATIONS

- Continue to proactively manage environmental permits and continue to maintain a strategy of anticipating major changes in permitting as far in advance as possible.

ECONOMIC ANALYSIS

Under NI 43-101 rules, producing issuers may exclude the information required for Section 22 Economic Analysis on properties currently in production, unless the technical report includes a material expansion of current production. RPA notes that Barrick is a producing issuer, the Mine is currently in production, and a material expansion is not being planned. RPA has performed an economic analysis of the Cortez Operations using the estimates presented in this report and confirms that the outcome is a positive cash flow that supports the statement of Mineral Reserves.

TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The Cortez Operations are located 62 mi southwest of Elko, Nevada, USA, in Eureka and Lander Counties.

LAND TENURE

All Mineral Reserves and Mineral Resources, in addition to existing and future facilities to be used to exploit the Mine's deposits, are on public lands administered by the Battle Mountain or Elko Field Offices of the U.S. Department of Interior, Bureau of Land Management (BLM).

At Cortez, Barrick directly controls approximately 307,022 acres of mineral rights with ownership of mining claims and fee lands. There are 10,869 claims consisting of:

- 10,012 unpatented lode claims
- 575 unpatented mill-site claims
- 129 patented lode claims
- 125 patented mill-site claims
- 28 unpatented placer claims

All lease agreements and claim holdings are current and in good standing.

EXISTING INFRASTRUCTURE

There is extensive infrastructure in place to support the Cortez Operations including:

- The 15,000 stpd No. 2 Mill complete with run-of-mine (ROM) pad and crushing circuit (including a primary jaw crusher)
- Area 30 leach pad and gold recovery plant
- Area 34 leach pad and gold recovery plant for Cortez Hills and Pediment
- A tailings storage facility (TSF)
- A gyratory crusher at the CHOP and an 11 mi long conveyor to the No. 2 Mill
- Existing active open pit mines at CHOP, Cortez, Pipeline, and Crossroads
- Pit dewatering wells and pumps for the open pits
- Rapid Infiltration Basins (RIBs) for the return to groundwater of water generated by mine dewatering
- An existing underground mine at CHUG
- Batch plant for shotcrete and cemented rock fill preparation
- Stockpile areas for an assortment of ore types
- Office complexes at Mill No. 2, Mill No. 1, CHUG, and CHOP

- Equipment maintenance shops at CHOP, CHUG, and adjacent to Mill No. 2
- Geology offices, core handling, and core storage warehouse
- System of public and private roads connecting the facilities
- Shared business support services from the business unit offices in Elko

HISTORY

Mining in the Cortez Mining District began with the discovery of silver ore in 1862. Underground silver mining was conducted in the area until the 1930s. Mineralization at Hilltop was also identified during the 1860s. Gold mineralization at Gold Acres was discovered in the late 1920s and mined by a small mining company from 1935 to 1960.

In 1959, American Exploration & Mining Co. (AMEX), a wholly-owned US subsidiary of Placer Development Ltd. (subsequently Placer Dome Inc.), entered into a lease-option agreement on the properties and started extensive exploration. In 1964, AMEX formed the Cortez Joint Venture (CJV).

The CJV initiated open pit mining in the Cortez open pits from 1968 to 1972 and moved to the Gold Acres North and South pits in 1973. Leaching and milling of Gold Acres stockpiles and dumps continued until 1983. Mill grade ores were mined from 1987 to 1996 and processed at Cortez Mill No. 1. In 2003, the CJV commenced shipping Gold Acres refractory stockpiles for toll processing at third-party facilities.

The Pipeline deposit was discovered by CJV geologists in March 1991 during drilling of deep condemnation holes. The Gap deposit was discovered in 1991 adjacent to the planned Stage 9 of the Pipeline Pit.

In November 1991, CJV discovered the South Pipeline deposit. Construction of Mill No. 2 and pre-stripping of the first stage of the Pipeline it began in 1996. Continued drilling resulted in the 1998 discovery of the Crossroads deposit beneath 550 ft of alluvium.

In 1996, CJV geologists began a program that led to the 1998 discovery of the Pediment deposit. The Cortez Hills deposit was discovered in October 2002. In 2004, the Cortez Hills Lower Zone was discovered. In November 2008, the Environmental Impact Statement (EIS)

for the Cortez–Pediment development was approved. Production from underground began in late 2008, and the first ore production from CHOP occurred in late December 2009.

Barrick acquired an interest in Cortez through the 2006 acquisition of Placer Dome Inc. In March 2008, Barrick acquired its 100% interest in the Mine, purchasing the former Kennecott 40% interest, from Rio Tinto.

GEOLOGY AND MINERALIZATION

The Cortez gold district is in the eastern Great Basin of the Basin and Range Province. The Paleozoic basement rocks of northeastern Nevada are made up of a western deep-water, eugeoclinal siliclastic assemblage (Upper Plate) and an eastern shallow-water, miogeosynclinal carbonate assemblage (Lower Plate) of sedimentary strata. Cortez lies within the “Battle Mountain-Eureka Trend” (BMT), an alignment of gold mines and occurrences located in a northwest-southeast belt extending from the Marigold Mine some 50 mi northwest of Cortez, to Ruby Hill at Eureka 60 mi to the southeast. Paleozoic basement rocks have been folded and faulted and cut by younger Jurassic and Tertiary aged intrusions.

The Cortez deposits are Carlin-type sedimentary rock-hosted and porphyry/epithermal deposits. Carlin deposits form as structurally and/or stratigraphically controlled replacement bodies consisting of strata-bound, tabular, disseminated gold mineralization occurring in Silurian-Devonian carbonate rocks. Deposits are localized at contacts between contrasting lithologies, metamorphosed to varying extents. They can also be discordant or breccia-related. The deposits are hydrothermal in origin, are usually structurally controlled and at Cortez are hosted in Lower Plate carbonate strata exposed by two erosional windows through allochthonous Upper Plate siliclastic units; the windows are on either side of Crescent Valley.

Mineralization consists primarily of submicron to micrometre-sized gold particles, very fine sulphide grains, and gold in solid solution in pyrite. Gold is disseminated throughout the host rock matrix in zones of silicified and decarbonatized, argillized, silty calcareous rocks, and associated jasperoids. Gold may occur around limonite pseudomorphs of authigenic pyrite and arsenopyrite. Major ore minerals include native gold, pyrite, arsenopyrite, stibnite, realgar, orpiment, cinnabar, fluorite, barite, and rare thallium minerals. Gangue minerals typically comprise fine-grained quartz, barite, clay minerals, carbonaceous matter, and late-stage calcite veins.

In the Cortez district, the favoured host rocks for gold mineralization are the Devonian Wenban Limestone, followed by the Horse Canyon and Roberts Mountain Formations. Mineralization reflects an interplay between structural and lithological ore controls in which hydrothermal solutions from intrusives moved to favourable porous decalcified limestone.

Mineralized host rocks are predominantly characterized as oxides, along with sulphidic and carbonaceous refractory material. Carbon content in the deposits is highly variable and occurs generally in the Devonian Wenban Limestone and the Roberts Mountain Formation. Supergene alteration extends up to 656 ft depth resulting in oxide ores, which overlie the refractory sulphides. Alteration has liberated gold by the destruction of pyrite and resulted in the formation of oxide and secondary sulphate minerals, which include goethite, hematite, jarosite, scorodite, alunite, and gypsum.

EXPLORATION STATUS

Modern exploration commenced along the Battle Mountain–Eureka Trend in the 1960s and has been nearly continuous since that time. Exploration in the Cortez district has been undertaken by Barrick and its predecessor companies such as the CJV and has included mapping, various geochemical and geophysical surveys, pitting, trenching, petrographic, and mineralogy studies, and various types of drilling.

Barrick purchased the Robertson property from Coral Gold Resources Ltd. in June 2017. The Robertson property is an advanced exploration project and the dimensions of the mineralization and metallurgy are being verified in 2017, 2018, and 2019. Barrick has not estimated Mineral Resources to date for the Robertson property.

MINERAL RESOURCES

RPA considers the EOY2018 Mineral Resource estimate completed by Barrick to be reasonable, acceptable, and reported in compliance with CIM (2014) definitions as incorporated by reference into NI 43-101. The Mineral Resources are reported exclusive of Mineral Reserves and are summarized in Table 1-1.

The Mineral Resources are estimated from three dimensional block models created using Vulcan software. Surfaces and solids representing topography, overburden, geological units, and gold mineralization were incorporated into the resource block models. Resource

estimates utilize drill hole, survey, geological, analytical and bulk density information entered, validated and maintained in a centralized acQuire SQL Server database. Industry standard best practices were used to obtain the data; quality assurance and quality control (QA/QC) protocols, as well as data validation procedures, were employed to ensure that the quality and quantity of data used for the resource estimates were appropriate and acceptable.

MINERAL RESERVES

The EOY2018 Mineral Reserves for Cortez are summarized in Table 1-2. These Mineral Reserves are a combination of the open pit and underground operations and the stockpiles.

RPA considers the Mineral Reserve estimate, completed by Barrick, to be reasonable, acceptable, and reported in accordance with CIM (2014) definitions and NI 43-101. The Mineral Reserves are generated based upon the mine designs applied to the Measured and Indicated Mineral Resources. The design methodology uses both the cut-off grade estimation and economic assessment to design and validate the Mineral Reserves. Mineral Reserve estimates include consideration of the mining dilution, ore loss, and extraction.

MINING METHOD

The current Cortez site has been operating since 1988. Currently, the active mining areas are the CHOP, the Pipeline and Crossroads pits, and the CHUG.

Open pit mining at CHOP and Pipeline is by conventional open pit methods using hydraulic and electric front shovels and large, off-highway dump haul trucks. The open pit mine life is estimated to be eight years for Pipeline Complex (2019 through 2026), and the CHOP is scheduled to be completed in the second quarter of 2019. The Crossroads Pit is located immediately south of the Pipeline Pit and mining will continue until 2026. The open pit operations have an estimated current daily material movement capacity of approximately 400,000 stpd.

Underground mining is being carried out in the Middle and Lower Zones. The underground mine is operating at a rate of 3,000 stpd of ore with all ore hauled to surface by truck. The mining is by drift and fill mining method in the Middle Zone and longhole stoping in the Lower Zone. The Deep South Zone is planned to be mined using longhole mining. The longhole stoping includes the use of cemented and uncemented backfill. Underground mining at CHUG

is scheduled to increase the daily rate to up to 4,000 stpd and the mine life extends through 2031.

Zone boundaries were redefined in 2017 and some reserves from the Lower Zone, above the 3,800 ft level were moved to the Deep South Zone. Mining below the 3,800 ft level requires approval of an amendment to the PoO. The permitting process has been underway since 2016. Following the receipt of permits, dewatering and development work below the 3,800 ft level could begin as early as 2019, with initial production from the Deep South Zone commencing in 2019 from areas above the 3,800 ft level. At the end of 2018 the water level was at the 3,790 ft level.

Over the past four years, the underground mine ore production has risen from 2,091 stpd in 2015 to 3,016 stpd. Over the same period, the grade has decreased from 0.627 oz/st Au to 0.313 oz/st Au.

MINERAL PROCESSING

Ore from Cortez is either processed on site in the oxide processing facilities or transported to Barrick's Goldstrike operation for refractory ore treatment.

Mill No. 2, or the Pipeline mill, is an oxide processing plant with crushing, a semi-autogenous grinding (SAG) mill, a ball mill, grind thickener, a carbon-in-column (CIC) circuit for the grind thickener overflow solution, a CIL circuit, tailings counter-current-decantation (CCD) wash thickener circuit, carbon stripping and reactivation circuits, and a refinery to produce gold doré. Plant throughput is permitted for an annual average of 15,000 stpd.

A primary gyratory crusher is located adjacent to the CHOP together with a series of overland conveyors that transport the ore to the coarse ore stockpile at Mill No. 2. There is a primary jaw crusher at Mill No. 2 that is used when processing ore from south Pipeline.

Tailings are stored in a zero-discharge tailings storage facility. A double liner covers the entire tailings area, extending completely under the dam embankment.

Low-grade oxide material is leached as ROM ore on three prepared double-lined leach pads. Pregnant solution from the leach pads is fed to CIC columns for gold recovery. The loaded carbon from the heap leach operation is transported to the mill for gold recovery. Area 28

heap leach circuit has a water balance that is interlinked with the Pipeline mill circuit since it uses the tailings pond under-drain solution as leach solution and excess pad effluent is processed in the mill CIC circuit. Area 28 is at maximum capacity for ore stacking and is no longer an operating leach pad. The Area 30 heap leach circuit is independent of the Pipeline mill. Ore delivery to the pad recommenced in 2013. An expansion of seven million square feet is planned for 2019 with ore deliveries extending through 2031. Area 34 heap leach is a third pad that was designed to treat CHOP ore. The first cells were placed under leach during March 2011 and ore deliveries are scheduled to continue through June 2019 based on the current LOM plan.

Ores that have a cyanide soluble (shake test) to fire assay gold (AA/FA) ratio of less than 50% are transported to Goldstrike for processing in the roaster. Haulage of refractory ore to Goldstrike is currently limited by permit to 1.8 million stpa. At Goldstrike, the ore will be processed in the roaster followed by a CIL circuit or in the total carbonaceous material (TCM) process, which includes pressure oxidation (POX) followed by resin-in-leach with calcium thio-sulphate (CaTS).

MARKET STUDIES

Gold is the principal commodity at Cortez and is freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured. Prices are usually quoted in US dollars per troy ounce.

ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS

Cortez and Barrick have environmental groups and management systems to obtain and maintain the necessary permits and licences. These groups also carry out the required monitoring and reporting required. Cortez has developed an ISO14001:2015 certified environmental management system (EMS) to help manage the environmental requirements.

The BLM issued the original EIS and Record of Decision (ROD) in November 2008 and a supplemental EIS and ROD in March 2011. In October 2012, Cortez submitted a second proposed amendment to the existing PoO (APO2). All components of the APO2 application were approved by the BLM on February 24, 2014.

Cortez submitted additional proposed modifications to the PoO (APO3) in August 2014 and then, following a revision, in October 2014, APO3 was approved by the BLM and a ROD was completed in 2015.

In January 2018, Cortez submitted an amendment to the PoO to incorporate a change to ship additional refractory ore from CHOP to the Goldstrike Mine for processing in an 18-month period beginning immediately after approval to bring the total transport limit to 1.8 million stpa. This amendment was approved by the BLM and a Finding of No Significant Impact (FONSI) issued in June 2018.

The Deep South Expansion Project Amendment was submitted to the BLM in March 2016. The draft EIS was published October 22, 2018. The ROD for that EIS is expected in late 2019.

A number of permits are required to operate the Cortez Mine. Cortez adheres to permitting guidelines from the BLM, the Nevada Revised Statutes (NRS), the Nevada Administrative Code (NAC), and other federal government requirements.

CAPITAL AND OPERATING COST ESTIMATES

The total capital expenditure in the LOM plan through to 2031 is \$1,393 million. This total includes capital required to complete the Lower Zone development and infrastructure and to expand underground mining into the Deep South Zone.

The LOM operating costs are shown in Table 1-5.

TABLE 1-5 OPERATING COSTS
Barrick Gold Corporation – Cortez Operations

Area	Unit	OP	UG Longhole	UG Cut & Fill
Total Cost Oxide	\$/st ore	17.20	99.77	127.41
Total Cost Roaster	\$/st ore	39.66	112.85	140.49
Royalties	\$/oz	18.98	18.98	18.98

2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Barrick Gold Corporation (Barrick) to prepare an independent Technical Report on the Cortez Open Pit and Underground Mine Operations (the Cortez Operations or the Mine), in Eureka and Lander Counties, Nevada, USA. The purpose of this report is to support the public disclosure of Mineral Resources and Mineral Reserves at Cortez as of December 31, 2018. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

Barrick is a Canadian publicly traded mining company with a portfolio of operating mines and projects across five continents. The Cortez Operations are located in northeastern Nevada approximately 62 mi west and south of Elko.

The Mine is a joint venture between two wholly-owned subsidiaries of Barrick, Barrick Cortez Inc. (60%) and Barrick Gold Finance Inc. (40%). The Cortez Hills Project is 100% owned by Barrick Cortez Inc. The Cortez Operations consist of the Pipeline, Crossroads, and Cortez Hills (CHOP) open pits; the Cortez Hills underground (CHUG) mine; a 15,000 short ton per day (stpd), carbon-in-leach (CIL) gold plant and heap leach pads and heap leach processing plants; with additional Mineral Resources contained in the Cortez and Gold Acres open pits.

On March 10, 2019, Barrick and Newmont Mining Corporation entered into an implementation agreement (Implementation Agreement) to create a joint venture combining their respective mining operations, assets, reserves and talent in Nevada (Barrick-Newmont Joint Venture). In connection with the completion of the transactions contemplated by the Implementation Agreement expected later this year, the Mine will be contributed to the Barrick-Newmont Joint Venture. This Technical Report provides estimates as of December 31, 2018, for Mineral Resources, Mineral Reserves, production schedules, and cost projections. These estimates do not take into account any changes or benefits that might arise from the commencement of Barrick-Newmont Joint Venture operations.

The open pits use a conventional truck and shovel fleet mining approximately 400,000 stpd of ore and waste. Mining operations move between the various pits over the Life of Mine (LOM) plan. The underground mine is a 2,000 stpd mechanized mine. Ore from the mines is treated

at an oxide mill and on leach pads at the site and refractory ore is shipped to Barrick's Goldstrike operation for processing.

In March 2016, Cortez submitted additional proposed modifications to the Plan of Operations (PoO) that include mining in the Deep South Zone, located below currently permitted areas of the CHUG. The Record of Decision (ROD) is expected in Q3 2019. Mining and processing of this ore is included in the LOM plan.

In 2017, Barrick completed a Feasibility Study (FS) for underground mining in the Deep South Zone (the Cortez Underground Expansion Project). The 2018 LOM planning process incorporated the project as part of the underground design and budgeting regular process at the Cortez Mine. The Deep South Zone Mineral Reserves are based upon a planned underground mine below the 3,800 ft level. The Deep South Zone development and mine production are planned to follow the dewatering downwards. There will be a stope access ramp as well as a conveyor gallery. The conveyor will be built progressively with a total of four legs below the lower zone. Ore and waste from the Deep South Zone will be handled by truck and load-haul-dump (LHD) on the levels and then fed through feeder breakers before being conveyed to surface via the Deep South conveyor systems.

SOURCES OF INFORMATION

Site visits were carried out by Hugo Miranda, ChMC(RM), RPA Principal Mining Engineer, Wayne Valliant, P.Geo., RPA Principal Geologist, Kathleen Ann Altman, Ph.D., P.E., RPA Principal Metallurgist, and Philip Geusebroek, P.Geo., RPA Senior Geologist, from January 14 to 16, 2019. Dennis R. Bergen, P.Eng. visited the site from May 5 to 7, 2015.

Discussions were held with the following personnel from Barrick and Cortez:

- Tasha Caple, Landman
- Chris Cavasin, Integrated Planning – Superintendent
- Brandon Cooper, Heap Leach Process Operations
- Sam Edens, Metallurgical Coordinator
- Matt Haas, Open Pit Engineering – Superintendent
- Vince Johnson, Senior Environmental Engineer – Water Resources
- Guillaume Ladouceur, Underground Long Range Planner
- Miguel Lamadrid, Underground Manager

- Robert Malloy, Database Administrator – Senior
- Chris McCabe, Water Management – Superintendent
- Vivian Medina, Heap Leach Metallurgist
- Briana Mendoza, Metallurgist – Metal Planning
- Maria Ray, Open Pit Geology – Superintendent
- Sam Reid – Open Pit Geologist
- Patrick Ruffridge, Resource Geologist – Senior
- Larry Snider, Resource Geologist – Chief
- Carly Stroker, Process Technical Services – Superintendent
- Ben Tanner, Resource Geologist
- Dave Todaro, Underground Geologist – Senior
- Anne Wang, Metallurgist – Metal Planning
- Jace Young, Plant Metallurgist – Mill

Mr. Miranda is responsible for the overall preparation of this report and, in particular, for Sections 19 and 22, portions of Sections 15 (open pit Mineral Reserves), 16 (open pit mining), 18, and 21, and relevant disclosure in Sections 1, 25, 26, and 27. Dr. Altman is responsible for Sections 13, 17, 20, portions of Section 18, and relevant disclosure in Sections 1, 25, 26, and 27. Mr. Valliant is responsible for Sections 2 to 11, 23, and 24, and relevant disclosure in Sections 1, 25, 26, and 27. Mr. Bergen is responsible for portions of Sections 15 (underground Mineral Reserves), 16 (underground mining), and 21, and relevant disclosure in Sections 25, 26, and 27. Mr. Geusebroek is responsible for Sections 12 and 14 and relevant disclosure in Sections 1, 25, 26, and 27.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the US customary system, unless otherwise noted. All currency in this report is US dollars (US\$) unless otherwise noted.

A	annum	kWh	kilowatt-hour
amsl	average mean sea level	L	litre
A	ampere	lb	pound
bbl	barrels	L/s	litres per second
btu	British thermal units	m	metre
°C	degree Celsius	M	mega (million); molar
C\$	Canadian dollars	m ²	square metre
cal	calorie	m ³	cubic metre
cfm	cubic feet per minute	μ	micron
cm	centimetre	μg	microgram
cm ²	square centimetre	m ³ /h	cubic metres per hour
d	day	mi	mile
dia	diameter	min	minute
dmt	dry metric tonne	μm	micrometre
dwt	dead-weight ton	mm	millimetre
°F	degree Fahrenheit	mph	miles per hour
ft	foot	MVA	megavolt-amperes
ft ²	square foot	MW	megawatt
ft ³	cubic foot	MWh	megawatt-hour
ft/s	foot per second	oz	Troy ounce (31.1035 g)
g	gram	oz/st	ounce per short ton
G	giga (billion)	ppb	part per billion
g/L	gram per litre	ppm	part per million
g/t	gram per tonne	psia	pound per square inch absolute
gr/ft ³	grain per cubic foot	psig	pound per square inch gauge
gr/m ³	grain per cubic metre	RL	relative elevation
ha	hectare	s	second
hp	horsepower	st	short ton
hr	hour	stpa	short ton per year
Hz	hertz	stpd	short ton per day
in.	inch	t	metric tonne
in ²	square inch	tpa	metric tonne per year
J	joule	tpd	metric tonne per day
k	kilo (thousand)	US\$	United States dollar
kcal	kilocalorie	USgal	United States gallon
kg	kilogram	USgpm	US gallon per minute
km	kilometre	V	volt
km ²	square kilometre	W	watt
km/h	kilometre per hour	wmt	wet metric tonne
kPa	kilopascal	wt%	weight percent
kVA	kilovolt-amperes	yd ³	cubic yard
kW	kilowatt	yr	year

3 RELIANCE ON OTHER EXPERTS

This Technical Report has been prepared by RPA for Barrick. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report.
- Assumptions, conditions, and qualifications as set forth in this report.

For the purpose of this report, RPA has relied on ownership information provided by Barrick. RPA has not researched property title or mineral rights for the Cortez Operations and expresses no opinion as to the ownership status of the property.

RPA has relied on Barrick for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Cortez Operations.

Except for the purposes legislated under provincial securities laws, any use of this Technical Report by any third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

The Mine is located 62 mi southwest of Elko, Nevada, USA, in Eureka and Lander Counties (Figure 4-1). The Cortez property is surrounded by the Cortez Joint Venture Area of Interest (CJVAOI) that covers approximately 1,053 mi² (Figure 4-2). The location of the deposits is illustrated in Figure 4-3.

The CJVAOI includes private land, patented and unpatented mineral claims and fee land, and land controlled by competitors. The co-ordinates of the Pipeline open pit are approximately 40°15' North latitude and 116°43' West longitude.

LAND TENURE

At Cortez, Barrick directly controls approximately 307,022 acres of mineral rights with ownership of mining claims and fee lands. There are 10,869 claims consisting of:

- 10,012 unpatented lode claims
- 575 unpatented mill-site claims
- 129 patented lode claims
- 125 patented mill-site claims
- 28 unpatented placer claims

All lease agreements and claim holdings are current and in good standing.

The 2018 holding costs for the Cortez property include \$1.8 million in holding costs and \$348,000 in lease payments.

Unpatented lode and mill-site claims are held under the 1872 mining law as amended, which requires the annual payment of \$155 per claim on or before noon on September 1 each year. If the annual payment is not made for a specific claim, the claim will lapse and be subject to forfeiture. Patented ground or claims are surveyed by a certified mineral surveyor, and appropriate monuments are placed in the ground. Each unpatented claim is marked on the ground and does not require a mineral survey.

All Mineral Reserves and Mineral Resources, in addition to existing and future facilities to be used to exploit the deposits at the Mine, are on public lands administered by the Battle Mountain or Elko Field Offices of the U.S. Department of Interior, Bureau of Land Management (BLM).

ROYALTIES

The Cortez operation is subject to a number of royalties. All production at Cortez is subject to a 1.28595% gross smelter return (GSR) royalty payable to the former shareholders of Idaho Mining Corporation. This was originally a 2.5% GSR royalty covered by a capping of ounces produced; the production limit has been met and the royalty reduced to 1.28595%. GSR is defined as 100% of smelter revenue before deductions for refining and transportation. The Idaho Mining Corporation royalty pertains to any production from the Pipeline, South Pipeline, Crossroads, Gold Acres, Cortez NW Deep, Cortez Hills, and Hilltop deposits.

Royal Gold Inc. (Royal Gold) holds a sliding-scale GSR royalty over the Pipeline/South Pipeline deposits ranging from 0.40% to 5.0%. An additional sliding-scale GSR royalty is held over the undeveloped Crossroads deposit.

Denver Mining Finance Company, Inc. holds a net value royalty of 3.75% of gold sales from the South Pipeline deposit.

Rio Tinto holds a sliding-scale royalty of 0% at gold prices less than \$400/oz to 3% at gold prices greater than \$900/oz on 40% of all Cortez production in excess of 15 million ounces on and after January 1, 2008, which threshold has not yet been met.

The State of Nevada imposes a 5% net proceeds tax on the value of all minerals severed in the State. This tax is calculated and paid based on a prescribed net income formula which is different from book income.

In order to minimize environmental liabilities on the property, Barrick has secured all required environmental permits and conducts work in compliance with these permits. Additionally, Barrick complies with all applicable legal and other obligations. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.



Legend:

- Major Highway
- Road
- County Boundary
- Town/City
- Capital City

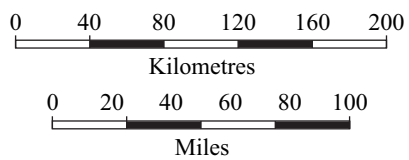


Figure 4-1

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Location Map

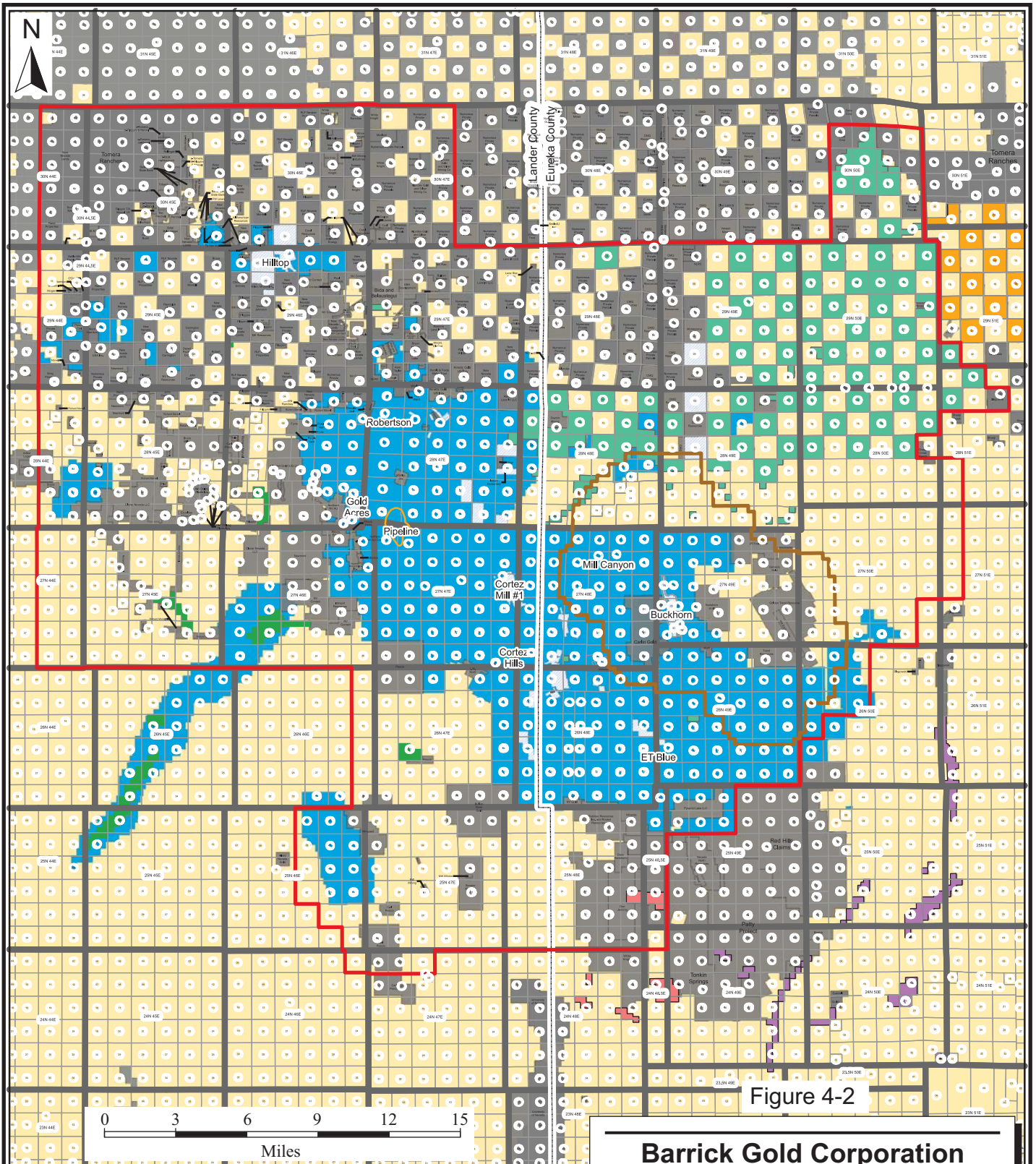
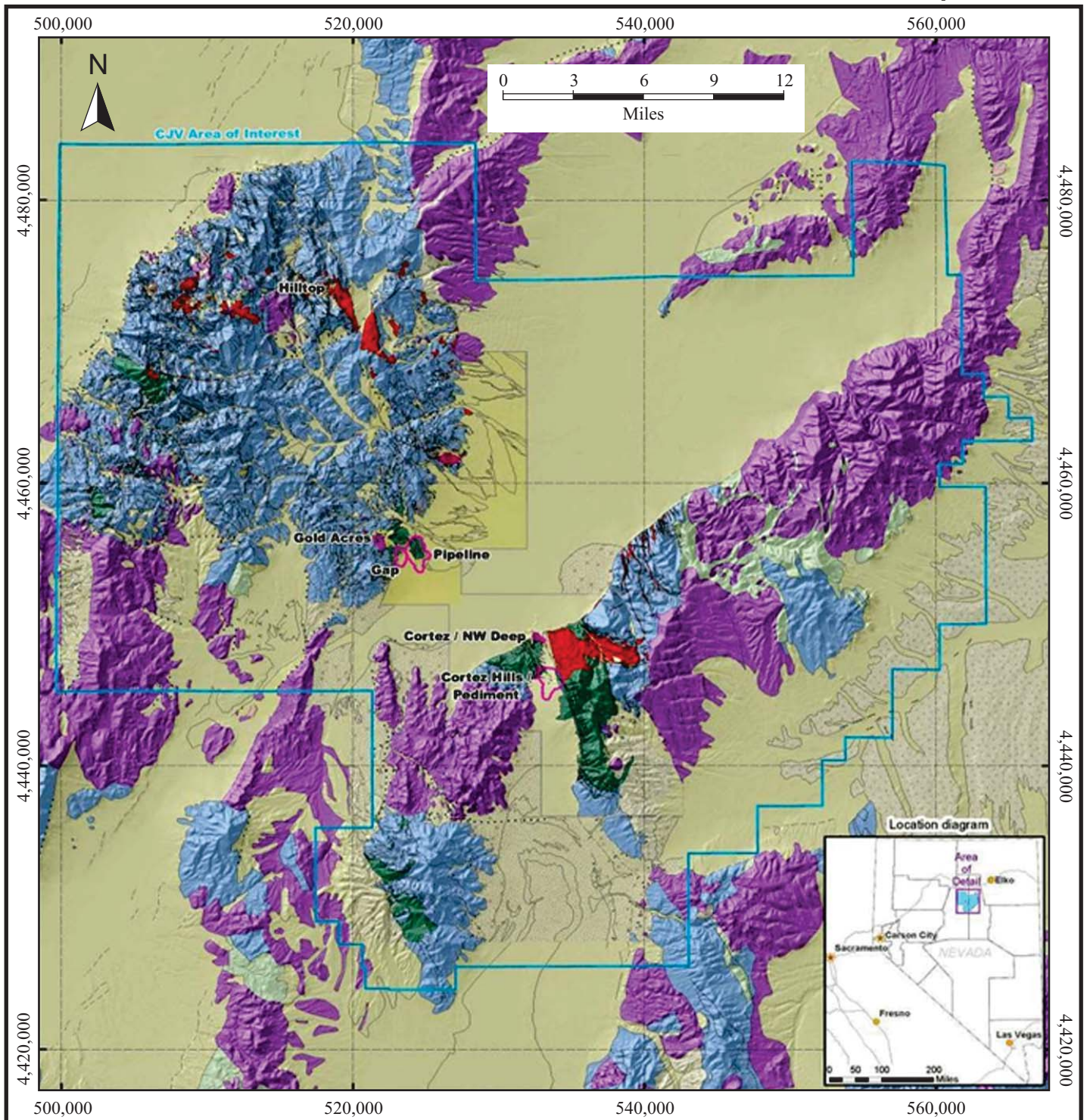


Figure 4-2

Legend:

Boundary of CJV	JD Ranch	Counties
Buckhorn Joint Venture AOI	Carico Lake Ranch	Township
Third Party Lands	McClusky Ranch	
Barrick Fee	Dean Ranch	
Barrick Claims	Hay Ranch	
BLM Ground		

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Land Status



Legend:

- Jasperoid, Breccia, Skarn & Hornfels
Quaternary/Tertiary Sediments & Sedimentary Rocks
- Tertiary Volcanic Rocks
- Tertiary, Cretaceous & Jurassic Intrusive Rocks
- Triassic, Permian & Pennsylvanian Rocks
- Upper Plate of Roberts Mountains Thrust (Western Siliceous Assemblage)
- Lower Plate of Roberts Mountains Thrust (Eastern Carbonate Assemblage)

Figure 4-3

Barrick Gold Corporation

Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Deposit Locations

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

The Mine is reached by travelling approximately 32 mi east from Battle Mountain, Nevada, on US Interstate 80. Alternative access is from Elko, Nevada, approximately 45 mi west to the Beowawe exit, then approximately 35 mi south on Nevada State Route 306, which extends southward from US Interstate 80. Both US Interstate 80 and Nevada State Route 306 are paved roads.

The mining district is also crossed by a network of gravel roads, providing easy access to various portions of the Mine. All roads are suitable for all weather conditions; however, in extreme winter conditions, roads may be closed for short periods for snow removal.

The Union Pacific Rail line runs parallel to US Interstate 80 to the north of the Mine. Elko, the closest city to the Mine, is serviced by daily commercial airline flights to Salt Lake City, Utah.

CLIMATE

The Mine is located in the high desert region of the Basin and Range physiographic province. There are warm summers and generally mild winters, however, overnight freezing conditions are common during winter. The mean annual temperature is 51°F. Precipitation averages six inches per year, primarily derived from snow and summer thunderstorms. Typically, the months with the greatest precipitation are March, May, and November. During the winter months at elevations above approximately 5,500 ft amsl, precipitation generally occurs as snow. Evaporation is estimated at 39 in. per year.

Operations continue on site year-round and are not materially impacted by weather.

LOCAL RESOURCES

Cortez is located in a major mining region and local resources including labour, water, power, contractors and suppliers, and local infrastructure for transportation of supplies are well

established. The majority of the workforce lives in the nearby towns of Elko, Spring Creek, Carlin, and Battle Mountain.

Electric power is provided to the Cortez site by NV Energy via an approximately 50 mi long radial transmission line originating at their Falcon substation. The incoming NV Energy line terminates at the Barrick owned Pipeline Substation. Two 120 kV lines that tap onto the NV Energy power line feed Barrick owned 120 kV power lines: an approximately 9 mi extension to serve the Cortez Hills development and an approximately 3 mi extension to serve the South Pipeline and Crossroads pits.

Water for process use at Cortez Mill No. 2 is supplied from the Pipeline open pit dewatering system. Approximately 1,450 gpm of the pit dewatering volume is diverted for plant use. Additional water can be sourced as needed from wells at Mill No. 1.

Process water supply for Cortez Hills will be drawn in whole or in part from dewatering operations. If sufficient volume cannot be produced by dewatering, process water will be supplied by existing production wells at the Pipeline and/or Cortez facilities.

Water from the CHUG is pumped across Crescent Valley to an existing surface re-infiltration area.

INFRASTRUCTURE

There is an extensive infrastructure in place to support the Cortez Operations, including:

- The 15,000 stpd No. 2 Mill complete with run-of-mine (ROM) pad and crushing circuit (including a primary jaw crusher)
- Area 30 leach pad and gold recovery plant
- Area 34 leach pad and gold recovery plant for Cortez Hills and Pediment
- A tailings storage facility (TSF)
- A gyratory crusher at the CHOP and an 11 mi long conveyor to the No. 2 Mill
- Existing active open pit mines at CHOP, Cortez, Pipeline, and Crossroads
- Pit dewatering wells and pumps for the open pits
- Rapid Infiltration Basins (RIBs) for the return to groundwater of water generated by mine dewatering

- An existing underground mine at CHUG
- Batch plant for shotcrete and cemented rock fill preparation
- Stockpile areas for an assortment of ore types
- Office complexes at Mill No. 2, Mill No. 1, CHUG, and CHOP
- Equipment maintenance shops at CHOP, CHUG, and adjacent to Mill No. 2
- Geology offices, core handling, and core storage warehouse
- System of public and private roads connecting the facilities
- Shared business support services from the business unit offices in Elko

PHYSIOGRAPHY

The Pipeline mine and Mill No. 2 are located at the southern end of the Crescent Valley in Lander County, Nevada. The Cortez Hills deposits and operations are located at the northern end of Eureka County. The Crescent Valley is a structural and topographic basin between the Northern Shoshone Range on the west and the Cortez Range on the east. Most mine facilities are on the west side of the valley at an elevation of approximately 5,000 ft amsl. This includes the original workings of the Gold Acres mine, now inactive, the Pipeline Pit, the Gap Pit (now included in the Pipeline Mineral Resource), and the Crossroads Pit.

The property is located at elevations between 4,500 ft amsl and 6,000 ft amsl on the valley floor and up the side of Mount Tenabo.

The Cortez Mine and Mill No. 1 (both inactive) are located along the northern edge of the Cortez Range seven miles southeast of the Pipeline Pit. The Cortez Hills and Pediment deposits are located in the Cortez Hills approximately three miles south of the Cortez Pits and at an elevation of approximately 6,000 ft amsl.

The vegetation consists primarily of shrubs and grasses, such as sagebrush, rabbitbrush, cheatgrass, and grama. Juniper trees, piñon pine, mountain mahogany, and a variety of grasses are also present. In general, vegetation is relatively sparse. The valley floor is sparsely vegetated while the mountain slopes have small piñon pine and juniper trees. No endangered or threatened species, BLM-sensitive species, or plants proposed for listing have been identified in the Mine area.

Fauna that has been observed in the Mine area is typical of the Great Basin area, and includes jackrabbits, cottontail rabbits, mule deer, antelope, coyotes, various rodents, and reptiles. No proposed threatened or endangered species are known to exist within the Mine area.

6 HISTORY

Mining in the Cortez Mining District began with the discovery of silver mineralization in 1862 along the quartzite outcroppings at the western base of Mount Tenabo, approximately four miles to the southeast of the Cortez Mill No. 1 complex. Underground silver mining was conducted in the area until the 1930s. Mineralization at Hilltop was also identified during the 1860s. The majority of production occurred between 1915 and 1951 from underground sources, with approximate production of 18,000 ounces of gold, 360,000 ounces of silver, and subordinate amounts of lead, copper, and antimony. Gold mineralization at Gold Acres was discovered in the late 1920s and mined by a small mining company from 1935 to 1960. The mine was one of the few gold operations to remain open during World War II.

In 1959, American Exploration & Mining Co. (AMEX), a wholly-owned US subsidiary of Placer Development Ltd. (subsequently Placer Dome Inc. (Placer Dome) and Barrick), entered into a lease-option agreement on the properties of the Cortez Metals Co. and started extensive exploration of the mine workings and surrounding area. In 1963, AMEX entered into an exploration agreement with Idaho Mining Corp., which had acquired large areas of mineralized ground adjoining the AMEX holdings. In 1964, AMEX formed the Cortez Joint Venture (CJV) with the added participation of the Bunker Hill Co., Vernon F. Taylor, Jr., and Webb Resources Inc.

The US Geological Survey found anomalous gold in altered outcrops at the base of the Cortez Range in 1966. The CJV shortly afterwards discovered the Cortez deposit. Production at Cortez began in 1969 and continued until 1972, and then resumed from 1988 to 1993. Production was from the F-Canyon, Cortez, and Ada 52 pits. Waste dumps from the operations were reclaimed during the 1990s. The Cortez process facilities include three inactive heap leach pads, West, East and 91-C leach pads, constructed in 1972, 1984, and 1990 respectively. The leach pads have been inactive since 1994. Seven tailings storage areas are situated in the Cortez area, TA 1 to TA 7, inclusive.

The CJV initiated exploration drilling around the pre-existing Gold Acres deposit in 1969 and obtained exploration rights to the former mining area in 1969. Open pit mining began in 1973, from the North and South pits. Low-grade ores from Gold Acres were mined and processed by heap leaching until 1976. Leaching and milling of Gold Acres stockpiles and dumps

continued until 1983. The Gold Acres heap leach facility is associated with the deposits. Drilling resumed, resulting in the discovery of refractory gold mineralization in the vicinity of the North pit. Mill-grade ores were mined from 1987 to 1996 and processed at Cortez Mill No. 1. Total production from this deposit (historic and recent) is estimated to exceed 500,000 ounces of gold. In 2003, the CJV commenced shipping Gold Acres refractory stockpiles for toll processing at third-party facilities.

The Horse Canyon deposits were discovered in early 1976. Three pits, North, South, and South Extension, were mined in the period from 1984 to 1987. Approximately 3.5 million tons were mined with approximately 385,000 ounces of gold recovered.

The Pipeline, South Pipeline, and Crossroads gold deposits occur in sequence from northwest to southeast and were entirely concealed beneath pediment gravels up to 300 ft thick. The Pipeline deposit was discovered by CJV geologists in March 1991 during drilling of deep condemnation holes on the pediment east of Gold Acres. The Gap deposit was discovered in 1991 adjacent to the planned Stage 9 of the Pipeline Pit.

The Pipeline South area was initially controlled by association placer claims under the control of the CJV since the early 1970s. Only scattered sub-ore grade gold has been identified. The area was over-staked with lode claims by ECM, Inc. (ECM) in early 1987. By May 1987, Royal Gold had leased this property, known as the GAS claims, from ECM. The claim conflict was resolved by the formation of the Royal/Cortez Joint Venture between Royal Gold and the CJV later that year.

Royal Gold completed geophysical surveys and drilling programs between 1987 and 1989 that led to the identification of additional sub-economic gold grades, primarily in an anomaly known as GAS 2. Although a mineral resource was estimated, no further work was undertaken by Royal Gold or by CJV due to the limited amount of drill data available. No further drilling by Royal Gold occurred due to lack of funding.

In August 1991, the Royal/Cortez Joint Venture was terminated and the CJV leased the property directly from ECM. A later dispute between Royal Gold and the CJV concerning termination of the Royal/Cortez Joint Venture led to the formation of the South Pipeline Project and the royalty structure.

In November 1991, the CJV discovered the South Pipeline deposit. Additional gold was identified in August 1992. Step-out and in-fill drilling continued through July 1994. This drilling confirmed the presence of a relatively shallow gold occurrence above the water table, the Crescent deposit. Mining of the Crescent pit (northwest part of the South Pipeline deposit) commenced in May 1994 and was completed in 1997. The Crescent pit has since been subsumed by the Pipeline Pit.

An internal Feasibility Study (FS) covering the Pipeline and South Pipeline deposits was completed by Placer Dome Technical Services in 1995. Construction of Mill No. 2 and pre-stripping of the first stage of the Pipeline Pit began in 1996. The Pipeline Pit has estimated Mineral Reserves and is included in Barrick's current LOM plan. Two waste dumps are permitted for Pipeline. Associated infrastructure includes the integrated Pipeline heap leach and tailings facility, South Area heap leach facility, and Mill No. 2.

Continued drilling along northwest-southeast structural trends at Pipeline in 1998 resulted in discovery of the Crossroads deposit southeast of the South Pipeline deposit. Crossroads is concealed beneath 550 ft of alluvium. It represents a continuation of mineralization from South Pipeline.

In 1996, CJV geologists began a program to test for concealed mineralization south of the Cortez Mine. Geochemical and geophysical surveys were used to guide deep reverse circulation (RC) drilling, initially focusing on an area immediately west of the Cortez Fault. In 1998, the Pediment deposit was discovered in a deep RC drilling program designed to test potential for bedrock mineralization in the central and western portions of the alluvium-covered Cortez Fault Corridor. Subsequent RC and core drilling programs through 2002 defined the Pediment deposit.

The Cortez Hills deposit was discovered in October 2002 as part of an RC drilling exploration program investigating a steep gravity gradient anomaly near the projected intersection of north-northwest trending Cortez Fault Corridor structures and west-northwest trending faults beneath alluvial cover immediately to the north of the Pediment deposit. In 2004, the Cortez Hills Lower Zone was discovered as part of the step-out drilling to the west of the Cortez Hills deposit.

In November 2008, the Environmental Impact Statement (EIS) for the Cortez–Pediment development was approved. The project was developed as two open pits and a concurrent underground development of a high-grade portion underlying the pits. Production from underground began in late 2008, and the first ore production of CHOP phases one through three occurred in late December 2009.

In March 2008, Barrick acquired a 100% interest in the Mine, purchasing the former Kennecott 40% interest from Rio Tinto for a consideration of \$1.695 billion in cash, an additional \$50 million payable to Rio Tinto if and when an additional 12 million ounces of contained gold Mineral Resources were added to Barrick’s December 31, 2007 Mineral Reserve statement for Cortez, and a sliding-scale royalty payable to Rio Tinto on 40% of all Cortez production in excess of 15 million ounces on and after January 1, 2008. In 2012, the threshold of an additional 12 million ounces added to Mineral Resources was reached, and the \$50 million payment was made to Rio Tinto. Cortez has not yet produced in excess of 15 million ounces of gold on or after January 1, 2008.

Table 6-1 summarizes the exploration and mining history of the Mine.

**TABLE 6-1 HISTORY OF EXPLORATION AND MINING AT CORTEZ SITE
Barrick Gold Corporation – Cortez Operations**

Period	Activity
1862–1932	Cortez silver mine in operation.
1912–1921	Mining of gold, lead, copper, and antimony at Hilltop.
Late 1920s	Gold Acres deposit discovered.
1935–1960	Gold mined from the Gold Acres deposit by other companies. Gold Acres mined as an open pit operation.
1964	CJV formed.
1966	Cortez deposit discovered.
1968	Horse Creek (formerly Red Hill) discovered by Homestake Mining Co.
1969–1972; 1988–1993	Cortez deposit mined.
1973–1976	New southern extension of the Gold Acres deposit mined and Horse Canyon deposit discovered.
1976–1983	Low-grade oxide ores from Cortez and Gold Acres heap leached
1983–1987	Horse Canyon deposit mined.
1987–1996	Mining resumed in the Cortez and Gold Acres deposits.
1989	Acquisition of Hilltop deposit.
1991	Pipeline, South Pipeline, Crescent and Gap deposits discovered.
1994	Mining commenced at the Crescent pit within the northwestern portion of the South Pipeline deposit.
1996	Mining commenced on the Pipeline deposit.
1997	Production at Mill No. 2 commenced. Total development and capital costs were \$250 million.
1998	Crossroads and Pediment deposits discovered.
1999	Mill No. 1 was placed on care and maintenance.
2001	Plan of Operations was submitted for Pipeline expansion and Pediment.
2002	South Area heap leach facility was commissioned.
2003	Cortez Hills deposit discovery announced.
2004–2009	Infill drilling continued at Cortez Hills and Pediment deposits. Discovery of Lower Zone at Cortez Hills.
2005	Completion of positive internal Feasibility Study on Cortez Hills.
2006	Barrick acquires Placer Dome; commencement of mining at the South Gap deposit.
2008	Acquisition of remaining 40% interest in the Mine through Barrick purchase of Kennecott interest from Rio Tinto. Positive Record of Decision received for Cortez Hills development.
2009	Development of open pit commences at Cortez Hills. Mining halted at the Pipeline Complex.
2011	Goldrush deposit discovered.
2013	Production resumed at Pipeline Complex.

Production from the Mine in the period 1969 to 2018 is summarized in Table 6-2.

TABLE 6-2 ANNUAL PRODUCTION, 1969–2018
Barrick Gold Corporation – Cortez Operations

Year	Gold (000 oz)
1969	166
1970	209
1971	120
1972	190
1973	76
1974	104
1975	74
1976	28
1977	2
1978	2
1979	2
1980	8
1981	21
1982	25
1983	47
1984	49
1985	56
1986	62
1987	51
1988	42
1989	40
1990	54
1991	58
1992	77
1993	67
1994	70
1995	111
1996	161
1997	407
1998	1,138
1999	1,328
2000	1,010
2001	1,188
2002	1,082
2003	1,065
2004	1,052
2005	904
2006	427
2007	323
2008	428
2009	518

Year	Gold (000 oz)
2010	1,140
2011	1,421
2012	1,370
2013	1,337
2014	901
2015	999
2016	1,058
2017	1,447
2018	1,265
Total	23,780

Note: Production from 1969 to 2005 is total production, reported on a 100% basis, sourced from Barrick's corporate annual reports. Production from April to December 2006, 2007, and January to February 2008 is the Barrick interest only, at 60% of production. Barrick production at 100% is included from March 2008 onwards.

7 GEOLOGICAL SETTING AND MINERALIZATION

REGIONAL GEOLOGY

The Mine is located in the eastern Great Basin (Basin and Range Province) at the southern closure of Crescent Valley, a northeast trending structural and topographic basin between the Northern Shoshone Range on the west and the Cortez Range on the east. The Mine lies within the “Battle Mountain-Eureka Trend” (BMT), an alignment of gold mines and occurrences located in a northwest-southeast belt extending from the Marigold Mine approximately 50 mi northwest of Cortez, to Ruby Hill at Eureka 60 mi to the southeast.

Two regionally recognized Paleozoic assemblages comprise the basement sedimentary strata of northeastern Nevada. These assemblages were deposited on the western continental margin of North America. The western assemblage is a deep water marine package of siliciclastic rocks consisting of mudstone, chert, siltstone, sandstone, and minor limestone. The eastern shallow water sedimentary assemblage consists predominantly carbonate rocks including limestone, dolomite, and some quartzite units. The eastern assemblage underlies all other stratigraphic units in eastern and central Nevada.

Jurassic to Cretaceous intrusive rocks of granitic composition intrude the Paleozoic sedimentary rock and are locally exposed as stocks, sills, and dikes. Tertiary extrusive rocks unconformably overlie the older packages and are dominated by a bimodal suite of rhyolite and basaltic flows with associated felsic tuffs and lesser amounts of intermediate volcanic rocks. Post-mineralization Eocene to Oligocene quartz porphyry dikes and sills have been emplaced along low angle thrust faults as well as high angle structures, in some cases intruding the gold deposits. Late Tertiary and Quaternary erosional products have partially filled the valley basins with coalescing alluvial fan deposits marginal to the mountains and finer-grained alluvium in the valley centres.

The Antler orogeny extensively deformed Paleozoic rocks of the Great Basin in Nevada and western Utah during Late Devonian and Early Mississippian time. In the late Devonian about 350 million years ago, the Antler volcanic island arc terrane collided with what was then the west coast of North America and the North American Plate. The collision zone is marked by

the Roberts Mountains Thrust, a system of low-angle thrust faults along which the Upper Plate clastic rocks were thrust some 90 mi eastward over the Lower Plate carbonates. Mesozoic compressional deformation was also important regionally as indicated by various east and west as well as north-northeast and south-southwest verging thrusts. Tertiary faulting developed basins and ranges with the former subsequently filled with volcanic and sedimentary rocks during Tertiary time. Gold mineralization occurred at the onset of Tertiary volcanism, approximately 39 million years ago.

The stratigraphic section is cut by a series of north-northwest, northwest, northeast, and north-northeast striking high- and low-angle faults with extensive fracturing, brecciation, and folding. These faults both control and displace mineralization, with evidence for both dip-slip and oblique-slip displacements. Jurassic and Tertiary intrusive rocks utilized both high and low-angle faults as they intruded the Paleozoic section. Cenozoic Basin and Range deformation most likely reactivated the majority of faults in the area.

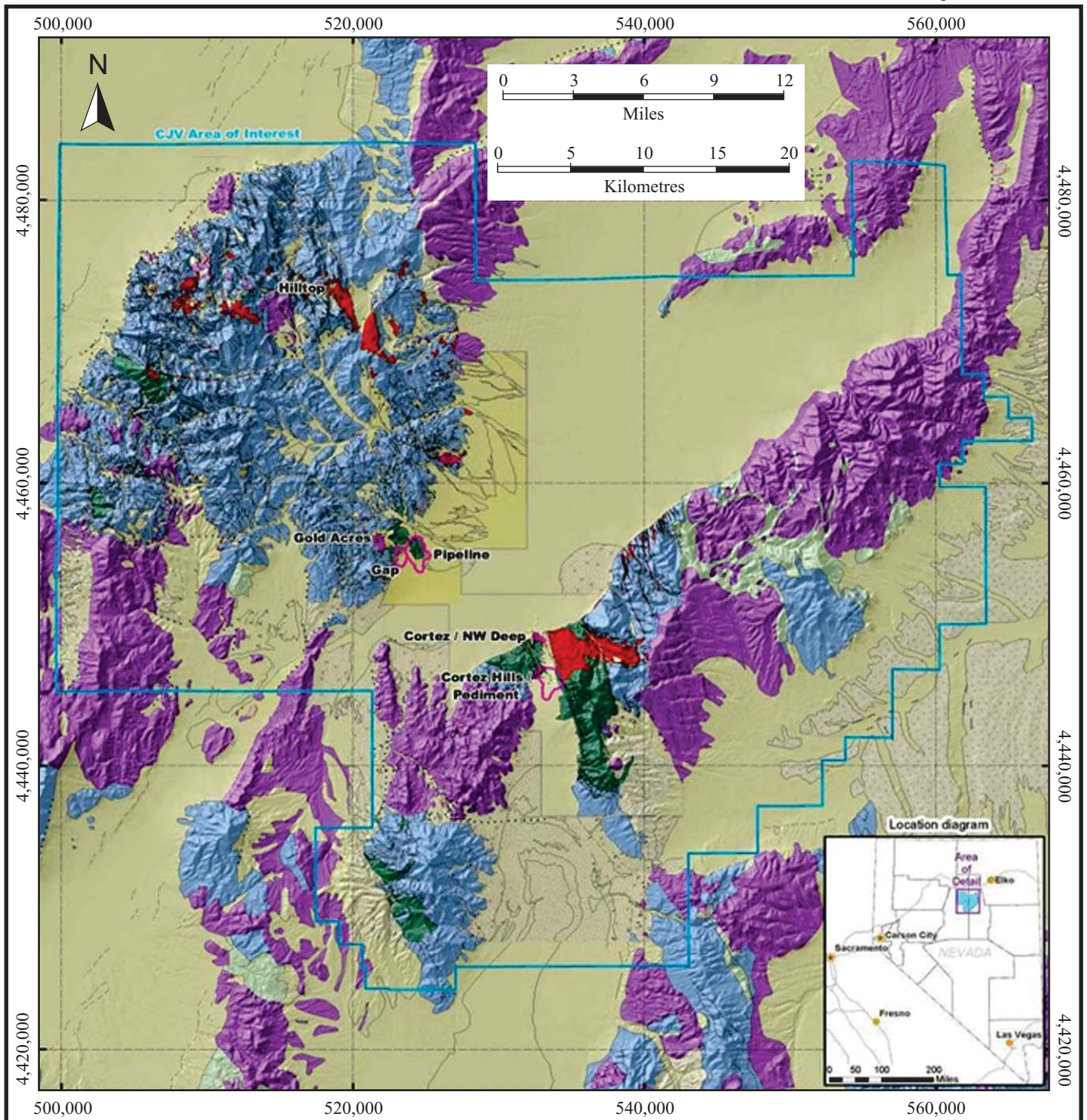
In terms of their regional tectonic setting, the BMT gold deposits are hosted in carbonate rocks within a thick sequence of Paleozoic miogeosynclinal sedimentary rocks coincident with:

- the thinned western margin of the North American craton in early Paleozoic times,
- the west-central portion of the Lower Devonian Antler foreland basin,
- the east edge of deformation related to the late Paleozoic Humboldt orogeny,
- an area of Jurassic plutonism, metamorphism and deformation,
- the hinterland of the early Tertiary Sevier orogenic belt, and
- the broad zone of Eocene to Miocene calc-alkaline magmatism and tectonic extension that occurred throughout much of the Great Basin.

The collision between the Antler terrane and the North America Plate induced higher crustal temperatures and pressures, which produced numerous hot springs along the suture zone. Several episodes of subsurface magmatism are known to have occurred subsequent to the collision. During these episodes, and particularly during the Eocene epoch, hot springs brought dissolved minerals toward the surface, precipitating them out along fissures. Among these minerals were gold and silver. Most of the largest gold deposits lie within approximately 300 ft of the Roberts Mountain Thrust at the base of the Upper Plate allochthon. Geochronologic study indicates that most of the gold in the BMT was emplaced over a short interval of time between approximately 42 Ma and 36 Ma. Analyses of the sulphosalt galkhaite

from the Rodeo deposit at Barrick's Goldstrike Mine (Carlin Trend) have yielded a mineralization age of 39.8 ± 0.6 Ma.

The regional geology is shown in Figure 7-1.



Legend:

- Jasperoid, Breccia, Skam & Hornfels
Quaternary/Tertiary Sediments & Sedimentary Rocks
- Tertiary Volcanic Rocks
- Tertiary, Cretaceous & Jurassic Intrusive Rocks
- Triassic, Permian & Pennsylvanian Rocks
- Upper Plate of Roberts Mountains Thrust (Western Siliceous Assemblage)
- Lower Plate of Roberts Mountains Thrust (Eastern Carbonate Assemblage)

Figure 7-1

Barrick Gold Corporation

Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Regional Geology

LOCAL GEOLOGY

Both the western and eastern Paleozoic assemblages are present in the Cortez area. At Cortez the western assemblage, termed the Upper Plate, includes:

- Devonian Slaven Formation cherts and argillites
- Silurian Elder Formation sandstone and Fourmile Canyon Formation
- Ordovician Vinini and Valmy Formation siliclastic rocks

The eastern assemblage, or Lower Plate, consists of:

- Devonian Horse Canyon Formation laminated calcareous siltstone, mudstones with interbedded chert and silicified siltstones
- Early Devonian Wenban Formation carbonate turbidites, debris flows, micrites, and silty limestones
- Silurian-Devonian Roberts Mountains Formation laminated silty limestones
- Ordovician Eureka Formation quartzites and Hanson Creek Formation sandy dolomites
- Cambrian Hamburg dolomite

Two erosional windows of Lower Plate rocks are mapped in the Cortez area, both located at the southern end of Crescent Valley (Figure 7-2). The Gold Acres window on the eastern flank of the Shoshone Range is buried to the east beneath the alluvial fill of Crescent Valley, and presumably is offset by the Crescent Fault located on the south side of the valley near the Mine. South of the Crescent Fault is the Cortez window, which appears to be a continuation of the Gold Acres window. The Cortez window is a two to three mile wide, north–south trending zone that extends from the margin of Crescent Valley near the Mine south through the Cortez Hills area and into the northern Grass Valley area.

Aeromagnetic studies indicate that intrusive rocks underlie most of the Cortez Mountains. Outcrops of igneous intrusions in the Cortez district are granodiorite of Jurassic-cretaceous age (104 Ma to 150 Ma) and the Jurassic-age quartz monzonite Mill Canyon Stock. Felsic and mafic dikes of similar age occur primarily in north to northwest striking faults. Contact metamorphism affects the sedimentary rocks adjacent to the larger igneous bodies and is evident in the formation of marble, calc-silicates, hornfels, and skarn. Post-mineral porphyry dacite and rhyodacite dikes and sills of Tertiary age are present and notable where they cross-cut mineralized zones.

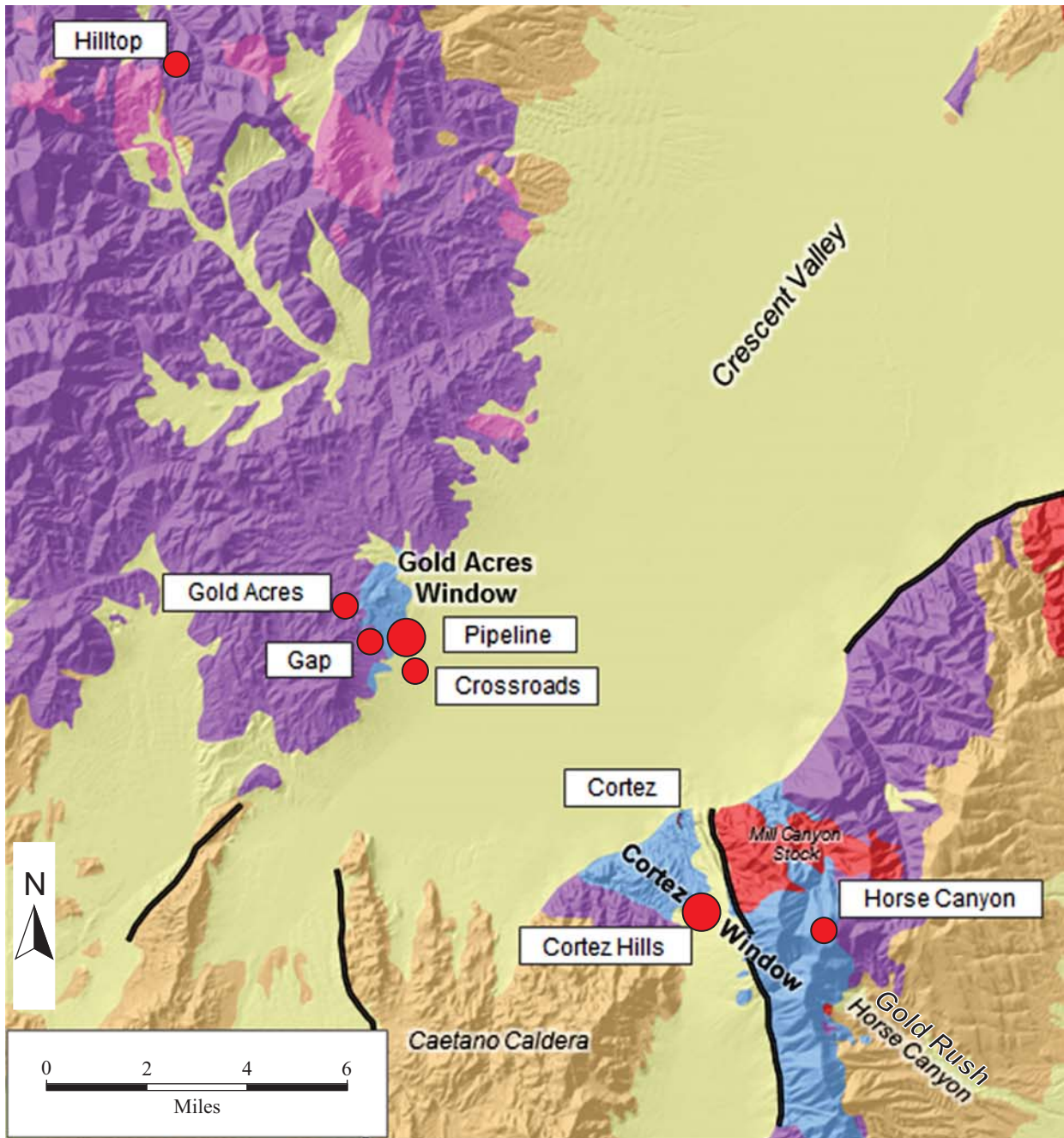
The local geology and stratigraphy of the Cortez Mine area is shown in Figures 7-2 and 7-3, respectively.

The Gold Acres, Pipeline, and Crossroads gold deposits are at the south end of the Shoshone Range located on the west side of Crescent Valley within the Gold Acre Lower Plate window. Gold Acres mineralization is hosted within the Roberts Mountains thrust fault, which is up to 400 ft thick in the mine. The Pipeline, South Pipeline, and Crossroads deposits occur within Lower Plate Horse Canyon, Wenban, and Roberts Mountains formations.

The Hilltop gold deposit, located approximately 10 mi north of Gold Acres, is hosted by an Eocene porphyry and surrounding brecciated, Upper Plate siliciclastic sedimentary rocks of the Ordovician Valmy Formation along a northwest trending belt of similar aged intrusions.

The Cortez Pits and Cortez Hillsgold deposits are on the south side of Crescent Valley associated with the Cortez Lower Plate window. The Cortez Hills mineralized breccia, thrust fault related Middle and Lower Zones are within Horse Canyon, Wenban, and Roberts Mountains units.

The Buckhorn gold mine, approximately seven miles east of Cortez, is a past producer that shut down in 1991 with historical production of 250,000 ounces of gold. It is a low-sulphidation epithermal vein and replacement mineralization localized by structures and permeable horizons in Tertiary basalts and underlying fanglomerate.



- Cenozoic Undifferentiated Sediments
- Tertiary Volcanic Rocks
- Tertiary Intrusive Rocks
- Jurassic Intrusive Rocks
- Pz Eastern Assemblage
- Pz Western Assemblage
- Major Normal Faults

- Gold Mine > 10 Moz
- Gold Deposit

Figure 7-2

Barrick Gold Corporation

Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Local Geology

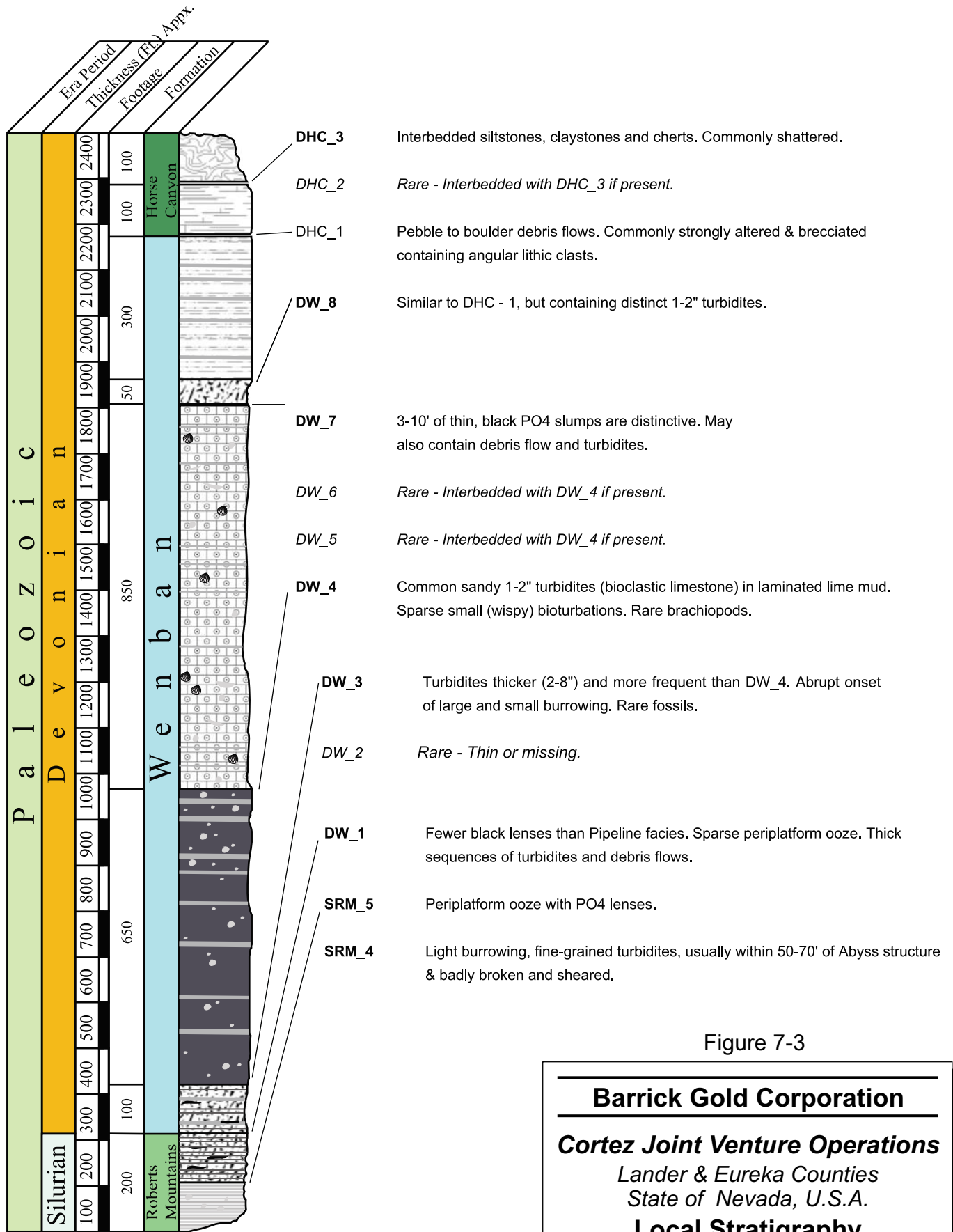


Figure 7-3

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Local Stratigraphy

PROPERTY GEOLOGY

Deposit descriptions for the Pipeline Complex, Gold Acres, and Cortez Pits deposits were extracted in whole or in part from the RPA March 21, 2016 Technical Report (RPA, 2016) and modified where required for this Report to reflect the current geological understanding of these areas.

PIPELINE COMPLEX

PIPELINE/SOUTH PIPELINE/CROSSROADS

The Pipeline, South Pipeline, and Crossroads deposits are separate zones of one gold-mineralized system, which collectively strike approximately N20W for over 8,000 ft and extend up to 5,000 ft wide east-west. Economic gold grades do not occur over the full expanse of this system, however, variable degrees of hydrothermal alteration are evident including oxidation, decalcification, weak contact metamorphism, argillization, silicification, and carbonization. Mineralization at the Pipeline Complex occurs just outside the metamorphic aureole associated with the Gold Acres intrusive. Alluvial cover is absent in the northwest but thickens up to 450 ft in the eastern Pipeline Pit area and ranges from 315 ft to 770 ft over the Crossroads deposit to the south.

The area is characterized by folded and low-angle faulted Paleozoic carbonates. The primary host rocks are variably altered, thin- to thick-bedded, carbonate turbidites, debris flows, micrites, and silty limestones of the Devonian Wenban Limestone and thin-bedded, planar-laminated calcareous siltstones, mudstones, inter-bedded chert, and silicified siltstones of the Devonian Horse Canyon Formation overlying. At depth, planar laminated, silty limestones of the Silurian Roberts Mountains Formation also host mineralization.

Initial porosities in the turbidites, siltstones, and silty limestones were enhanced through argillization and decarbonization along structural and stratigraphic controls. Thrust and normal faulting have shattered the more brittle cherty and silicified beds creating a secondary porosity. The highest and most continuous gold grades occur in the inter-bedded cherts and silicified turbidites of the Horse Canyon Formation and in the Wenban Formation either where capped by the Horse Canyon Formation or in areas of more intense decarbonization. Host formations have been thickened and repeated by low-angle thrusting largely associated with the Late Devonian Antler Orogeny.

GOLD ACRES

The Gold Acres Pit is centred on the axis of a low-amplitude, north-northwest trending antiform. The primary host rocks of the mineralization are sheared Upper Plate siliciclastics and greenstones of the Ordovician Valmy Formation and cherts and quartz siltstone of the Devonian Slaven Formation, sheared Lower Plate silty limestone with discontinuous thin phosphatic black lenses of the Silurian Roberts Mountains Formation and micrite to silty micrite of the Devonian Wenban Limestone. The intensity of metamorphism associated with the Gold Acres Stock varies depending on original lithology and ranges from hornfels to calc-silicate marble to skarn. Drill hole intercepts indicate that the pluton is 400 ft to 600 ft below the current Gold Acres pits.

Two discrete horizons, referred to as “Upper Skarn” and “Lower Skarn”, have been mapped at Gold Acres. The Upper Skarn unit is a bleached felsic sill-like body with endoskarn development and is presumed to be associated with the granodioritic Gold Acres Stock of Jurassic-Cretaceous (104 Ma to 150 Ma) age. The “Lower Skarn” is a garnet–diopside skarn believed to be lower Wenban Limestone. The two skarn horizons are separated by an 80 ft to 200 ft thick zone comprising slices of Upper and Lower Plate rocks known as the Imbricate Thrust Zone (ITZ).

CORTEZ HILLS COMPLEX

The Cortez Hills Complex includes the Cortez Hills Breccia and the Middle and Lower Zones.

BRECCIA, MIDDLE AND LOWER ZONES

The upper levels of mineralization in the Cortez Hills deposit are hosted in the Horse Canyon Formation. The bulk of the deposit is hosted in the Devonian Wenban Limestone. At depth, mineralization is also hosted by the Roberts Mountains Formation as well as Hanson Creek Dolomite. The range-bounding Cortez Fault is located just east of the deposit.

The location of Breccia gold mineralization appears to have been emplaced on hydrothermal brecciated and fractured rocks that are centred on a northwest striking and moderately southwest dipping fault and its attendant structures, named the Voodoo Fault. At depth the stratigraphy has been deformed by thrust faulting leading to both folding and fracturing. Gold mineralization at depth occurs as tabular, sub-horizontal to shallow dipping zones associated with calcareous rocks subject to preparation by alteration and deformation; this deeper mineralization forms the Middle and Lower Zones at Cortez Hills. Post-mineral quartz porphyry

dikes and sills intrude the Cortez Hills deposits. A northwest trending swarm of steeply dipping dikes defines the limits between the Middle and Lower Zones.

CORTEZ PITS (NW DEEPS)

The Cortez NW Deeps deposit is hosted by strongly altered, thin- to medium-bedded silty limestone of the Roberts Mountains Formation and by sheared and altered interbedded dolomite and limestones of the underlying Ordovician Hanson Creek Formation. Devonian Wenban Limestone caps most ridges and hills around the NW Deeps deposit and locally appears to have acted as a cap rock over alteration systems in the underlying Roberts Mountains Formation. Prior to mining, Quaternary alluvium formed a thin veneer of cover over the deposit. Alluvium thickens abruptly to the north across the Cortez range-front normal fault.

Quartz monzonites of the Jurassic Mill Canyon Stock are present east of the deposit on the uplifted side of a north-northwest trending normal fault. Numerous Oligocene quartz porphyry dikes and sills intrude the deposit. These dikes are considered to be post-mineralization.

A series of north-northwest trending and northeast trending faults cut the Roberts Mountains Formation at the deposit. Mineralization occurs where these faults intersect shallow east dipping thrust breccia zones (thrust duplexes) within the Roberts Mountains Formation.

MINERALIZATION

With the exception of Cortez Hills, the description of mineralization for this section is taken largely from the RPA March 21, 2016 Technical Report with modifications as required for this report (RPA, 2016).

Gold mineralization is reported as Mineral Resources for the following nine deposits in the Cortez area:

- Pipeline Complex (2 deposits) – Pipeline and Crossroads (Gap is now appended into Pipeline.)
- Gold Acres
- Cortez Hills Complex (4 zones) – Breccia, Middle, and Lower Zones
- Cortez Pits (NW Deeps)

Mineralization consists primarily of submicron to micrometre sized gold particles, very fine sulphide grains, and gold in solid solution in pyrite. Mineralization occurs disseminated throughout the host rock matrix in zones of silicified and decarbonatized, argillized, silty calcareous rocks, and associated jasperoids. Gold may occur around limonite pseudomorphs of authigenic pyrite and arsenopyrite. Major ore minerals include native gold, pyrite, arsenopyrite, stibnite, realgar, orpiment, cinnabar, fluorite, barite, and rare thallium minerals. Gangue minerals typically comprise fine-grained quartz, barite, clay minerals, carbonaceous matter, and late-stage calcite veins.

Argillization is characterized by removal of kaolinite and growth of illite in proximity to controlling faults. Arsenic, antimony, iron, and copper accompany gold in north–northwest oriented fault structures and silver, arsenic, manganese, and lead in northeast trending faults.

In the Cortez district, the favoured host rocks for gold mineralization are the Wenban Limestone, followed by the Horse Canyon and Roberts Mountain formations. Mineralization reflects an interplay between structural and lithological ore controls in which hydrothermal solutions from intrusives moved to favourable porous decalcified limestone.

Mineralization is predominantly characterized by oxides, and sulphidic and carbonaceous refractory material. Carbon content in the deposits is highly variable and occurs generally in the Devonian Wenban Limestone and Roberts Mountain Formation.

Supergene alteration extends up to 656 ft depth resulting in oxide ores, which overlie the refractory sulphides. Alteration has liberated gold by the destruction of pyrite and resulted in the formation of oxide and secondary sulphate minerals, which include goethite, hematite, jarosite, scorodite, alunite, and gypsum.

PIPELINE COMPLEX

Mineralization at Pipeline occurs where an east dipping thrust duplex crosses a deep seated 305° striking fracture system. The majority of the mineralization is tabular and stratiform with a shallow easterly dip.

The main Pipeline deposit is a 50 ft to 300 ft thick, tabular zone at 500 ft to 600 ft beneath the surface; it dips at a low angle to the east and extends 750 ft north-south by 1,500 ft east-west. South Pipeline consists of two zones 1) a shallow zone starting at 65 ft to 150 ft depth and 2)

a deep zone starting at 1,000 ft. The shallow zone occupies an area of approximately 1,800 ft by 2,000 ft, north and east respectively, and exhibits both low-angle and high-angle structural controls on gold distribution. The deep zone occupies an area 200 ft north-south by 600+ ft east-west, is up to 250 ft thick and is more closely associated with high-angle structures. Drill depths average 1,000 ft although drill holes up to 1,400 ft are not uncommon in the centre of the deposit where mineralization ranges from 400 ft to over 1,000 ft thick.

Crossroads lies at the south end of the Pipeline trend and is deeper, varying in thickness from less than 10 ft to greater than 300 ft with a primary control of low-angle structures sub-parallel to bedding and an overall 20° easterly dip. The zone is intensely sheared, shattered, and/or brecciated, with minor offsets along the high-angle faults. Oxidation extends to depths in excess of 1,300 ft. Crossroads consists of two mineralized zones: an upper stratiform zone along the Horse Canyon–Wenban contact and a deeper zone controlled by an east-northeast striking, west dipping (20° to 25°) structural zone that cuts across stratigraphy.

GOLD ACRES

At Gold Acres, the mineralized area is approximately 6,000 ft long by 2,500 ft wide with an average thickness ranging from 80 ft to 200 ft. Mineralization is mainly refractory; high gold grades (greater than 0.10 oz/st Au) are associated with secondary carbon and/or fine-grained sooty sulphide minerals. Minor oxide gold mineralization is hosted within the Upper Plate rocks overlying the ITZ. The Lower Skarn is largely barren of gold, although it does host minor polymetallic mineralization (Zn–Mo–Cu) presumed to be coeval with intrusive emplacement and skarn formation.

The Gold Acres deposit was developed in two lobes, the north (London Extension Pit) and the south (Old Gold Acres Pit, or OGA). The London Extension Pit is bounded on the north by the northeast striking, moderately westward dipping (50° to 60°) Gold Acres Fault. The Gold Acres Fault down drops the ITZ and Gold Acres Stock approximately 200 ft to the northwest. The Island Fault separates the London Extension and OGA pits and strikes approximately to the north–northeast, dipping at 50° to the northwest. The Island Fault apparently down-drops mineralization in the London Extension Pit relative to the OGA Pit. Multiple northeast trending faults between the Gold Acres and Island Faults incrementally down-drop mineralized stratigraphy to the north in a stair-step pattern. Both pits have been inactive since 1995 except for a small program in the London Extension Pit in 2000–2001 when refractory ore was mined to supply a third-party for processing.

CORTEZ HILLS COMPLEX

BRECCIA, MIDDLE AND LOWER ZONES

Breccia gold mineralization is hosted in hydrothermally brecciated and fractured rocks that are spatially associated with the Voodoo Fault and its attendant structures. Altered, matrix supported breccia bodies contain the highest gold grades and are surrounded by “crackle” breccias and highly fractured rock with moderate gold grades continuing outwards to less fractured rocks with lower grades. Most of the Breccia mineralization dips moderately southwest enveloping the Voodoo Fault. The upper portion has a northeast dip that possibly reflects control by an antithetic structure. Breccia Zone mineralization extends from a near surface elevation of 5,850 ft to 4,070 ft, terminating just east of the Middle Zone. It is approximately 1,000 ft wide with a northwest trend, and varies in width from 250 ft to 1,900 ft.

Mineralization of the Middle and Lower zones lie at depth to the west and southwest of the Breccia Zone. These sub-horizontal, tabular zones are associated with alteration localized along a complex zone of thrust faulting and back thrusts in the Roberts Mountain Formation that has also incorporated slices of Devonian Wenban Limestone. A swarm of northwest trending post mineral quartz porphyry dikes separates the Middle from the Lower Zone. The Lower Zone has a distinct northwest-southeast trend in the Roberts Mountain and Hanson Creek formations that is interpreted as the crest of a plunging antiform. The Middle Zone occurs between elevations 4,235 ft and 3,825 ft, is approximately 1,800 ft wide northwest-southeast by 1,300 ft long northeast-southwest, and ranges in thickness from 10 ft to 270 ft. The Lower Zone lies at an elevation of 4,260 ft to the northwest and 3,060 ft to the southeast, extends 4,300 ft northwest-southeast, varies in width from 1,450 ft in the north to 500 ft in the south, and ranges in thickness from 60 ft to 270 ft. Both the Middle and Lower zones are open to both the northwest and southeast.

Post-mineral dikes and sills are significant in that they are estimated to account for up to 10% of the waste rock volume within portions the Cortez Hills deposits.

Gold mineralization is often spatially associated with decalcification and, to a lesser degree, silicification. Deep oxidation at Cortez Hills is inferred to be related to deep, convection-driven circulation of mixed meteoric and spent hydrothermal fluids during the waning stages of the mineralizing event. The enhanced weathering phenomenon resulted in significant carbonate dissolution and clay formation as well as extremely deep oxidation of gold-bearing iron

sulphide minerals. Arsenates of copper and zinc have been noted in, and adjacent to, oxidized mineralization.

CORTEZ PITS (NW DEEPS)

The Cortez NW Deep deposit is a continuation of the mined-out main Cortez deposit. The deposit consists of remnants of oxide mineralization in the east wall of the Bass Pond pit and deeper, sulphide and carbonaceous mineralization. A series of north–northwest trending and northeast trending faults cut the Roberts Mountains Formation at the deposit. Gold mineralization is localized where these faults intersect shallow east dipping thrust breccia zones (thrust duplexes). Most of the Cortez NW Deep higher-grade gold mineralization (less than 0.1 oz/st Au) occurs in two zones lying between the 4,200 ft and 4,500 ft elevations beneath the old Cortez open pit floor. Present surface elevations are between 4,800 ft and 5,300 ft. One zone consists of an oxidized and strongly altered thrust zone within the Roberts Mountains Formation and the other is an unoxidized, sulphide-bearing thrust zone at the top of the Hanson Creek Formation. Post mineral quartz porphyry dikes have been emplaced along high-angle faults.

Locally, silica overprints all lithologies, but does not show a strong correlation with gold at a local scale. Silicification occurs as massive fault fill, bedding replacements after decalcification and as micro-veinlets. Massive silicification fills both north-northwest and northeast trending faults. Bedding replacement by silica occurs along beds that were originally carbonate-rich.

Oxidation is pervasive at 4,700 ft elevation. Mineralization becomes dominantly refractory at 4,200 ft to 4,350 ft elevation.

8 DEPOSIT TYPES

The Cortez deposits are Carlin-type sedimentary rock-hosted deposits. Carlin deposits form as structurally and/or stratigraphically controlled replacement bodies consisting of stratabound, tabular, disseminated gold mineralization occurring in Silurian-Devonian carbonate rocks. Deposits are localized at contacts between contrasting lithologies, metamorphosed to varying extents. They can also be discordant or breccia related.

Host rocks are most commonly thinly bedded, silty or argillaceous carbonaceous limestone or dolomite, commonly with carbonaceous shale. Although less mineralized, non-carbonate siliciclastic and rare metavolcanic rocks can locally host gold that reaches economic grades. Felsic plutons and dikes may also be mineralized at some deposits.

The deposits are hydrothermal in origin and are usually structurally controlled. The carbonate host rocks are part of an autochthonous miogeoclinal carbonate sequence (Lower Plate) exposed as tectonic windows beneath the Roberts Mountain allochthon. The lower Paleozoic allochthonous (Upper Plate) rocks are siliciclastic eugeoclinal rocks that were displaced eastward along the Roberts Mountain Thrust over younger units during the upper Paleozoic Antler Orogeny. Carlin deposits are localized along the thrust.

Current models attribute the genesis of the deposits to:

- epizonal plutons that contributed heat and possibly fluids and metals;
- meteoric fluid circulation resulting from crustal extension and widespread magmatism;
- metamorphic fluids, possibly with a magmatic contribution, from deep or mid-crustal levels;
- upper crustal orogenic-gold processes within an extensional tectonic regime.

The past-producing Buckhorn gold-silver mine and the Hilltop gold project are examples of different styles of mineralization in the Cortez district. Buckhorn is a typical example of a low-sulphidation epithermal system while Hilltop is an intrusive-related deposit. Hilltop is an Eocene-age system clearly associated with 38 Ma to 39 Ma felsic gold-copper porphyries, while Buckhorn is a Miocene occurrence, deposited during the initiation of 15 Ma to 17 Ma Northern Nevada Rift extension and associated bimodal volcanism.

9 EXPLORATION

Modern exploration commenced along the Battle Mountain–Eureka Trend in the 1960s, and has been nearly continuous since that time. Exploration in the Cortez district has been undertaken by Barrick and its predecessor companies such as the CJV and has included mapping, various geochemical and geophysical surveys, pitting, trenching, petrographic, and mineralogy studies, and various types of drilling. The description of drilling, sampling methods, and sample quality is provided in Section 10 Drilling.

Many of the targets being investigated are partially or totally concealed by younger overburden and Tertiary rock cover or by allochthonous Upper Plate Paleozoic siliclastic rocks. Geophysical surveys are being used to help map buried bedrock features.

EXPLORATION POTENTIAL

There is potential for further increases in Mineral Resources. Barrick funds multi-million dollar budgets for projects at various stages of exploration maturity each year across the Cortez land holding as well as advanced stage drilling projects at the various mine sites. Exploration activity since 2016 has been focused in the Cortez Range and includes the following projects.

- 2016
 - a. Cortez Window: \$0.5 million for detailed mapping and sampling to define gold bearing structures and update 3D geologic model for future targeting.
- 2017
 - a. Cortez Window: \$422,000 for detailed mapping and sampling to define gold bearing structures and update 3D geologic model for future targeting.
 - b. Toiyabe: \$2.1 million for five RC and one core hole to identify potential targets for follow up drill testing.
- 2018
 - a. Cortez Window: \$1.35 million for one core hole (1,688 m) testing depth to favourable host strata.

ROBERTSON PROPERTY - SURFACE

Barrick purchased the Robertson property from Coral Gold Resources Ltd. in June 2017. The Robertson property is an advanced exploration project and the dimensions of the

mineralization and metallurgy are being verified in 2017, 2018, and 2019. Barrick has not estimated Mineral Resources to date for the Robertson property.

Barrick completed 17 holes in 2017 and 45 holes in 2018 for a total of 12,200 m of drilling. The current program is focusing on building a geologic model and managing the metallurgical test work to establish a deposit grade continuity. The Robertson property is an upper plate and intrusive hosted gold mineralization. The 2019 drill program will in-fill the deposit where necessary for grade continuity, metallurgical recovery process options, and estimate a Mineral Resource.

10 DRILLING

This description of drilling is taken largely from the RPA March 2016 Technical Report (RPA, 2016). It has been updated based on RPA's site visit and subsequent review of available documentation.

Exploration and drilling activities for resource development in the Cortez district span a period of more than 40 years and include a variety of drilling techniques and the use of numerous different drill contractors. Approximately 22,865 drill holes are currently in the Barrick Cortez database. This number is known to be incomplete, as a significant portion of the drilling completed by companies other than Barrick and the CJV has not been incorporated in the digital database. The drill hole types included in the database are summarized in Table 10-1.

TABLE 10-1 DRILL HOLE TYPES
Barrick Gold Corporation – Cortez Operations

Drilling Type	Number of Holes	%
Reverse Circulation	14,431	63
Core	4,788	21
Other	3,646	16
Total	22,865	100

Figure 10-1 illustrates the distribution of drill holes contained in the database for the Cortez district. Drill hole collars included in this figure are not representative of the total drilling within the Mine. Many of the drill holes external to the Cortez and Gold Acre Windows were completed for reconnaissance purposes.

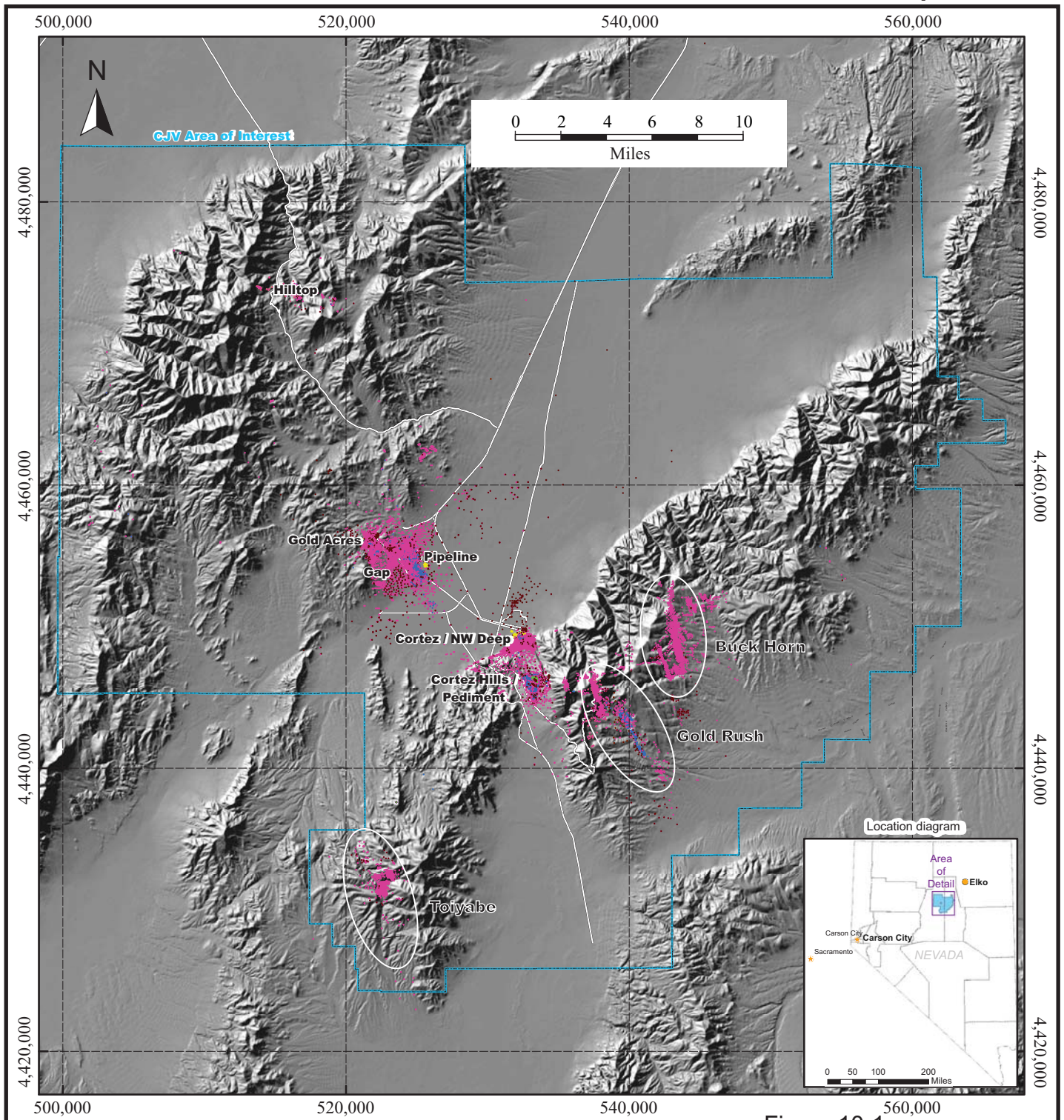


Figure 10-1

Legend:

● RC Hole	— Existing Road
● Core Hole	□ AOI
● CUBEX	
● Sonic Hole	
● Unknown Hole	

Map Specifications:
 Topography from USGS DEM - 1:24,000
 Horizontal Datum: North American 1927
 Vertical Datum: NGVD 1929
 Zone: 11
 Projection: Transverse Mercator (meters)

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Drill Hole Map

REVERSE CIRCULATION DRILLING METHODS

Reverse circulation (RC) drilling is occasionally used during the initial phases of exploration, condemnation drilling, and to pre-collar diamond coring holes through intervals of overburden and unaltered cap rocks. RC holes range in diameter from 4.5 in. to 7.0 in. Diameters of 6.5 in. and 6.75 in. are currently used for exploration.

Current practice is for RC holes encountering mineralization to be bracketed on four sides by core holes increasing the density of core holes in mineralized zones. RC pre-collar holes are cased with appropriately sized casing and core drilling is continued through mineralization and footwall rocks. The depth to which RC drilling is used depends on the water table depth, which is in turn dependent on mining dewatering activity in the area. Since 1980, RC has been typically used for 600 ft to 3,500 ft holes. RC pneumatic hammers are used up to approximately 1,800 ft. depending on water inflow. Auxiliary compressors are used to increase the effectiveness of the down-hole hammers. Tri-cone rock bits are used at depths below the working depth of hammer bits. Centre-return hammers and bits were used for RC drilling at Pipeline. The deepest RC hole at Pipeline reached a depth of 4,540 ft while the deepest at Cortez Hills has been 4,400 ft.

CORE DRILLING METHODS

Core sizes for wire-line diamond drilling are typically HQ (2.5 in. diameter) for resource development drilling. Occasionally, core holes are reduced from HQ size to NQ (1.9 in. diameter) size in difficult drilling conditions. Surface metallurgical core includes HQ and PQ-3 (3.27 in. diameter) sizes.

Conventional core handling methods and wax impregnated cardboard core boxes are used by the contractors. Cortez geotechnicians deliver the core to the logging facility on site. Core runs of five or ten feet are typical in waste rock zones, but the shattered and broken nature of the Pipeline shear zone usually results in shorter runs. The drill crew inserts wooden blocks to mark the end of each core run. Some holes designated as structurally significant manual versus natural breaks in the core are clearly marked with a wax crayon. PQ core (3.35 in. diameter) is occasionally used in alluvium to collect geotechnical data or where larger samples are required for nugget mineralization.

CONVENTIONAL AND MUD DRILLING METHODS

These drilling methods use air to pull the sample from the bit to the hole collar up the outside of the drill stem. Typically, conventional air holes were short, and terminated at the water table. The drill diameter range was from 5.5 in. to 6.5 in. Conventional mud drilling used a similar sampling technique, with drill water-based bentonite clay/inorganic polymer muds employed facilitating drill sample return. Mud rotary drill holes range in diameter from 6 in. to 9 in. Mud-rotary drills have been used to drill relatively thick sections of alluvium over the Crossroads deposit or in areas being condemned for waste dumps and processing facilities. Core tools were used to complete the bedrock sections of these holes. Limited information remains on the drilling, logging, and sampling methodology for hole types that were drilled prior to the mid-1990s. Mud drilling has not been used in recent years.

COLLAR SURVEYS

Collar coordinates from the 1960s to the 1980s drilling were determined by optical surveys, field estimates, Brunton compass and pacing, or compass-and-string distance. Recent campaigns have hole collars surveyed primarily with global positioning system (GPS) instruments or, to a lesser extent, total Station electronic distance measurement (EDM) or geodetic-grade, instruments. Two separate reference grids (Pipeline Mine grid and Cortez grid) are maintained. Survey Data in remote areas is collected in both Truncated Universal Transverse Mercator (TUTM) and North American Datum 83 (NAD83) coordinates and then converted to the appropriate mine grid.

DOWNHOLE SURVEYS

Downhole surveying began in 1991 at the Pipeline deposit. Significant deviations were shown in RC drilling and downhole surveying has been carried out since then. Most holes were surveyed with a recording gyroscope by a commercial contractor. Readings were taken every 50 ft downhole and digitally transferred to the database. Until April 1993, Boyles Brothers Drilling used a multi-shot recording gyroscope (MSRG) tool. Silver State Surveying later performed all MSRG surveys and, currently, contractors WelNav, International Directional Services LLC (Deep South), and other qualified contractors, provide the surveys.

Underground core holes drilled prior to May 2008 were surveyed downhole by Deep South. Since then surveying has been done by Cortez personnel using Reflex magnetic and gyro instrumentation. Geotechnical holes have been drilled in each discovery to date using oriented tools. These normally use a plasticine, triple scribe, and downhole camera system. Currently, the drill contractor uses a Reflex gyroscope downhole survey tool for all underground drilling. Drill setups are done by the drill contractor using a Reflex azimuth aligner. Collar surveys are picked up post drilling by an underground survey crew.

Surface hole downhole surveys were mostly by gyro.

For a limited number of holes where ground conditions such as caving restrict access for the survey instrument, downhole surveys are incomplete.

SAMPLE RECOVERY

In general, core drilling practices at Pipeline, Crossroads, the Cortez Pits (NW Deeps), and Cortez Hills ensure a relatively high core recovery. Core recovery is sufficient to provide representative samples of a sediment-hosted gold deposit. Prior to 1991, core recovery values and RC sample weights were not routinely digitized or added to the general drill hole database. Wet drilling conditions for RC holes prohibit measurements of sample weights and, as a result, recovery of RC materials cannot be calculated.

Core recoveries are maximized by use of triple-tube core barrels, face-discharge bits, and special drilling mud. Core recovery averaged 93% for 314 holes used in the Pipeline and South Pipeline FS. The median core recovery for the Cortez Hills deposit was 96%.

GEOTECHNICAL AND HYDROLOGICAL DRILLING

Geotechnical and hydrological holes have been drilled to provide raw data for the hydrological and geotechnical portions of the PFS and FS on the Pipeline and Cortez Hills deposits, and subsequently to support mining operations. Underground core holes have been drilled as required for geotechnical purposes. These holes were designed parallel to planned drifts and served to predict the character of the rock mass to be developed.

GRADE CONTROL DRILLING

OPEN PIT

The bench height, hole spacing, and blast hole diameter varies by pit.

CROSSROADS

- 40 ft bench
- Alluvium (10 5/8 in. bit) 31 ft by 36 ft – 0 sub-drill
- Bedrock (9 7/8 in. bit) 22 ft by 25 ft. – 4 ft sub-drill
- Trims (8 3/4 in. bit) 10 ft on toe 20 ft intermediate and crest rows
- Sub-drill is dependent upon the crest of the next bench

PIPELINE

- 50 ft bench
- Bedrock (9 7/8 in. bit) 22 ft by 25 ft – 4 ft sub-drill
- Trims (8 3/4 in. bit) 10 ft on toe 20 ft intermediate and crest rows
- Sub-drill is dependent upon the crest of the next bench

CHOP

- 25 ft bench
- Bedrock (8 3/4 in. bit) 16 ft by 16 ft dependent on the average width of the underground workings – 2 ft sub-drill
- Trims (8 3/4 in. bit) 8 ft on toe 18 ft intermediate and crest rows
- Sub-drill is dependent upon the crest of the next bench

UNDERGROUND

Core drilling was carried out from drill platforms that drill perpendicular (shower heads) to mineralization. Breccia Zone holes were drilled from the hanging wall side of the deposit. Middle and Lower Zone holes were drilled from development drifts located directly above the mineralization. The Middle Zone was drilled using the shower head method around the perimeter utilizing near vertical holes. HQ holes were drilled on 50 ft to 75 ft centres, with follow-up infill drilling where required to 25 ft centres using HQ core. Very little RC centre - return 4 1/4 in. drilling was completed, of which most was in the Wisconsin Zone.

Lower Zone drilling was done from development drifts located above mineralization, which allowed for near vertical HQ core. Lower Zone A was initially drilled with HQ at 50 ft to 75 ft centres, Lower Zone C was initially drilled with HQ at 50 ft to 75 ft centres, and Lower Zone D was drilled with HQ at 75 ft to 100 ft centres. Subsequent infill drilling used 4 ¼ in. RC centre-return holes and was carried out from footwalls and mining levels, with holes at flatter -40° to +50° angles. All RC drilling is being done with dual purpose rigs. No Cubex drills are currently on site.

MINERAL RESOURCE DELINEATION DRILLING

Surface drilling is initially carried out on a 400 ft square pattern, closing in the next stage to a 200 ft grid. In-fill drilling is done on a five-spot pattern, resulting in an average hole spacing of 141 ft. At Pipeline, “X-shaped” patterns of more closely spaced holes have been drilled to provide information for gold grade variography; this may locally decrease the hole spacing to approximately 70 ft.

Underground mineralization is drilled to a nominal 200 ft spacing from surface, then underground drilling is conducted to reduce spacing to 100 ft or less for Mineral Resource to Mineral Reserve transition. Prior to production, additional underground drilling is completed to close up the spacing to between 25 ft and 50 ft for final mine design.

PIPELINE COMPLEX AND GOLD ACRES

Drilling in the area of the Pipeline Complex including the Pipeline, Crossroads, and Gold Acres deposits comprises 5,419 drill holes for approximately five million feet completed from the 1960s to 2014, and comprises conventional, RC, and core drilling. Almost all of the conventional drilling was in upper portions of the deposits and has subsequently been mined out. Approximately 20 conventional holes were drilled after 2006, for approximately 60,000 ft. The resource estimation database contains 3,370 holes totalling 3,030,485.5 ft. Additional metallurgical and ore characterization drilling was done in 2014 in the Pipeline Complex. The resource drilling database for Gold Acres consists of 1,725 surface drill holes for 461,363 ft and includes over 68,700 assays.

Figure 10-2 illustrates a drill hole location plan for the Pipeline Complex including the Pipeline (now includes Gap) and Crossroads deposits.

Figures 10-3 and 10-4 show representative cross sections through the Pipeline and Crossroads deposits, respectively.

Figure 10-5 shows a surface plan with drill hole locations for the Gold Acres deposit and Figure 10-6 provides a representative cross section through the deposit.

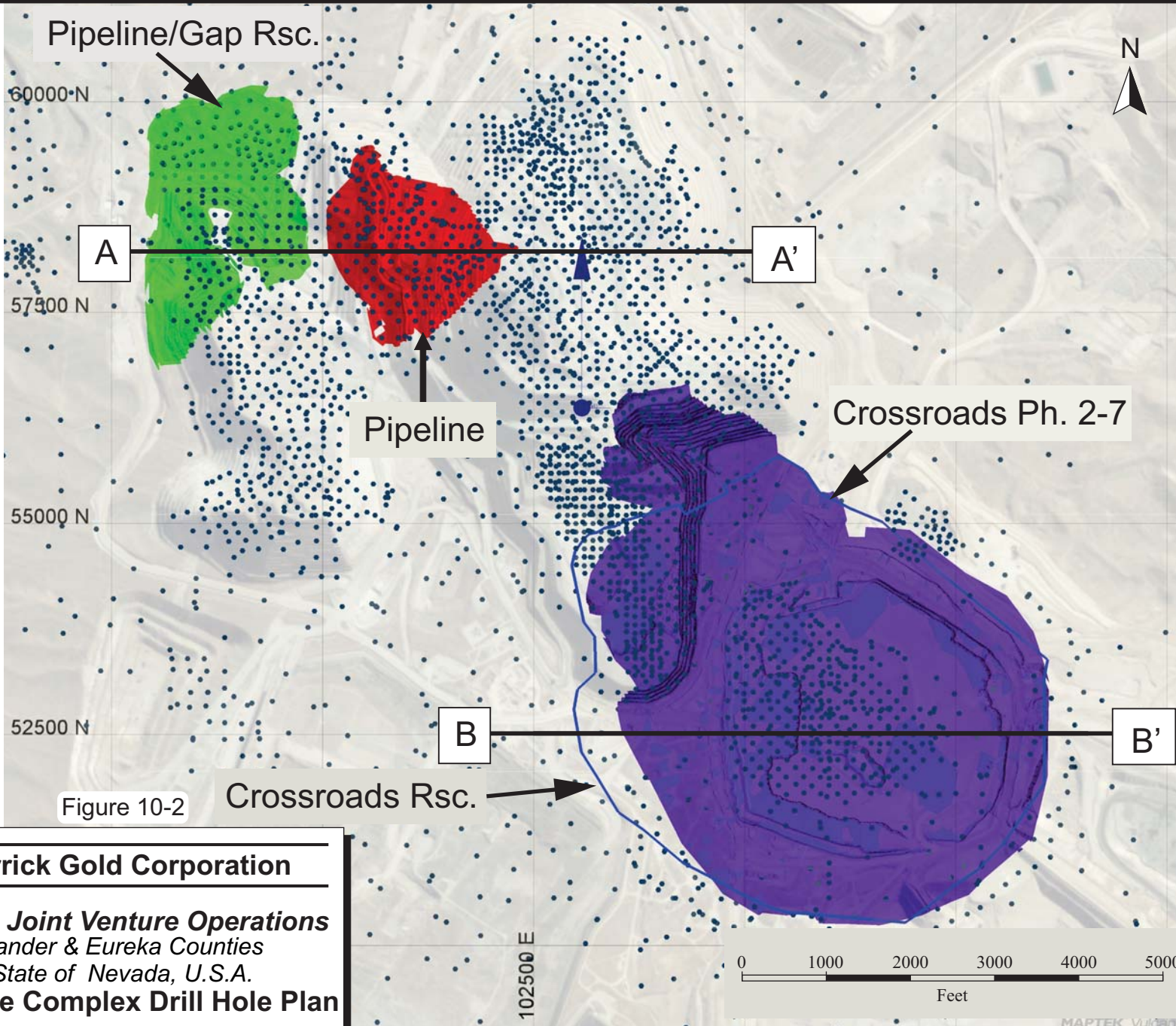
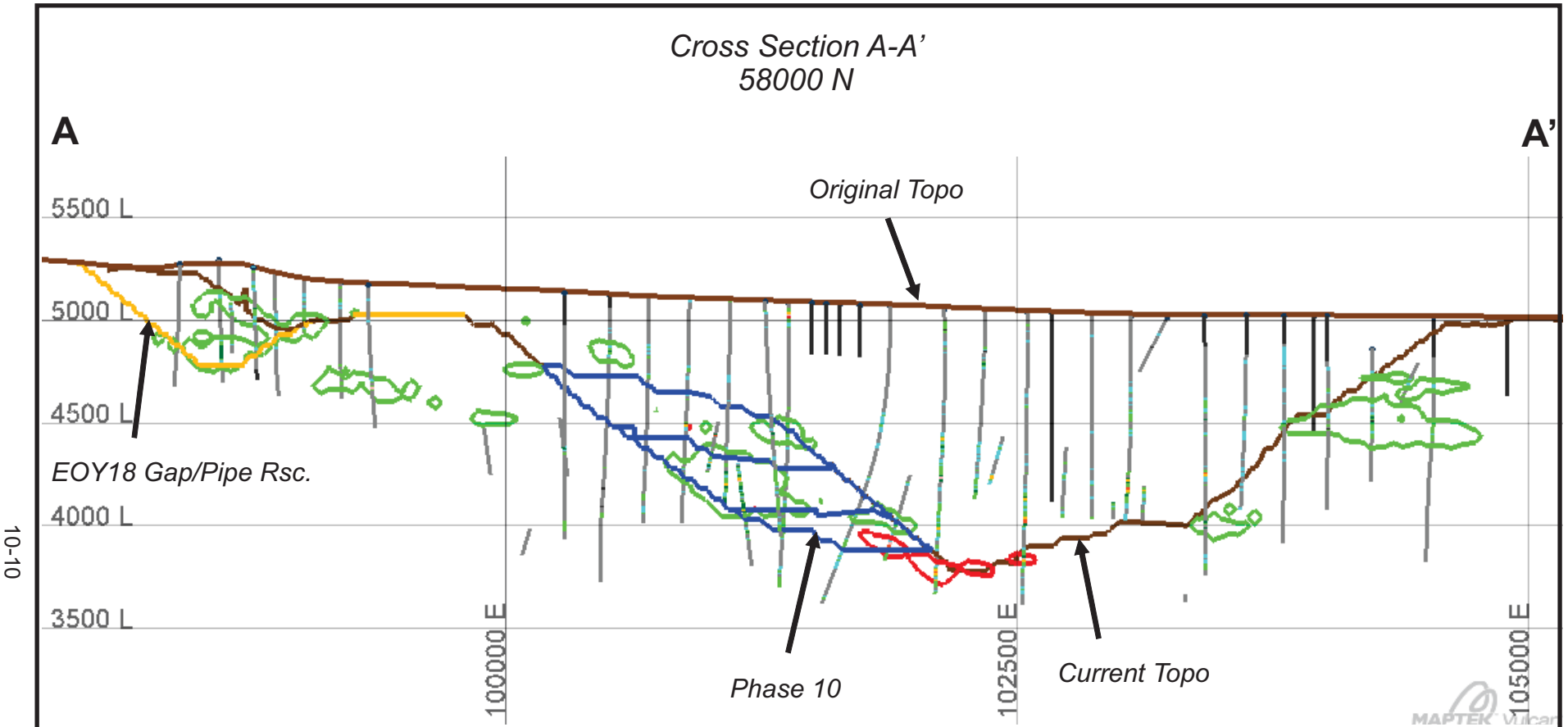


Figure 10-2

Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Pipeline Complex Drill Hole Plan

10-9



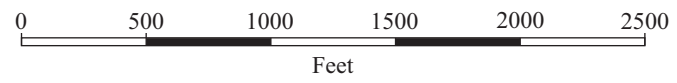
10-10

Note: Vertical lines indicate drillholes with hot colors indicating higher grades

Figure 10-3

Legend:

- Oxide > 0.004 oz/st
- Refractory > 0.05 oz/st
- Topography
- Mining Phases
- EOY18 Rsc. Phase



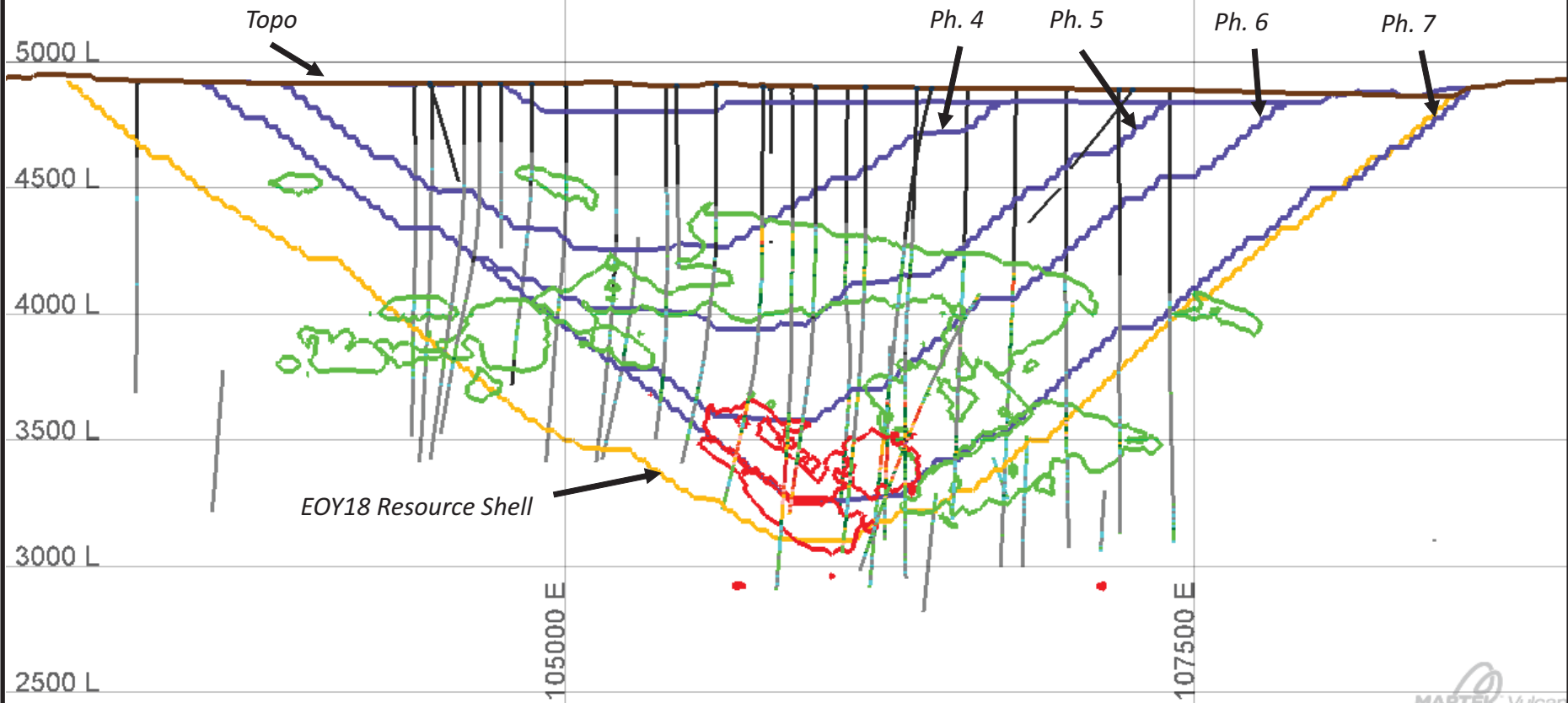
Barrick Gold Corporation

Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.

Pipeline Deposit Cross Section A-A'

Cross Section B-B'
52,500 N

10-11

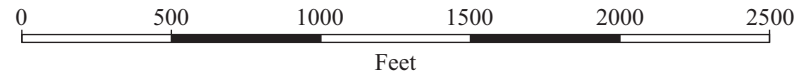


Note: Vertical lines indicate drillholes with hot colors indicating higher grades



Figure 10-4

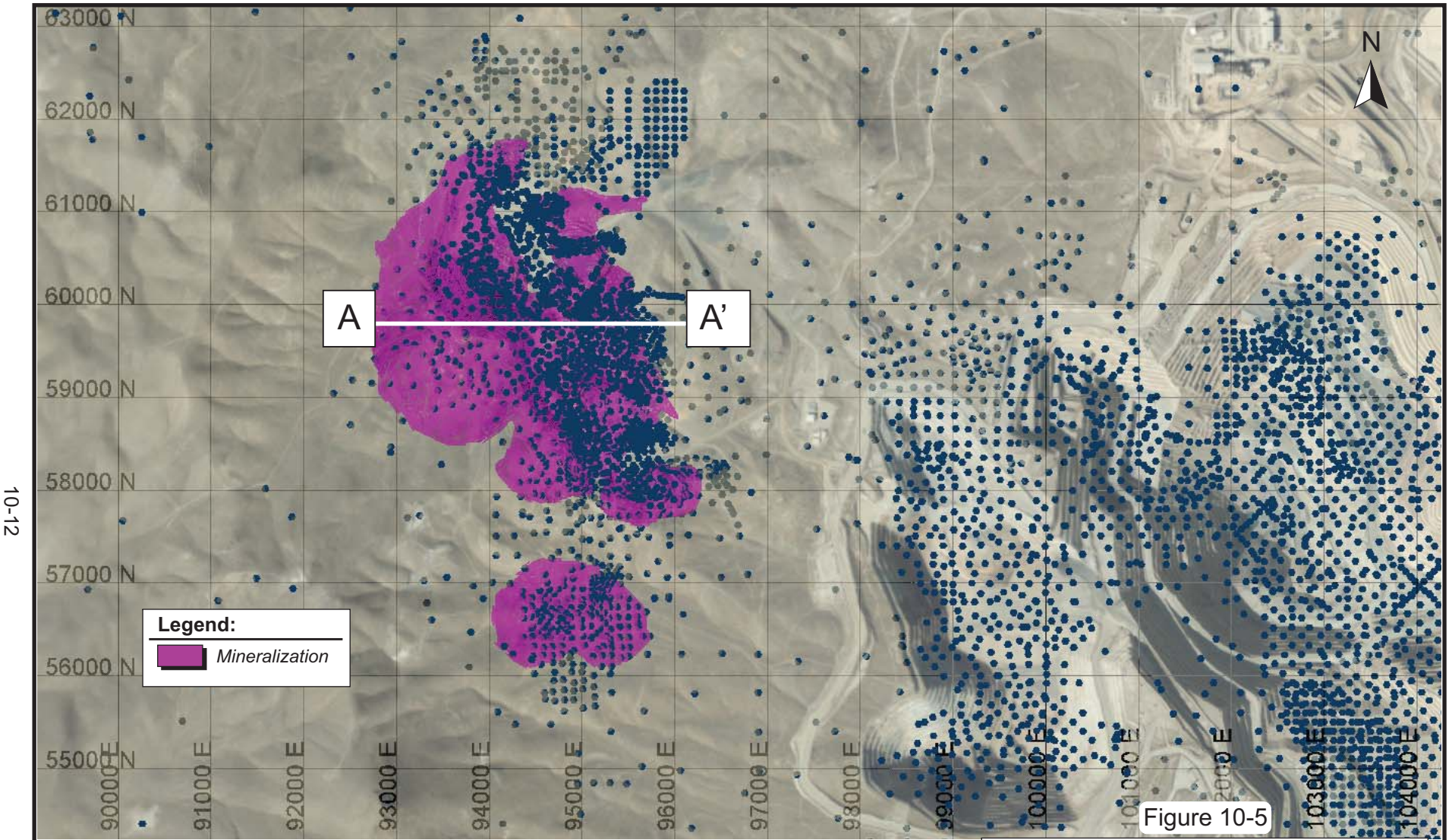
- Legend:**
- Oxide > 0.004 oz/st
 - Refractory > 0.05 oz/st
 - Topography
 - Mining Phases
 - EOY18 Resource Shell



Barrick Gold Corporation

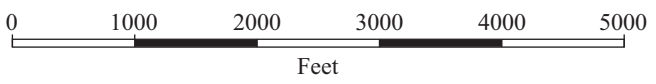
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.

Crossroads Deposit Cross Section B-B'

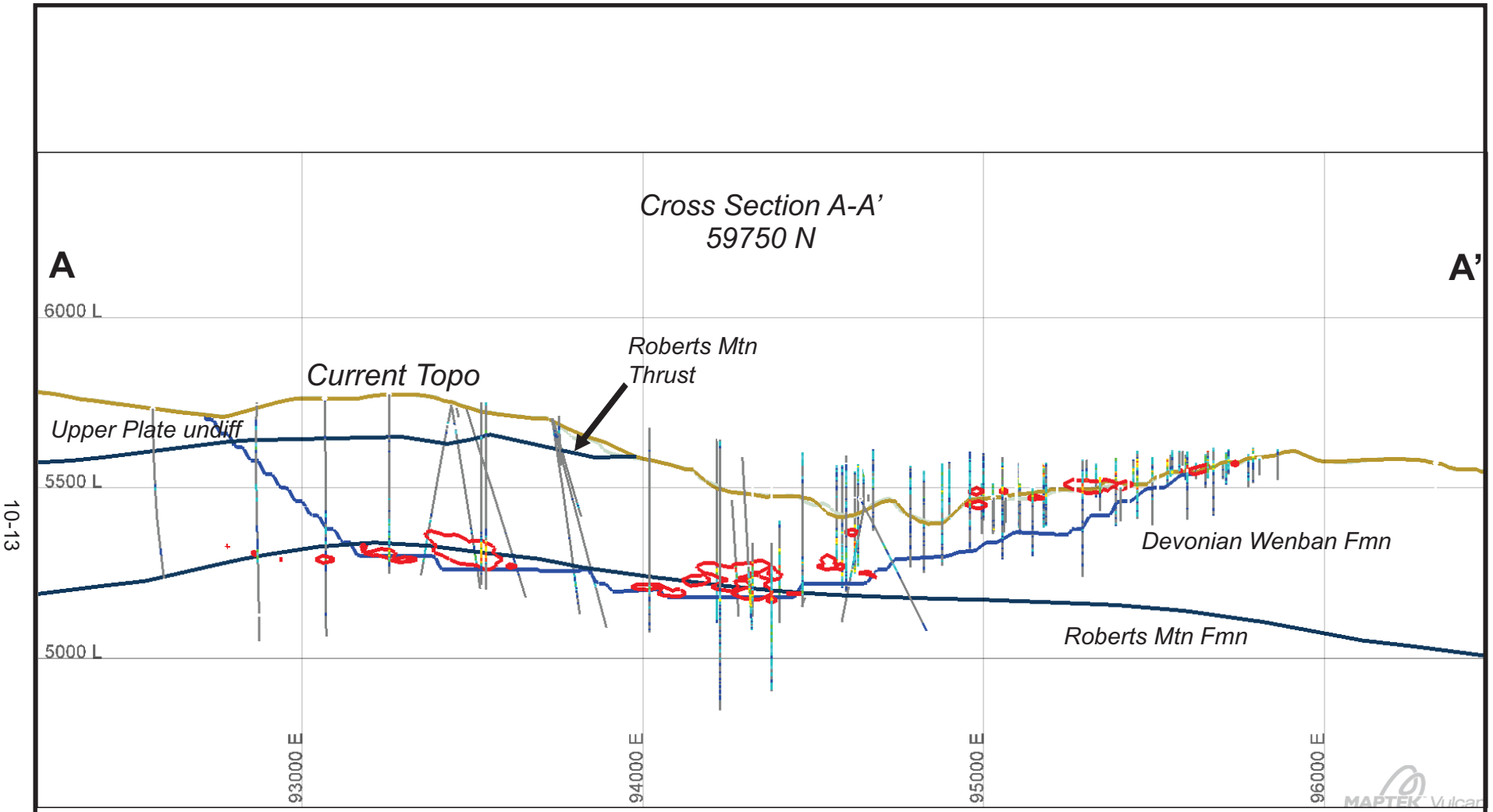


Legend:
Mineralization

Figure 10-5



Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Gold Acres Drill Hole Plan

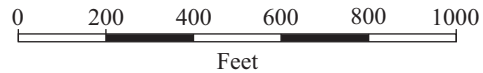


0.05 oz/st refractory grade shell (all refractory at Gold Acres)

Figure 10-6

Legend:

- Oxide > 0.004 oz/st
- Refractory > 0.05 oz/st
- Topography
- Mining Phases
- EOY18 Rsc. Phase



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Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.

Gold Acres Deposit Cross Section A-A'

CORTEZ HILLS

The surface and underground drilling in the area of the Cortez Hills deposit totals over two million feet in 4,427 holes completed from 1964 to 2018. This includes RC, core, dewatering, piezometer, and various other drilling types. The drill data for Cortez Hills was culled and data with various quality assurance/quality control quality assurance and quality control (QA/QC) issues (i.e., downhole contamination, poor assay sampling, missing collars and surveys, etc.) was later excluded from the resource estimations.

Drill holes at the Cortez Hills deposit are nominally spaced at 100 ft by 100 ft. Underground drilling of the Breccia Zone varies from 50 ft by 50 ft or less in areas of active underground mining to 150 ft by 150 ft within the “open-pit only” portions of the Mineral Resources. Underground drill hole spacing in the Middle Zone of Cortez Hills varies from 50 ft by 50 ft to 25 ft by 25 ft or less. Drill spacing in the Lower Zone of Cortez Hills varies from 50 ft by 50 ft to 100 ft by 100 ft depending on the level of delineation across the deposit.

Figure 10-7 shows a location plan for the Cortez Hills Complex including the Breccia, Middle, and Lower zones of Cortez Hills and the previously mined Pediment deposit. Figures 10-8 and 10-9 show cross and longitudinal sections illustrating the geology, gold mineralization limits, and typical drill hole density for the various Cortez Hills zones.

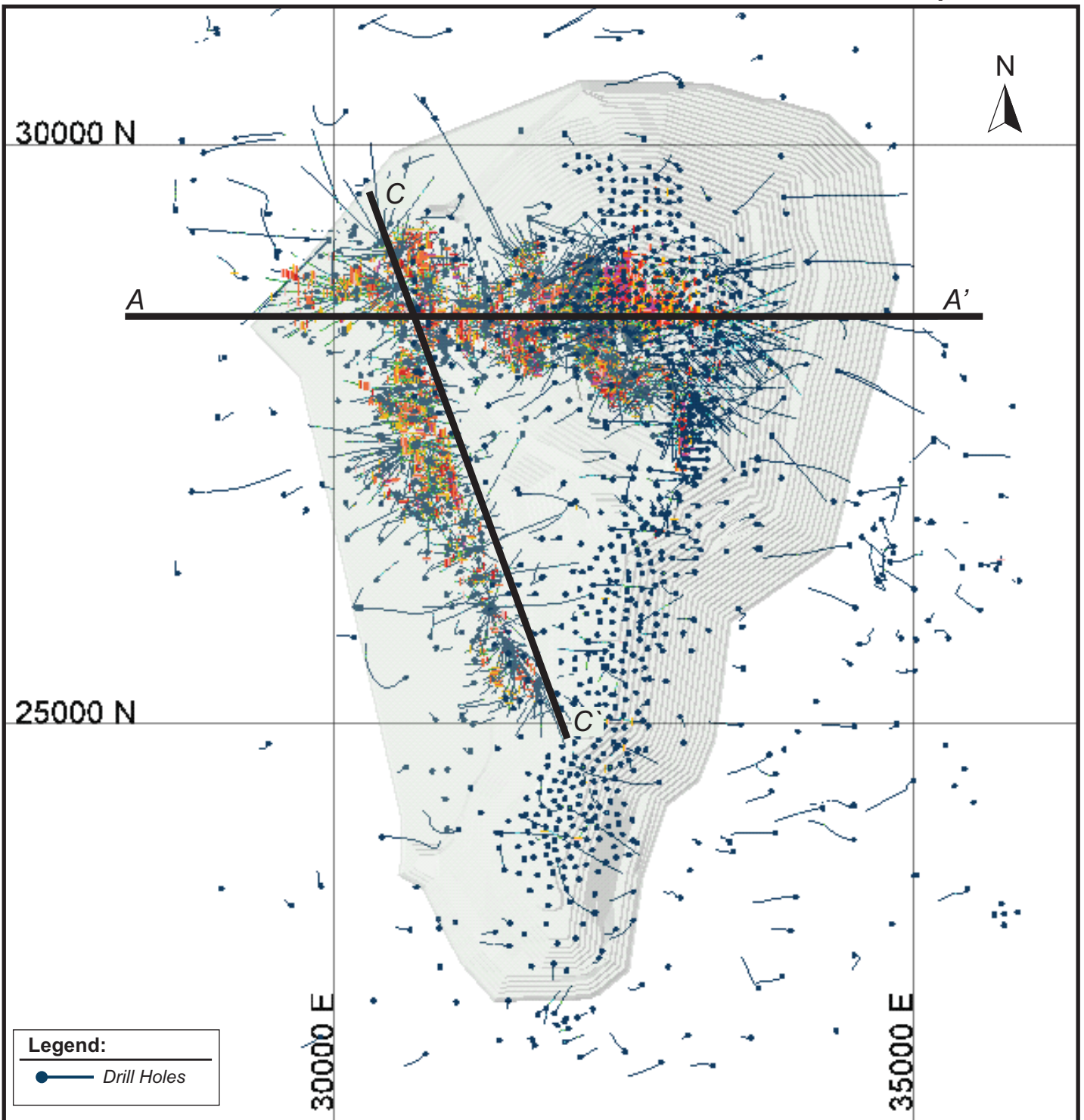
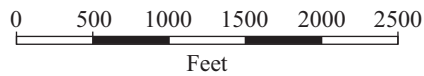


Figure 10-7



Barrick Gold Corporation
Cortez Joint Venture Operations
State of Nevada, U.S.A.
Cortez Hills Drill Hole Plan

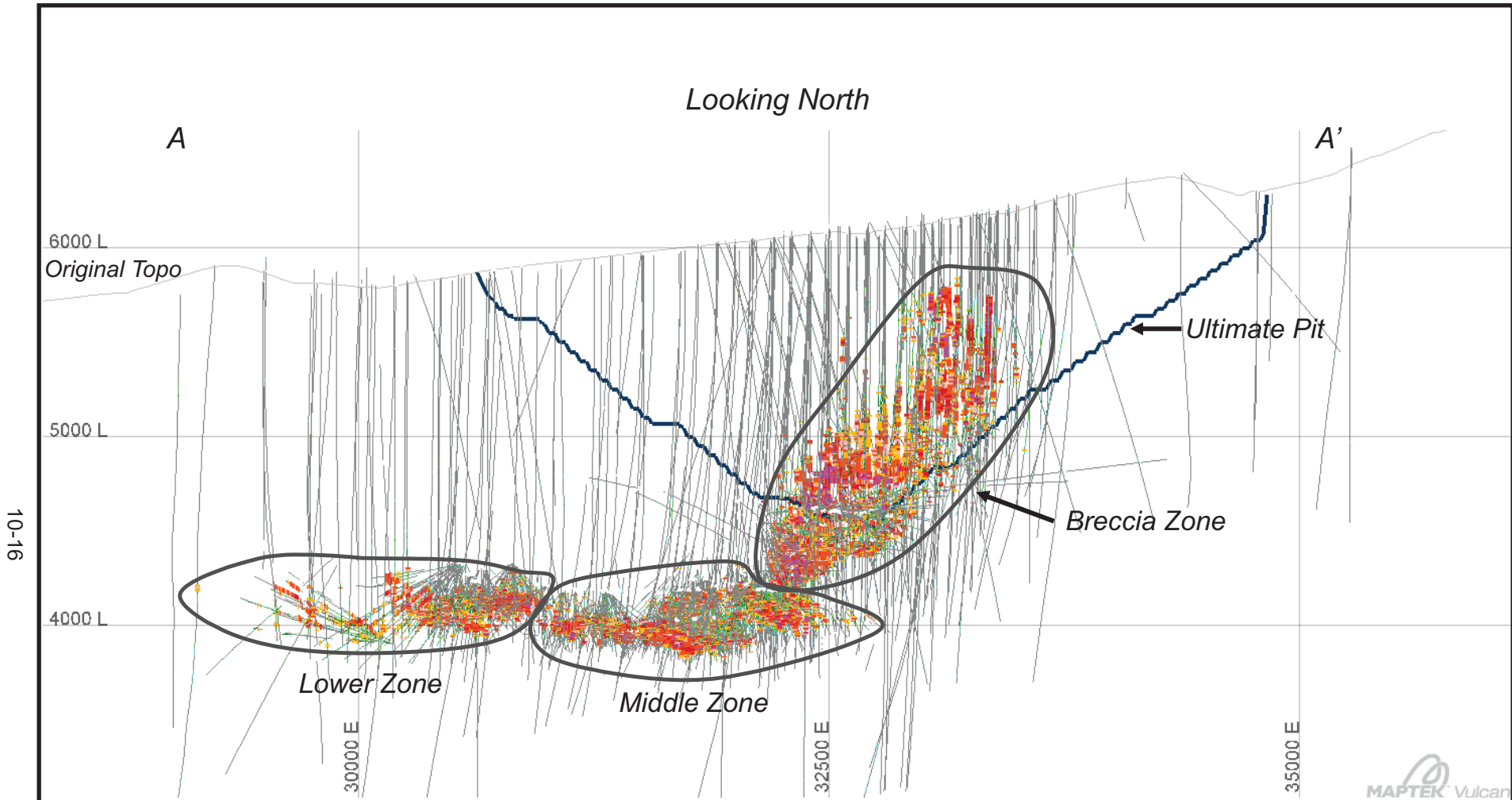
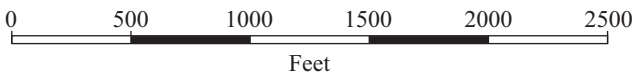


Figure 10-8



Barrick Gold Corporation
Cortez Joint Venture Operations
State of Nevada, U.S.A.
Cortez Hill Breccia Zone
Cross Section 28,600N (A-A')

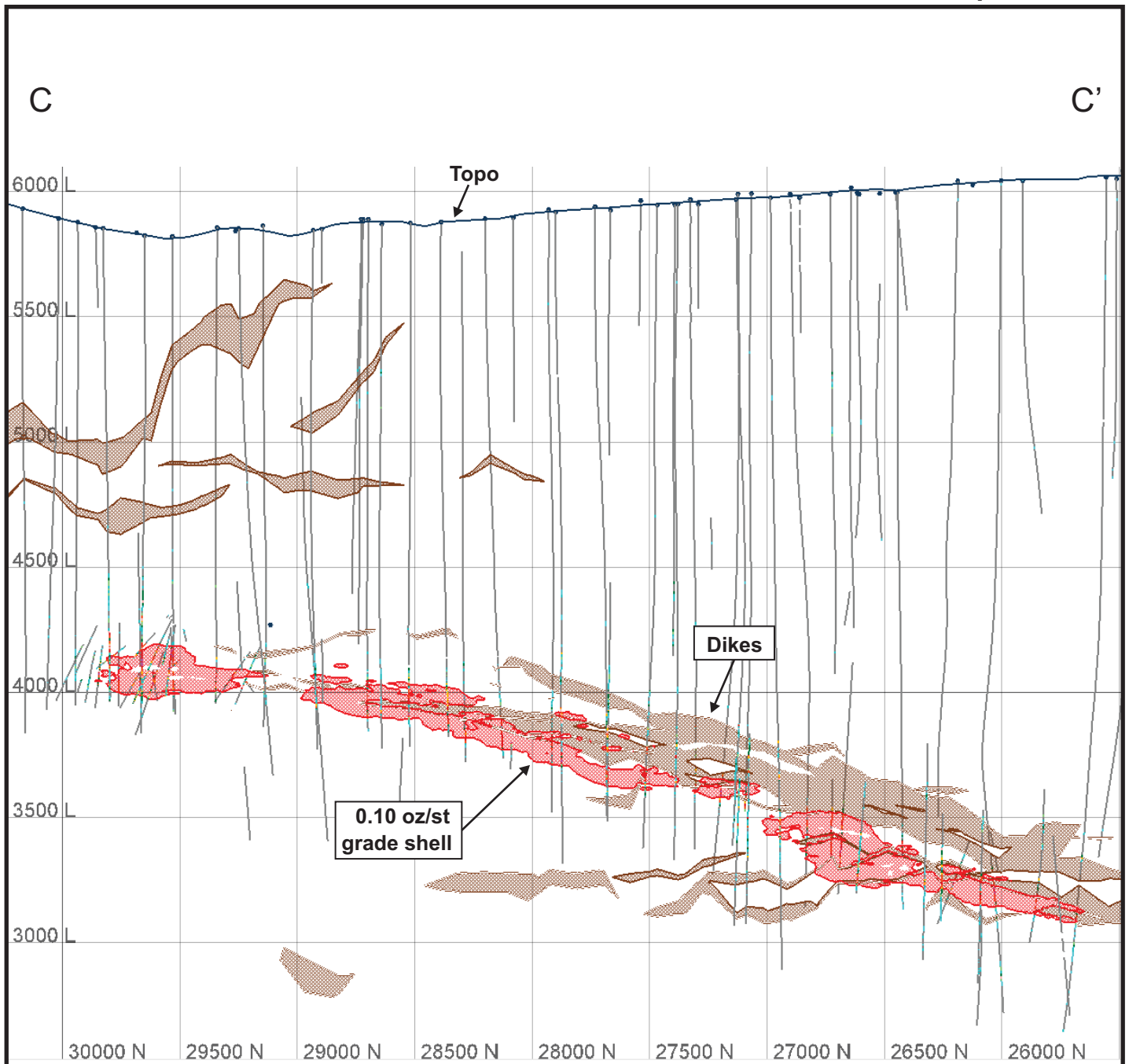


Figure 10-9

Barrick Gold Corporation
Cortez Joint Venture Operations
State of Nevada, U.S.A.
Cortez Hills Lower Zone
Looking East (C-C')

CORTEZ PITS (NW DEEP)

Drilling in the Cortez Pits area dates back to before 1967, but only validated holes from 1986 to 2015 are included in the drill database used for resource work. The Mineral Resource estimate is supported by approximately 280,860 ft of drilling in 450 holes and 37,415 assays. This includes 245,951 ft of RC drilling in 396 holes and 34,952 ft of core drilling in 54 holes.

Figure 10-10 presents the drilling for the Cortez Pits area and Figure 10-11 is a typical cross section.

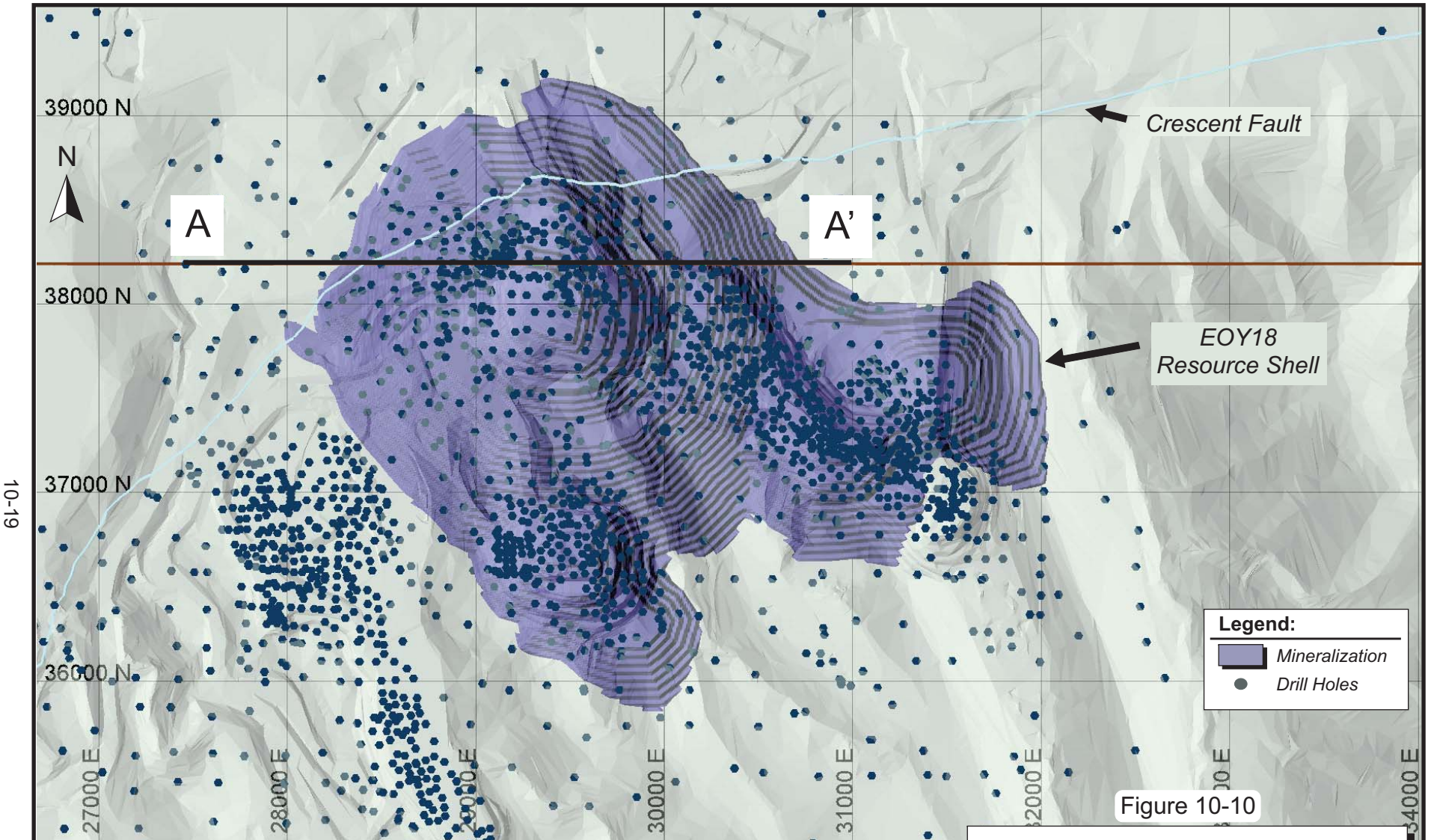
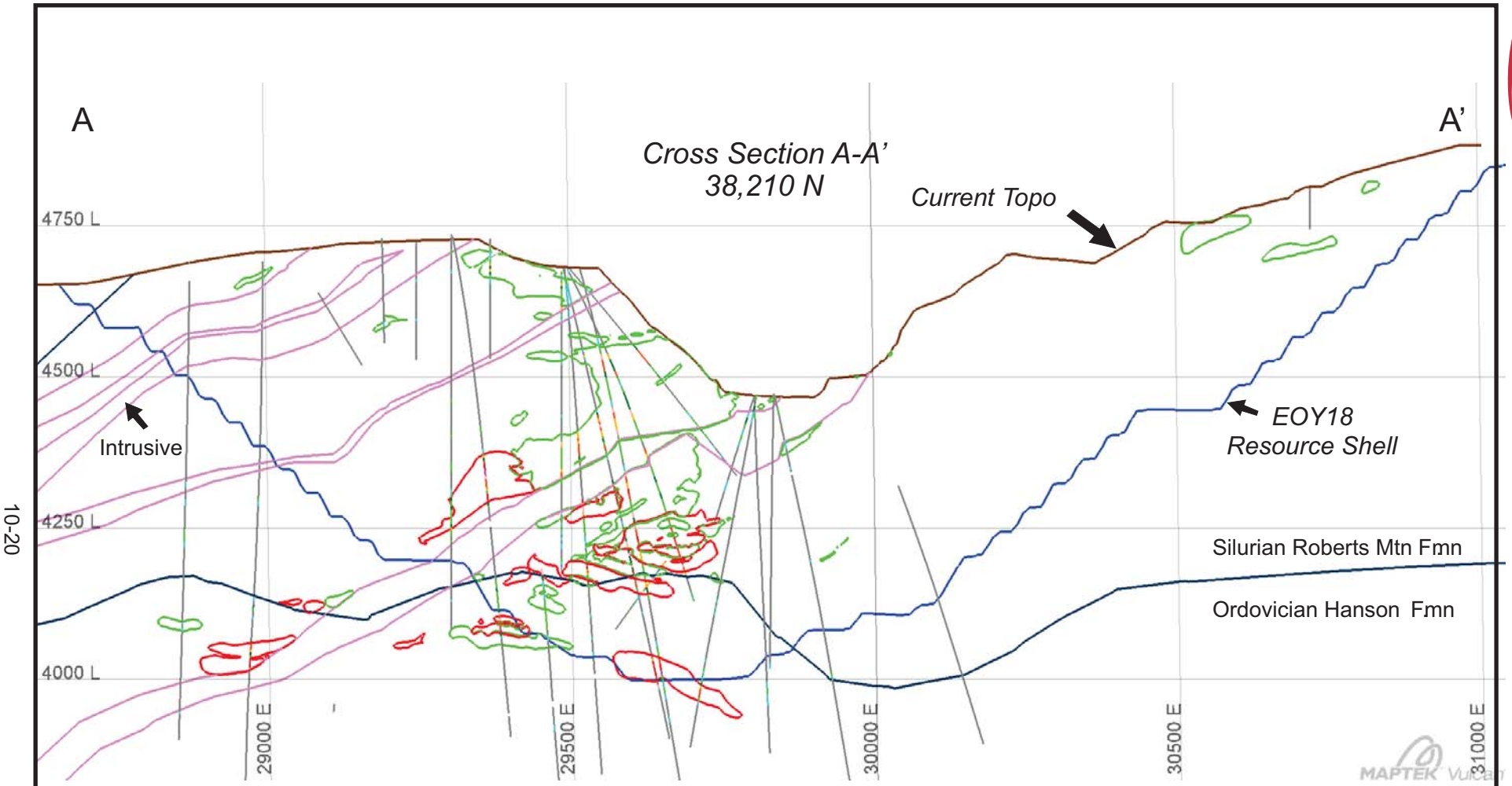


Figure 10-10

Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Cortez Pits Area (NW Deeps)
Drill Hole Plan



10-20

Legend:

	Oxide > 0.004 oz/st
	Refractory > 0.05 oz/st
	Topography
	Mining Phases

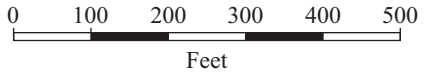


Figure 10-11

Barrick Gold Corporation

Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.

Cortez Pits Area Cross Section A-A'

COMMENTS ON DRILLING

In RPA's opinion, the quantity and quality of the lithological, geotechnical, collar, and downhole survey data collected in the exploration, delineation, and grade control drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation. RPA also notes that:

- Drill hole orientations are appropriate with respect to the orientation of the mineralization.
- Drilling is normally perpendicular to the strike of the mineralization, however, depending on the dip of the drill hole and the dip of the mineralization, drill intercept widths are typically greater than true widths.
- Drill hole intercepts adequately reflect the nature of the gold mineralization. Downhole composite data indicate areas of higher-grade and lower-grade mineralization, and waste material within the deposits.
- The deposits have been well drilled.
- Through interpretation and aggregation of the drill hole data, the sections provide a representative estimation of the true thickness of the mineralization for the various deposits in relation to planned pit and underground mining boundaries that are used to constrain the Mineral Resources and Mineral Reserves.
- Collar surveys have been performed using industry-standard instrumentation.
- Downhole surveys have been performed using industry-standard instrumentation.

SAMPLING METHOD AND APPROACH

RC SAMPLING

Drillers carry out the sampling on the RC drill rig. After material discharges from the hydraulic, revolving wet sample splitter on the cyclone, the fraction to be sampled is subdivided by a Y-shaped joint in a 5 in. sample discharge pipe and each split collected in a five-gallon plastic bucket lined with 19 in. by 22 in. Micro-Pore sample bags. Bags are pre-numbered and tagged by Cortez. Recently, collection has been modified to Micro-Pore bags placed in one-gallon metal sleeves hung beneath each arm of the Y pipe splitter. Samples are allowed to air dry in the field and are then picked up at the drill sites by geological technicians. Where areas are relatively open to the public, this loss of chain of command may compromise sample security.

RC chip samples (typically $\frac{1}{2}$ in.) were collected by drillers in 5 ft intervals for Gold Acres drilling and in the initial 1991 drilling at Pipeline. By late 1991, RC samples at Pipeline were collected on 10 ft intervals per the Cortez Hills protocol. The 10 ft samples weigh from 10 lb

to 15 lb and represent a mass reduction to a small percent of the original. The sample reduction is summarized in Table 10-2.

**TABLE 10-2 REVERSE CIRCULATION SAMPLE REDUCTION
Barrick Gold Corporation – Cortez Operations**

RC Hole Diameter	10 ft Length	
	10 lb	15 lb
7"	2%	4%
4.5"	6%	9%
7"	41x	27x
4.5"	17x	11x

Footage intervals were recorded by a technician on a separate shipment record from the corresponding sample numbers. Commercially prepared standards and blank samples of landscaping marble are inserted by the drillers randomly into the numbering sequence prior to sample pickup.

Chip samples of each RC interval are collected and stored in plastic chip trays for geologic logging. Each chip tray represents approximately 200 ft of drilling. Chips are logged by project geologists or geological contractors. The logging form is set up to record stratigraphic formation, rock type, rock textural characteristics, veining, significant minerals, alteration, and estimated sulphide, carbonate, and carbon content. Completed logs are entered into a master database. Chip trays are stored in a central warehouse facility on site. Until the 1970s, representative RC chips were glued to boards as hole records; however, none have survived. Digital backup copies of the geologic logs are stored offsite. All hardcopy logs that were used prior to the inception of digital logging are archived in files, labelled, and stored in the exploration or mine geology offices.

Drilling is almost always carried out with water injection. Drilling below elevations ranging from 5,000 ft to 5,700 ft at Cortez Hills is below the water table. Total sample weight cannot be measured because of wet drilling conditions; therefore, RC recovery cannot be calculated.

CORE LOGGING AND SAMPLING

Drill core is washed and photographed prior to logging. Core is digitally photographed wet, except in cases of exceptionally poor rock quality. Older film photographs have been scanned and electronically archived. Step-out exploratory drill holes are summary-logged and

representative chip samples are collected at one foot intervals, making up a composite sample over 20 ft. The chip samples are analyzed for gold as well as multi-element geochemistry. Chip samples are excluded from grade estimations. If the core was later cut, the cut core values are used for grade estimation, if the core was not cut, because of low grade assay results than the chip grades are set 0.0001 oz/st Au and treated as waste during grade estimation. Retained core character samples are stored on site at the Pipeline and Cortez core storage facilities.

When the assays are returned for the exploratory hole, detailed geologic logging is carried over the mineralized interval, bracketed by 100 ft of core above and below. The interval is then cut and resubmitted for gold assay. In-fill and development drill holes are subjected to detailed geologic and geotechnical logging.

The core is logged by a geologist for geological and geotechnical elements. Prior to 2004, logging was either done on paper and then entered into a computer or entered directly into a computer and was verified by Placer Dome software with text and graphics capability. After review by geologists, corrected logs were reprinted and electronically merged into the master database by a computer administrator. After the implementation of an acQuire SQL Server database in 2004, logging was changed to an acQuire data input form. This requires selection of attributes from a prescribed list, avoiding entry of non-standard symbols or qualifiers. The computerized geological logging format allows for recording mineralogy, structure, texture, alteration, rock type, colour, brightness, lightness, grain size, sorting, sphericity, shape, degree of decalcification, and carbon content.

Point load tests of selected intervals and other geotechnical data were collected by staff technicians and the geology department. After mid-2006, Golder Associates Ltd. (Golder) carried out this task, but only on core drilled for geotechnical purposes or upon request.

Most drill core from Pipeline and Cortez Hills was sampled and assayed at 10 ft intervals, though several holes were assayed at five feet or variable geological intervals early in the drilling programs. Since 2004, exploration core holes have been sampled on 10 ft intervals in barren rock and on geologically defined intervals up to five feet in mineralization. Underground core is sampled on five foot intervals, however, samples could be a minimum of two feet to a maximum of six feet to facilitate respecting lithological or mineralization contacts.

Almost all core was sawn in half by a Cortez technician except for underground core where whole core is sampled. A hydraulic splitter has been used for extremely hard rock to maintain acceptable production rates. Any fragmented core less than one inch diameter was split through a riffle splitter. One-half of the core or a riffle split was placed back in the original core box and the other half in 10 in. by 22 in. Micro-Pore cloth sample bags with a numbered paper sample tag. Sample numbers are assigned using sample ticket books. The sample number was also handwritten on the exterior of the bag with a permanent marking pen, along with the drill hole number. Including drill hole numbers with sample labels is not considered best practice. A technician recorded footage intervals on a separate shipment record form with the corresponding sample number. Metallurgical core was quartered, with one quarter retained as a character sample and the remaining assayed and consumed for metallurgical testing.

The retained core is stored on site. Barrick exploration has a core storage facility, which contains drilling for the site, located near the Pipeline administration office. Other sample storage areas include the East Pit at Cortez Pits and the Gold Acres Pit.

CONVENTIONAL AIR-ROTARY AND MUD-ROTARY SAMPLING

Sampling was carried out at 5 ft to 10 ft intervals. Early (mid-1980s) rotary air sampling may have been accomplished in dry conditions using non-porous plastic bags. Sample numbers were assigned using sample ticket books.

BLAST HOLE SAMPLING

The practice is to double sample the 40 ft blast holes on mineralized horizons. One sample represents the bottom 20 ft, while the other represents the upper 20 ft of the hole. Any 40 ft trim shots are single sampled as are 20 ft holes on a 20 ft bench. A representative sample of blast hole drill cuttings is collected by placing a 6 in. diameter, 12 in. tall vertical cylinder near the drill hole and inside the rig dust rubber curtain. Approximately 7 lb to 8 lb of material is collected. The sample number records the location and uses a bar-coded tag. Samples are assayed at the Cortez Mine assay laboratory. Analytical data are incorporated electronically into the blast hole database. The blast hole sample reduction is summarized in Table 10-3.

TABLE 10-3 BLAST HOLE SAMPLE REDUCTION
Barrick Gold Corporation – Cortez Operations

Diameter (in.)	Sample Reduction to:		Including Sub-Drill	
	7 lb	8 lb	7 lb	8 lb
9.875	0.22%	0.25%	0.20%	0.22%
8.875	0.53%	0.61%	0.44%	0.51%
9.875	465x	407x	511x	447x
8.875	188x	164x	225x	197x

Blast hole sample results are used for open pit mine grade control, however, the results are not used for Mineral Resource and Mineral Reserve estimates.

UNDERGROUND MUCK SAMPLING (CORTEZ HILLS)

Muck samples are the only means for grade control on face rounds. Samples are taken either from the face or from the muck bay if the face is not safe to sample. Muck samples are taken every 1st, 6th, 12th, and so on, scoop from the muck pile of a given round.

The muck sample is placed in 12 in. by 18 in. bar coded bags and represents approximately 20 lbs of material. Analysis developed by Pierre Gy and screen tests determined that samples of one-inch to two-inch fragments plus fines are representative. Samples are assayed at the Cortez Mine assay laboratory. Analytical data are incorporated electronically into a muck database within the acQuire database and there is a plan to use the muck sample results and the exploration drilling results in a Vulcan software grade control module to create mini-block models.

Bulk muck from longhole stopes or benches is sampled from the blast hole sample cones. Each row of blast cone samples is composited into one assay. The combination of all composited row assays is weighted and averaged together based on the ratio of total row holes lengths to total row hole lengths for the entire stope. This grade is then associated to all tons coming out of that given stope.

This sampling method both reconciles better to the mill (averaging +/-3%), and is the only method that works with automated mucking at Cortez Hills.

Underground muck and blasthole sample results are used for mine grade control, i.e., material routing on a round by round basis, but are not used for Mineral Resource and Mineral Reserve estimates.

BULK DENSITY DETERMINATION

Whole core sampling for bulk density measurement was initiated in April 1992 at the Pipeline deposit and density was determined for a total of 467 ore and waste samples. Standard practice since 1999 has been to collect samples at 35 ft to 40 ft intervals in mineralized rock and one sample within 50 ft in the hanging wall and footwall. Generally, density samples are taken zero to fifty feet above the mineralization, in mineralization, and zero to fifty feet below the mineralization.

Core is prepared by the Cortez geology staff and the mine metallurgical laboratory carries out the density measurements. The primary method of measuring core density is by wax immersion. Competent core is coated in wax and then immersed in water. There are five other methods, which have been used in the past and may be used on occasion depending on the situation. Those other methods are:

- Fragment displacement (lacquer coated fragments are immersed in water)
- Core displacement (lacquer coated core is immersed in water)
- Core axis length and diameter is measured and applied to dry weight of sample
- Plastic sleeve (poor quality core in PVC pipe is wrapped and immersed in water)
- Buoyancy (competent core is wrapped in cellophane and immersed in water)

Cortez has compiled bulk densities for the various rocks and overburden for each deposit. Values range from 11.7 ft³/st to 16.6 ft³/st for rocks and 16.2 ft³/st to 19.1 ft³/st for alluvium..

LOGGING, SAMPLING, AND SAMPLE STORAGE FACILITIES

Cortez has permanent facilities for core logging and sampling, as well as storage warehouses. RPA visited the exploration core facility located near the Pipeline Mill and found the layout to be clean, organized, and in line with industry standards for layout, facilities, and procedures. Drill core, RC chips, retained character core, pulp, and pulp duplicate samples are stored on-site in the Cortez and Pipeline storage warehouses. Older core for mined-out portions of the deposits has been skeletonized to reduce storage. Sample rejects are retained, but stored outside where they degrade after two to three years at which time they are no longer useful.

Prior to 2006, core could be stored in open air core yards, but this practice has been discontinued.

In RPA's opinion, the core handling, logging, and sampling protocols conform to industry-standard practice, are being carried out to a reasonable standard, and are acceptable for Mineral Resource and Mineral Reserve estimation.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

Analytical procedures that support Mineral Resource estimation, including sample preparation and sample analysis, were performed by independent analytical laboratories without company involvement from 2005 to the present. Samples prior to that date were primarily prepared and analyzed by the Cortez laboratory.

ANALYTICAL LABORATORIES

Prior to 2000, the mine laboratories at Mill No. 1 (Laboratory No. 1) and Mill No. 2 (Laboratory No. 2) assayed the majority of exploration samples, principally those for Pipeline, Crossroads, and Cortez NW Deep (Cortez Pits). Laboratory No. 1 was located at the old Cortez Mine facility and closed in 1997. Laboratory No. 2 was constructed in 1997 and is currently operating at the Pipeline process facility.

Several commercial laboratories, independent of the Cortez Operations, were used for assaying or check assaying since 1991, including Rocky Mountain Geochemical Laboratory, American Assay Laboratories (Sparks, Nevada), ALS Chemex, Barringer Laboratories (now Inspectorate) in Reno, Nevada, the Placer Dome Research Centre, and Monitor Geochemical Laboratory (Elko, Nevada).

ALS Chemex has been the primary independent commercial laboratory. The majority of core and RC samples for Cortez Hills were prepared by the ALS Global - Geochemistry Analytical Lab in Reno, Nevada, USA, and assayed by the ALS Global - Geochemistry Analytical Lab in Vancouver, British Columbia, Canada. Both of the ALS Chemex laboratories are ISO/IEC 17025:2005 and ISO 9001:2015 accredited.

Since 2005, all exploration assaying, as well as underground assaying for development drilling at Cortez Hills and supplementary drilling at Pipeline and Crossroads, has been performed by ALS Chemex. The Cortez mine laboratory is neither independent nor ISO accredited, but has been principally used for mine related grade control samples and processing analysis.

SAMPLE PREPARATION

Sample preparation protocols for the independent commercial laboratories and Cortez Mine laboratories were similar. The initial sample preparation for Pipeline drilling in 1991 to 1992 was:

- Sample bags were dried at 350°F for six to 12 hours.
- Samples were weighed on a triple beam balance to an accuracy of 0.1 kg.
- Samples were fed through a TM Engineering Ltd.'s (TM) Rhino Jaw Crusher set at 1/8 in.
- Entire sample was screened to minus 10 mesh. Oversize was run through a Bico disc pulverizer to reduce the oversize to minus 10 mesh.
- Entire samples were split to 500 g with a Jones-type splitter. The 500 g split was dried a second time.
- A 500 g aliquot was pulverized to 100% passing 150 mesh in a TM vibratory ring pulverizer. Pulverized sample was homogenized on a roll mat. Ring pulverizer was cleaned by pulverizing a crushed crucible between each sample.
- Reject was retained and stored.

The coarse-crush protocol was changed to 80% passing 10 mesh in late 1992, and between 1992 and 1997, it was changed to 95% passing 6 mesh. By 1998, the crushing protocol was changed to:

- Entire sample crushed to minus ¼ in. using a jaw crusher.
- Entire sample crushed to 95% passing 8 mesh in a roll crusher.
- 500 g aliquot split for pulverizing to minus 200 mesh in an automated pulverizer.

This protocol was maintained until 2000 when new crushing and grinding equipment was acquired by mine Laboratory No. 2. The mine laboratory now uses a Rocklabs crusher and rotary splitter and a TM automated ring-and-puck pulverizer for exploration samples. The Rocklabs splitter uses a two-stage process to crush the entire exploration sample to 95% passing 10 mesh and produce a 500 g sample aliquot. The 500 g is pulverized for 75 seconds in the automated pulverizer, producing a product of 95% passing 175 mesh. Gravel is pulverized between each run of the 24-compartment pulverizer to clean the unit. Crush and pulverizer specifications are checked once weekly. Balances are calibrated every six months.

ALS Chemex uses the following sample preparation procedures for Cortez samples:

- High temperature drying of samples (DRY-21 procedure).
- Weighing, drying, fine crushing entire sample to greater than 70% minus 2 mm, splitting off up to 250 g, and pulverizing split to greater than 85% passing 75 µm (PREP-31 procedure).
- Compositing procedure, homogenizing the composite pulp, gravimetric procedure (CMP-22).

ANALYSIS

In 2004, ALS Chemex assayed Cortez Hills samples by fire assay and atomic absorption (AA) finish, using a 30 g pulp aliquot. All samples reporting greater than 0.1 oz/st Au on the initial assay were re-assayed by fire assay with gravimetric finish. Cyanide leach gold assays were performed for initial fire assays (FA) higher than 0.008 oz/st Au. A cold cyanide shake leach, analyzed by AA, is performed if the initial fire assay is higher than 0.015 oz/st Au. If the initial fire assay is higher than 0.040 oz/st Au and lower than 0.15 oz/st Au, a “preg-rob” test is performed. This is performed by combining 10 g of pulp with 20 mL of a 0.050 oz/st Au cyanide solution and agitating for eight to ten minutes, then analyzing by AA. Samples with a cyanide soluble (AA)/FA ratio of less than 0.3 are routinely assayed for sulphur and total carbon in a LECO furnace.

The current practice is to FA, AA, and test for preg-rob on all intervals within pre-selected zones. More selective triggers apply in unmineralized zones. The following general protocol is used for gold and multi-element analyses:

- Gold analyses: Gold assay (0.005 ppm to 10 ppm) by 30 g FA/AA analysis (Au-AA23 procedure).
- Au (0.03 ppm to 50 ppm by cyanide leach – AAS, 30 g nominal weight (Au-AA13 procedure).
- Au by fire assay and gravimetric finish, 30 g nominal weight, range 0.05 ppm to 1,000 ppm Au (Au-GRA21 procedure).
- Multi-element analyses by aqua regia digestion/inductively coupled plasma-atomic emission spectroscopy (ICP-AES)/ICP-mass spectroscopy (ICP-MS), 51 elements or 48 element analyses by four acid and ICP-AES/ICP-MS (ME-MS41 procedure or ME-MS61m procedure, respectively).

A Laboratory Information Management System (LIMS) was implemented at mine Laboratory No. 2 in 1998. Laboratory No. 2 uses a sample bar code system and transfers all information

to the mine database electronically via the LIMS. ALS Chemex assay certificates are downloaded from the ALS Chemex website and loaded directly into the mine database using acQuire.

A standard FA with gravimetric finish is performed on one-assay ton (29.18 g) pulp aliquots for all core and RC samples analyzed by the mine laboratory. If the initial fire assay is greater than 0.1 oz/st Au, an additional fire assay is performed. If the initial fire assay is greater than 0.2 oz/st Au, two additional fire assays are performed.

Twenty foot composites made from core and RC samples are routinely analyzed for a 49 element suite by ALS Chemex. For the underground development holes, multi-element analysis is performed on every sample (approximately 5 ft intervals). The trace-element suite is obtained by inductively coupled plasma (ICP) – arc atomic absorption spectroscopy following an aqua regia digestion of the sample pulp. Trace elements include As, Sb, Hg, Tl, Fe, and Ca, which in association with Au show positive or negative correlations with mineralized areas. High Hg analyses from the partial-digestion ICP data have been checked against cold-vapour hydride analyses, also run at ALS Chemex, and have shown generally close correlation ($\pm 5\%$) with the cold-vapour values. The multi-element ICP suite has changed in composition and detection limits several times in the last 15 to 20 years as analytical techniques have improved.

Additional assay methods, as recorded in the database of the 1960s, were typically used for exploration or other specialized purposes such as gas sampling, and were not consistently carried out. They include gravimetric, sulphuric acid digest, total copper, neutron activation analysis, X-ray diffraction (XRD), and X-ray fluorescence (XRF) methods.

SAMPLE SECURITY

Grade control samples from operations are managed by employees of the Cortez mining operation and its drill contractors, while exploration samples are managed by Barrick exploration personnel and its contractors. Prior to 2008 the chain-of-custody was managed by CJV staff and their contractors.

Blast hole samples are delivered directly from the open pits to the Cortez mine laboratory. Underground muck samples are dropped off at sample tables located throughout the underground workings where sample technicians retrieve them up and bring them to surface.

Blast hole samples for bulk muck are sampled by sample technicians, and then brought to surface. These are then brought to the sample room at the F-Canyon Office block. Underground RC and core samples are brought to surface by contract drillers then left and checked into the sample office on surface.

Sample security relies on the samples being either always in custody of Cortez personnel or stored in the locked on-site preparation facility or stored in a secure area prior to pick-up by ALS Laboratory personnel or delivery to the on-site Cortez laboratory. A unique and independent sample number is used for each sample with dispatch-submittal sheets and database entries used to track the progress of samples and to ensure that all samples are received by the laboratory.

Unique and independent sample numbers and sample tags are used in all cases. Sample dispatch and submittal sheets are used to check and track samples through the system. Sample information is entered into the computer database to track the samples and record results.

Table 11-1 summarizes the chain-of-custody of the samples from the collection point to the analytical laboratory.

**TABLE 11-1 CHAIN OF CUSTODY SUMMARY
Barrick Gold Corporation – Cortez Operations**

Blast-holes (OP)	Grade Control			Exploration Drilling	
	Muck (UG)	Core (UG)	RC (UG)	RC	Core
Material Collection at Source					
Cortez drillers	Cortez loader operator	Cortez Geotechnician	Drill Contractor	Drill Contractor	Barrick employees
Transportation from Source, Handling, Sample Delivery to Laboratory					
Cortez drill & blast personnel	Cortez Supervisor	Drill Contractor	Drill Contractor	Barrick employees	Barrick employees
	Cortez employees	Cortez employees	Cortez employees	Barrick Geotechnician	
		ALS employees	ALS employees	ALS employees	ALS employees
Sample Preparation and Analysis					
Cortez laboratory	Cortez laboratory	ALS laboratory	ALS laboratory	ALS laboratory	ALS laboratory

COMMENTS ON SAMPLE PREPARATION, ANALYSIS, AND SECURITY

In RPA's opinion, the sample preparation, analytical procedures, and sample security used at Cortez for mining operations and exploration projects are appropriate for use in the estimation of Mineral Resources.

QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC for sampling, sample preparation, and assaying has evolved at Cortez since 1991. Current procedures include insertion of blanks and certified standard samples into sample streams to the mine and commercial laboratories, check assays of pulp duplicates by commercial laboratories, and assaying of coarse reject duplicates. Since 2006, Barrick corporate geochemists have inspected the laboratories that undertake analysis and sample preparation for the Cortez Mine.

Barrick's QA/QC practices for exploration at Cortez comprise a minimum of one standard, one blank, and one duplicate introduced per batch of 30 samples to the sample stream resulting in 10% quality control samples. Underground grade control drilling involves insertion of one standard and one control blank for every 30 samples, however, because whole core is often sampled there is no opportunity for duplicate samples.

The acQuire database is maintained by the Database Administrator at the Barrick Nevada – Cortez District office at Cortez. The assay laboratories report results to the central office as well as the project geologist. Monthly QA/QC reports are prepared by the Database Administrator. The report evaluates the performance of the QA/QC samples, identifies any QA/QC failures, and tracks their investigation and resolution including any assay re-runs. Failures are reported to the project geologist who decides on a course of action. Issues that cannot be resolved by the project geologist result in a re-run of an entire batch or in some cases an entire hole. Assays are maintained on temporary status until signed off by the central office and the project geologist.

RPA reviewed the QA/QC program for 2017 and 2018 which included the insertion of standards, blanks, and duplicate samples into the sample stream. QA/QC samples accounted for greater than 6% of the total. All samples considered failures were accepted or resolved.

STANDARD SAMPLES

Certified Reference Standard (CRM) samples are materials of known values used to check and quantify the analytical accuracy of laboratories.

At Cortez, standards were originally made from stockpile materials at the mine. Since 2006, commercially available standards have been used. CRM samples were purchased from Rocklabs as pulps that were assayed in a round robin of 28 laboratories or made from bulk samples sent from Barrick's Nevada operations to CDN Resource Laboratories Ltd. where reference material was prepared after a 14 laboratory round robin. The average value and its standard deviation (SD) for the round robins are certified. The variation from the standard's mean value in standard deviations defines the QA/QC variance and is used to determine acceptability of the standard sample assay. Approximately 150 g of sample material is submitted per QA/QC sample.

There are currently twenty standard samples being used with expected values ranging from 0.0024 oz/st Au to 0.5285 oz/st Au. Standard samples are inserted into the sample stream at a ratio of 1:30 for surface exploration and approximately 1:15 for open pit and underground production samples.

The criteria for pass or failure are as follows.

- Assay value $<$ certified mean ± 2 SD \rightarrow Pass
- Assay value \geq mean ± 2 SD and \leq mean ± 3 SD \rightarrow Warning or Failure
- Assay value $>$ mean ± 3 SD \rightarrow Failure

A failure is declared when the same standard exceeds two consecutive ± 2 SD warnings or when an individual result exceeds ± 3 SD from the expected result.

The geologist in charge is notified when a standard failure occurs. The geologist then determines if the failure can be accepted, e.g., located in an unmineralized zone or a verified CRM swap. If the geologist determines the result cannot be accepted the laboratory is requested to re-run the failing batch.

BLANK SAMPLES

A blank control sample is material with a zero gold value. Blanks are inserted to assess sample preparation, specifically to identify “grade smearing” or sample carryover in subsequent samples caused by improper sample preparation and contamination, and to evaluate analytical “background noise”. Prior to 2006, blank material was made from:

- Un-mineralized drill core from Gold Acres
- Waste rock from the Cortez Pits
- Alluvial gravel taken from a pit near the Gold Acres haul road

Since 2006 landscape marble has been the material used to make blank samples for QA/QC at Cortez.

The following criteria are used to evaluate analytical results received for blank samples:

- Assay result less than 0.002 oz/st Au - Pass
- Pass limit is extended by 1% carryover from surrounding samples
- Assay result equal to or greater than 0.002 oz/st Au - Failure

The geologist in charge is notified when a blank failure occurs. The geologist then determines if the failure can be ignored or if it needs to be resolved by re-running the failing batch. Examples where the failure might be ignored include:

- The blank sample has been accidentally switched with a CRM or non-QA/QC sample
- The failure is in an area of known waste distal from mineralization

Laboratory procedures include cleaning of the sample preparation circuit after sample batches, however, the 1% allowance of carryover grade from surrounding samples makes some allowance for potential contamination from high grade samples processed within a sample batch.

During 2017 and 2018, 1,254 CRMs were submitted to ALS Chemex of which 147, or 12%, were considered failures. Of the 147 failures, 86 were accepted by the project geologist, e.g., sample mix-ups. Sixty-one of the samples, or approximately 5%, of the total samples were considered important enough to warrant re-assaying the entire batch. The failure rate for CRMs was higher in 2017 at 6%. In RPA’s opinion the reason for the high failure rate for 2017 should be investigated and explained. CRM QA/QC control charts are summarized in Appendix 1.

During the 2017 and 2018 period, 1,257 blank samples were submitted of which 42, or 3%, were considered failures. Twenty-eight of the failures were accepted by the project geologist as not justifying further consideration. Fourteen of the failures were considered important enough to warrant re-assaying the entire batch. Table 11-2 summarizes the failure statistics for CRM and blank samples for 2017 and 2018.

TABLE 11-2 CRM AND BLANK SAMPLES - SUMMARY 2017-2018
Barrick Gold Corporation - Cortez Operations

Year	Samples Submitted	Failures	Accepted	Resolved Rejected
Blanks				
2017	707	30	20	10
2018	550	12	8	4
Standards				
2017	692	110	67	43
2018	562	37	19	18

DUPLICATE SAMPLES

Duplicate samples of coarse rejects provide information on sample preparation and assay precision, while duplicate pulp samples may be used to quantify analytical precision. The assay results of the duplicates were analyzed by preparing scatter plots and relative difference plots that compared the difference of grade of the pairs to the mean grade of the pairs. The pass/fail criteria used by Barrick for duplicate pulp samples was nominally +/- 20%.

Duplicates of coarse rejects from RC samples were historically submitted at the rate of one in thirty samples. Between 2016 and 2018 duplicates of coarse rejects from core samples were limited, however, this practice has been re-implemented at the rate of one in thirty samples in individual projects with the intention of becoming standard for all projects.

OUTSIDE CHECK SAMPLES

Historically, 2% of the Cortez original sample pulps were sent for independent check assays. Using the original assay results from the primary laboratory as a guide, the geologist selected the pulps to be submitted for check assay. The chosen suite of pulps was representative of the ore types present in the samples, and included high grade, low grade, and waste material.

In 2015, the Mine discontinued the use of outside check samples, however, this practice has been re-implemented with a 5% check rate.

Similar to the description of duplicate sample protocols, the practice has been re-implemented at the rate of one in thirty samples in individual projects with the intention of becoming standard for all projects.

In the past, results of check assaying on pulps and coarse rejects were not routinely evaluated. Check assays, however, were used intermittently to evaluate biases between the mine laboratories and commercial laboratories.

For the period 1992 to 1996, a large number of commercial laboratories were used to check assays by the mine laboratory (Laboratory No. 1). No record was kept of the source laboratories for each check in all cases; therefore, some of the data cannot be differentiated by laboratory. A detailed review of check and duplicate assay records in 2003 reduced the number of unidentified laboratory assays to approximately 4%. No significant bias was detected between the mine and the commercial laboratories.

Check assay plots show a relatively high variability between the mine laboratory and commercial laboratories for 1997 through 1999 assaying. For grades greater than 0.01 oz/st Au, the majority of check assays are within $\pm 20\%$ to $\pm 30\%$ of the original value, which is somewhat higher than the expected $\pm 10\%$.

Check assays on samples primarily from the Cortez Hills deposit by Rocky Mountain Geochemical and American Analytical laboratories in 2000 to 2003 show less variability, with most checks within $\pm 10\%$ of the original value. In 2003, Cortez technical team investigated these biases in detail and adjusted historical assays for the Pipeline, South Pipeline, Crossroads, and Gap deposits for laboratory biases and sampling biases. The practice of adjusting assays has been discontinued.

Checks of the mine laboratory (Laboratory No. 1) assays were made as part of the 1995 FS. A pulp duplicate was prepared for one in every five Pipeline core samples and one in every ten South Pipeline core samples. A pulp duplicate was prepared for one in every ten RC samples for Pipeline and one every twenty RC samples for South Pipeline. These were assayed by Monitor Geochemical Laboratory and the Placer Dome Research Centre. Since

1995, this procedure of checking the mine laboratory assays has continued using Rocky Mountain Geochemical Laboratory, American Assay Laboratory, Inspectorate, and Monitor Geochemical Laboratory.

SCREEN CHECKS

Screen check assaying is not done at Cortez. Previous test work determined that coarse gold has not been an analytical issue to date, given the disseminated distribution and very fine-grained character of the gold mineralization. In RPA's opinion screen check assaying is not necessary in the mineralization types currently being mined, however, screen checks should be initiated in future discoveries if the mineralization is atypical, especially if coarse gold is present.

Screen checks have been implemented at the Robertson Project and the protocol will be assessed to determine if it is beneficial.

CORTEZ LABORATORY QA/QC

The on-site Cortez laboratory does not currently process any samples that are used for Mineral Resource modelling as these are all done at ALS Chemex.

The on-site laboratory runs its own internal QA/QC program. It uses commercially prepared and purchased standards of various grades. Current frequency of control samples is as follows:

- Production samples, fire assay with a gravity finish (FA-GRAV) and cyanide leach and Atomic Adsorption finish (CNL-AA)
 - 21 samples per set
 - one standard, one blank, and one duplicate per set
- Mill shift samples (solutions and solids)
 - one standard for each solution set of 23 samples and each solid set of 12 samples
- XRF – Carbon analysis
 - one standard for each set of 20 samples
- LECO – Carbon and sulphur analyses
 - one standard and one blank for each set of 22 samples

The laboratory is organized such that quality control samples are inserted automatically. Different grades of standards are used and run with underground, open pit, and mill process samples.

A monthly QA/QC compliance report details investigative findings regarding samples that fail the control criteria. With respect to gold analysis by both FA-GRAV and CNL-AA the following pass/fail criteria are applied by the Cortez laboratory. The pass criterion for standards is two standard deviations; standard variance between two and three standard deviations is taken as a warning; action is required when variance exceeds three standard deviations. The pass criterion for blanks is gold values less than 0.002 oz/st Au.

COMMENTS ON QA/QC

In RPA's opinion, the current QA/QC protocols and reports meet industry-standard practice and provide the necessary control to identify potential analytical problems and allow for corrective follow-up and re-analysis when required.

RPA concurs with the re-implementation of duplicate samples and outside laboratory checks, especially in areas of atypical mineralization that has little or no mining history and in areas with poor reconciliation.

In RPA's opinion screen check assaying is not necessary in the mineralization types currently being mined, however, screen checks should be initiated in future discoveries if the mineralization is atypical, especially if coarse gold is present.

12 DATA VERIFICATION

RPA checked previous Cortez and external data reviews and has conducted independent reviews of the methods and practices used by Barrick to generate the Cortez resource database (including drilling, sampling, analysis, and data entry) in 2010, 2012, 2016, and again in the preparation of this Technical Report. The verification included a review of the QA/QC methods and results, standard database validation tests, and a site visit. The review of the QA/QC program and results is presented in Section 11 of this report. RPA did not collect independent samples as the historical production of gold clearly demonstrates the presence of economic mineralization.

DATABASES

The Cortez technical database is being managed by the acQuire system implemented in 2004 replacing an earlier database system. Exploration data from a variety of sources are imported into acQuire using a variety of techniques and procedures to check the integrity of the data entered. Data that were collected prior to the introduction of digital logging have been subject to validation, using built-in program triggers that automatically checked data upon upload to the database. Since the mid-1990s, geological data have been validated by software routines and uploaded directly into the database. Analytical data are uploaded from digital sources. Survey data is uploaded by the project geologist from digital survey files. Verification is performed on all digitally collected data upon upload to the main database, and includes checks on surveys, collar co-ordinates, lithology data, and assay data. Since 2009, Cortez Hills and Pipeline Complex blast-hole data and CHUG drilling data are also imported into acQuire.

Database security and integrity is accomplished by restricting access and user level permissions that are set by the Database Manager. Once data entry and validation are completed for a drill hole, access is locked. There are procedures for updates that retain all the original information and prioritize use of the updates.

BARRICK REVIEWS

REVIEW OF ASSAY BIASES

In 2003, an in-house study was carried out to determine the causes of historical biases between resource estimates based on exploration drilling, mine production based on blast hole models, and mill production. Results indicated that:

- Blast hole assays performed by AA were biased low.
- Blast hole and exploration hole fire assays performed by the mine laboratories were biased low relative to fire assays by commercial laboratories.
- There are sampling losses in exploration holes, which result in an occasional low bias, even though core recovery is very high.
- There are smoothing effects in resource estimation procedures that result in lower average grades in RC holes.
- Small scale higher grade zones may exist between holes and are missed by drilling.

Bias adjustment factors were developed, however, by 2006 most of the affected areas had been mined out. Remaining data were evaluated on a hole by hole basis and where a downhole contamination or bias issue occurred it was noted. The drill hole in question was flagged and was not used to support Mineral Resource or Mineral Reserve estimates. No bias adjustment factors for assay data have been used since 2007.

CORE VERSUS RC DRILL COMPARISON, CORTEZ HILLS

An in-house study, triggered by downhole contamination noted in at least three RC drill holes, was undertaken in July 2004 to compare results from RC and core holes used in the Cortez Hills resource estimate. Core versus RC twin data were reviewed and resources were estimated separately based on only RC data and on only core data for comparison. Preliminary results suggested that core holes on average were of higher grade than RC holes, depending on the grade range. The core averages were considered to be biased high because core holes were more common in the high-grade centre of the deposit. Individual RC/core twin holes compared reasonably well, showing less of a high bias in the core holes. Additional core drilling at Cortez Hills since 2004 has replaced the contaminated RC holes, and new twinning holes are currently being planned.

BLAST HOLE SAMPLING REVIEW

Cortez reviewed the use of a pie sampler versus the cylinder sampler and found no significant difference in assays between the methods for 1,900 blast holes. The cylinder sampler has been retained.

EXTERNAL REVIEWS

AMEC reviewed the Cortez Hills drill database in 2004 and 2005, checking lithological and analytical data and database integrity. Data were found to be suitable to support Mineral Resource estimation.

RPA DATABASE REVIEW

RPA undertook reviews of the database as part of an audit review report in July 2010, January 2012, May 2015, and again in the preparation of this Technical Report.

JULY 2010 REVIEW

RPA received drill hole and block model databases in Vulcan/ISIS formats. Files were reformatted to ASCII and imported into Gemcom GEMS 6.2.2 software for review. GEMS was employed to validate the drill hole database using software routines that trap errors and potential problems.

GEMS validation routines found some downhole survey records lacking collar zeros (fourth bullet above) and several cases of zero intervals, most at the end of lithology files/tables. None of these minor errors have an impact on resource estimation. Otherwise the drill hole databases were clean and readily imported.

JANUARY 2012 REVIEW

Drill hole and block model databases for each of the resources reported by Cortez for mid-2011 were received from Barrick in Vulcan/ISIS formats. The validation review focused on the databases supporting the June 30, 2011 Mineral Resource and Mineral Reserve estimates for the Cortez Hills Complex open pit, underground, and Lower Zone models that represented 76% of the contained gold in the Mineral Reserves.

The resource databases were imported into Vulcan 3D Version 8.0.3 software for review. Vulcan database validity routines found no errors with out-of-range values, or from-to intervals, and that sample lengths and assays values were within reasonable limits. With a few minor exceptions, drill hole collars were found to be within the area limits of the model.

All the data was consistently presented and organized and all units within the database were consistent.

RPA also carried out a spot check comparison of the supplied resource databases against original documents for collar surveys, downhole surveys, and laboratory assay certificates. The 35 holes checked for collar surveys were all found to be correctly entered. Two of the 16 holes reviewed for downhole surveys had minor errors that were corrected.

The azimuth and inclination measurements for the remainder of the database entries were found to correspond with the original downhole survey measurements.

The gold fire assay (“fa1”) and cyanide leach assay (“aa1”) values for 16 holes were checked against the original laboratory assay certificates. The fire assay values corresponded to the original certificates for all 16 holes. Two of the 16 holes had cyanide leach values that did not correspond to the laboratory reports and were corrected.

MAY 2015 REVIEW

RPA undertook the following validation checks as part of the database validation routine:

1. Overlapping sample intervals
2. Empty database tables
3. Visually anomalous survey records

RPA also undertook a spot check comparison of the supplied resource databases against original documents for laboratory assay certificates. The gold fire assay values for 12 underground drill holes and five surface drill holes were checked against the original laboratory assay certificates. All 1,004 fire assay values corresponded to the original certificates.

FEBRUARY 2019 REVIEW

RPA received the results and raw data from an independent database audit performed by Mine Technical Services Ltd. (MTS) at the end of 2018. For data from 2013 to 2018, the audit analyzed 71% of the 2013 – 2018 collar information, 13.8% of the downhole survey data, 18% of the FAA assay data, and performed high level checks on lithology and density measurements. MTS also recommended the mine surveyors implement improvements to the collar certificate information and procedures, including additional information about base stations, instrumentation. and refinements to drill hole exclusion criteria for future estimates. MTS concluded that collar, downhole survey, and assay information in the database were generally adequate to support Mineral Resource estimation and mine planning. Based on the reported results of the external review, RPA agrees with MTS' conclusions.

RPA was provided with the Mineral Resource databases for Crossroads and CHUG mines, which together represent the bulk of the Mineral Resource tonnage. RPA checked a select number of drill holes to verify the described methods and application of practices and performed the following digital queries:

- Reviewed the drill hole traces in 3D, level plan, and vertical sections and found no unreasonable geometries.
- Queried the database for missing or repeated data, unique header, duplicate holes, and gaps or overlapping intervals. No issues were identified.
- Ensured that the total depth recorded in each drill hole database table was consistent. No issues were identified.

COMMENTS ON DATA VERIFICATION

RPA found no issues with the validation process and found the work to be appropriate for the geology and style of mineralization. In RPA's opinion, the practices and procedures used to generate the Cortez database and the data contained therein are appropriate to support Mineral Resource and Mineral Reserve estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

INTRODUCTION

As a result of the nearly 40 year history of the Cortez Mine, a significant number of metallurgical studies including laboratory scale and/or pilot plant test work have been completed and historical operating data is available. The Cortez Mine has utilized numerous processing methods including CIL for higher grade oxide ore, heap leaching for lower grade oxide ore, roasting for carbonaceous refractory ore, and pressure oxidation (POX) for higher grade sulphidic ore. Mill No. 1, which included CIL and a roaster, was placed on care and maintenance at the end of October 1999. The roaster has been inactive since 1995 and is currently being demolished.

METALLURGICAL TESTING

Metallurgical testing of new ore types has confirmed the selected processing unit operations and has provided data to estimate capital and operating costs and gold recovery. Test data has also been generated to determine the expected performance in Mill No. 2 as new reserves have been identified and included in the LOM plans.

Recent metallurgical testing has been conducted to confirm the metallurgical performance of CHOP and Crossroads. Additional work is on-going to predict the metallurgical performance of Crossroads.

Cortez has extensive metallurgical testing facilities so much of the test work is done on site, however, Cortez utilizes external laboratories when specific expertise is needed or when timing dictates that the data is needed sooner than the in-house laboratory can provide it. Testing is conducted by McClelland Laboratories Inc. (MLI) located in Reno, Nevada, USA, Hazen Research Inc. located in Golden, Colorado, USA, at the Barrick Goldstrike laboratory located north of Carlin, Nevada, USA, and by AuTec located in Vancouver, British Columbia, Canada, among others. MLI and Hazen are independent of Barrick. The Barrick Goldstrike laboratory and AuTec are not independent. As metallurgical laboratories, they do not have certifications.

ORE ROUTING

Ore routing is conducted based on cyanide leaching amenability (CNAA) to fire assay (FA) ratio. If the AA to FA ratio is greater than 50%, the ore is designated as oxide ore. If the AA to FA ratio is less than 50%, the ore is designated as refractory. The oxide ore will be routed to the Pipeline Mill or a heap leach pad depending on the gold grade. The refractory ore is routed to the Goldstrike roaster.

GOLD RECOVERY ESTIMATES

The recovery of gold is a function of the processing method (CIL, heap leaching, roasting, and arsenic concentration for refractory ore) and the lithology of the mineralization being processed. The recoveries used to support Mineral Resource and Mineral Reserve estimations are based on recovery equations that are derived from feasibility studies, metallurgical laboratory test work, and historic production data, as summarized in Tables 13-1 to 13-3. These figures are incorporated in the Lerchs–Grossman pit shells that constrain the Mineral Resources and Mineral Reserves to be extracted by open pit mining methods.

The recovery estimates are a function of the head grade (HG), cyanide soluble gold to fire assay gold ratio (AAFA), sulphide sulphur concentration (S₂S), total organic carbon concentration (TOC), and silica concentration (Si).

TABLE 13-1 CORTEZ OXIDE MILL GOLD RECOVERY EQUATIONS
Barrick Gold Corporation – Cortez Operations

Ore Type	Divisions	Recovery Equation	Source
CHUG	Middle and Lower Zone	% Rec = 72.6 AAFA – 42.5 S2S + 68.4	100 CHUG bottle roll tests (June 2015 to April 2017)
	Deep South	% Rec = 64.2 AAFA + 6.05 TOC – 24.8 S2S +29.2	88 bottle roll tests on Deep South drill core (2015 study)
CHOP		% Rec = 27.61 + 90.21 AAFA – 71.21(AAFA – 0.3092) ² – 15.9 S2S	2013 metallurgical testing on refractory bridge drill core and December 2017 CR80 and CR 100 bottle roll tests
Pipeline/South Gap	HG >0.207	% Rec = 88.1 – 8.3	2013 metallurgical testing
	HG ≤ 0.207	% Rec = 85.11*EXP(0.36*HG) – 11.9	Metallurgical laboratory work and 2014 plant recovery
Crossroads	HG > 0.08	% Rec = 88	2008 and 2016 test work
Robertson		% Rec = 88	Growth group metallurgical testing

TABLE 13-2 CORTEZ HEAP LEACH ULTIMATE GOLD RECOVERY EQUATIONS
Barrick Gold Corporation – Cortez Operations

Open Pit	Recovery Estimate, % Au
Pipeline	62
CHOP	80
Crossroads	62
Cortez Pits	75
Gold Acres	55
Robertson	62
Gold Skarn	62
South Gap	62

Recovery at the roaster is estimated using the following equation:

$$\% \text{ Recovery} = (92.027536 - 37.35906 * \text{EXP}(-12.94386 * \text{Head Grade})) / 100$$

TABLE 13-3 PRODUCTION DATA 2016-2018
Barrick Gold Corporation – Cortez Operations

	2016			2017			2018		
	Actual	Budget	Actual vs. Budget	Actual	Budget	Actual vs. Budget	Actual	Budget	Actual vs. Budget
Open Pit									
Mill									
Grade Processed	0.120	0.103	116%	0.131	0.155	85%	0.131	0.073	180%
Recovery	87.5%	85.0%	103%	82.4%	85%	97%	82.4%	82.5%	100%
Average stpd	12,023	11,518	96%	13,005	14,119	92%	13,005	12,868	101%
Leach									
Grade Processed	0.021	0.021	96%	0.016	0.013	128%	0.015	0.012	129%
Recovery	50.2%	50.1%	100%	96.4%	172.6%	56%	89.1%	58.1%	153%
Average stpd	60,353	62,976	96%	30,718	22,033	139%	32,348	66,181	49%
Autoclave									
Grade Processed	0.126	-	-	-	-	-	-	-	-
Recovery Rate	64.4%	-	-	-	-	-	-	-	-
Average stpd	266	-	-	-	-	-	-	-	-
Roaster									
Grade Processed	0.141	0.139	102%	0.132	0.333	40%	0.279	0.198	141%
Recovery	85.9%	85.2%	101%	85.4%	91.4%	93%	90.3%	88.6%	102%
Average stpd	1,023	11,518	9%	1,392	2,605	53%	3,268	1,865	175%
Open Pit Total									
Grade Processed	0.039	0.037	107%	0.075	0.086	87%	0.064	0.026	248%
Recovery	70.9%	68.0%	104%	91.5%	94.1%	97%	85.8%	74.4%	115%
Average stpd	73,665	76,285	97%	45,487	38,756	117%	48,620	80,914	60%
Underground									
Mill									
Grade Processed	0.547	0.463	118%	0.413	0.390	106%	0.365	0.365	100%
Recovery	88.9%	82.9%	107%	88.7%	89.3%	99%	86.1%	91.5%	94%
Average stpd	597	798	75%	401	378	106%	669	316	212%
Roaster									
Grade Processed	0.396	0.462	86%	0.380	0.321	118%	0.312	0.331	94%
Recovery	91.7%	89.1%	103%	92.4%	91.5%	101%	91.1%	91.6%	99%
Average stpd	1576	1148.34	137%	1,987	2,132	93%	2,058	3,122	66%
Underground Total									
Grade Processed	0.438	0.462	95%	0.386	0.331	116%	0.325	0.334	97%
Recovery	90.7%	86.5%	105%	91.7%	91.1%	101%	89.7%	91.6%	98%
Average stpd	2,173	1,946	112%	2,388	2,509	95%	2,727	3,438	79%

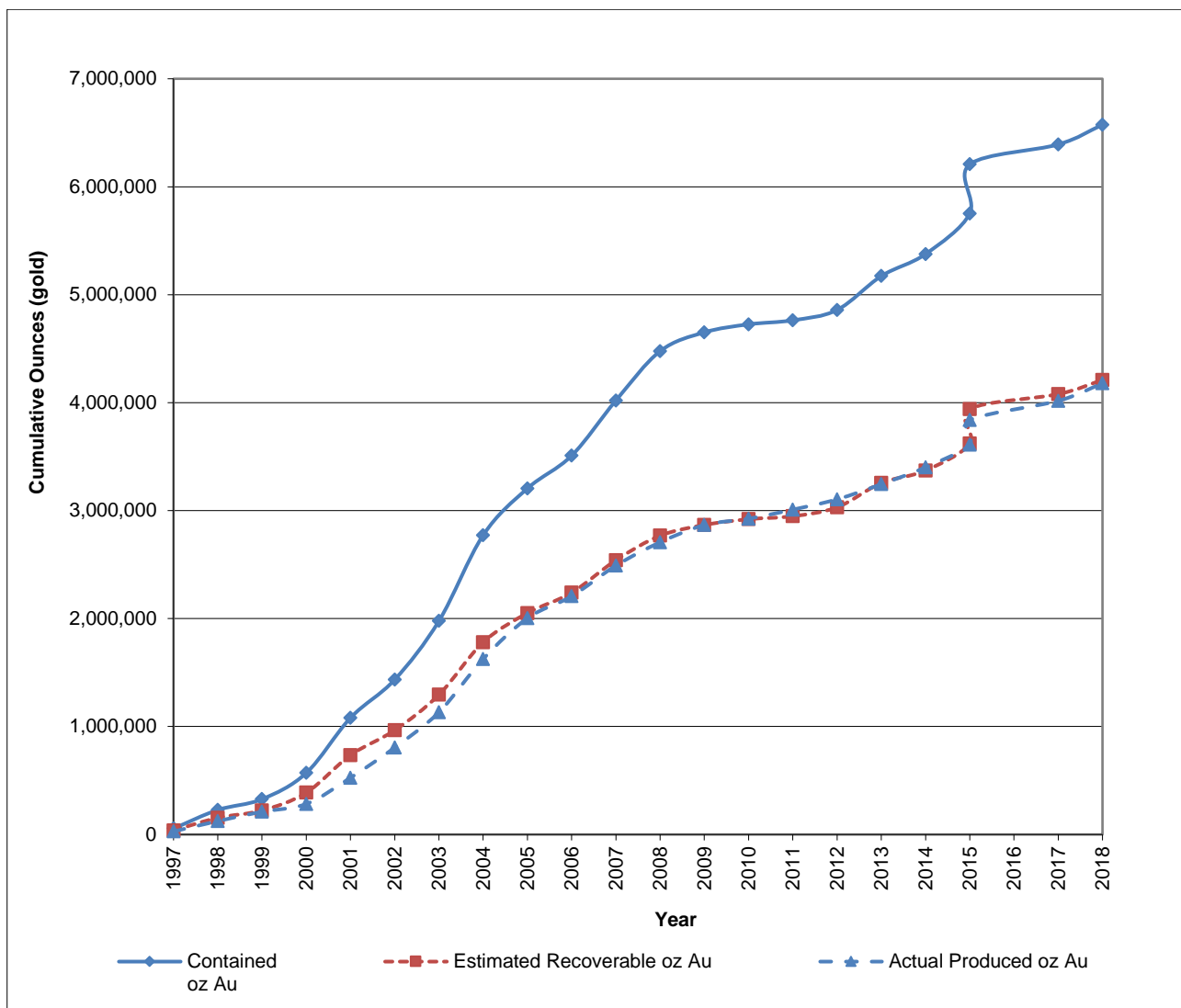
In most cases, the estimated and actual gold recoveries correlate well which indicates that the recovery estimates are accurate.

Table 13-4 compares the contained, estimated recoverable, and actual recovered gold ounces for the life of the Cortez heap leach pads (i.e. Areas 28, 30, and 34). Figure 13-1 provides the same data graphically.

TABLE 13-4 HEAP LEACH CUMULATIVE GOLD PRODUCTION
Barrick Gold Corporation – Cortez Operations

Year	Contained (000 oz)	Estimated Recoverable (000 oz)	Actual Produced (000 oz)
1997	55	38	28
1998	228	155	124
1999	327	223	211
2000	570	387	283
2001	1,080	735	526
2002	1,434	966	805
2003	1,978	1,295	1,133
2004	2,773	1,780	1,626
2005	3,206	2,051	2,004
2006	3,509	2,240	2,207
2007	4,020	2,540	2,491
2008	4,477	2,768	2,706
2009	4,651	2,867	2,866
2010	4,725	2,920	2,925
2011	4,763	2,948	3,009
2012	4,859	3,031	3,105
2013	5,173	3,256	3,245
2014	5,376	3,371	3,401
2015	5,752	3,620	3,611
2016	6,207	3,941	3,839
2017	6,392	4,079	4,017
2018	6,574	4,210	4,179

FIGURE 13-1 HISTORICAL HEAP LEACH DATA



METALLURGICAL TESTING

DEEP SOUTH ZONE METALLURGICAL TESTING

AuTec completed optimization and variability testing using samples from the Deep South Zone. MLI also completed column leach tests using the oxide samples from Deep South Zone. The results of the testing program were used to support a Pre-Feasibility Study of the Cortez Underground Expansion Project (AuTec, 2015; Barrick and Minetech, 2015) and then the Deep South Feasibility Study (Barrick and Minetech, 2017). Eighty samples were used to create eight composite samples that were used for the optimization testing. Variability testing was also conducted using the 80 samples.

Comminution testing for 60 samples estimated that the majority of the samples are moderately hard ($A \times b < 40$), but a few samples were exceptionally soft ($A \times b > 300$) with respect to semi-autogenous grinding (SAG) milling. Bond work index (BWi) tests were conducted on seven of the composite samples at a closing size of 105 μm . The average BWi is 11.3 kWh/st. The comminution test results indicate that the grinding characteristics of Deep South samples are similar to the ore mined at Cortez Hills.

A series of tests were conducted using the optimization samples to complete the following tests:

- Column leach tests
- Direct cyanide leach (DCN)
- CIL tests
- Bench top roaster followed by CIL (BTR-CIL)
- Bench top alkaline pressure leach tests followed by CIL (BTALK-CIL)
- Bench top alkaline pressure leach tests followed by thiosulfate resin in leach (TCM) (BTALK-TCM)

The results are summarized in Table 13-5.

TABLE 13-5 DEEP SOUTH ZONE TEST RESULTS (AU RECOVERY)
Barrick Gold Corporation – Cortez Operations

Sample	Ore Type	Au (oz/st)	DCN	CIL	BTR-CIL	BTALK-CIL	BTALK-TCM	Column Tests
V1	Oxide	0.238	67.2%	87.4%	84.9%	81.5%	68.4%	76.5
V2	Oxide	0.598	82.6%	88.1%	88.7%	88.2%	42.2%	71.5
V3	Oxide	0.683	83.3%	91.2%	91.2%	89.1%	26.8%	77.6
V4	Oxide	0.680	63.6%	88.1%	88.1%	76.0%	30.2%	47.0
V5	Oxide	0.187	82.4%	89.1%	89.1%	89.3%	28.7%	84.4
V6	Oxide	0.225	77.8%	89.9%	89.9%	88.1%	36.9%	74.4
V7	Refractory	0.436	12.3%	15.7%	91.2%	83.2%	82.6%	-
V8	Refractory	0.256	32.3%	85.9%	85.9%	89.9%	89.5%	-
Minimum		0.683	12.4%	15.7%	84.9%	76.0%	26.8%	47.0
Maximum		0.187	84.0%	91.8%	91.2%	89.9%	89.5%	84.4
Average		0.418	63.1%	72.6%	88.6%	85.6%	50.7%	76.9

The key assays for the samples are summarized in Table 13-6.

TABLE 13-6 DEEP SOUTH ZONE OPTIMIZATION SAMPLES ANALYTICAL RESULTS

Barrick Gold Corporation – Cortez Operations

Sample	Au (oz/st)	CNAA/HG	S=	C _{org}
V1	0.238	65.7%	0.10%	1.17%
V2	0.598	92.5%	0.05%	0.02%
V3	0.683	91.4%	≤ 0.01%	0.02%
V4	0.680	87.8%	≤ 0.01%	0.04%
V5	0.187	97.6%	≤ 0.01%	0.02%
V6	0.225	89.1%	≤ 0.01%	0.03%
V7	0.436	15.8%	1.38%	≤ 0.01%
V8	0.256	34.3%	0.34%	0.17%

The Deep South Zone FS recommends that the heap leach recovery (HL) can be estimated using the relationship between the CNAA and HG ratio and the direct cyanidation test results plus the relationship between DCN and column leaching. The resulting equation is:

$$\text{HL \% Au Recovery} = 1.315 \times (\text{CNAA/HG}) - 40.481$$

The CIL recovery can be estimated accurately by applying the relationship between the CNAA/HG ratio and the CIL recovery using this equation:

$$\text{CIL \% Au Recovery} = 0.942 \times \text{CNAA/HG}$$

The recovery for refractory ore processed in the Goldstrike roaster followed by CIL was estimated using the roaster recovery curves.

CORTEZ HILLS OPEN PIT

In 2017, the mill recovery for CHOP ore dropped due to increased sulphide concentration and an increase in the ore hardness. A total of 35 bottle roll tests (BRT) were conducted to evaluate the change. The test data, plant data, and block model data from ore control were evaluated. As a result of this evaluation, the recovery model was updated and the ore routing criteria were revised based on sulphide concentration and gold head grade (Barrick Cortez, 2018).

CROSSROADS

For Crossroads, MLI evaluated oxide samples to determine the amenability to cyanide leaching (MLI, 2016) and AuTec evaluated sulphide samples to evaluate the sulphide ore processing options (AuTec, 2016).

MLI received 4,000 lbs of split drill core samples. From the sample material, 56 variability intervals were composited to represent benches of the mine. Head analyses and BRTs were conducted on these samples. Of the 56 samples, only five demonstrated a potential for preg-robbing.

Subsequently, the interval samples were composited to form 15 composite samples that were used for BRTs and column leach tests. The BRTs were conducted at particle sizes of 80% passing (P_{80}) 10 mesh (i.e., 1.6 mm) and 150 mesh (i.e., 105 μm). Optimization tests were conducted to evaluate various cyanide concentrations and particle sizes. The column leach tests were conducted at two particle sizes (i.e., P_{80} 19 mm and P_{100} 25.4 mm).

The results showed that 45 of the 56 variability samples were amenable to direct cyanide leaching at P_{80} 1.6 mm with only material from BNCH showing preg-robbing tendencies (i.e., carbonaceous material in the samples that adsorbs gold from the leach solutions rendering it non-recoverable) at the coarser particle size. All of the variability samples were amenable to milling/CIL recovery at P_{80} 105 μm . At this particle size, gold leaching was rapid and completed in two to six hours.

The optimization testing showed that recovery increased slightly with smaller grind sizes, cyanide consumption was unchanged at the smaller grind size but increased at higher cyanide concentrations, and lime consumption was not sensitive to grind size or cyanide concentration.

All but one of the column leach tests was amenable to cyanide leaching at P_{80} 1.6 mm. Gold recovery varied from 60% to 82.4% in 65 to 71 days. Leaching was rapid with the majority of the gold extracted in 20 to 30 days. The tests showed low cyanide and lime consumptions and good permeability. Table 13-7 compares the results from the MLI tests.

TABLE 13-7 MLI OXIDE SAMPLE TEST RESULTS
Barrick Gold Corporation – Cortez Operations

Sample	Test	Particle Size	Au Recovery, %
HPLH-01	CN	80% - 10 mesh	85.7
	CIL	80% - 150 mesh	90.3
HPLH-02	CN	80% - 10 mesh	73.8
	CIL	80% - 150 mesh	86.1
HPLH-03	CN	80% - 10 mesh	72.4
	CIL	80% - 150 mesh	87.5
HPLH-04	CN	80% - 10 mesh	36.4
	CIL	80% - 150 mesh	70.0
HPLH-05	CN	80% - 10 mesh	73.9
	CIL	80% - 150 mesh	82.6
HPLH-06	CN	80% - 10 mesh	57.9
	CIL	80% - 150 mesh	84.2
HPLH-07	CN	80% - 10 mesh	66.7
	CIL	80% - 150 mesh	83.3
HPLH-08	CN	80% - 10 mesh	60.0
	CIL	80% - 150 mesh	84.2
HPLH-09	CN	80% - 10 mesh	73.7
	CIL	80% - 150 mesh	83.3
HPLH-10	CN	80% - 10 mesh	55.6
	CIL	80% - 150 mesh	84.2
HPLH-11	CN	80% - 10 mesh	60.0
	CIL	80% - 150 mesh	92.5
HPLH-12	CN	80% - 10 mesh	82.4
	CIL	80% - 150 mesh	89.2
HPLH-13	CN	80% - 10 mesh	75.0
	CIL	80% - 150 mesh	89.5
HPLH-14	CN	80% - 10 mesh	8.8
	CIL	80% - 150 mesh	80.6
HPLH-15	CN	80% - 10 mesh	32.1
	CIL	80% - 150 mesh	82.8
MSTR-01	CIL	80% - 150 mesh	84.2
MSTR-02	CIL	80% - 150 mesh	81.3
MSTR-03	CIL	80% - 150 mesh	79.4

AuTec composited 72 samples. One sample was used for a JK Rotary Breakage Test and the remaining 71 samples were composited to produce four master composite (MSTR) samples and eight HPLH samples. Head characterization, comminution, mineralogy, and metallurgical testing was conducted using the samples. Metallurgical tests consisted of BTR-CIL tests, BTALK-CIL tests, and BTALK-TCM tests. Table 13-8 compares the results from the MLI tests.

TABLE 13-8 AUTECH SULPHIDE SAMPLE OPTIMIZATION TEST RESULTS
Barrick Gold Corporation – Cortez Operations

Test Type	Gold Recovery, %		
	Minimum	Maximum	Average
BRT-CIL	78.8	94.6	89.5
BTALK-CIL	1.5	81.9	29.9
BTALK-TCM	38.8	79.7	58.2

GEOMETALLURGICAL EVALUATION

Cortez has assembled a team consisting of metallurgists, geologists, ore control personnel, and strategic planning personnel to complete geometallurgical characterization of the material from the open pit and underground mines. The evaluation commenced in June 2018 and is scheduled for completion in 2019 (Barrick Cortez, 2019).

Table 13-9 summarizes the timetable for completing the geometallurgical characterization.

TABLE 13-9 GEOMETALLURGICAL CHARACTERIZATION TIMETABLE
Barrick Gold Corporation – Cortez Operations

Task Name	Duration	Start	Finish
Crossroads	267 days	1-Jun-2018	10-Jun-2019
Pit Characterization	205 days	1-Jun-2018	14-Mar-2019
BRTs	71 days	14-Mar-2019	10-Jun-2019
Leach (short-range)	158 days	1-Nov-2018	10-Jun-2019
Mill Throughput	49 days	4-Dec-2018	8-Feb-2019
Plant Trial #1	3 days	10-Jan-2019	14-Jan-2019
Plant Trial #2	3 days	6-Feb-2019	8-Feb-2019
CHOP	97 days	15-Nov-2018	29-Mar-2019
Mill	97 days	15-Nov-2018	29-Mar-2019
Coarse Reject BRTs	63 days	15-Nov-2018	11-Feb-2019
Recovery Model Validation	85 days	3-Dec-2018	29-Mar-2019
Cortez Pits	348 days	1-Jan-2019	30-Apr-2020
Pit Characterization	348 days	1-Jan-2019	30-Apr-2020
Identify 'zones' in ore body	86 days	1-Jan-2019	30-Apr-2019
Met tests (recovery and throughput)	132 days	1-Sep-2019	29-Feb-2020
Upload data to model	23 days	1-Mar-2020	31-Mar-2020
Recovery Model	64 days	3-Feb-2020	30-Apr-2020
Mill	130 days	1-Dec-2018	31-May-2019
Stockpile tests	75 days	1-Dec-2018	15-Mar-2019
Collect stockpile samples	14 days	1-Dec-2018	19-Dec-2018
Met characterization test work at Goldstrike	40 days	21-Jan-2019	15-Mar-2019
Rock Hardness Tests	119 days	18-Dec-2018	31-May-2019

Task Name	Duration	Start	Finish
Identify core available to test	53 days	18-Dec-2018	28-Feb-2019
Select Core Samples, Send for Testing	67 days	28-Feb-2019	31-May-2019

SUMMARY AND CONCLUSIONS

Metallurgical test work completed for the Mine has been appropriate to establish optimal processing routes for the different ore types encountered at Cortez. Historical process data demonstrates that the metallurgical recovery models have been reliable. The metallurgical testing data available for ore scheduled to be processed in the LOM plan indicates that the models and methods used for estimating metallurgical performance will continue to be successful. Based on these observations, RPA concurs that the samples used to generate the metallurgical data and the historical operating data have been representative. Therefore, the estimates used to estimate future performance appear to be accurate.

RPA is not aware of any processing factors or deleterious elements that could have a significant impact on the potential economic extraction.

14 MINERAL RESOURCE ESTIMATE

SUMMARY

A summary of the Mineral Resources, excluding Mineral Reserves, for Cortez as of December 31, 2018, is shown in Table 14-1, and Table 14-2 in metric units. The Mineral Resources are presented by the most likely mine extraction method and gold recovery process. Cut-off grades for the Mineral Resources were established using a gold price of US\$1,500 per ounce.

Measured and Indicated Mineral Resources total 62.53 million tons grading 0.051 oz/st Au and contain 3.17 million ounces of gold. In addition, Inferred Mineral Resources total 14.5 million tons grading 0.049 oz/st Au, and contain 705,000 ounces of gold.

In metric units, the Measured and Indicated Mineral Resources total 56.73 million tonnes grading 1.75 g/t Au, containing 3.17 million ounces of gold. In addition, Inferred Mineral Resources total 13.16 million tonnes grading 1.67 g/t Au, and contain 705,000 ounces of gold.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions) were used for the Mineral Resource and Mineral Reserve estimates.

RPA is not aware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

TABLE 14-1 MINERAL RESOURCE SUMMARY: US CUSTOMARY UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

Mine & Process Type	Total Measured			Total Indicated			Total Measured and Indicated			Total Inferred		
	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)
Open Pit												
Mill	367	0.065	24	4,538	0.081	369	4,905	0.080	392	458	0.079	36
Heap Leach	2,097	0.005	11	35,803	0.008	301	37,900	0.008	312	10,418	0.009	92
Refractory	1,040	0.098	102	15,343	0.092	1,406	16,383	0.092	1,508	1,211	0.083	101
Open Pit Total	3,505	0.039	137	55,684	0.037	2,075	59,189	0.037	2,212	12,087	0.019	229
Underground												
Mill	170	0.324	55	936	0.286	268	1,106	0.292	323	363	0.190	69
Refractory	21	0.286	6	2,214	0.284	628	2,236	0.284	634	2,054	0.199	408
Underground Total	191	0.319	61	3,150	0.284	896	3,341	0.286	957	2,417	0.197	477
Total Open Pit & Underground	3,696	0.054	198	58,834	0.051	2,971	62,530	0.051	3,169	14,504	0.049	705

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at cut-off grades ranging from 0.004 oz/st Au to 0.124 oz/st Au depending on deposit, mining method, and process type.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 10 ft was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk density ranges from 0.052 st/ft³ to 0.091 st/ft³.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

TABLE 14-2 MINERAL RESOURCE SUMMARY: METRIC UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

Mine & Process Type	Total Measured			Total Indicated			Total Measured and Indicated			Total Inferred		
	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Contained Gold (000 oz)
Open Pit												
Mill	333	2.23	24	4,117	2.78	369	4,450	2.74	392	416	2.71	36
Heap Leach	1,902	0.17	11	32,480	0.27	301	34,382	0.27	312	9,451	0.31	92
Refractory	943	3.36	102	13,919	3.15	1,406	14,862	3.15	1,508	1,099	2.85	101
Open Pit Total	3,180	1.34	137	50,515	1.27	2,075	53,694	1.27	2,212	10,965	0.65	229
Underground												
Mill	154	11.11	55	849	9.81	268	1,003	10.01	323	329	6.51	69
Refractory	19	9.81	6	2,009	9.74	628	2,028	9.74	634	1,863	6.82	408
Underground Total	173	10.94	61	2,858	9.74	896	3,032	9.81	957	2,193	6.75	477
Total Open Pit & Underground	3,353	1.84	198	53,374	1.73	2,971	56,726	1.75	3,169	13,158	1.67	705

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at cut-off grades ranging from 0.14 g/t Au to 4.25 g/t Au depending on deposit, mining method, and process type.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 3.05 m was used for underground Mineral Resources
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk density ranges from 1.67 t/m³ to 2.92 t/m³.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

The Cortez Mine Technical Group is currently reporting Mineral Resource estimates for four principal areas in the district. These include the Pipeline Complex and the Gold Acres deposit on the west side of Crescent Valley and the Cortez Hills Complex and Cortez Pits areas on the east side of the valley. Each of the mentioned areas include several gold deposits or zones. Table 14-3 identifies the principal areas, the deposits or zones included in them, and the date that the Mineral Resources were most recently updated. All models with new drilling were updated to June 30, 2018 except Gold Acres. Several holes were drilled at Gold Acres in 2016, and results will be incorporated into the next model update. The EOY2017 Crossroads model update used the same parameters as the 2014 model, as there were only 10 new holes added.

TABLE 14-3 CORTEZ MINERAL RESOURCE MODELS
Barrick Gold Corporation – Cortez Operations

Area	Deposits or Zones	Block Model Estimation Date	Block Model Depletion Date
Pipeline Complex	Pipeline	MID2014	EOY2018
	Crossroads	EOY2017	EOY2018
Cortez Hills Complex	Breccia (CHOP)	MID2015	EOY2017
	Breccia (CHUG)	MID2016	EOY2017
	Middle (CHUG)	MID2018	EOY2018
	Lower (CHUG)	MID2018	EOY2018
	Deep South (CHUG)	MID2018	EOY2018
Cortez Pits	-	EOY2018	EOY2018
Gold Acres	-	MID2008	EOY2018

RPA examined the EOY2018 open pit and underground Mineral Resource estimates, and is of the opinion that they meet industry standards and are acceptable to support Mineral Reserve estimation. The following is a list of some of the checks performed on the Crossroads open pit and CHUG Mineral Resource models by RPA:

- Checked for duplicate drill hole traces, twinned holes.
- Checked for overlapping wireframes to determine possible double counting.
 - Solids have priority levels in block definition file.
 - Diamond drill hole domains are similarly flagged by priority.
- Checked deposit/wireframe extensions beyond last holes to see if these are reasonable and consistent.
- Checked for capping of extreme values.

- Checked for reasonable compositing intervals.
- Checked that composite intervals start and stop at wireframe boundaries.
- Visually checked block resource classification coding for isolated blocks.
- Generated an independent Mineral Resource report to compare with the Barrick estimate.
- Compared block statistics (zero grade cut-off) with assay/composite basic statistics.
- Visually compared block grades to drill hole composite values on sections and plans.

Details of the Mineral Resource estimation for each area are described in the sections below.

PIPELINE COMPLEX

Areas designated for open pit development in the Pipeline Complex include the Pipeline, Gap and Crossroads deposits. At the EOY2018, the Gap and Pipeline deposit Mineral Resources were merged into one deposit designated the Pipeline Mineral Resource. Note that this section continues to refer to the Gap since it and Pipeline still exist as separate block models.

Mineral Resources, exclusive of Mineral Reserves, are listed in Table 14-4, and Table 14-5 in metric units. Cut-off grades for the reported Mineral Resources were established using a gold price of US\$1,500 per ounce and are shown in Table 14-6. Note that the minimum practical leach cut-off grade is 0.004 oz/st Au for all deposits due to the fire assay lower detection limit, even though theoretical leach cut-off grades are lower.

TABLE 14-4 PIPELINE COMPLEX MINERAL RESOURCE SUMMARY: US CUSTOMARY UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

	Mill Material			Leach Material			Refractory Material			Total		
	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)
Measured Resources												
Pipeline	6	0.110	1	575	0.014	8	0	0.000	0	581	0.015	9
Crossroads	361	0.064	23	1,522	0.002	3	532	0.097	52	2,416	0.032	78
Total Measured	367	0.064	24	2,097	0.005	11	532	0.097	52	2,996	0.029	86
Indicated Resources												
Pipeline	56	0.090	5	8,475	0.012	102	37	0.051	2	8,568	0.013	109
Crossroads	3,596	0.066	237	21,724	0.005	101	6,246	0.097	604	31,566	0.030	942
Total Indicated	3,652	0.066	242	30,198	0.007	203	6,283	0.096	606	40,133	0.026	1,051
Measured & Indicted Resources												
Pipeline	62	0.092	6	9,050	0.012	110	37	0.051	2	9,149	0.013	118
Crossroads	3,957	0.066	260	23,246	0.004	104	6,778	0.000	656	33,982	0.030	1,020
Total M+I	4,019	0.066	266	32,295	0.007	214	6,815	0.097	658	43,129	0.026	1,137
Inferred Resources												
Pipeline	0	0.000	0	358	0.007	2	1	0.059	0	359	0.007	2
Crossroads	51	0.110	6	6,940	0.008	56	72	0.152	11	7,064	0.010	73
Total Inferred	51	0.110	6	7,298	0.008	58	73	0.151	11	7,423	0.010	75

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at the cut-off grades given in Table 14-6.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 10 ft was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk densities vary by formation and zone and are listed in Table 14-11.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Gap Mineral Resources now included in Pipeline Mineral Resources.
10. Numbers may not add due to rounding.

TABLE 14-5 PIPELINE COMPLEX MINERAL RESOURCE SUMMARY: METRIC UNITS – DECEMBER 31, 2018
 Barrick Gold Corporation – Cortez Operations

	Mill Material			Leach Material			Refractory Material			Total		
	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)
Measured Resources												
Pipeline	5	3.77	1	522	0.48	8	0	0.00	0	527	0.51	9
Crossroads	327	2.19	23	1,381	0.07	3	483	3.33	52	2,192	1.10	78
Total Measured	333	2.19	24	1,902	0.17	11	483	3.33	52	2,718	0.99	86
Indicated Resources												
Pipeline	51	3.09	5	7,688	0.41	102	34	1.75	2	7,773	0.45	109
Crossroads	3,262	2.26	237	19,708	0.17	101	5,666	3.33	604	28,636	1.03	942
Total Indicated	3,313	2.26	242	27,395	0.24	203	5,700	3.29	606	36,408	0.89	1,051
Measured & Indicted Resources												
Pipeline	56	3.15	6	8210	0.41	110	34	1.75	2	8300	0.45	118
Crossroads	3,590	2.26	260	21,088	0.14	104	6,149	0.00	656	30,828	1.03	1,020
Total M+I	3,646	2.26	266	29,298	0.24	214	6,182	3.33	658	39,126	0.89	1,137
Inferred Resources												
Pipeline	0	0.00	0	325	0.24	2	1	2.02	0	326	0.24	2
Crossroads	46	3.77	6	6,296	0.27	56	65	5.21	11	6,408	0.34	73
Total Inferred	46	3.77	6	6,621	0.27	58	66	5.18	11	6,734	0.34	75

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at the cut-off grades given in Tables 14-6.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 3.05 m was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk densities vary by formation and zone and are listed in Table 14-11.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Gap Mineral Resources now included in Pipeline Mineral Resources.
10. Numbers may not add due to rounding.

TABLE 14-6 CORTEZ DISTRICT MINERAL RESOURCE REPORTING CUT-OFF GRADES

Barrick Gold Corporation – Cortez Operations

Crossroads Breakeven cut-off grade (BCOG)_inpit, \$1,500

Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,500	1,500	1,500
Gold Refining Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.90%	99.90%	99.90%
Recovery	%	62%	81%	71%
Mining Cost	\$	1.89	1.89	1.89
Process Operating Cost	\$	1.57	9.87	22.12
G&A Cost	\$	0.81	5.35	6.09
Sustaining Capital		0.032	1.14	0.093
Transportation Cost	\$			13.8
Sub-Total Operating Cost (wo mining)	\$	2.412	16.36	42.103
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US Customary Units)	oz/st Au	0.003	0.015	0.045
Cut-Off Grade (Metric Units)	g/t Au	0.103	0.514	1.543

Pipeline BCOG_inpit, \$1,500

Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,500	1,500	1,500
Gold Refining Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.90%	99.90%	99.90%
Recovery	%	62%	81%	71%
Mining Cost	\$	1.89	1.89	1.89
Process Operating Cost	\$	1.57	9.87	22.12
G&A Cost	\$	0.81	5.35	6.09
Sustaining Capital		0.032	1.14	0.093
Transportation Cost	\$			13.8
Sub-Total Operating Cost (wo mining)	\$	2.412	16.36	42.103
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US Customary Units)	oz/st Au	0.003	0.015	0.045
Cut-Off Grade (Metric Units)	g/t Au	0.103	0.514	1.543

DATA

For resource estimation, the drill hole data were limited to holes within or immediately adjacent to the various block model boundaries. A total of 3,370 drill holes over 3,030,485 ft and 279,120 assays are in the database.

GEOLOGICAL MODELLING

Three-dimensional wireframe surfaces were constructed in 2010 by Rangefront Consulting, LLC (Goss, 2010), representing alluvium-bedrock contact, rock formations, and alteration. The final surfaces were created considering, in order of importance:

- 1":1,000' scale geologic mapping in the Shoshone Range
- 1":50' scale mapping in Pipeline, Gold Acres London extension, OGA and Pipeline/Gap pits
- 27 geologic cross sections covering the Pipeline Complex at a scale of 1":100'
- Geological logs, based on drill holes completed during or after 2004
- Downhole, multi-element geochemistry in conjunction with analyses from the NITON portable XRF unit
- Geophysical interpretations

Surfaces were triangulated using sub-parallel cross sectional line work, which were modified to fit with surface mapping, intersecting cross sections, drill hole data and/or the results of geophysical interpretations. Snapping to drill hole intercepts was performed on sections with reliable results, but not drill holes between sections. The work was completed using the Mira Geoscience GoCad Mining Suite and the resultant geological interpretation was used to flag formation and alteration contacts in the block model and inform the interpolation design.

In addition to formation and alteration, topography and area wireframe surfaces and solids were used to define boundaries and mineralization controls within the Pipeline Complex block model. The three established areas corresponding to the main deposits, Pipeline, Crossroads, and Pipeline/Gap are shown in Figure 14-1. The Pipeline and Crossroads deposits are separated by the east high-wall fault in the southern end of the Pipeline Pit. Each area was treated individually during the estimation process.

ESTIMATION SUMMARY

Gold mineralization in the Pipeline Complex is complicated. It ponds and pools at formational contacts and stratigraphic boundaries. Mineralization can also follow structural trends related to compressional and extensional faulting. The estimation method developed by the Tucson Technical Group sought to incorporate this understanding into the block model by giving priority to stratigraphic over structural mineralization trends, where interpreted, and by using probabilities to categorize high and low grade blocks, which, due to the nature of the deposit, would be very difficult to accomplish using traditional "wireframing".

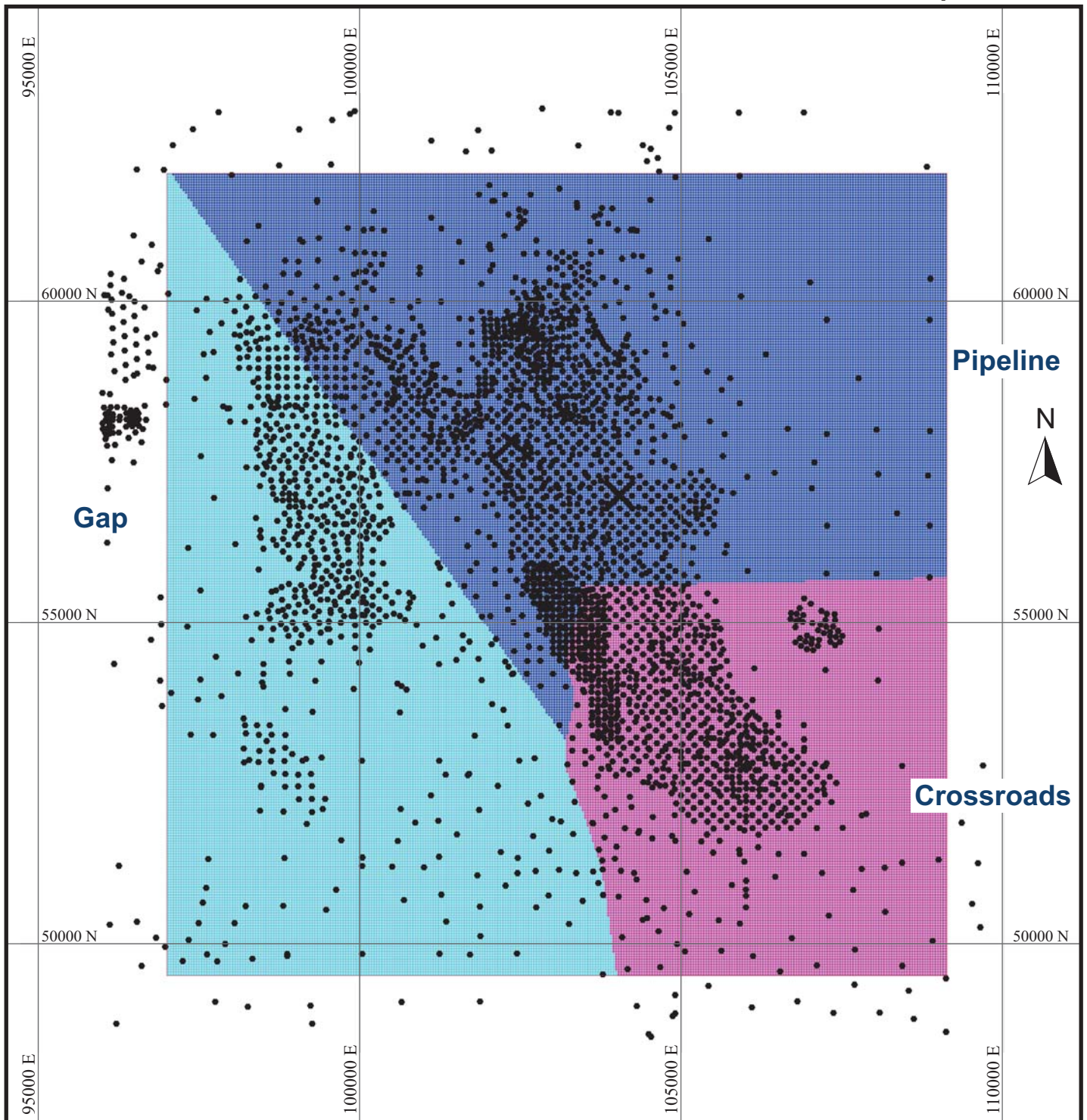
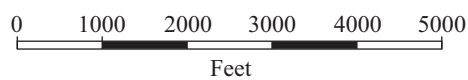


Figure 14-1



Barrick Gold Corporation
Cortez Joint Venture Operations
State of Nevada, U.S.A.
Resource Estimation Domains
Pipeline Complex
(4,000 ft. Elevation Plan)

At Crossroads, stratigraphic and structural controls were used as directions to guide the high and low grade indicators, along with gold and multi-element estimations. Triangulated surfaces were converted into a drill hole database, where each facet has a unique orientation and is represented as a “sample”. This database is estimated into blocks, controlling the effect of each surface by Inverse Distance power and sample count. Dynamic anisotropy techniques employed at Crossroads and Cortez Pits are now the preferred methodology chosen by Mine staff to guide the estimation with stratigraphy, structure, alteration and mineralization. Cortez Hills is switching to this method from the current Vulcan two-surface anisotropy method. RPA agrees with this new approach and recommends its application across all deposits at Cortez.

The Pipeline Complex (Pipeline and Gap), exclusive of Crossroads, used a Vulcan tetra modelling technique using trends based solely on stratigraphy. Unfold surfaces were based on the 2010 geological model.

BLOCK MODEL

A 40 ft x 40 ft x 20 ft block model was developed over the Pipeline Complex in Maptek’s Vulcan software. The block model parameters are listed in Table 14-7. Following estimation of variables, the model was reblocked to 40 ft x 40 ft x 50 ft to conform to bench height for mine design purposes.

TABLE 14-7 PIPELINE COMPLEX BLOCK MODEL PARAMETERS
Barrick Gold Corporation – Cortez Operations

Easting (ft)		Northing (ft)		Elevation (ft)	
Min	Max	Min	Max	Min	Max
97,000	109,120	49,500	61,980	2,880	5,530

Block Size (ft)			Number of Blocks		
Easting	Northing	Elev.	Easting	Northing	Elev.
40	40	50	303	312	53

INDICATOR INTERPOLATION

The Tucson Technical Group applied Inverse Distance squared (ID²) for the estimation of high and low grade indicators to categorize each block within each of the areas at the Pipeline Complex as high or low grade, and, in the case of Pipeline, as dominated by stratigraphic or structural control on mineralization.

A low grade gold indicator was assigned at a threshold of 0.002 oz/st Au, in all areas. High grade gold indicators were assigned at thresholds of 0.05 oz/st Au, 0.10 oz/st Au, and 0.10 oz/st Au for Gap (now merged with Pipeline), Crossroads, and Pipeline, respectively. Table 14-8 shows the general orientations of the structural mineralization control search ellipses within each area.

**TABLE 14-8 SEARCH ELLIPSE ORIENTATIONS OF STRUCTURAL DOMAINS – PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations**

Domain	Azimuth	Plunge	Dip
Pipeline/Gap	320°	20°	-10°
Crossroads	330°	10°	10°

Indicators were estimated into unique high grade stratigraphic, and low grade stratigraphic and structural indicator block variables at Pipeline/Gap and Crossroads, and into high and low grade stratigraphically controlled indicator block variables at Pipeline. Stratigraphic high and low grade indicator estimation runs employed a search ellipse of 400 ft x 400 ft x variable, oriented parallel to the unfolded surfaces of each mineralized formation: Devonian Wenban (DW) within the Devonian Horse Canyon (DHC), Silurian Roberts Mountain (SRM), Hanson Creek (OHC), and the Quaternary Alluvium (QAL). Structural search ellipse dimensions for Pipeline/Gap and Crossroads were 400 ft x 400 ft x 60 ft and limited to the SRM and DW formations at Pipeline/Gap and to the DW Formation at Crossroads.

A minimum and maximum of five and 13 composites, respectively for each indicator variable was used. The number of composites per drill hole was limited to two, which in tandem with composite restrictions, forced contribution from three drill holes to estimate an indicator value for a block.

Following estimation, mineralization control was ranked at Pipeline/Gap and Crossroads based on the outcome of the low grade indicators. Where the stratigraphically control indicator

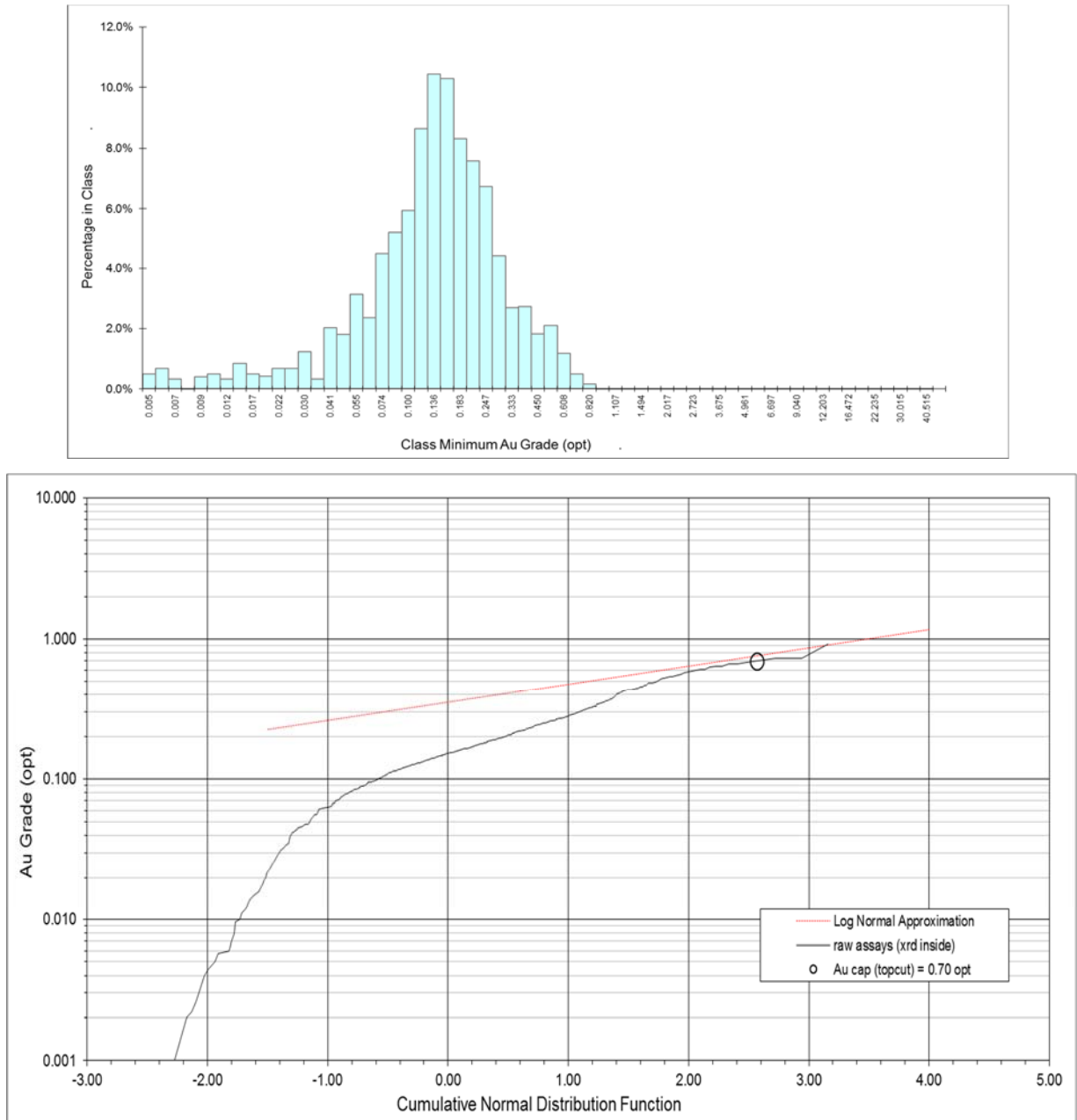
in the low grade threshold yielded a higher probability value than the structurally controlled indicator, it was ranked as the dominant control. All other blocks were assumed to be structurally controlled.

The results of the indicator estimation and mineralization control ranking as well as the modelled formation and alteration codes were back-flagged from the block model to the original drill hole database to accommodate data selection for grade interpolation.

GRADE CAPPING AND COMPOSITING

Flagged raw gold assays were capped for outliers based on examination of cumulative probability plots and histograms by the Tucson Technical Group. The capped assays were composited using downhole 20 ft lengths. Composites honoured domain boundaries, and were distributed to prevent the formation of residual composites. A cumulative probability plot from within Crossroads High Grade indicator is shown in Figure 14-2. A summary of gold grade caps is shown in Table 14-9.

FIGURE 14-2 CUMULATIVE PROBABILITY PLOT: CROSSROADS HIGH GRADE INDICATOR



Source: Barrick 2019.

(There is already a very low CV within the high grade indicator, so the capping point was chosen where the data density became sparse. A 0.7 oz/st threshold represents capping at the 99.3 percentile.)

**TABLE 14-9 SUMMARY OF GOLD GRADE CAPS – PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations**

Deposit	HG (oz/st)	Percentile	%GT > cap	LG (oz/st)	Percentile	%GT > cap
Crossroads	0.7	99.3	2.8	0.3	99.9	2.3
Pipeline	1.2	98.1	8.9	0.4	99.7	6.2
Gap*	0.4	98.3	14.3	0.18	99.7	4.9

* Gap now part of Pipeline Mineral Resource estimate.

Where drill holes were completed in mineralization (gold greater or equal to 0.003 oz/st Au), and at depth were poorly supported by surrounding drill hole information, an additional 20 ft composite was added manually to the end of the hole at a near-zero (0.0001 oz/st) grade to prevent the extension of gold below the depth of drilling. A total of 397 drill holes were modified.

Intervals with poor recovery that could not be sampled were excluded from the compositing routine and estimation, as were selected drill holes identified by the onsite team as having poor location, sampling, or drilling angle to mineralized structures. Unsampled intervals were assigned a background grade of 0.0001 oz/st Au.

VARIOGRAPHY

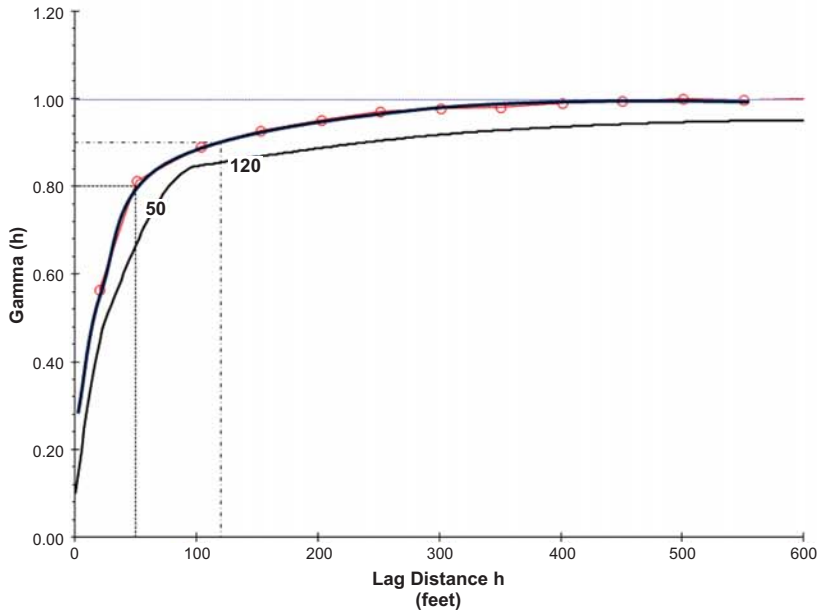
Normalized, omni-directional variograms were modeled over the low grade domains of Gap, Crossroads and Pipeline, shown in Figure 14-3 and in Table 14-10. Variograms of the blast hole data at Pipeline and Gap were also modelled (not shown).

**TABLE 14-10 LOW GRADE OMNIDIRECTIONAL VARIOGRAM MODELS –
PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations**

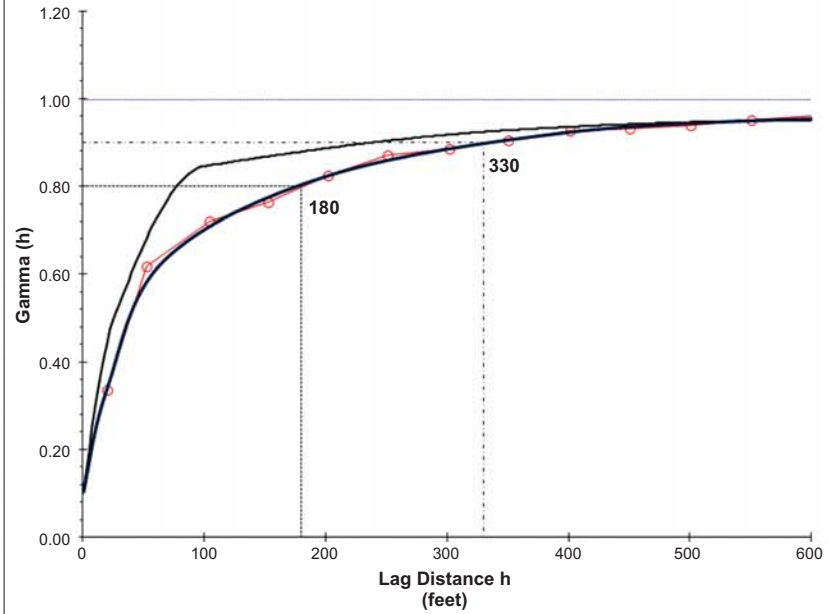
Area		Pipeline/Gap	Crossroads
Type		Spherical	Spherical
Nugget		0.1	0.1
Structure 1	Range (ft)	25	25
	Variance	0.2	0.2
Structure 2	Range (ft)	100	100
	Variance	0.5	0.5
Structure 3	Range (ft)	350	350
	Variance	0.05	0.05
Structure 4	Range (ft)	600	600
	Variance	0.1	0.1
Total Variance		0.95	0.95

The models for each of the areas are identical, however, the values derived from the variography for informing search ellipse parameters are based on the raw data.

Gap Omnidirectional Variogram



Pipeline Omnidirectional Variogram



Crossroads Omnidirectional Variogram

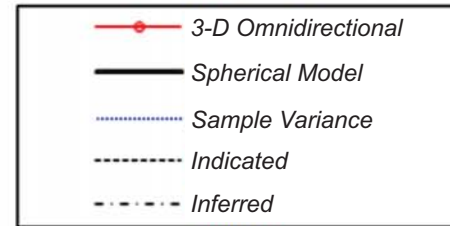
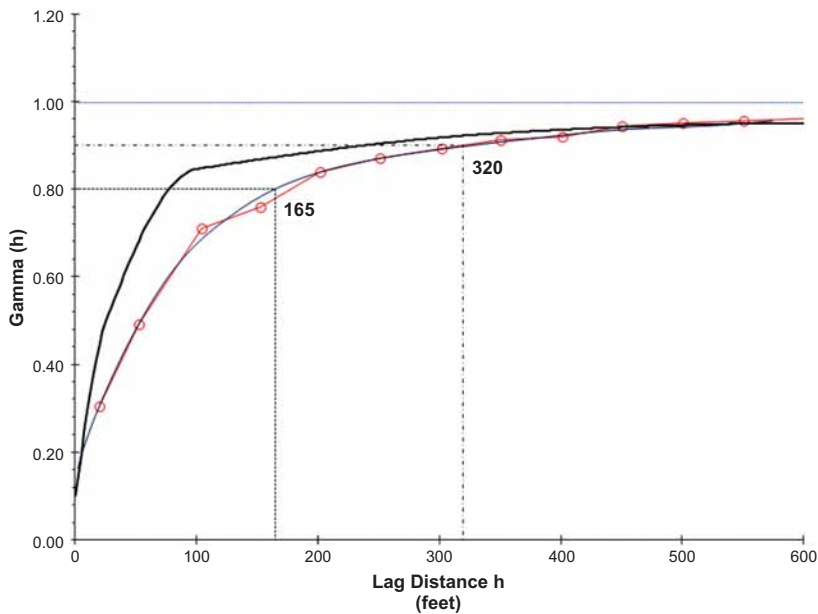


Figure 14-3

Barrick Gold Corporation
Cortez Joint Venture Operations
State of Nevada, U.S.A.
Low Grade, Omnidirectional Variograms at Pipeline Complex

GRADE INTERPOLATION

Gold was interpolated into high and low grade indicator areas individually for each formation within Pipeline, Gap and Crossroads using a five pass Inverse Distance cubed (ID³) estimation approach, and incorporating mineralization control at Gap and Crossroads (Table 14-11). The first pass employed a box search equal to the block size. Search ellipse dimensions were set to the lag distance at 80% and 90% of the variogram sill for each area for the second and fourth passes, respectively, which were each followed by a pass using a smaller search ellipse with less composite restrictions. As with the indicator estimation, blocks flagged as dominated by stratigraphic mineralization control employed Vulcan's tetramesh unfolding. Grade estimations incorporating structural control were limited to the DW Formation at Crossroads and to the DW and SRM formations at Gap.

**TABLE 14-11 ESTIMATION PASS SUMMARY – PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations**

Pass	Major (ft)	Semi-major (ft)	Minor- strat (ft)	Minor – struct (ft)	No. of Composites Min./Max./Max. per DH
Gap					
1	20	20	10	10	1/99/99
2	180	180	variable	20	2/3/1
3	70	70	variable	20	1/3/1
4	320	320	variable	40	2/3/1
5	100	100	variable	40	1/3/1
Pipeline					
1	20	20	10	n/a	1/99/99
2	180	180	variable	n/a	2/3/1
3	70	70	variable	n/a	1/3/1
4	320	320	variable	n/a	2/3/1
5	130	130	variable	n/a	1/3/1
Crossroads					
1	20	20	10	10	1/99/99
2	180	180	variable	20	2/3/1
3	70	70	variable	20	1/3/1
4	320	320	variable	40	2/3/1
5	130	130	variable	40	1/3/1

Select composite weights were assigned manually by the Tucson Technical Group to allow limited influence of composite groups (grade and mineralization control) across domain boundaries. For example, low grade, stratigraphically controlled composites were assigned a weight of 0.25 in the high grade domain at Gap, and a weight of 0.1 at Pipeline and Crossroads.

A complete summary of composite weights used in grade interpolation are shown in Table 14-12.

TABLE 14-12 SUMMARY OF COMPOSITE WEIGHTS – PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations

Deposit Area/Grade Zones	High Grade	Low Grade Stratigraphic Control	Low Grade Structural Control	Waste Stratigraphic Control	Waste Structural Control
Gap					
High Grade	1.00	0.25	-	0.10	-
Low Grade Stratigraphic Control	0.75	1.00	-	0.10	-
Low Grade Structural Control	0.75	-	1.00	-	0.10
Waste - Stratigraphic Control	0.10	0.10	-	1.00	-
Waste - Structural Control	-	-	0.10	-	1.00
Pipeline					
High Grade	1.00	0.10	-	0.10	-
Low Grade - Stratigraphic Control	0.50	1.00	-	0.10	-
Waste - Stratigraphic Control	0.10	0.10	-	1.00	-
Crossroads					
High Grade	1.00	0.10	-	0.10	-
Low Grade - Stratigraphic Control	0.50	1.00	-	0.10	-
Low Grade - Structural Control	0.50	-	1.00	-	0.10
Waste - Stratigraphic Control	0.10	0.10	-	1.00	-
Waste - Structural Control	-	-	0.10	-	1.00

In addition to gold based upon fire assay results, cyanide leach gold and carbon were also estimated for use in material type definition in conjunction with geology, alteration, and area flags. Nearest neighbour interpolation was run in parallel to ID³ for fire assay gold for validation purposes.

Where areas over the Pipeline Complex have been mined and backfilled with waste, grades, and densities were updated to reflect this.

BULK DENSITY

Bulk density values were assigned to the rock unit formations and alteration types. Table 14-13 lists the bulk density values used for the deposits in the Pipeline Complex.

TABLE 14-13 BULK DENSITY – PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations

Formation	Density (st/ft³)	Density (t/m³)
Dumps	0.057	1.83
QAL	0.062	1.99
SRM - Gossan	0.066	2.11
Shear	0.068	2.18
Gossan	0.074	2.37
Silica	0.074	2.37
SRM	0.075	2.40
DW	0.076	2.43
DHC	0.076	2.43
Marble	0.078	2.50
Skarn	0.079	2.53
Abyss	0.08	2.56
OHC	0.084	2.69
SRM - Marble	0.086	2.76
SRM - Skarn	0.091	2.92

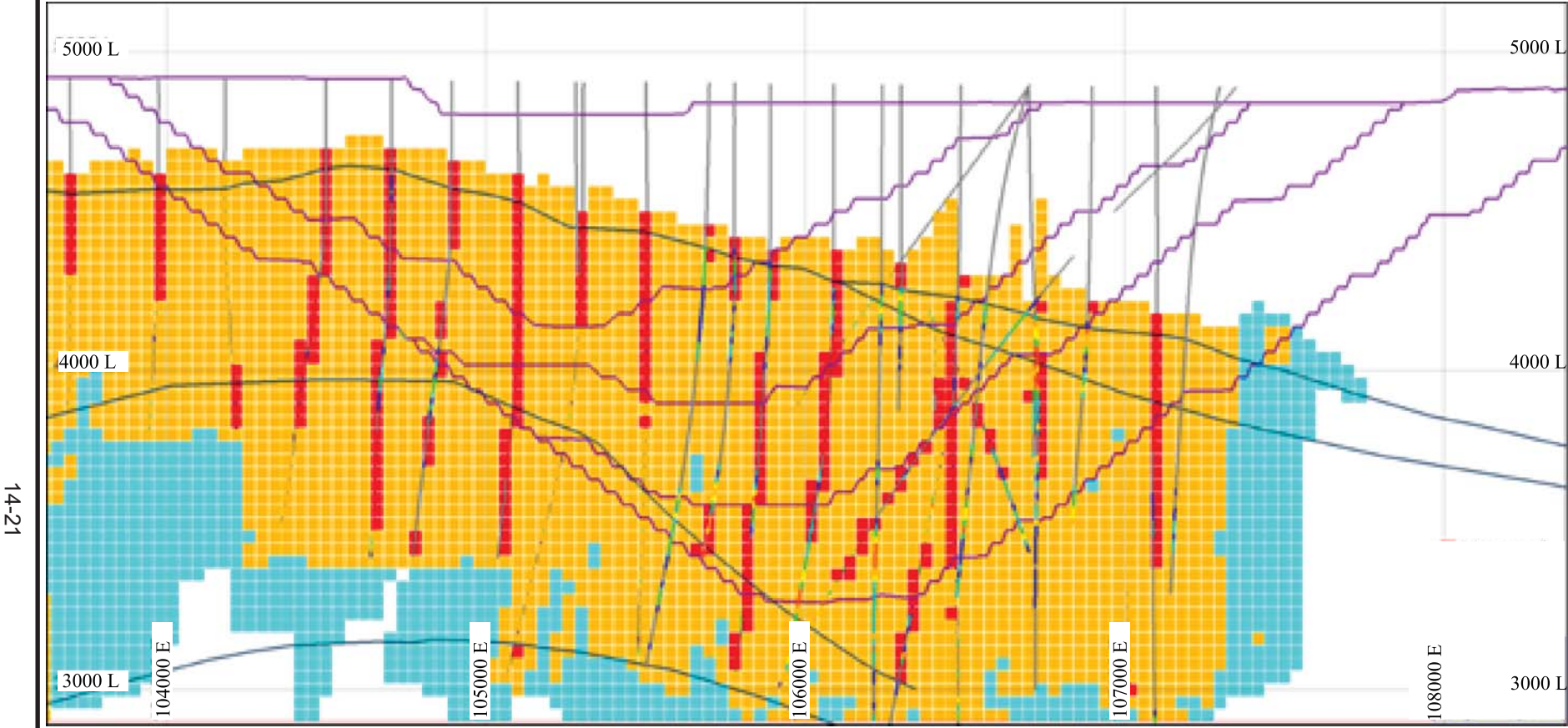
CLASSIFICATION

The Measured Mineral Resource classification is assigned to blocks directly intersected by drill holes used in the interpolation, and estimated during the initial box search. Indicated Mineral Resources are those blocks estimated in the second or third pass, equal to a maximum distance range of 80% of the variogram sill. Inferred Mineral Resources are those blocks estimated in the two final passes, where the search ellipse dimensions are equal to, or smaller than, a distance range of 90% of the variogram sill for each area. A classification script updated the block model to reclassify isolated blocks assigned a class of Indicated as Inferred. A cross section showing classification of blocks meeting Mineral Resource criteria over the Crossroads deposit is shown in Figure 14-4.

REBLOCKING

Subsequent to grade estimation, the Pipeline Complex block model was reblocked to 40 ft x 40 ft x 40 ft for use in mine planning. Mine staff perform a model comparison after each reblock to confirm that the total ounces are correct, and a bias is not introduced. The original and reblock models are also compared visually in section with block texts and inquires. Grade variables were averaged into the larger block size and weighted by density, all other variables were assigned based on majority.

Looking North

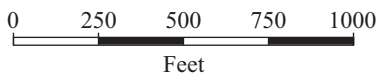


14-21

Figure 14-4

Legend:

- Measured
- Indicated
- Inferred



Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Mineral Resources Classification
Crossroads Deposit, Pipeline Complex

March 2019

Source: RPA, 2019.

MODEL VALIDATION

Checks and validation performed by the Tucson Technical Group included:

- Examination of the interpolation scripts and comparison to the interpolation plan
- Visual comparisons of interpolated gold grades relative to drill hole composite values on sections and plans
- For Pipeline, results of the estimation were compared to the blast hole block model
- Comparison of block model grades and gold assays using histograms and cumulative frequency plots
- Comparison of the ID³ estimation to the nearest neighbor (NN) estimation model
- Local trends in the grade estimates were reviewed using swath plots

Following these checks, the Tucson Technical Group concluded that the block model was globally unbiased and demonstrated good correlation between the different estimation methods and different supports.

RPA has reviewed various modelling aspects of the Pipeline Complex, with focus on the Crossroads deposit, which represents approximately 25% of classified material at Cortez. RPA's observations and comments from the model validation are provided below. All comments are based on the EOY2018 model data, which has been depleted to December 31, 2018.

RPA conducted several checks on the drill hole database and composite file provided by the Tucson Technical Group, including a search for duplicate and missing samples, overlapping intervals, anomalous values and missing tables. No significant errors were found.

Compositing routines were checked to confirm appropriate flagging and selected domains were reviewed using histograms, probability plots, and decile analysis to confirm appropriate gold grade caps. RPA is satisfied with the compositing routines and chosen gold grade caps and finds the composites appropriate for resource estimation.

RPA reviewed the stratigraphic surfaces against the drill hole data and found the general trends of the surfaces to be honoured.

RPA reviewed block and database flagging, field calculation, block estimation, and block calculation files and scripts provided by the Tucson Technical Group for errors and found them to be in good order.

RPA compared flagged formation codes to formation wireframes and expected stratigraphy and density and found the block model to be appropriately flagged.

Block model sizes and orientations were reviewed and found appropriate to the drilling density, mineralization and proposed mining methods. Mine staff perform a model comparison after each re-block to confirm that the total ounces are correct, and a bias is not introduced. The original and reblock models are also compared visually in section with block texts and inquires.

Assigned density values in the block model were compared to measured density values in drill core using basic statistics. The average values of the measured density within each formation and alteration zone compared well to the assigned block model value, if slightly conservative.

Omni-directional variography continues to be the predominant tool to evaluate grade continuity and set interpolation search distances. Detailed variography should be carried out, where sample numbers are sufficient, to evaluate grade continuity anisotropy and better quantify search ellipse parameters for interpolation of the grade block models. Omni-directional variography was used on the older Pipeline deposits. Directional variography is now used on all of the updated models.

Search ellipse dimensions were compared to the omnidirectional variography completed by the Tucson Technical Group and found to be reasonable. A strong northeastern mineralization trend was visually observed by RPA in the composites and resultant block model. RPA is of the opinion that this trend may be discernible using directional variography in unfolded space, which would yield more precise variogram models to inform search ellipse dimensions in future updates. RPA also recommends updating the variogram models to fit with raw data.

In 2016, RPA created isotropic and anisotropic grade shells using Seequent Leapfrog software for comparison with interpolated blocks and to identify mineralization trends. The block model and grade shells were spatially comparable. An additional mineralization trend dipping approximately 35° to the west was visible within the Crossroads Pit. This shallow dipping trend has been observed, projecting off from the SRM/DW fold.

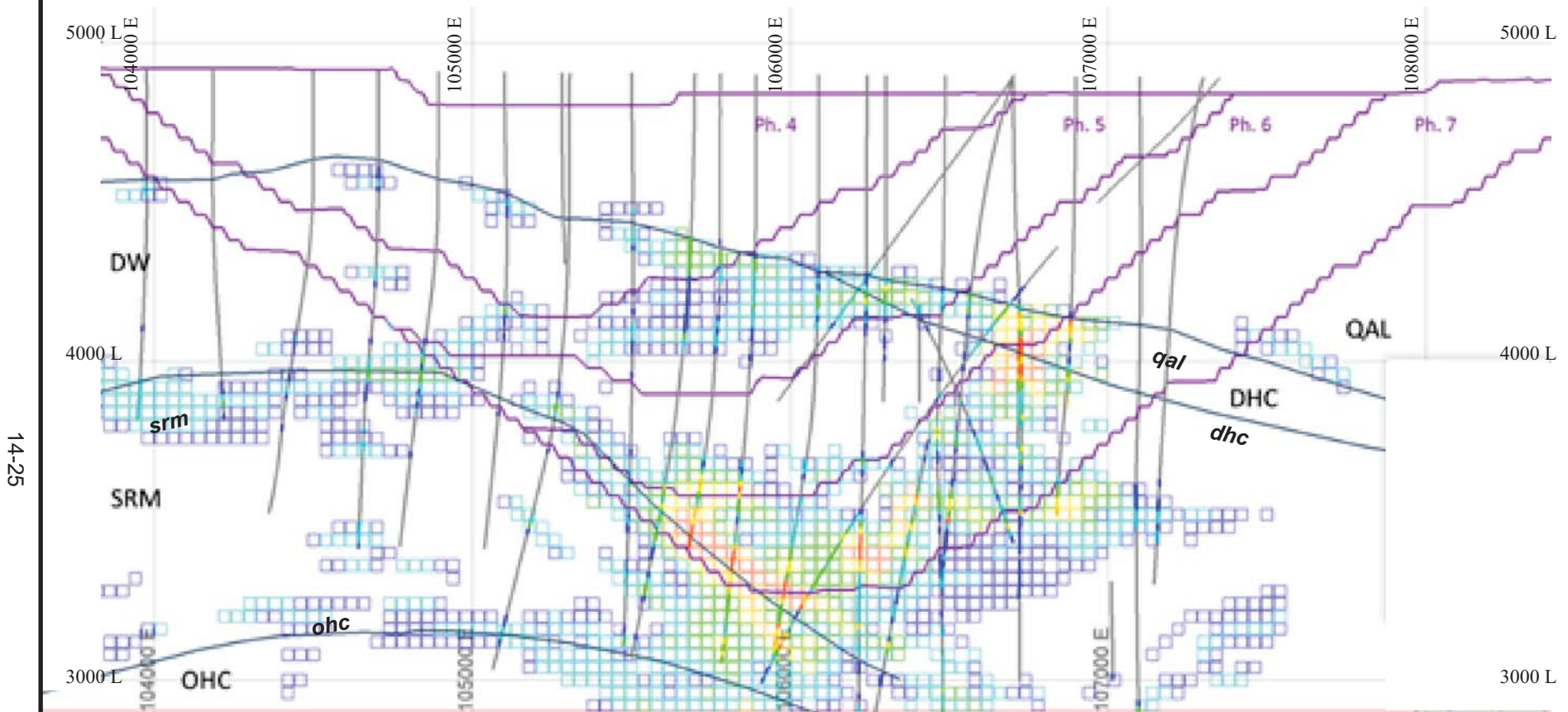
RPA conducted visual comparisons of assay, composite and block gold values in cross section and plan and found good spatial correlation. Gold grade was not observed to extend into regions dominated by waste and did not appear to be overly smoothed in higher grade areas. An example cross section of composite and block gold grades is shown in Figure 14-5.

RPA compiled basic statistics, histograms and probability plots of blocks and composites within the SRM, OHC, Abyss fault, DHC including DW, and QAL units of Crossroads, above a gold cut-off grade of 0.004 oz/st, and found excellent spatial correlation. Basic statistics are summarized in Table 14-14.

TABLE 14-14 COMPARISON OF BASIC STATISTICS OF GOLD VALUES – PIPELINE COMPLEX
Barrick Gold Corporation – Cortez Operations

	Minimum (g/t Au)	Maximum (g/t Au)	Mean (oz/st Au)	Number of (g/t Au)	(oz/st Au)	(g/t Au)	Data Points
Crossroads							
Blocks	0.004	0.14	0.649	22.25	0.024	0.82	107,788
Composites	0.004	0.14	0.649	22.25	0.027	0.93	7,883
Gap							
Blocks	0.004	0.14	0.389	13.34	0.013	0.45	93,265
Composites	0.004	0.14	0.389	13.34	0.015	0.51	4,812
Pipeline							
Blocks	0.004	0.14	1.2	41.14	0.031	1.06	256,466
Composites	0.004	0.14	1.2	41.14	0.04	1.37	18,594

Looking North



Gold (oz/st)	
Dark Blue	< 0.004
Light Blue	0.004 - 0.010
Green	0.010 - 0.050
Yellow	0.050 - 0.100
Orange	0.100 - 0.300
Red	0.300 - 0.500
Purple	> 0.500

..... Unfold Surface
 Blocks ≥ 0.004 oz/t Au

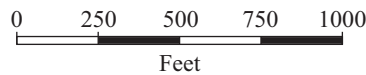


Figure 14-5

Barrick Gold Corporation
Cortez Joint Venture Operations
 State of Nevada, U.S.A.
 Comparison of Block and Composite Grades
 at Crossroads Deposit, Pipeline Complex
 Section 52600N

RPA reviewed the classification criteria at the Pipeline Complex as well as visually inspected classified blocks in cross section and plan view. The standard approach where Measured Mineral Resource is assigned by a drill hole piercing a block was not used outside of Crossroads after 2015. For CHUG Middle Zone (MZ) and Lower Zone (LZ), it was decided that this method did not truly represent Measured Mineral Resource, and it was not incorporated. All mineralization in the CHUG MZ/LZ was classed as Indicated. A new approach for assigning Measured Mineral Resource has been designed and will be implemented in the mid-2019 resource model. Additionally, assigning classification of Indicated Mineral Resource and Inferred Mineral Resource primarily by interpolation pass has resulted in isolated blocks, yielding a 'spotted dog' appearance in cross section, which is impractical for mine design purposes. RPA concurs with Barrick's review of classification criteria at the Pipeline Complex, and is of the opinion that future updates should consider the inclusion of classification wireframe shells and revision of classification smoothing scripts.

CORTEZ HILLS COMPLEX

Open pit and underground development are present at the Cortez Hills Complex. The Cortez Hills Breccia, Middle, and Lower zones, as well as the Deep South extension of the Lower Zone, make up the underground component, and the near-surface portion of the Breccia Zone is designated for open pit development. At the EOY2018, the Mineral Resource for the Pediment deposit has been completely depleted and not included in the final resource estimation. The open pit resource for the Breccia Zone is also nearly depleted and represents a very small portion in the final resource estimate. Mineral Resources at Cortez Hills Complex, exclusive of Mineral Reserves, are listed in Tables 14-15 and 14-16. Cut-off grades used in reporting Mineral Resources were established using a gold price of US\$1,500 per ounce and are shown in Table 14-17. Measured and Indicated Mineral Resources are limited to the underground portions of the Cortez Hills Complex.

**TABLE 14-15 CORTEZ HILLS COMPLEX MINERAL RESOURCE SUMMARY: US CUSTOMARY UNITS –
DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations**

	Mill Material			Leach Material			Refractory Material			Total		
	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)
Measured Resources												
Underground (CHUG)												
Breccia Zone	170	0.324	55	0	0.000	0	21	0.294	6	191	0.321	61
Total	170	0.324	55	0	0.000	0	21	0.294	6	191	0.321	61
Indicated Resources												
Underground (CHUG)												
Breccia Zone	334	0.305	102	0	0.000	0	39	0.243	9	373	0.298	111
Middle Zone	142	0.263	37	0	0.000	0	1,012	0.301	305	1,154	0.296	342
Lower Zone	35	0.264	9	0	0.000	0	573	0.271	156	608	0.271	165
Deep South	424	0.281	119	0	0.000	0	590	0.268	158	1,015	0.273	278
Total	936	0.286	268	0	0.000	0	2,214	0.284	628	3,150	0.284	896
Measured and Indicated Resources												
Underground (CHUG)												
Breccia Zone	504	0.311	157	0	0.000	0	60	0.261	16	564	0.306	173
Middle Zone	142	0.263	37	0	0.000	0	1,012	0.301	305	1,154	0.296	342
Lower Zone	35	0.264	9	0	0.000	0	573	0.271	156	608	0.271	165
Deep South	424	0.281	119	0	0.000	0	590	0.268	158	1,015	0.273	278
Total	1,106	0.292	323	0	0.000	0	2,236	0.284	634	3,341	0.286	957
Inferred Resources												
Open Pit (CHOP)												
Breccia Zone	0	0.000	0	3	0.008	0	0	0.000	0	3	0.008	0
Total	0	0.000	0	3	0.008	0	0	0.000	0	3	0.008	0

	Mill Material			Leach Material			Refractory Material			Total		
	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)
Underground (CHUG)												
Breccia Zone	16	0.500	8	0	0.000	0	0	0.000	0	16	0.500	8
Middle Zone	22	0.186	4	0	0.000	0	211	0.220	46	233	0.217	50
Lower Zone	7	0.197	1	0	0.000	0	1,104	0.196	216	1,111	0.196	218
Deep South	318	0.175	56	0	0.000	0	739	0.196	145	1,057	0.190	201
Total	363	0.190	69	0	0.000	0	2,054	0.199	408	2,417	0.197	477

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at the cut-off grades given in Table 14-17.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 10 ft was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk densities vary by formation and zone and are listed in Table 14-20.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

TABLE 14-16 CORTEZ HILLS COMPLEX MINERAL RESOURCE SUMMARY: METRIC UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations

	Mill Material			Leach Material			Refractory Material			Total		
	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)
Measured Resources												
Underground (CHUG)												
Breccia Zone	154	11.11	55	0	0.00	0	19	10.08	6	173	11.01	61
Total	154	11.11	55	0	0.00	0	19	10.08	6	173	11.01	61
Indicated Resources												
Underground (CHUG)												
Breccia Zone	303	10.46	102	0	0.00	0	35	8.33	9	338	10.22	111
Middle Zone	129	9.02	37	0	0.00	0	918	10.32	305	1,047	10.15	342
Lower Zone	32	9.05	9	0	0.00	0	520	9.29	156	552	9.29	165
Deep South	385	9.63	119	0	0.00	0	535	9.19	158	921	9.36	278
Total	849	9.81	268	0	0.00	0	2,009	9.74	628	2,858	9.74	896
Measured and Indicated Resources												
Underground (CHUG)												
Breccia Zone	457	10.66	157	0	0.00	0	54	8.95	16	512	10.49	173
Middle Zone	129	9.02	37	0	0.00	0	918	10.32	305	1,047	10.15	342
Lower Zone	32	9.05	9	0	0.00	0	520	9.29	156	552	9.29	165
Deep South	385	9.63	119	0	0.00	0	535	9.19	158	921	9.36	278
Total	1,003	10.01	323	0	0.00	0	2,028	9.74	634	3,031	9.81	957

	Mill Material			Leach Material			Refractory Material			Total		
	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)
Inferred Resources												
Open Pit (CHOP)												
Breccia Zone	0	0.00	0	3	0.27	0	0	0.00	0	3	0.27	0
Total	0	0.00	0	3	0.27	0	0	0.00	0	3	0.27	0
Underground (CHUG)												
Breccia Zone	15	17.14	8	0	0.00	0	0	0.00	0	15	17.14	8
Middle Zone	20	6.38	4	0	0.00	0	191	7.54	46	211	7.44	50
Lower Zone	6	6.75	1	0	0.00	0	1,002	6.72	216	1,008	6.72	218
Deep South	288	6.00	56	0	0.00	0	670	6.72	145	959	6.51	201
Total	329	6.51	69	0	0.00	0	1,863	6.82	408	2,193	6.75	477

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at the cut-off grades given in Table 14-17.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. A minimum mining width of 3.05 m was used for underground Mineral Resources.
5. Open pit Mineral Resources are constrained by an optimized pit shell.
6. Mineral Resources are exclusive of Mineral Reserves.
7. Bulk densities vary by formation and zone and are listed in Table 14-20.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

**TABLE 14-17 CORTEZ HILLS COMPLEX MINERAL RESOURCE REPORTING
CUT-OFF GRADES**

Barrick Gold Corporation – Cortez Operations

Cortez Pits BCOG_inpit, \$1,500 Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,500	1,500	1,500
Gold Refining Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.90%	99.90%	99.90%
Recovery	%	80%	84%	70%
Mining Cost	\$	1.89	1.89	1.89
Process Operating Cost	\$	1.57	9.87	22.12
G&A Cost	\$	0.81	5.35	6.09
Sustaining Capital		0.032	1.14	0.093
Transportation Cost	\$			13.8
Sub-Total Operating Cost (wo mining)	\$	2.412	16.36	42.103
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US customary units)	oz/st Au	0.002	0.013	0.041
Cut-Off Grade (metric units)	g/t Au	0.069	0.446	1.406

DATA

For the purpose of resource estimation, the drill hole data was limited to drill holes within or immediately adjacent to the block model extents. The resource database includes 4,299 drill holes comprising 3,470,927 ft and 344,289 assays. This database includes all drill holes used for Mineral Resource estimates for all of Cortez Hills including the Breccia open pit and underground, and underground Middle, Lower, and Deep South zones.

BLOCK MODEL AND MINERALIZED DOMAINS

Block modelling at the Cortez Hills Complex was performed by the Cortez Mine Technical Group. Geologic, structural and alteration interpretations were provided by onsite geologists. Three dimensional solids and surfaces constructed from these interpretations were used as the basis for defining mineralization domains.

The Cortez Mine Technical Group built a series of estimation domain wireframes using grade breaks derived from statistical analysis of gold distributions in conjunction with structural and alteration elements derived from geological logs and core photographs. This approach was particularly useful for the volumetric definition of the very high grade transported hydrothermal breccias and the surrounding moderate grade crackle breccia or fractured rock bodies of the Cortez Hills Breccia Zone. All of the mineralized domain wireframes (mzones) were bounded

by a sub-economic grade domain wireframe to provide dilution grades for mine planning. Wireframes representing barren, post-mineralization dikes and sills were modelled and cross cut the mineralization domain wireframes. An overview of the zones at Cortez Hills Complex are shown in Figure 14-6.

Two 10 ft x 10 ft x 10 ft sub-blocked models for the underground areas of the Cortez Hills deposit were built by the Cortez Mine Technical Group. The first was built to define the lower portions (< 5,000 ft elevation) of the Breccia Zone and the second, deeper model defines the Middle and Lower zones, including Deep South. Both were constructed honouring domain boundaries and formational contacts. Minimum and maximum sub-block dimensions of 2.5 ft x 2.5 ft x 2 ft and 10 ft x 10 ft x 10 ft were defined within mineralized domains; parent blocks of 30 ft x 30 ft x 20 ft were retained in areas outside these zones. A third model over upper Breccia Zone (> 5,000 ft) was defined using parent blocks of 10 ft x 10 ft x 10 ft, with sub-block dimensions of 5 ft x 5 ft x 2 ft. Following interpolation of all variables in the sub-blocked model, it was reblocked to 30 ft x 30 ft x 50 ft. Block model parameters are shown in Table 14-18.

TABLE 14-18 CORTEZ HILLS COMPLEX BLOCK MODEL PARAMETERS
Barrick Gold Corporation – Cortez Operations

	Easting (ft)		Northing (ft)		Elevation (ft)	
	Min	Max	Min	Max	Min	Max
Open Pit Breccia Zone	29,400	36,990	21,000	31,290	3,800	7,200
CHUG Breccia Zone	29,400	36,300	22,320	31,320	3,800	7,200
CHUG Middle and Lower Zones (including Deep South)	29,010	36,300	22,320	31,320	2,800	7,200

	Original Block Size (ft)			Reblocked Block Size (ft)		
	Easting	Northing	Elev.	Easting	Northing	Elev.
CHOP Breccia Zone	10	10	10	30	30	50
CHUG Unmineralized Parent	50	50	50	-	-	-
CHUG Mineralized Parent	10	10	10	-	-	-
CHUG Sub-block	2.5	2.5	2	-	-	-

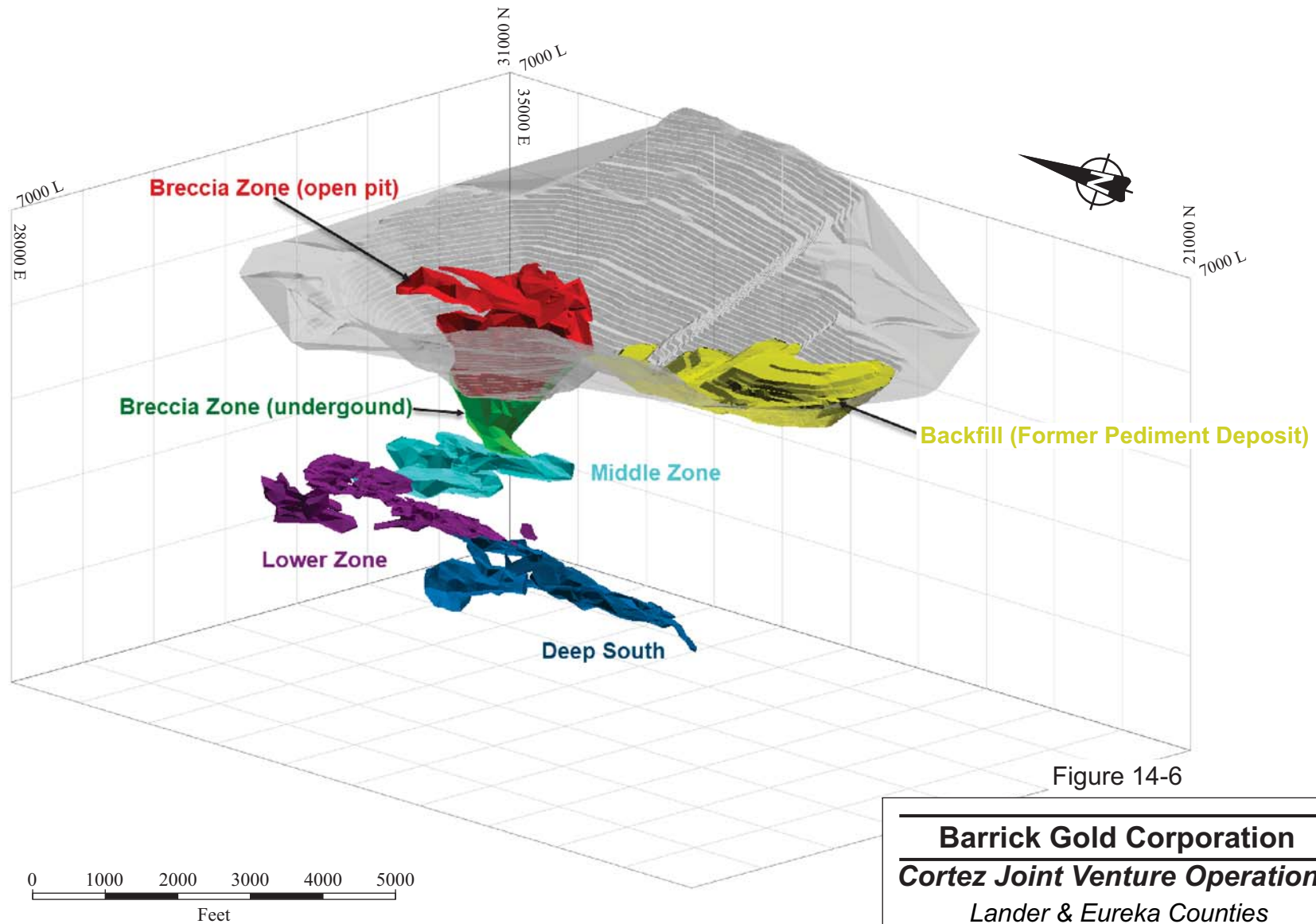


Figure 14-6

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Resource Estimation Domains
Cortez Hills Complex

GRADE CAPPING AND COMPOSITING

Assays contained in mineralized envelopes were grouped according to their statistical parameters, and reviewed together to determine the relevant gold caps. Details of the mzone grouping and resultant gold caps is shown in Table 14-19.

TABLE 14-19 CORTEZ HILLS COMPLEX CAPPING
Barrick Gold Corporation – Cortez Operations

Area and Group	Mzone	Gold Assay Cap (oz/st)	Gold Assay Cap (g/t Au)
Breccia			
I Very High Grade	30,40,49	10.0	342.86
II High Grade	15-29, 31-39, 41-48, 51	5.5	188.57
III Low Grade	11-14	0.3	10.29
Middle Zone			
I High Grade	143-149,161,162, 163, 198	3.0	102.86
II High Grade	121- 126,127,133,135,141,142,191,192,196	3.5	120.00
III High Grade	111-113,132,134,151-158,193,194	2.0	68.57
IV Intermediate Grade	110, 130, 140, 150	0.5	17.14
Lower Zone			
I High Grade	210,212-214,224- 228,230,231,233,234,236-238	3.0	102.86
II High Grade	209,211,215-217,220,221,226,232,239	1.3	44.57
III High Grade	246-249	0.6	20.57
IV High Grade	241-245	1.2	41.14
V Intermediate Grade	202,240	0.8	27.43
Uneconomic Buffer Zone	10	-	-
Unestimated Zones	101, 201	-	-

Capped assays were composited down hole at 10 ft lengths. This composite length was chosen to allow for the higher resolution grade interpolation needed for underground mine planning and is close to the accepted smallest mining unit (SMU) for underground. Intervals with poor recovery that could not be sampled were excluded from the compositing routine and estimation, as were selected drill holes identified by the on-site team as having poor location, sampling, or drilling angle to mineralized structures. Unsampled intervals were assigned a background gold grade of 0.0001 oz/st Au. Assays lengths were distributed within each domain to prevent the formation of residual composites.

VARIOGRAPHY

Directional variograms were developed for gold and used to establish search distances equal to lag at 80% and 90% of the total sill variance range for the different estimation domain groups.

In most cases, data from multiple domains was interpreted together in a group. Search ellipses were based on the ranges modelled in the variograms and preferred orientations of modelled mineralized zones.

GRADE INTERPOLATION

Grade models were interpolated using ID³ employing varying search criteria (directions and distances) customized to each domain within the models. ID³ was initially chosen based on previous model performance compared to grade control. Current parameters are compared against NN using cumulative normal distribution plots. The Breccia, Middle, and Lower zones have been modelled with 33, 44, 24, and 8 individual estimation domains, respectively. The interpolation approach within the Middle and Lower zones at Cortez included four nested estimation runs; the first being equal to 80% of the variogram sill, with a minimum of three and maximum of five composites, and only two composites per hole. These composite restrictions were also applied to the third pass, which used a search ellipse equal to 90% of the variogram sill. The second and fourth passes used search ellipses equal to half the dimensions of the first and third passes, respectively, but reduced the composite restrictions to allow a block to be estimated with a single composite. The Breccia Zone interpolation approach also included an initial box search, 5 ft x 5 ft x 5 ft, which allowed a single composite to estimate a block, if that composite was centred on the block.

BULK DENSITY

Bulk densities were determined from average tonnage factors (TF) measured for the different mineralized domains, rock formations or units, and refractory and oxide materials. Table 14-20 lists the bulk densities used in the block model at the Cortez Hill Complex.

TABLE 14-20 CORTEZ HILLS COMPLEX - BULK DENSITY
Barrick Gold Corporation – Cortez Operations

Area	TF (ft ³ /st)	1/TF (st/ft ³)	Density (t/m ³)	Comments
Default	13.5	0.074	2.37	default
QAL (Cortez Hills)	18.2	0.055	1.76	
QCL ¹ (Cortez Hills)	15	0.067	2.15	
QCS ²	17.9	0.056	1.79	
DHC ³	16.2	0.062	1.99	
DW ⁴	12.4	0.081	2.59	
SRM ⁵	12.4	0.081	2.59	
Dike ⁶ (mzone ⁷ 900)	13.8	0.073	2.34	
Breccia Zone				
mzone 11 (oxide)	12.6	0.079	2.53	low grade halo around main breccia
mzone 11 (refractory)	12.3	0.081	2.59	low grade halo around main breccia
mzone 12	16.6	0.06	1.92	low grade capping zone
mzone 13	13.9	0.072	2.31	low grade upper breccia
mzone 14	13	0.077	2.47	low grade - north breccia wing
mzone 15	12.6	0.079	2.53	
mzone 20 (oxide)	13.2	0.076	2.43	main breccia zone
mzone 20 (refractory)	12.8	0.078	2.50	main breccia zone
mzone 21	12.8	0.078	2.50	footwall zones - dominantly breccia
mzones 22 - 33	12.6	0.079	2.53	footwall zones - dominantly breccia
mzone 34	16.6	0.06	1.92	capping zone
mzone 35 (DHC)	15.4	0.065	2.08	upper high grade breccia
mzone 35 (DW)	13.8	0.073	2.34	upper high grade breccia
mzone 35 (CHUG model)	13.8	0.073	2.34	upper high grade breccia
mzone 36 & 37	13.8	0.073	2.34	north breccia wing
mzone 38	12.6	0.079	2.53	south breccia wing
mzone 39	18.1	0.055	1.76	mineralized QCS
mzone 40 (oxide)	14.4	0.069	2.21	high grade breccia core
mzone 40 (refractory)	13.7	0.073	2.34	high grade breccia core
mzones 41 - 48	12.6	0.079	2.53	footwall zones
mzone 49 (oxide)	14.4	0.069	2.21	high grade breccia core
mzone 49 (refractory)	13.7	0.073	2.34	high grade breccia core
mzone 51	12.6	0.079	2.53	breccia
Middle Zone				
101	12.1	0.083	2.66	
110 (oxide)	12.1	0.083	2.66	
110 (refractory)	12.3	0.081	2.59	
130, 140, 150 (oxide)	12.1	0.083	2.66	
130, 140, 150 (refractory)	12.2	0.082	2.63	
111, 112, 113, 121 - 127, 191-196 (oxide)	12.5	0.08	2.56	

Area	TF (ft ³ /st)	1/TF (st/ft ³)	Density (t/m ³)	Comments
111, 112,113, 121 - 127, 191-196 (refractory)	12.8	0.078	2.50	
131 - 135, 141 - 149, 151-158, 161, 162,163, 198 (oxide)	12.5	0.08	2.56	
131 - 135, 141 - 149, 151-158, 161, 162,163, 198 (refractory)	13	0.077	2.47	
Dikes	13.8	0.073	2.34	
Lower Zone				
Default	12.2	0.082	2.63	
Dikes	13.8	0.073	2.34	
201	12.4	0.081	2.59	
202 (oxide)	13.3	0.075	2.40	
202 (refractory)	12.3	0.081	2.59	
228,230 (oxide)	13.3	0.072	2.31	
228,230,238 (refractory)	13.1	0.073	2.34	
211,212,224,227,231,234,237 (oxide)	13.3	0.075	2.40	
210,212- 214,216,217,220,226,235,236,239,246-249 (refractory)	13.2	0.076	2.43	
209,210,213-217, 220, 221, 225, 226, 232, 233,235,236,238,239,246,247,248,249 (oxide)	12.7	0.079	2.53	
209,211,215,221,224,225,227,231,232,237 (refractory)	12.7	0.079	2.53	
240-245 (oxide)	12.2	0.082	2.63	
233,234 (refractory)	12.2	0.082	2.63	
240-245 (refractory)	12.8	0.078	2.50	

Notes:

1. QCL: Quaternary conglomerate, limestone dominated clasts
2. QCS: Quaternary conglomerate, siltstone dominated clasts
3. DHC: Devonian Horse Canyon Formation
4. DW: Devonian Wenban Formation
5. SRM: Silurian Roberts Mountains Formation
6. Dike: Barren Dikes
7. Mzone: Interpreted mineralized zone used to limit estimation

CLASSIFICATION

Blocks at the Cortez Hills Complex were classified considering estimation pass and the Cartesian distance to the nearest informing composite sample (same domain), with some downgrading at the discretion of the modelling geologist. In general, blocks estimated in the first estimation pass, a box search, were assigned a classification of Measured Mineral Resource. Indicated Mineral Resources were those with an informing composite sample within 80% of the modelled variogram sill distance for the different domains. All other estimated blocks were assigned a classification of Inferred Mineral Resource, equal to a distance of 90% of the modelled variogram sill value for each domain, as well as some additional areas with lower geological confidence. Blocks in the Middle and Lower zones were assigned to Indicated

Mineral Resource. A summary of classification criteria employed at the Cortez Hills Complex is shown in Table 14-21.

TABLE 14-21 CORTEZ HILLS COMPLEX - CLASSIFICATION DISTANCE CRITERIA
Barrick Gold Corporation – Cortez Operations
(MAXIMUM CARTESIAN DISTANCE TO CLOSEST COMPOSITE (FT))

CHUG Zone	Measured	Indicated	Inferred
Breccia Zone	5	150	270
Middle Zone	-	150	292
Lower Zone	-	170	257

MODEL VALIDATION

RPA has reviewed various modelling aspects of the Breccia, Middle, and Lower zones. RPA’s observations and comments from the model validation are provided below. The model has been depleted to December 31, 2018.

Mineralization solids were checked for conformity to drill hole data, continuity, similarity between sections, overlaps, appropriate terminations between holes and into undrilled areas, and minimum mining thicknesses. The wireframe solids were mostly snapped to drill hole intervals, reasonably consistent, continuous, honoured minimum thickness criteria, and are generally representative of the extents and limits of the mineralization. CHUG MZ/LZ is not reblocked, only the open pit portion of the Breccia Zone. A model tabulation is performed after each reblock to confirm that the total ounces are correct. Mine staff perform a model comparison after each reblock to confirm that the total ounces are correct, and a bias is not introduced. The original and reblock models are also compared visually in section with block texts and inquires.

Block model sizes and orientations were reviewed and are considered by RPA to be appropriate to the drilling density, mineralization, and proposed mining methods.

Compositing routines were checked to confirm that composites started and stopped at the intersections with the wireframes, that the composite coding is consistent with the wireframes. RPA is satisfied with the compositing routines and finds the composites appropriate for resource estimation.

Capping statistics were reviewed for a series of individual zones and compared to the statistics of capping groups defined by Barrick. RPA is satisfied with the chosen caps and is of the opinion that the values are appropriate for resource estimations.

Visual inspection and comparison of drill hole composites against mineralized solids was made for a number of sections from the Breccia, Middle, and Lower zones. The mineralized solids and gold grade shells were found to conform well to the drill hole composite grades. A cross section for each zone of the Cortez Hills Complex comparing composite and block gold grades is shown in Figures 14-7 to 14-10.

The drilling data, which include surface as well as tighter spaced underground core and Cubex holes, are locally clustered. Although no de-clustering was employed for the ID³ interpolation, the low number of composites and octant restriction used in the interpolation method helps to de-cluster the composites. Regular reconciliation to production reveals that the model does slightly overestimate high grade tons, but also underestimates average grade of processed material. Overall reconciliation between production and the reserve model remains close, however, it shows consistent positive gains from production relative to the model. RPA recommends validation by ordinary kriging be performed as part of the next model update at Cortez Hills Complex.

RPA reviewed the classification criteria at the Cortez Hills Complex as well as visually inspected classified blocks in cross section and plan view. The Cortez Hills Breccia Zone used the same measured method as Pipeline. As Cortez moved forward with MZ and LZ, it was decided that this method did not truly represent Measured Mineral Resources, and it was not incorporated. All mineralization in MZ and LZ was classed as Indicated. A new approach for assigning Measured Mineral Resources has been designed by Mine staff, and will be implemented in the mid-2019 resource model. RPA is of the opinion that in general classification of blocks is acceptable.

RPA is of the opinion that the drill hole density and reconciliation results are supportive of much of the Indicated material within the Breccia Zone, and some of the Indicated material in the Middle Zone being reclassified as Measured Resource.

Reported Mineral Resources for the open pit are restricted to Inferred Mineral Resource material within the final Mineral Reserve pit shell. Underground Mineral Resources are limited

by a grade shell enclosing blocks above 0.1 oz/st Au, filtered to remove isolated blocks, and a minimum mining width of 10 ft.

Figures 14-11 to 14-12 provide comparative statistics for the CHUG Breccia Zone, Middle Zone, and Lower Zone models.

Looking North

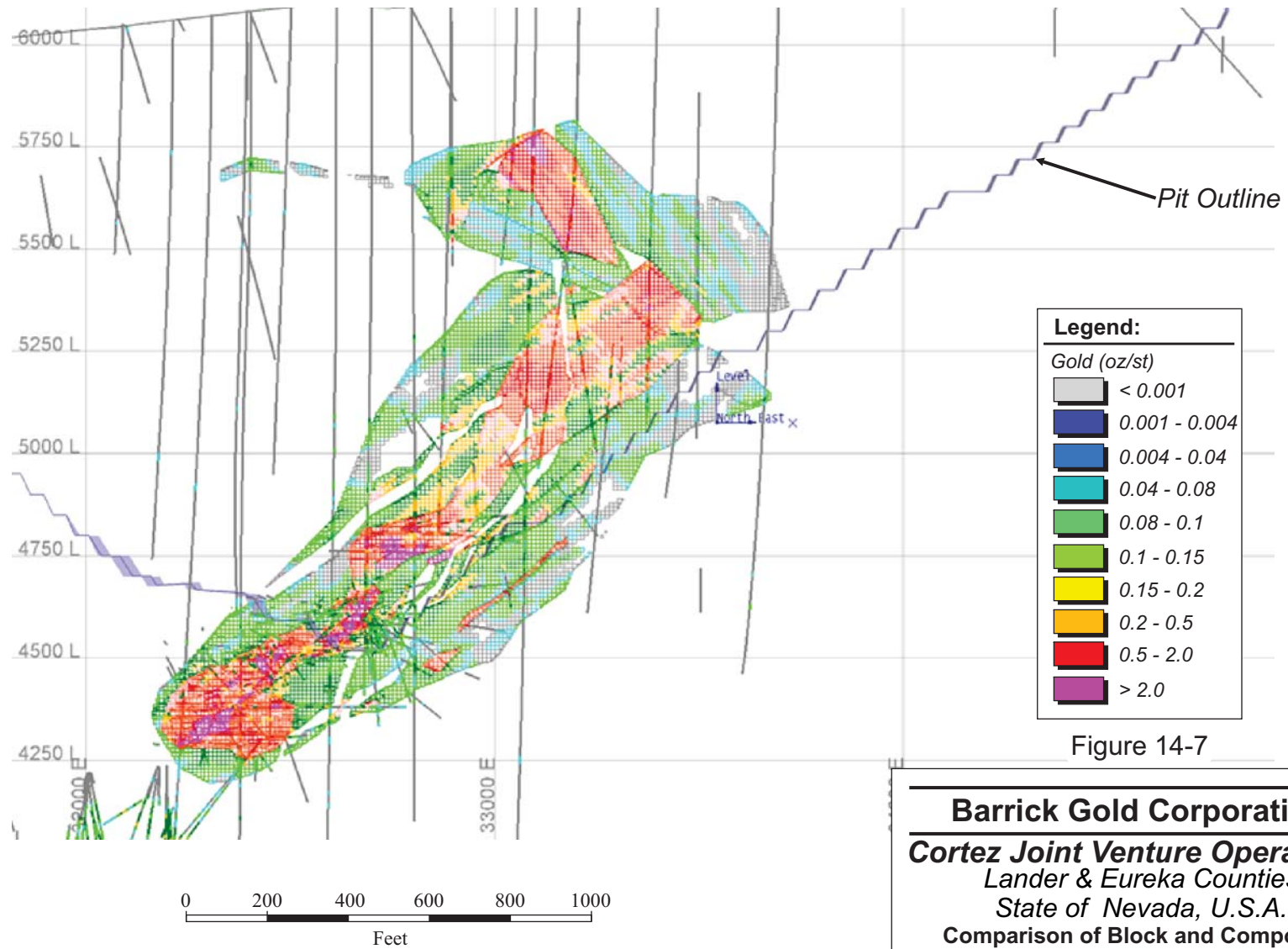
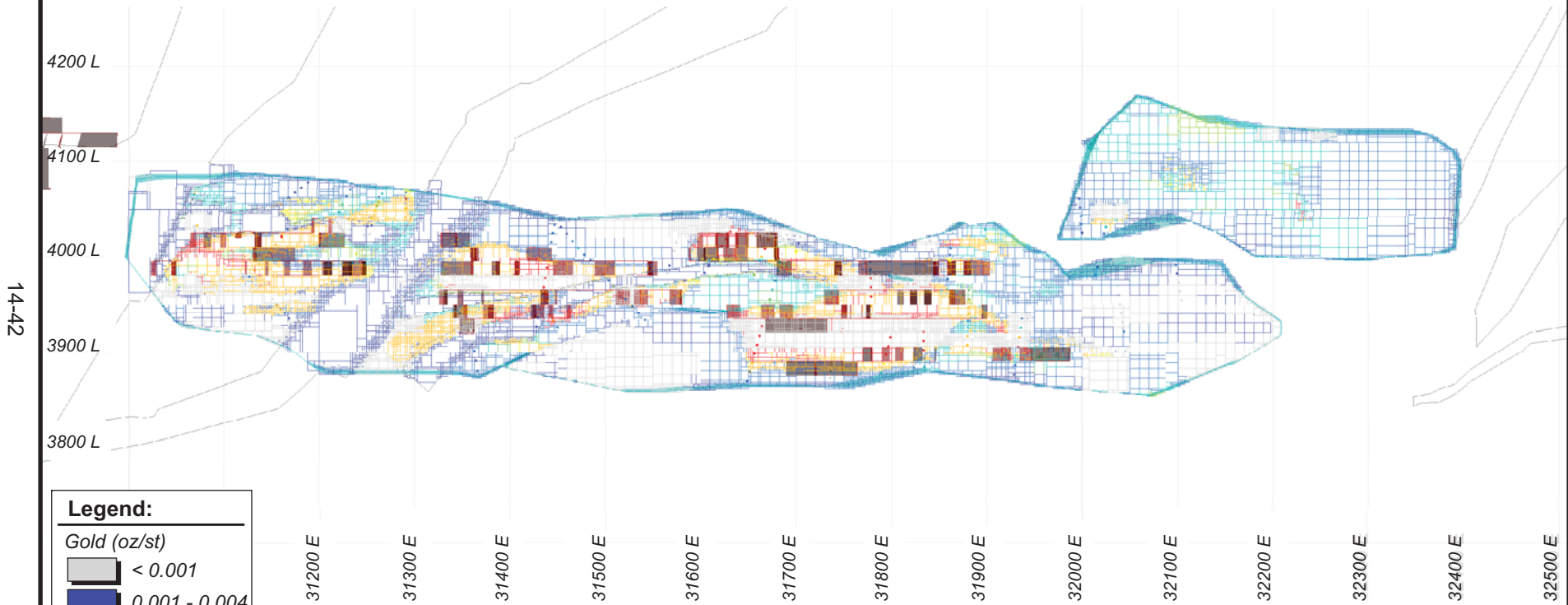


Figure 14-7

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
 Comparison of Block and Composite
 Grades within the Breccia Zone,
 Open Pit Portion, Cortez Hills Complex

14-41

Looking North
28,470 N



Legend:

Gold (oz/st)

	< 0.001
	0.001 - 0.004
	0.004 - 0.04
	0.04 - 0.08
	0.08 - 0.1
	0.1 - 0.15
	0.15 - 0.2
	0.2 - 0.5
	0.5 - 2.0
	> 2.0

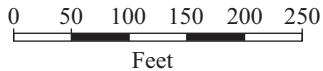


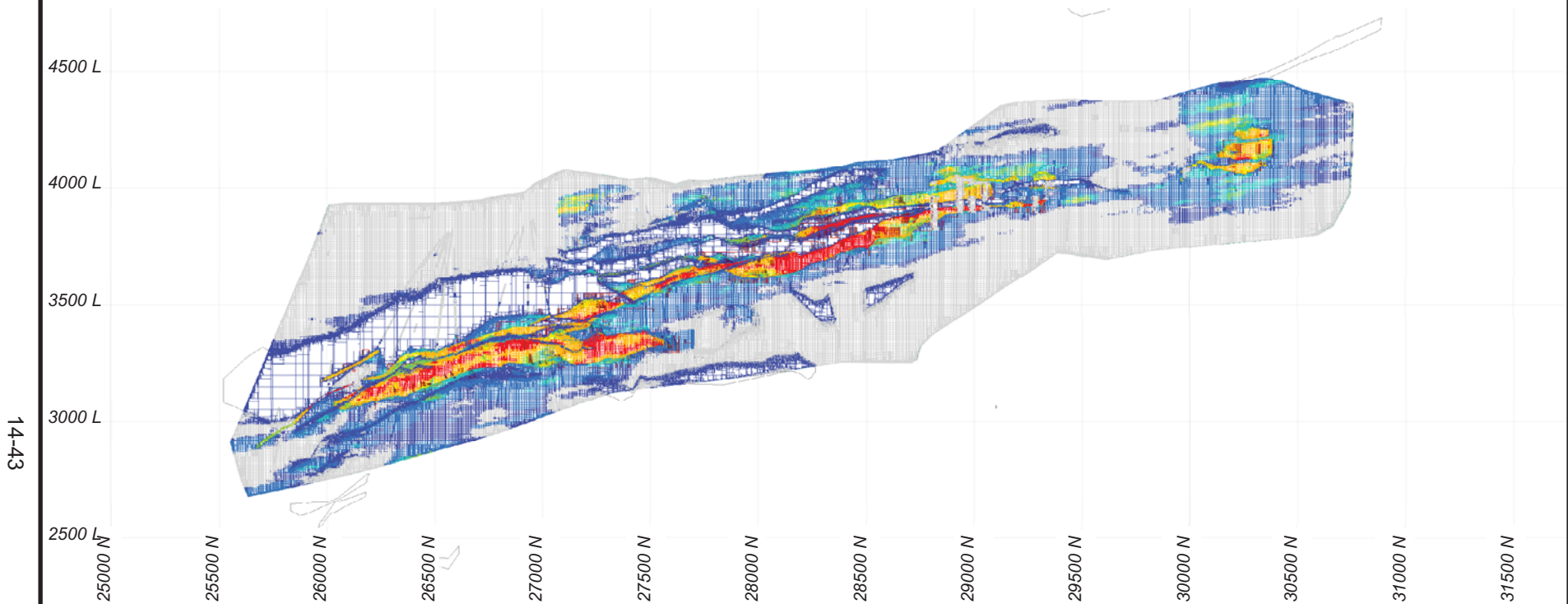
Figure 14-8

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
 Comparison of Block and Composite
 Grades within the Middle Zone,
 Cortez Hills Complex

March 2019

Source: RPA, 2019.

Looking West



14-43

Legend:

Gold (oz/st)











-  < 0.001
-  0.001 - 0.004
-  0.004 - 0.04
-  0.04 - 0.08
-  0.08 - 0.1
-  0.1 - 0.15
-  0.15 - 0.2
-  0.2 - 0.5
-  0.5 - 2.0
-  > 2.0



Figure 14-9

Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Comparison of Block and Composite
Grades within the Lower Zone, Including
Deep South, Cortez Hills Complex

March 2019

Source: RPA, 2019.

FIGURE 14-10 CHUG LOWER ZONE COMPARISON OF BLOCK AND COMPOSITE MEAN BY LOWER-DEEP SOUTH ZONE

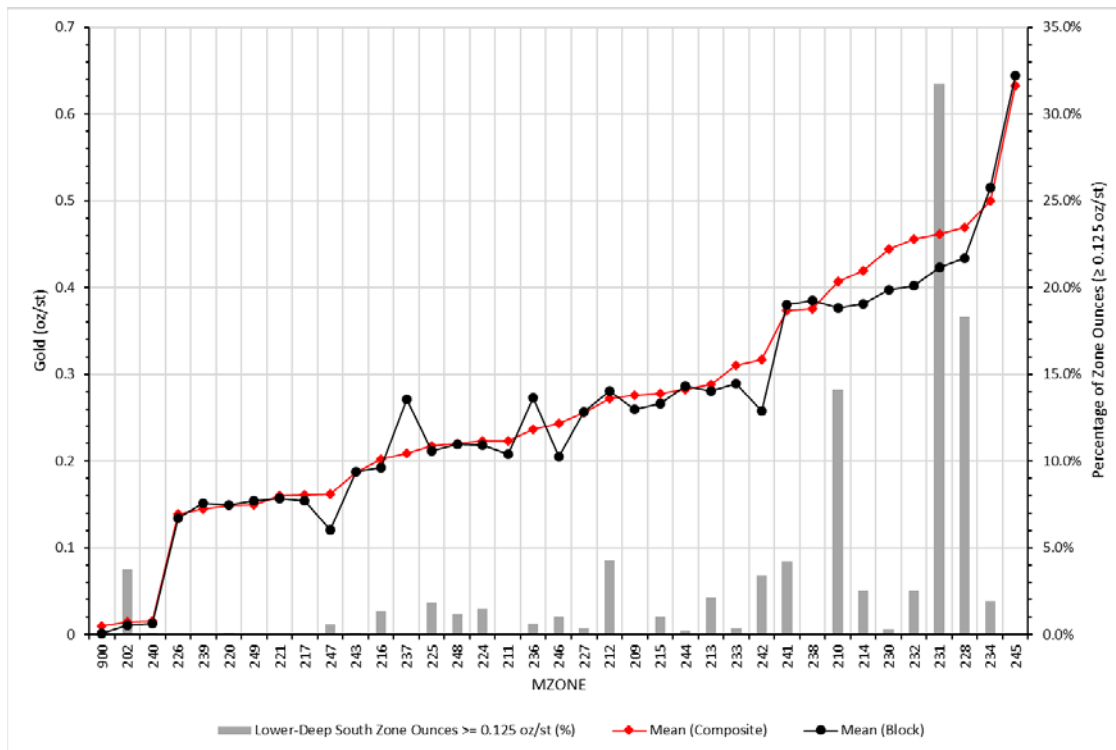


FIGURE 14-11 CHUG MIDDLE ZONE COMPARISON OF BLOCK AND COMPOSITE MEAN BY MIDDLE ZONE

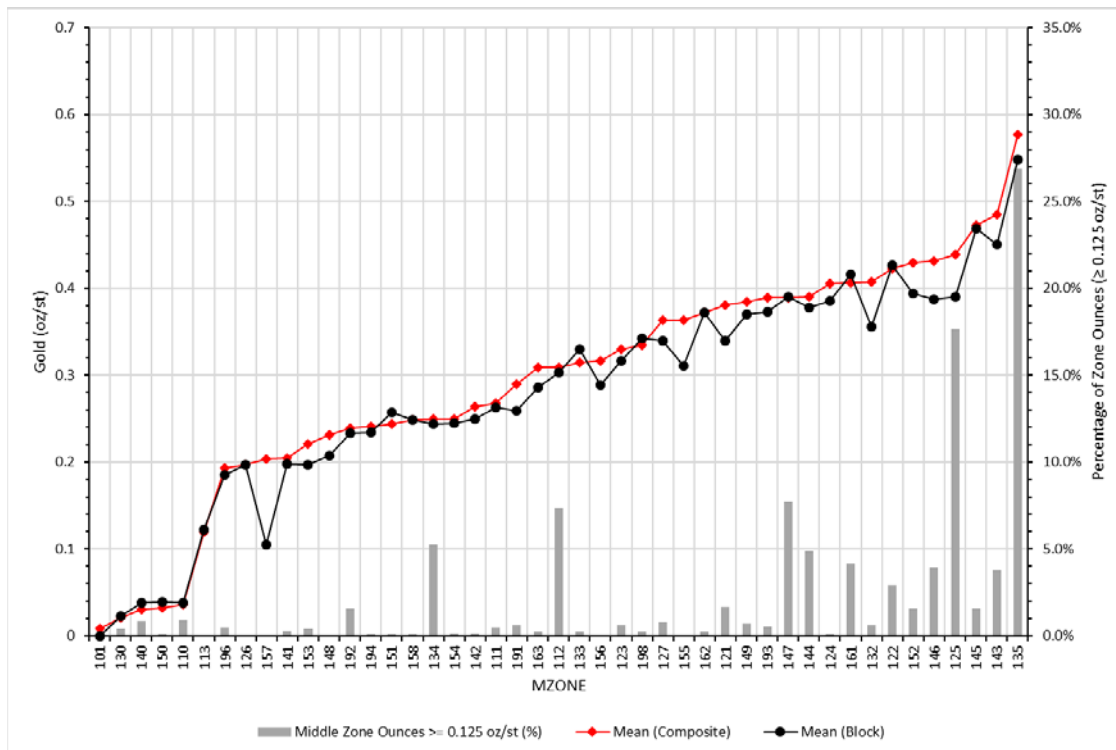
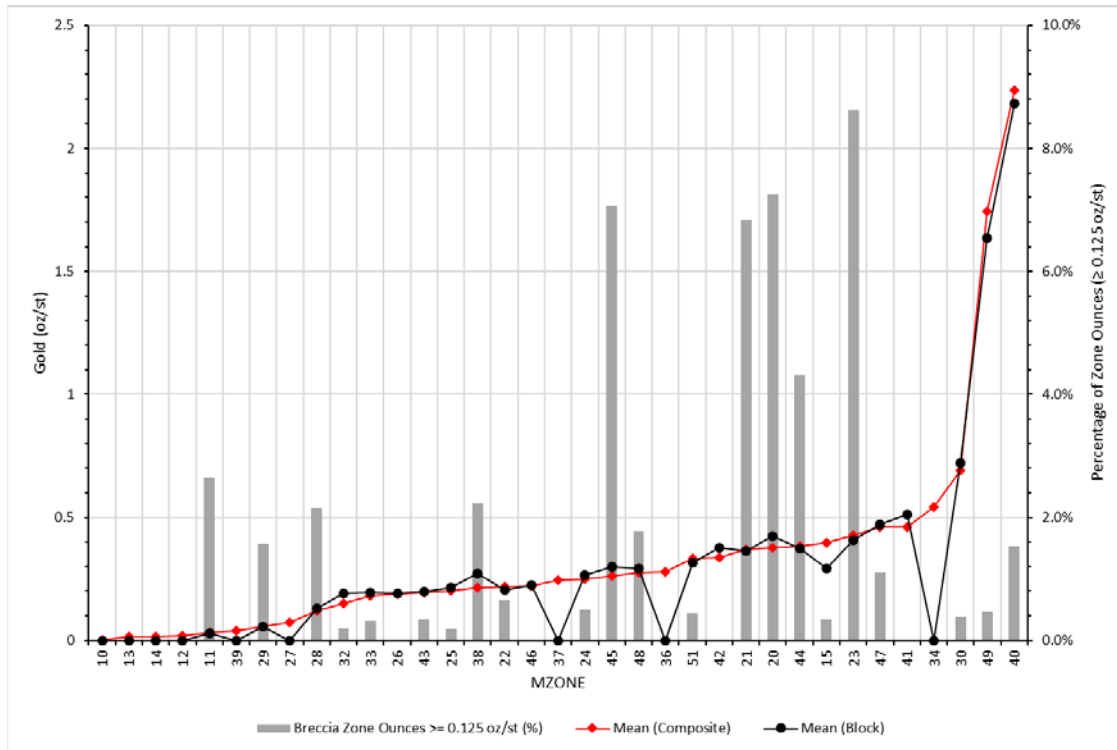


FIGURE 14-12 CHUG BRECCIA ZONE COMPARISON OF BLOCK AND COMPOSITE MEAN BY BRECCIA ZONE



CORTEZ PITS

The Cortez Pits area is located to the north of the current CHUG portal. The area was previously mined between 1969 and 1993. There is a remaining resource below the historic Cortez Pits that is a continuation of the mined-out portion of the Cortez deposit. The current reported Measured and Indicated Mineral Resources total 7.2 Mt at a grade of 0.046 oz/st Au with 326,000 oz of contained gold. Pending the appropriate level of studies to convert the mineralization to Mineral Reserves, mining would be by open pit methods, with primarily heap leach processing. Tables 14-22 and 14-23 detail the Mineral Resources at Cortez Pits.

**TABLE 14-22 CORTEZ PITS MINERAL RESOURCE SUMMARY: US
CUSTOMARY UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations**

	Mill Material			Leach Material			Refractory Material			Total		
	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)
Measured	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000	0
Indicated	886	0.143	127	5,605	0.017	98	672	0.151	101	7,163	0.046	326
Total M+I	886	0.143	127	5,605	0.017	98	672	0.151	101	7,163	0.046	326
Inferred	406	0.074	30	3,117	0.011	33	136	0.098	13	3,659	0.021	77

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported using a gold price of US\$1,500 per ounce and gold cut-off grades of 0.014 oz/st Au and 0.043oz/st Au for the mill and refractory material, respectively, and a grade range from 0.004 oz/st Au to 0.076 oz/st Au for heap leach material.
3. Bulk densities vary by formation and are listed in Table 14-20.
4. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
5. A minimum mining width of 10 ft was used for underground Mineral Resources.
6. Open pit Mineral Resources are constrained by an optimized pit shell.
7. Mineral Resources are exclusive of Mineral Reserves.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

**TABLE 14-23 CORTEZ PITS MINERAL RESOURCE SUMMARY: METRIC
UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations**

	Mill Material			Leach Material			Refractory Material			Total		
	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)
Measured	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
Indicated	804	4.90	127	5,085	0.58	98	610	5.18	101	6,498	1.58	326
Total M+I	804	4.90	127	5,085	0.58	98	610	5.18	101	6,498	1.58	326
Inferred	368	2.54	30	2,828	0.38	33	123	3.36	13	3,319	0.72	77

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported using a gold price of US\$1,500 per ounce and gold cut-off grades of 0.014 oz/st Au and 0.043 oz/st Au for the mill and refractory material, respectively, and a grade range from 0.004 oz/st Au to 0.076 oz/st Au for heap leach material.
3. Bulk densities vary by formation and are listed in Table 14-20.
4. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
5. A minimum mining width of 3.05 m was used for underground Mineral Resources.
6. Open pit Mineral Resources are constrained by an optimized pit shell.
7. Mineral Resources are exclusive of Mineral Reserves.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

There are no Mineral Reserves at Cortez Pits and only Mineral Resources from the open pit portion of the model have been reported. Cortez Pits block model was updated at EOY2018. The resources have increased due to a combination of new drilling, a refined resource model, and a lowering of roaster cost from new cost studies (Table 14-24).

TABLE 14-24 CUT-OFF GRADES BASED ON NEW ROASTER COSTS, CORTEZ PITS
Barrick Gold Corporation – Cortez Operations

Cortez Pits BCOG_inpit, \$1,500

Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,500	1,500	1,500
Gold Refining Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.90%	99.90%	99.90%
Recovery	%	75%	87%	70%
Mining Cost	\$	1.89	1.89	1.89
Process Operating Cost	\$	1.57	9.87	22.12
G&A Cost	\$	0.81	5.35	6.09
Sustaining Capital		0.032	1.14	0.093
Transportation Cost	\$			13.8
Sub-Total Operating Cost (wo mining)	\$	2.412	16.36	42.103
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US customary units)	oz/st Au	0.002	0.013	0.042
Cut-Off Grade (metric units)	g/t Au	0.069	0.446	1.440

DATA

Drill hole data in the resource database was limited to valid drill holes within or immediately adjacent to the block model extents. For the purpose of the current Mineral Resource estimate, a total of 2,097 drill holes for 719,887 ft and 90,569 assays were included in the database.

BLOCK MODEL AND MINERALIZED DOMAINS

Wireframe solids and surfaces of rock formations, faults, dikes, overburden, waste dumps, and backfill were constructed from topographic, drill hole, and pit mapping information, as well as interpreted cross-sections.

Stratigraphic and structural controls were used as directions to guide grade estimation using a dynamic anisotropy technique similar to Crossroads. Triangulated surfaces are converted into a drill hole database, where each facet has a unique orientation and is represented as a “sample”. This database is estimated into blocks, controlling the effect of each surface by Inverse Distance power and sample count.

The new dynamic anisotropy technique that is used at Crossroads and Cortez Pits is the preferred method to guide the estimation with stratigraphy, structure, alteration and mineralization. Cortez Hills is switching to this method from the Vulcan two-surface anisotropy method currently in use.

The initial model was 30 ft x 30 ft x 40 ft with 5 ft x 5 ft x 5 ft sub-cells used in the entire estimated mineralized volume. Following estimation, the model was reblocked to 40 ft x 40 ft x 20 ft for open pit evaluation by the Cortez engineering staff. Table 14-25 outlines the model parameters for the Cortez Pits.

TABLE 14-25 CORTEZ PITS PARAMETERS
Barrick Gold Corporation – Cortez Operations

Easting (ft)		Northing (ft)		Elevation (ft)	
Min	Max	Min	Max	Min	Max
25,500	32,520	34,500	40,020	4,080	5,680

Parent Block Size (ft)			Number of Blocks		
Easting	Northing	Elev.	Easting	Northing	Elev.
30	30	40	234	184	40

Reblocked version for pit evaluation:

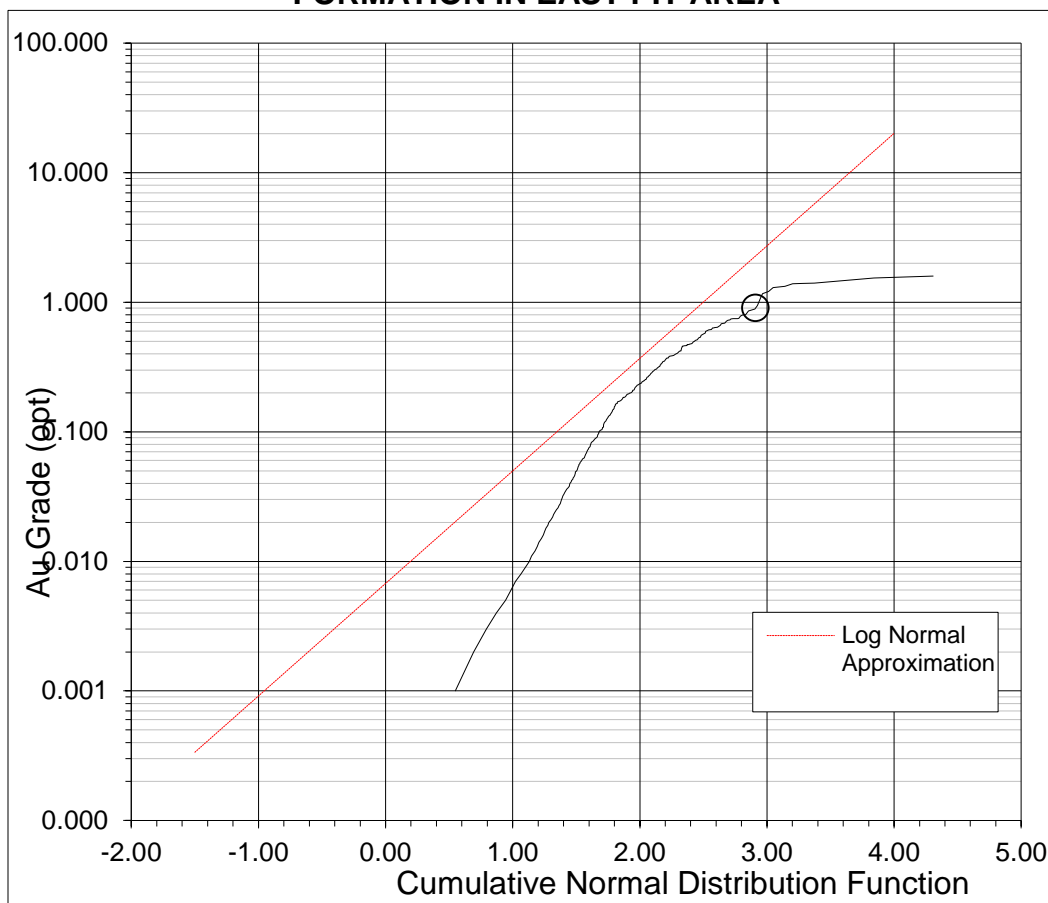
Easting (ft)		Northing (ft)		Elevation (ft)	
Min	Max	Min	Max	Min	Max
25,500	32,500	34,500	40,020	4,080	5,680

Block Size (ft)			Number of Blocks		
Easting	Northing	Elev.	Easting	Northing	Elev.
40	40	20	175	138	80

CAPPING AND COMPOSITING

The capping grades were determined through evaluation of high grade outliers on cumulative probability plots and histograms constructed for the low and high grade mineralized domains. A capping grade of 0.90 oz/st Au was applied to raw gold assays inside the high grade zones and no capping grade was applied to grades outside the high grade domains. The capped assay values were composited at 10 ft lengths down the hole; a length determined to be appropriate for consideration of underground mining. Example frequency distribution plots of capping with statistics tables are shown in Figures 14-13 to 14-15.

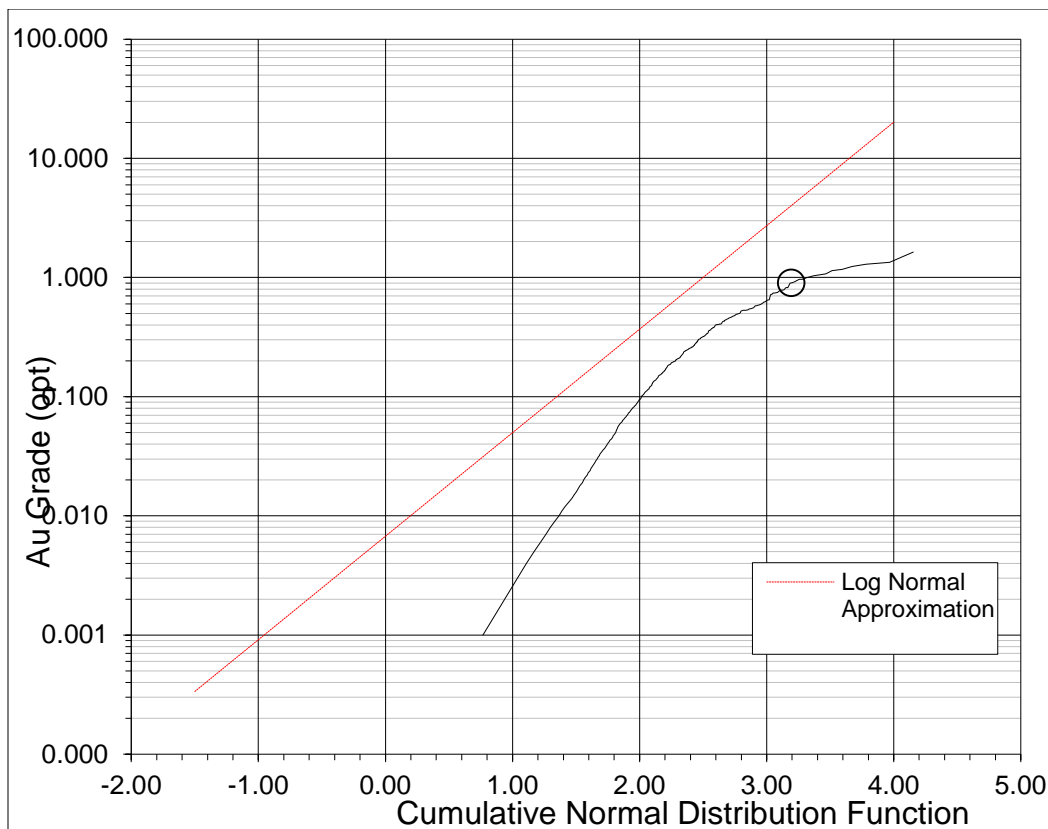
FIGURE 14-13 CORTEZ PITS FREQUENCY DISTRIBUTION FROM SRM FORMATION IN EAST PIT AREA



	Au cut-off = 0.004 oz/st			Au cu-toff = 0.050 oz/st		
	ft	Au (oz/st)	Au (GT)	ft	Au (oz/st)	Au (GT)
raw assays (NWD)	6,878	0.088	605	2,178	0.249	542
incr. % and grade	68.30%	0.013	10.40%	-31.70%	0	-8.00%
	Au cut-off = 0.010 oz/st			Au cut-off = 0.250 oz/st		
	ft	Au (oz/st)	Au (GT)	ft	Au (oz/st)	Au (GT)
raw assays (NWD)	4,361	0.135	590	678	0.525	356
incr. % and grade	53.60%	0.063	38.70%	9.90%	0.525	58.90%
Au cap (topcut)	0.90 oz/st percentile	percent of GT >= 0.90 oz/st	GT lost by capping	percent of GT >= 1.590 oz/st	CV uncapped	CV capped
0.9	99.04%	13.07%	4.19%	0.53%	1.92	1.67

Source: Barrick 2019

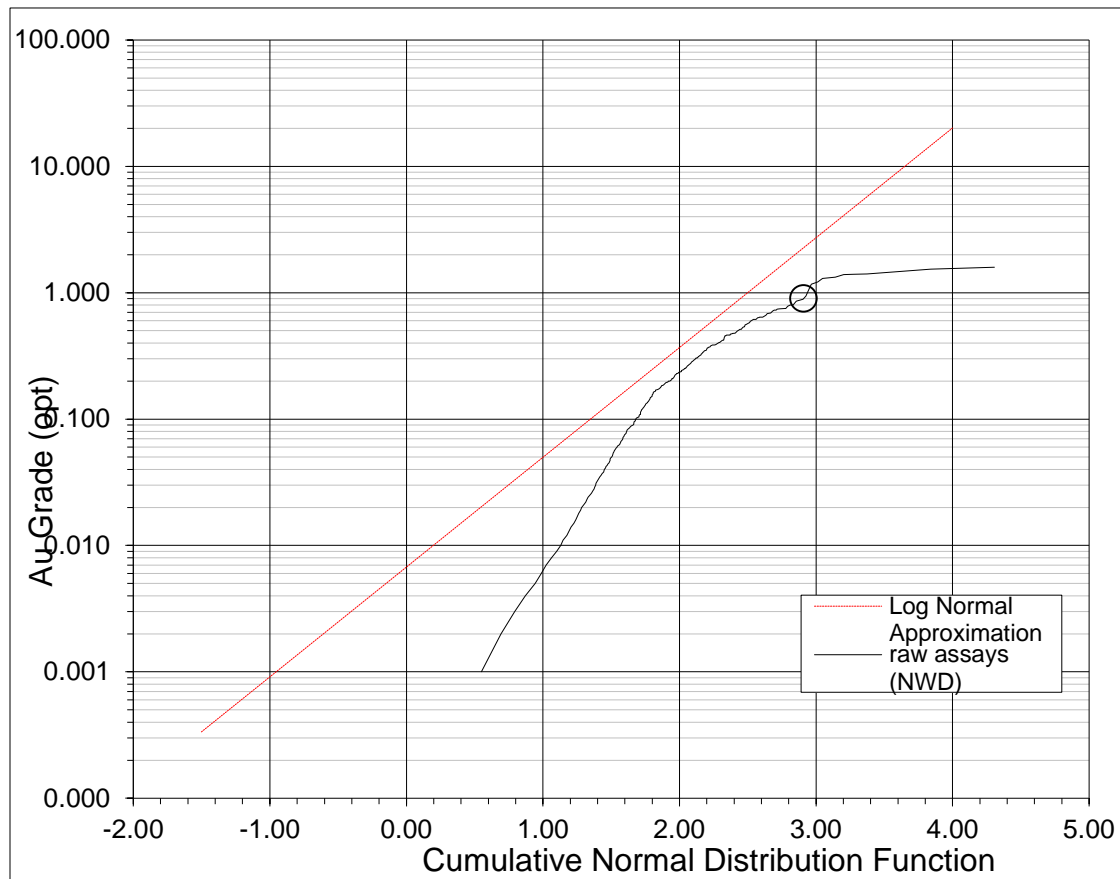
FIGURE 14-14 CORTEZ PITS FREQUENCY DISTRIBUTION FROM SRM FORMATION IN EAST PIT AREA



	Au cut-off = 0.004 oz/st			Au cut-off = 0.050 oz/st			
	ft	Au (oz/st)	Au (GT)	ft	Au (oz/st)	Au (GT)	
raw assays (SRM_Main_Pit)	17,822	0.059	1,048	4,228	0.204	862	
incr. % and grade	76.30%	0.014	17.70%	-37.40%	0	-13.80%	
	Au cu-toff = 0.010 oz/st			Au cut-off = 0.250 oz/st			
	ft	Au (oz/st)	Au (GT)	ft	Au (oz/st)	Au (GT)	
raw assays (SRM_Main_Pit)	10,896	0.092	1,007	1,035	0.478	494	
incr. % and grade	55.30%	0.051	48.90%	5.80%	0.478	47.20%	
Au cap (top cut)	0.90 oz/st percentile	percent of GT >= 0.90 oz/st	GT lost by capping	percent of GT >= 1.635 oz/st	CV uncapped	CV capped	
	0.9	99.45%	9.20%	1.68%	0.69%	2.04	1.91

Source: Barrick 2019

FIGURE 14-15 CORTEZ PITS FREQUENCY DISTRIBUTION FROM PREDOMINANTLY OHC FORMATION FROM NW DEEPS DOMAIN



	<i>Au cut-off = 0.004 oz/st</i>			<i>Au cut-off = 0.050 oz/st</i>			
	ft	Au (oz/st)	Au (GT)	ft	Au (oz/st)	Au (GT)	
raw assays (NWD)	6,878	0.088	605	2,178	0.249	542	
incr. % and grade	68.30%	0.013	10.40%	-31.70%	0	-8.00%	
	<i>Au cut-off = 0.010 oz/st</i>			<i>Au cut-off = 0.250 oz/st</i>			
	ft	Au (oz/st)	Au (GT)	ft	Au (oz/st)	Au (GT)	
raw assays (NWD)	4,361	0.135	590	678	0.525	356	
incr. % and grade	53.60%	0.063	38.70%	9.90%	0.525	58.90%	
Au cap (top cut)	0.90 oz/st percentile	percent of GT >= 0.90 oz/st	GT lost by capping	percent of GT >= 1.590 oz/st	CV uncapped	CV capped	
	0.9	99.04%	13.07%	4.19%	0.53%	1.92	1.67

Source: Barrick 2019

GRADE INTERPOLATION

Estimates were made with multiple nested ID³ passes using an octant-based search ellipsoid with a limit of two samples per octant to avoid undue influence from clustered composites. ID³ was chosen in Cortez Hills based on previous model performance compared to grade control and was therefore incorporated at Cortez Pits. The model was reviewed in section with drill holes and composites to determine if ID³ was appropriate. The search ellipse dimensions and distances correspond to ranges at 80% and 100% of the variogram sill value, as derived from directional variography. The long axis of the search ellipsoids was suitably oriented to the long axis trend of the individual domains. A number of grade variables were estimated including total FA and AA gold with the AA/FA ratio used for determining processing options. Table 14-26 summarizes the estimation passes.

TABLE 14-26 CORTEZ PITS - ESTIMATION PASS SUMMARY
Barrick Gold Corporation – Cortez Operations

Estimation Pass	Estimation Flag Number	Range (ft)			No. of Composites Min./Max./Max. per DH	Purpose
		Major	Semi-Major	Minor		
1	11	90	90	30	3/5/2	80% sill
2	21	45	45	30	1/5/1	Donut Pass
3	31	150	150	40	3/5/2	90% sill
4	41	75	75	40	1/5/1	Donut Pass
5	51	225	225	40	1/5/1	Cat 4 Pass
6	61	112.5	112.5	40	1/5/1	Cat 5 Donut Pass

Following interpolation of the gold variables, dike solids were incorporated into the block model with the applicable dilutions of gold grades. The sub-celled model was regularized from 10 ft x 10 ft x 10 ft blocks to 30 ft x 30 ft x 20 ft blocks for the portion potentially mineable by open pit.

BULK DENSITY

The rock unit bulk densities for Cortez Pits were updated in 2011 from those used in previous models. Table 14-27 summarizes the bulk densities used for tonnage calculations.

TABLE 14-27 CORTEZ PITS - BULK DENSITY
Barrick Gold Corporation – Cortez Operations

Formation/Rock Type	Code	Tonnage Factor (ft ³ /st)	Bulk Density (st/ft ³)	Bulk Density (t/m ³)
Roberts Mountain	SRM	13.1	0.076	2.43
Hansen Creek	OHC	12.2	0.082	2.63
Eureka Quartzite	OE	12.2	0.082	2.63
Quaternary Alluvium	QAL	15	0.067	2.15
Historic Dumps	BKFILL	18	0.056	1.79
Dikes	INT	14.2	0.07	2.24

CLASSIFICATION

The Measured component of the Mineral Resource is applied to blocks directly intersected by drill holes used for the estimates, essentially a box search. Indicated Mineral Resources are defined as those out to a range at 80% of the sill, and Inferred Mineral Resources at the range of 100% of the variogram sill. Blocks not meeting the above criteria are unclassified. Resulting resources were examined for amenability to development and mining and downgraded where applicable.

MODEL VALIDATION

The Cortez Mine Technical Group undertook validation checks including:

- Examination of the interpolation scripts and comparison to the interpolation plan
- Visual comparisons of interpolated gold grades relative to drill hole composite values on sections and plans
- Block model grades were compared to composite grades using histogram and cumulative frequency plots
- Comparison of the resource model to an NN model

Block model sizes and orientations were reviewed and found appropriate to the drilling density, mineralization, and proposed mining methods. The original and re-block models are also compared visually in section with block texts and inquires.

RPA has reviewed various modelling aspects of the Cortez Pits. RPA's observations and comments from the model validation are provided below. All comments are based on the EOY2018 model data, which has been depleted to December 31, 2018.

RPA conducted several checks on the drill hole database and composite file provided by the Tucson Technical Group, including a search for duplicate and missing samples, overlapping intervals, anomalous values and missing tables. No significant errors were found.

Assigned density values in the block model were compared to measured density values in drill core using basic statistics. The average values of the measured density within each formation and alteration zone compared well to the assigned block model value, if slightly conservative.

Compositing routines were checked to confirm appropriate flagging and selected domains were reviewed using histograms, probability plots, and decile analysis to confirm appropriate gold grade caps. RPA is satisfied with the compositing routines and chosen gold grade caps and finds the composites appropriate for resource estimation.

RPA reviewed the stratigraphic surfaces against the drill hole data and found the general trends of the surfaces to be honoured.

RPA reviewed block and database flagging, field calculation, block estimation, and block calculation files and scripts provided by the Tucson Technical Group for errors and found them to be in good order.

RPA compared flagged formation codes to formation wireframes and expected stratigraphy and density and found the block model to be appropriately flagged.

RPA reviewed the classification criteria at the Cortez Pits as well as visually inspected classified blocks in cross section and plan view. A new approach for assigning a classification of Measured Mineral Resource has been designed by Mine staff, and will be implemented in the mid-2019 resource model. RPA is of the opinion that in general classification of blocks is acceptable.

GOLD ACRES

As the Gold Acres block model has not been updated since 2008 and represents a small percentage of the Mineral Resources at Cortez, it was not reviewed by RPA as part of this technical review. Since 2016, a review of the cut-off grade conducted by Barrick to reflect adjustments in the cost of the roaster and increasing gold prices of from US\$1,300 to US\$1,500 has resulted in lowering the final cut-off grade from 0.062 oz/st Au to 0.043 oz/st Au, giving rise to an increase in Mineral Resources. There are no Mineral Reserves at Gold Acres, and Mineral Resources are limited to refractory ore. Table 14-28, and Table 14-29 in metric units, detail the refractory Mineral Resources at Gold Acres. Mineral Resources have increased due to a lowering of roaster cost from new cost studies (Table 14-30).

**TABLE 14-28 GOLD ACRES REFRACTORY MINERAL RESOURCE
SUMMARY: US CUSTOMARY UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations**

	Mill Material			Leach Material			Refractory Material			Total		
	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)	Tons (000 st)	Grade (oz/st Au)	Ounces (000 oz)
Measured	0	0.000	0	0	0.000	0	508	0.099	50	508	0.099	50
Indicated	0	0.000	0	0	0.000	0	8,388	0.083	698	8,388	0.083	698
Total M+I	0	0.000	0	0	0.000	0	8,896	0.084	748	8,896	0.084	748
Inferred	0	0.000	0	0	0.000	0	1,002	0.077	77	1,002	0.077	77

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported using a gold cut-off grade of 0.043 oz/st Au.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. Bulk densities vary by formation and are listed in Table 14-33.
5. A minimum mining width of 10 ft was used for underground Mineral Resources.
6. Open pit Mineral Resources are constrained by an optimized pit shell.
7. Mineral Resources are exclusive of Mineral Reserves.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

**TABLE 14-29 GOLD ACRES REFRACTORY MINERAL RESOURCE
SUMMARY: METRIC UNITS – DECEMBER 31, 2018
Barrick Gold Corporation – Cortez Operations**

	Mill Material			Leach Material			Refractory Material			Total		
	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)	Tonnes (000 t)	Grade (g/t Au)	Ounces (000 oz)
Measured	0	0.00	0	0	0.00	0	461	3.39	50	461	3.39	50
Indicated	0	0.00	0	0	0.00	0	7,609	2.85	698	7,609	2.85	698
Total M+I	0	0.00	0	0	0.00	0	8,070	2.88	748	8,070	2.88	748
Inferred	0	0.00	0	0	0.00	0	909	2.64	77	909	2.64	77

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported using a gold cut-off grade of 0.043 oz/st Au.
3. Mineral Resources are reported using a gold price of US\$1,500 per ounce.
4. Bulk densities vary by formation and are listed in Table 14-33.
5. A minimum mining width of 3.05 m was used for underground Mineral Resources.
6. Open pit Mineral Resources are constrained by an optimized pit shell.
7. Mineral Resources are exclusive of Mineral Reserves.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

**TABLE 14-30 CUT-OFF GRADES BASED ON NEW ROASTER COSTS, CORTEZ
PITS
Barrick Gold Corporation – Cortez Operations**

Gold Acres BCOG_inpit, \$1,500

Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,500	1,500	1,500
Gold Refining Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.90%	99.90%	99.90%
Recovery	%	55%	74%	70%
Mining Cost	\$	1.89	1.89	1.89
Process Operating Cost	\$	1.57	9.87	22.12
G&A Cost	\$	0.81	5.35	6.09
Sustaining Capital		0.032	1.14	0.093
Transportation Cost	\$			13.8
Sub-Total Operating Cost (wo mining)	\$	2.412	16.36	42.103
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US customary units)	oz/st Au	0.003	0.015	0.042
Cut-Off Grade (metric units)	g/t Au	0.103	0.514	1.440

DATA

For resource estimation, the drill hole data were limited to holes within or immediately adjacent to the block model extents. A total of 1,506 drill holes for 427,705 ft and 73,388 assays are in the database; the database for Gold Acres has not changed since mid-2008. Holes 4344,

4435, 4424, 4425, 4512, 4527, 7404, 89931, and 90816 were excluded. RC holes with potential downhole contamination remain in the database and their exclusion should be revisited for future models. All drill hole data is being reviewed by Mine staff for future resource model updates.

CAPPING AND COMPOSITING

Grade distribution statistics show a grade capping level of 0.5 oz/st Au is appropriate. Nine samples were capped in the drill hole database. Capped assays were composited downhole at 10 ft lengths.

BLOCK MODEL AND MINERALIZED DOMAINS

Geology wireframe surfaces and solids were modelled, however, visual review of the models for the lower skarn, Roberts Mountain Thrust, and Gold Acres Fault suggest that they are not relevant as controls for mineralization. The 2008 resource estimate does not include a “Carbon” or “Refractory” model since the refractory nature of the deposit could not be predicted geologically or metallurgically at the time.

Three mineralization domains were established based on visual review of the spatial distribution of gold grades by the Cortez Mine Technical Group.

Domain 1: High grade trending along a fold axis bearing 305°

Domain 2: East dipping mineralization (-15°) bearing 340°

Domain 3: Shallowly dipping mineralization striking 340°, varying in dip direction from eastward in the south, to westward north of section 60,250 N

A three-dimensional 20 ft x 20 ft x 10 ft block model was developed over these domains, which were estimated using 10 ft composites. Following grade estimation, the 20 ft x 20 ft x 10 ft blocks were reblocked up to a 40 ft x 40 ft x 20 ft model to better represent mining on 20 ft benches. The model extends 6,500 ft east, 9,000 ft north, and 1,500 ft vertically, from an origin of 91,000 E, 55,000 N and 4,300 elev. No rotation was applied.

INDICATOR BLOCK MODEL

The composites in the drill hole database were flagged at a gold indicator threshold of 0.015 oz/st Au. The composites were interpolated using orientations in line with the individual

domains. Composites within the block model volume defined by the indicator model (greater than or equal to 50% probability of 0.015 oz/st Au grade) were back flagged in the composite database. Indicator estimation model parameters are listed in Table 14-31.

TABLE 14-31 GOLD ACRES INDICATOR MODEL ESTIMATION PARAMETERS

Barrick Gold Corporation – Cortez Operations

	Estimation	Bearing	Dip	Axes (ft)	No. of Composites Min./Max./Max. per DH
Domain 1	Indicator 1	305°	0°	300x300x50	3/15/2
Domain 2	Indicator 1	340°	-15°	300x300x50	3/15/2
Domain 3	Indicator 1	160°	-15°	300x300x50	3/15/2

GRADE INTERPOLATION

Grade interpolation for Gold Acres was carried out in multiple passes using ID³ inside and outside the indicator model based on parameters shown in Table 14-32. Search ellipse distances corresponding to 80% and 90% of sill ranges from an omni-directional correlogram (not shown) defined the second and fourth passes, which were each followed by a pass defined by a smaller search ellipse, and with fewer composite restrictions. Additionally, an NN interpolation was performed on gold grades for the purposes of block model validation using a 250 ft x 250 ft x 50 ft search ellipse, estimating 33% of blocks in the model. Mined-out blocks were coded above the topographic surface and waste rock dumps were flagged.

TABLE 14-32 INTERPOLATION PASSES INSIDE AND OUTSIDE THE GOLD ACRES 0.50 INDICATOR MODEL

Barrick Gold Corporation – Cortez Operations

Estimation	Azimuth (°)	Dip (°)	Distance (ft)			No. of Composites Min./Max./Max. per DH	Estimated
			Major	Semi-Major	Minor		
Inside 0.50 Indicator Model							
11001	0	0	10.1	10.1	5.1	1/9/1	0.4%
11100	305	0	120	120	30	2/3/1	98.6%
11131	305	0	50	50	15	1/3/1	4.8%
11250	305	0	250	250	50	2/3/1	100%
12100	340	-15	120	120	30	2/3/1	59.4%
12131	340	-15	50	50	15	1/3/1	19.1%
12250	340	-15	250	250	50	2/3/1	80.2%
13100	160	-15	120	120	30	2/3/1	54.3%
13131	160	-15	50	50	15	1/3/1	17.4%
13250	160	-15	250	250	50	2/3/1	77.2%

Estimation	Azimuth (°)	Dip (°)	Distance (ft)			No. of Composites Min./Max./Max. per DH	Estimated
			Major	Semi-Major	Minor		
Outside 0.50 Indicator Model							
21100	305	0	100	100	30	2/3/1	25.2%
21131	305	0	50	50	15	1/3/1	0.7%
21250	305	0	250	250	50	2/3/1	8.4%
22100	340	0	-15	100	100	2/3/1	7.9%
22131	340	-15	50	50	15	1/3/1	1.2%
22250	340	-15	250	250	50	2/3/1	10.5%
23100	160	-15	100	100	30	2/3/1	5.4%
23131	160	-15	50	50	15	1/3/1	1.0%
23250	160	-15	250	250	50	2/3/1	8.2%

BULK DENSITY

Bulk densities are shown in Table 14-33.

TABLE 14-33 GOLD ACRES BULK DENSITY
Barrick Gold Corporation – Cortez Operations

Rock Type	Tonnage Factor (ft ³ /st)	Bulk Density (st/ft ³)	Bulk Density (t/m ³)
Skarn	11.49	0.087	2.79
Dumps, Backfill	16	0.0625	2.00
All Other Rocks	13	0.0769	2.46

CLASSIFICATION

The Measured component of the Mineral Resource is applied to blocks directly intersected by drill holes used for the estimates, essentially a box search. Indicated Mineral Resources are defined as those out to a range at 80% of the sill and Inferred Mineral Resources at the range of 90% of the variogram sill. Blocks not meeting the above criteria are unclassified. Resulting resources were examined for amenability to development and mining and downgraded where applicable.

MODEL VALIDATION

As part of the 2010 RPA audit, block grades were compared to composites by visual inspection of vertical sections. Gold block grade statistics and distributions were compared to composite grade statistics and distributions for Au greater than or equal to 0.01 oz/st (Table 14-34). In 2010, RPA found spatial and statistical block and composite grade distributions to be in general

accord. RPA did not perform additional validation of the Gold Acres Mineral Resource model, since the model has not been updated.

TABLE 14-34 GOLD ACRES UNTRANSFORMED GOLD STATISTICS
Barrick Gold Corporation – Cortez Operations

	Gold Cut-off = 0.01 oz/st		Gold Cut-off = 0.02 oz/st		Gold Cut-off = 0.03 oz/st		Gold Cut-off = 0.10 oz/st	
	(ft)	Grade (oz/st Au)	(ft)	Grade (oz/st Au)	(ft)	Grade (oz/st Au)	(ft)	Grade (oz/st Au)
Blocks - All	30,510	0.041	20,375	0.055	15,194	0.066	2,176	0.152
Incr. % and grade	33.2%	0.013	17.0%	0.024	42.7%	0.052	7.1%	0.152
Comps	95,941	0.049	65,057	0.067	48,422	0.081	11,692	0.169
Incr. % and grade	32.2%	0.013	17.3%	0.024	38.3%	0.053	12.2%	0.169

COMMENTS AND RECOMMENDATIONS

RPA has reviewed quality controls in workflow and grade estimation practices at Cortez, and is of the opinion that the methods follow industry best practices and the EOY2018 Mineral Resource estimate is reasonable.

Based on the site visit and review of the information available, RPA offers the following comments and recommendations:

- The drilling, sampling, sample preparation, analyses, security, and data verification meet or exceed industry standards and are appropriate for Mineral Resource estimation.
- The parameters, assumptions, and methodology used for Mineral Resource estimation are appropriate for the style of mineralization.
- Mineral Resource estimates have been prepared using acceptable interpolation strategies. The classification of Measured, Indicated, and Inferred Resources conform to CIM (2014) definitions.
- RPA concurs with the new dynamic anisotropy modelling approach at Cortez, and recommends its application across all deposits at the Mine where appropriate.
- Validation by ordinary kriging should be performed as part of the next model update at the Cortez Hills Complex.
- RPA agrees with Barrick’s ongoing review and modification of classification criteria at the Pipeline Complex, and is of the opinion that in general, classification of blocks is acceptable.

- For the Pipeline Complex, a strong northeastern mineralization trend was visually observed by RPA in the composites and resultant block model. RPA is of the opinion that this trend may be discernible using directional variography in unfolded space, which would yield more precise variogram models to inform search ellipse dimensions in future updates. RPA also recommends updating the variogram models to fit with raw data.
- The documentation for the Mineral Resource block models meets or exceeds industry standards.
- To streamline workflow and simplify reporting, RPA recommends updating all of the models at EOY, each year, with one drill hole and sample database export from acQuire. Models with no new information should be re-run EOY against the new database export and checked for changes.

To augment communication of key modelling information and procedures, facilitate correct and up to date information transfer, and improve on the clarity of the information to third parties, RPA recommends the following:

- Add a tab to the master spreadsheet for each model which summarizes the contextual information usually included in Technical Reports e.g. database cut-off dates, software and version, cut-off grades for mineralized domain wireframes, reporting cut-off grades, etc.
- Add supporting documentation describing the Mineral Resource procedures, workflows and checks in the master spreadsheets.
- Develop a standard procedure where final data and documentation supporting the final Mineral Resource and Mineral Reserve estimates are always archived to a separate, isolated set of folders containing only those files used in the estimates.

15 MINERAL RESERVE ESTIMATE

SUMMARY

The Mineral Reserves are contained within four open pit deposits, four underground zones in the Cortez Hills deposit, and surface stockpiles. Proven and Probable Mineral Reserves for the Mine as at EOY2018 are estimated to be 159.9 million tons grading 0.055 oz/st Au containing approximately 8.7 million ounces of gold.

In the Deep South Zone, the LOM plan supports the conversion of Indicated Mineral Resources to approximately 2.1 million ounces of Probable Mineral Reserves as at EOY2018. The Mineral Reserve estimate for Cortez as at December 31, 2018 is summarized in Table 15-1.

In metric units (Table 15-2), the Proven and Probable Mineral Reserves total 145.05 million tonnes grading 1.87 g/t Au and contain 8.74 million ounces of gold.

Open pit Mineral Reserves represent approximately 87% of the total tons and 46% of the total ounces of contained gold. Underground Mineral Reserves represent approximately 8% of the total tons and 45% of the total ounces of contained gold. Current underground mine life includes the Cortez Underground Deep South Project.

RPA is of the opinion that the December 31, 2018 Mineral Reserves as stated by Cortez are estimated by competent professionals in a manner consistent with industry practices. RPA is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

TABLE 15-1 MINERAL RESERVE SUMMARY: US CUSTOMARY UNITS – DECEMBER 31, 2018

Barrick Gold Corporation – Cortez Operations

Zone	Proven			Probable			Total Proven + Probable		
	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)	Tons (000 st)	Grade (oz/st Au)	Contained Gold (000 oz)
Open Pit									
Pipeline	1,299	0.024	31	13,180	0.021	270	14,479	0.021	302
Crossroads	9,699	0.031	299	112,992	0.030	3,336	122,690	0.030	3,634
Cortez Hills				1,721	0.059	102	1,721	0.059	102
Open Pit Subtotals	10,997	0.030	330	127,892	0.029	3,708	138,889	0.029	4,038
Underground									
Middle Zone				2,450	0.348	852	2,450	0.348	852
Lower Zone				3,513	0.281	986	3,513	0.281	986
Deep South				6,591	0.312	2,054	6,591	0.312	2,054
Underground Subtotals				12,554	0.310	3,892	12,554	0.310	3,892
Stockpiles									
Mill Stockpiles	1,137	0.066	75				1,137	0.066	75
Leach Stockpiles	2,219	0.009	19				2,219	0.009	19
Refractory Stockpiles	5,092	0.140	713				5,092	0.140	713
Stockpile Subtotals	8,449	0.096	808				8,449	0.096	808
Total	19,446	0.059	1,138	140,446	0.054	7,600	159,892	0.055	8,737

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at cut-off grades that range from 0.004 oz/st Au to 0.142 oz/st Au depending on deposit, mining method, and process type.
3. Mineral Reserves are estimated using an average gold price of US\$1,200 per ounce.
4. A minimum mining width of 25 ft was used.
5. Bulk density varies from 0.052 st/ft³ to 0.091 st/ft³, depending on material type.
6. Numbers may not add due to rounding.

TABLE 15-2 MINERAL RESERVE SUMMARY: METRIC UNITS – DECEMBER 31, 2018

Barrick Gold Corporation – Cortez Operations

Zone	Proven			Probable			Total Proven + Probable		
	Tonnes (000)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000)	Grade (g/t Au)	Contained Gold (000 oz)	Tonnes (000)	Grade (g/t Au)	Contained Gold (000 oz)
Open Pit									
Pipeline	1,178	0.83	31	11,957	0.70	270	13,135	0.71	302
Crossroads	8,799	1.06	299	102,505	1.01	3,336	111,304	1.02	3,634
Cortez Hills				1,561	2.03	102	1,561	2.03	102
Pediment									
Open Pit Subtotals	9,977	1.03	330	116,023	0.99	3,708	126,000	1.00	4,038
Underground									
Middle Zone				2,223	11.93	852	2,223	11.93	852
Lower Zone				3,187	9.62	986	3,187	9.62	986
Deep South				5,979	10.68	2,054	5,979	10.68	2,054
Underground Subtotals				11,389	10.63	3,892	11,389	10.63	3,892
Stockpiles									
Mill Stockpiles	1,032	2.27	75				1,032	2.27	75
Leach Stockpiles	2,013	0.30	19				2,013	0.30	19
Refractory Stockpiles	4,620	4.80	713				4,620	4.80	713
Stockpile Subtotals	7,665	3.28	808				7,665	3.28	808
Total	17,642	2.01	1,138	127,412	1.86	7,599	145,054	1.87	8,737

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at cut-off grades that range from 0.14 g/t Au to 4.9 g/t Au depending on deposit, mining method, and process type.
3. Mineral Reserves are estimated using an average gold price of US\$1,200 per ounce.
4. A minimum mining width of 7.62 m was used.
5. Bulk density varies from 1.67 t/m³ to 2.92 t/m³, depending on material type.
6. Numbers may not add due to rounding.

There are two principal locations of the Cortez mineral deposits, Pipeline and Cortez Hills. Pipeline is located on the valley floor approximately seven miles to the northwest of the Cortez Hills deposit, which is located on the southern flank of Mount Tenabo. The location of the deposits is shown in Figure 7-2.

The Pipeline pit represents a small portion of the open pit reserves of the LOM with approximately 10% of the Pipeline Complex Mineral Reserves. The pit is currently active, Phase 10 area will be operating for the next three year. Portions of the Pipeline Pit have been backfilled with mine waste.

The Crossroads Pit is located immediately south of the Pipeline pit and stripping is planned to continue mining until 2026. The planned final pit will be up to 1,700 ft deep designed to be mined in five phases.

The Cortez Hills deposit is located approximately seven miles to the southeast of the Pipeline Pit on the southern flank of Mount Tenabo. The shops and office facilities, gyratory crusher, 37,000 ft long conveyor from the gyratory crusher to the Mill No. 2 at Pipeline, and the assorted roads and other infrastructure are all in place and operating efficiently. Mining of the CHOP is nearly complete with 1.7 Mt of ore remaining in three benches at the bottom of the final pit design.

CHUG is the portion of the Cortez Hills deposit, that is being extracted by underground mining. There are twin declines to the Middle and Lower Zones and production is underway using the mechanized underhand cut and fill mining method with a cemented rock fill (CRF) and longhole stoping. Development of the Range Front Declines (RFDs) to access the Lower Zone Deep South is underway. Mining is limited to the 3,800 ft level pending permit approval.

OPEN PIT MINERAL RESERVES

The Cortez open pit Mineral Reserves consist of the CHOP and Pipeline, composed of Pipeline and Crossroads. The Mineral Resources within the Cortez Pits and Gold Acres are also planned for open pit mining, however, these pits are not included in the Mineral Reserves. Pit designs including access ramps with corresponding excavation schedules have been developed for both the CHOP and Pipeline Pit areas.

OPEN PIT MINE DESIGN

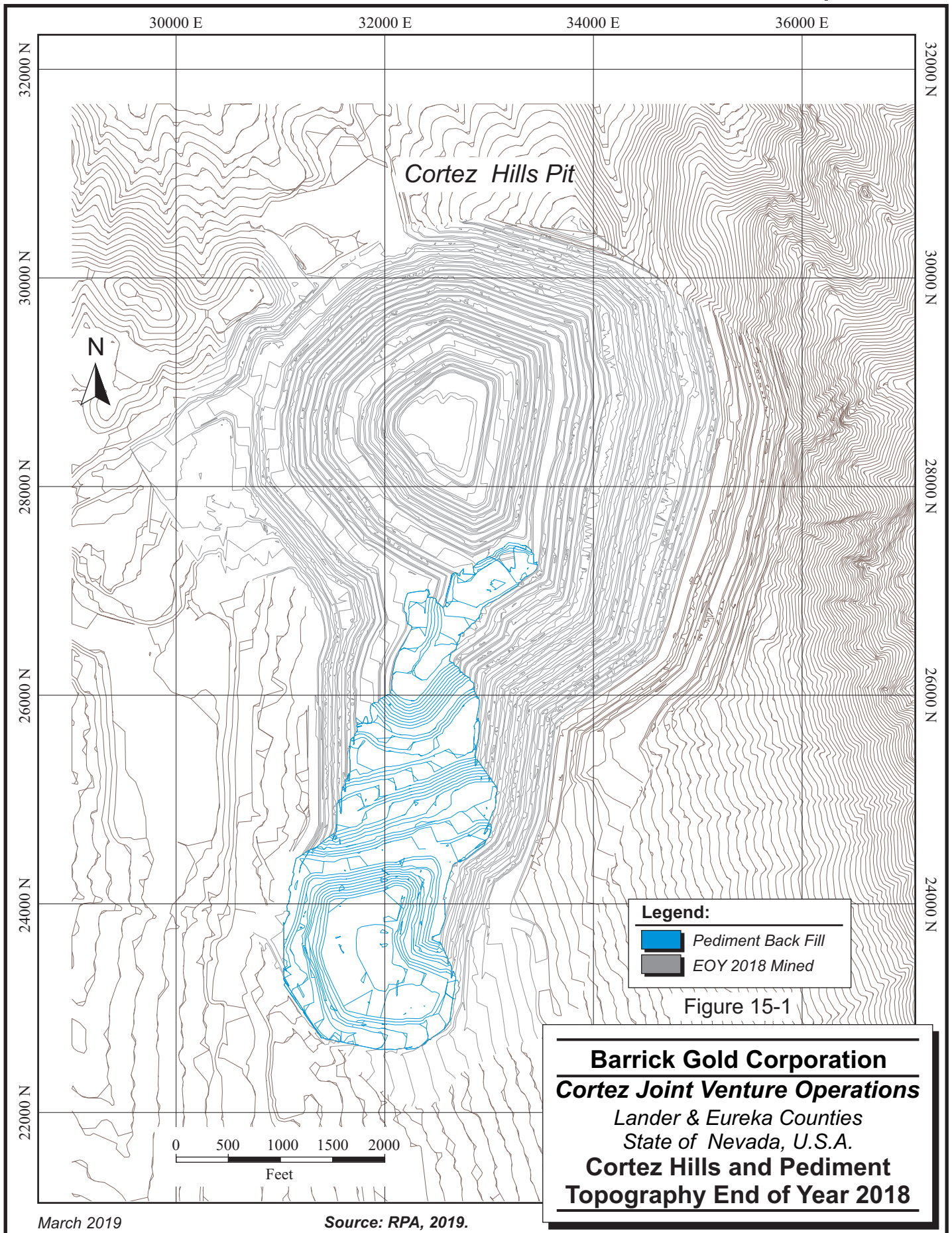
CORTEZ HILLS

Open pit mining is active on the lower portion of the Cortez Hills deposit. The Pediment pit is completely mined and backfilled with waste from the CHOP. CHOP daily mine production rates for 2019 are planned at 30,000 stpd for the first five months of the current year when mining operation will be completed.

The long axis length of the Cortez Hills and Pediment pit is approximately 7,900 ft, and the minor axis width is approximately 5,600 ft. The designed pit bottom elevation is 4,525 ft amsl. The two primary pit exits are 5,950 ft amsl and 5,720 ft amsl, respectively.

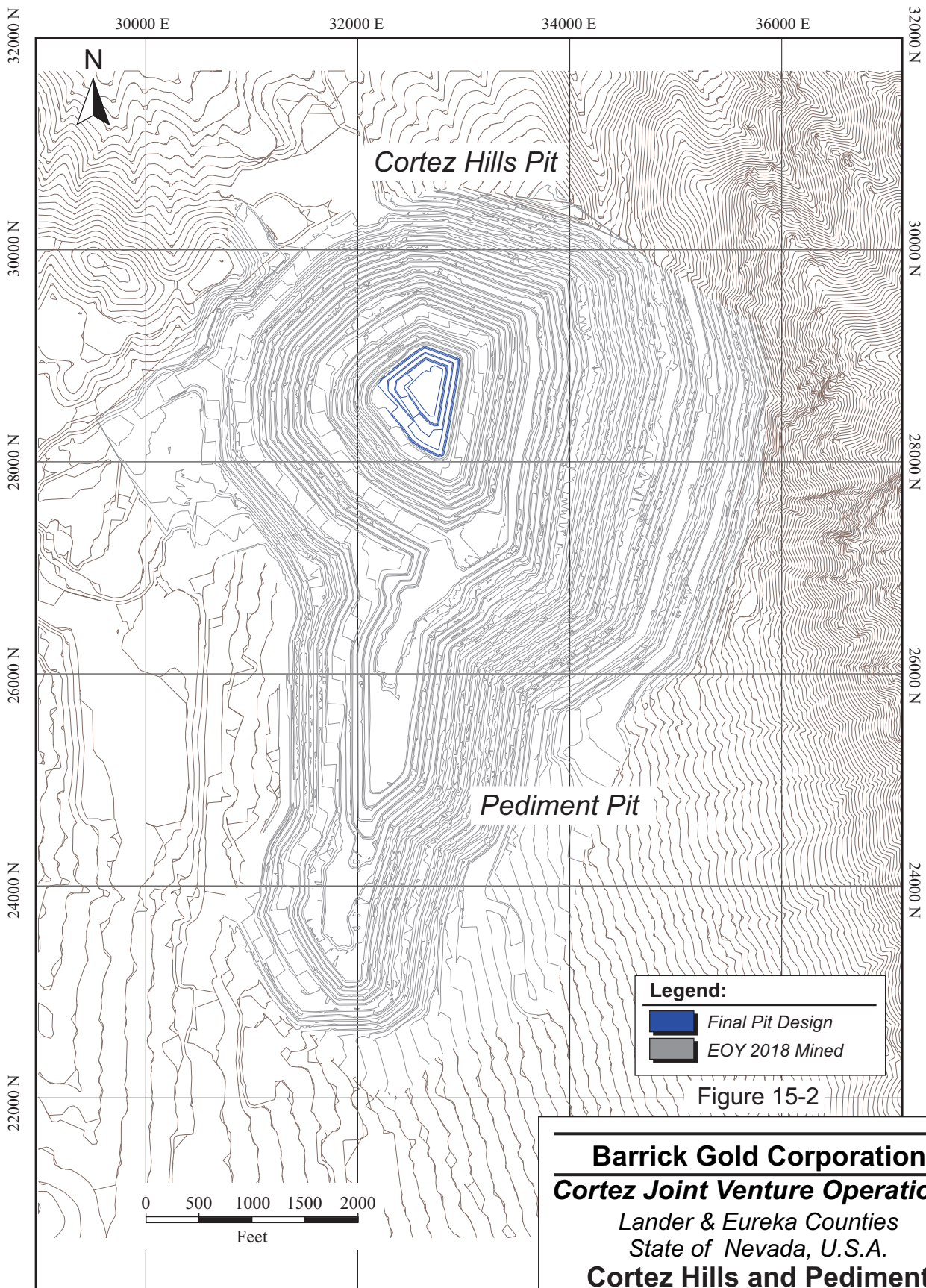
The Cortez Hills Pit design includes 50 ft bench heights. Typical road widths are 120 ft to the 4980 bench, narrowing to approximately 70 ft to 80 ft wide for the ten bottom benches. Road grades average 10%. Single benching is normal with berm widths that range from 25 ft to 35 ft. An approximate 100 ft wide catch bench is included for every 420 ft of vertical extent.

The Cortez Hills and Pediment Pit topographies at the end of 2018 are shown in Figure 15-1. Figure 15-2 is a view of the Cortez Hills final pit design, excluding pit backfill.



March 2019

Source: RPA, 2019.



Legend:
Final Pit Design
EOY 2018 Mined

Figure 15-2

Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Cortez Hills and Pediment
Final Pit Design

PIPELINE AND CROSSROADS

The Pipeline and Crossroads operations use conventional open pit mining techniques. Mining operation includes drill, blast, load, and haul cycles, using conventional truck-and-shovel equipment.

The Crossroads final pit design includes bench heights of 40 ft. Road widths are 120 ft to the 3380 bench, narrowing to approximately 70 ft from the 3380 bench to the 3100 bench. Road grades average 10%. Single benching is normal with berm widths that range from 25 ft to 27 ft. An approximate 100 ft wide catch bench is designed every 280 ft of vertical extent. The Pipeline open pit was designed and has been mined based on 50 ft bench height.

All leach material is placed directly on the leach pad. A small portion of the mill ore is stockpiled to ensure consistent crusher feed. Refractory ore is also stockpiled, and shipped to Goldstrike for processing. The waste is hauled and placed in permanent waste dumps.

The Pipeline and Crossroads ultimate pit areas are shown in Figure 15-3. The Pipeline Complex layout including waste dump location is shown in Figure 15-4.

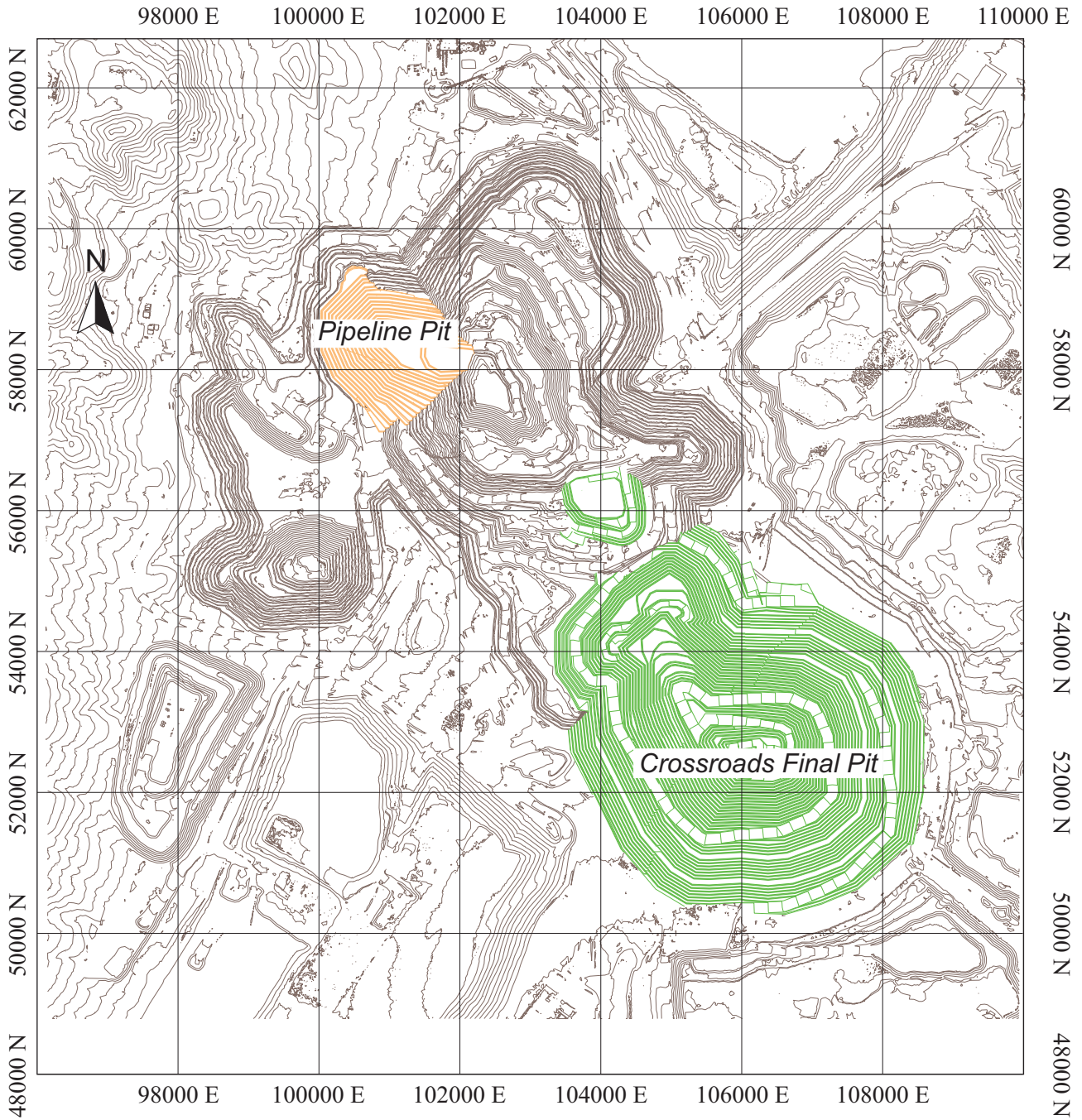


Figure 15-3



Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Pipeline -
Crossroads Final Pit Design

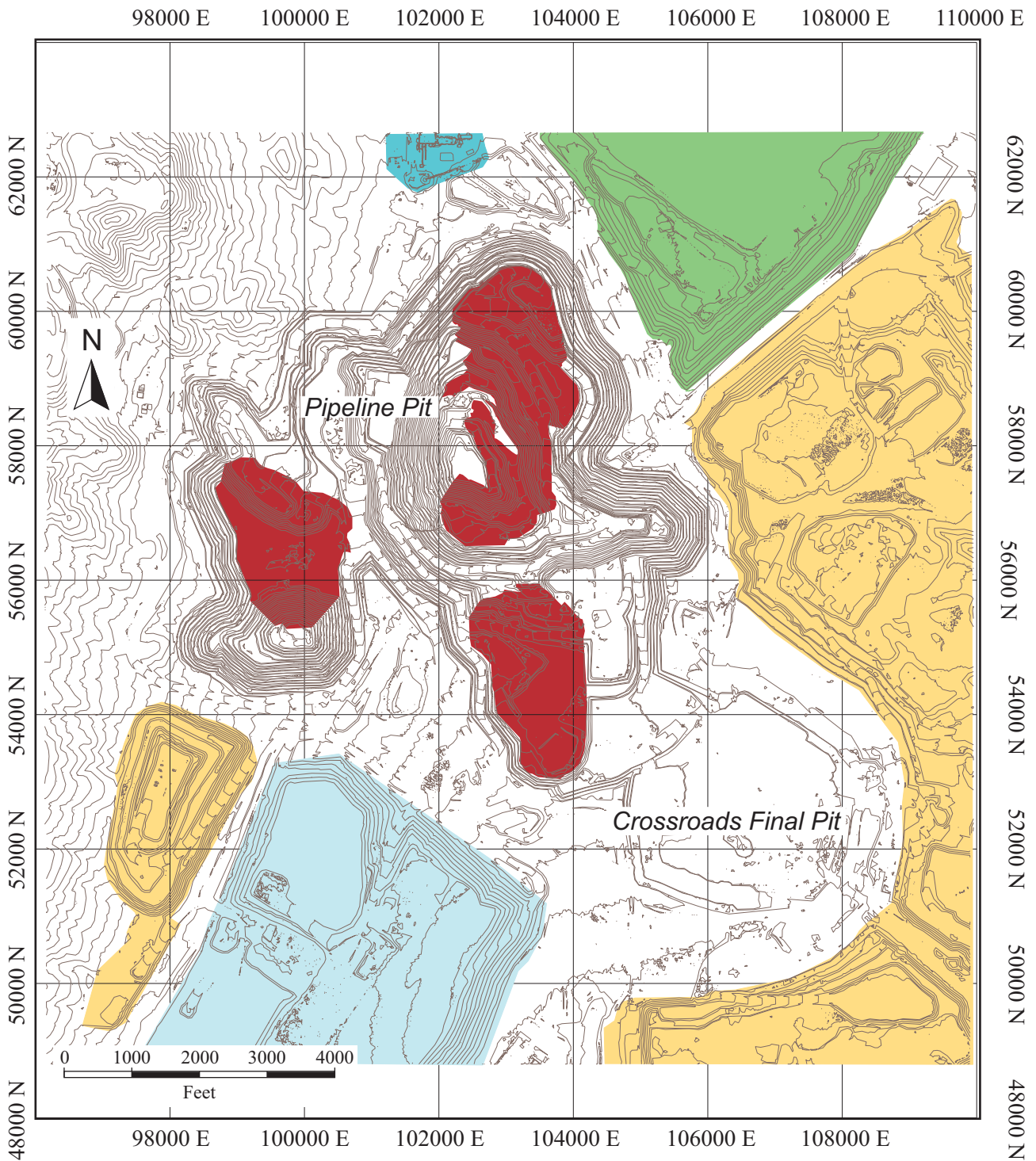







Figure 15-4

Legend:

	Plant
	Tailings
	Waste Rock Facilities
	Leachpad
	Pit Backfill

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Pipeline Complex Layout

March 2019

Source: RPA, 2019.

OPEN PIT DILUTION AND EXTRACTION

Dilution and extraction in the open pit Mineral Reserve estimate are addressed by diluting to whole blocks, at a block size that is considered to be representative of the selective mining unit. No further external factors are applied.

RPA recommends additional work in order to identify zones that may have higher dilution after the reblocking steps, then apply the appropriate dilution for different open pit zone.

The open pit design is based upon 100% extraction of the open pit Mineral Reserves.

OPEN PIT OPTIMIZATION

The optimized economic pit shells selected for the basis of open pit designs were created using the Whittle 4X software package. Whittle is a commonly used commercial product that uses various geologic, mining, and economic inputs to determine the pit shell of greatest net value. Whittle implements the Lerchs-Grossmann 3D network-flow optimization method. The Lerchs-Grossmann 3D algorithm is a true pit optimizer used for determining the optimal ultimate limit for open-pit mines. Whittle input parameters are presented below. Tables 15-3 and 15-4 summarize the key open pit inputs for the Whittle analysis on each of the primary open pit areas, Crossroads and Pipeline.

**TABLE 15-3 CROSSROADS WHITTLE PIT OPTIMIZATION PARAMETERS
Barrick Gold Corporation – Cortez Operations**

Block Dimensions	40 ft x 40 ft x 40 ft
Origin Coordinates	97000, 48980, 2900
Mining Cost Adjustment Factor Formula	Bedrock $1.928+(1.87-(Z \times 0.000199))$
	Fill $1.71+(1.87-(Z \times 0.000199))$
	Alluvium $1.86+(1.87-(Z \times 0.000199))$
Slope by sector	30,36,40,43.5,45 degrees.
Gold Price	US\$1,200/oz
Gold Selling Cost	US\$0.38/oz
Gold Payable	99.9%
Royalty	9.2%
Recovery Leach	62.0%
Recovery Mill	If $Au < 0.08 \text{ oz/t} = 81\%$; If $Au \geq 0.08 \text{ oz/t} = 88\%$
Recovery Refractory	$92.027536 - (37.35906 \times \text{EXP}((-12.94386) \times Au))$ %
Leach Cost + G&A	US\$1.89 + \$0.81
Mill Cost + G&A	US\$11.01 + \$5.35
Refractory Cost + G&A	US\$36.85 + \$6.09

**TABLE 15-4 PIPELINE WHITTLE PIT OPTIMIZATION PARAMETERS
Barrick Gold Corporation – Cortez Operations**

Whittle Parameter	Description
Block Dimensions	40 ft x 40 ft x 50 ft
Origin Coordinates	97000, 49500, 2880
Mining Cost Adjustment Factor Formula	Bedrock $1.65+(1.986-(Z \times 0.00023))$ Fill $1.50+(1.986-(Z \times 0.00023))$ Alluvium $1.59+(1.986-(Z \times 0.00023))$
Slope by Sector	37,40,41,42,45 degrees
Gold Price	US\$1,200/oz
Gold Selling Cost	US\$0.38/oz
Gold Payable	99.9%
Royalty	7.46%
Recovery Leach	62.0%
Recovery Mill	If $Au < 0.207 \text{ oz/t} = (85.11 \times \text{EXP}(0.36 \times Au)) - 11.9 \%$; If $Au \geq 0.207 \text{ oz/t} = 79.8 \%$
Recovery Refractory	$92.027536 - (37.35906 \times \text{EXP}((-12.94386) \times Au)) \%$
Leach Cost + G&A	US\$1.89 + \$0.81
Mill Cost + G&A	US\$11.01 + \$5.35
Refractory Cost + G&A	US\$36.85 + \$6.09

OPEN PIT CUT-OFF GRADE

A cut-off grade (COG) estimation was compiled for the EOY2018 Mineral Reserve estimates.

- A gold price of \$1,200/oz for EOY2018.
- The applicable Cortez Mine royalty payments.
- The process operating costs and on-site (and off-site) metal recoveries by material type, applicable or selected process method, and orebody.

Gold price assumptions are dictated by the corporate office. Royalties at Cortez vary by area, metal price, and processing type. The various royalties cover different areas, which are described internally as royalty areas to assess Mineral Reserves for each area. Certain royalties are held by subsidiaries of Barrick, and these royalties are excluded from consideration in the cut-off grade estimation. The royalty is estimated for each of five different areas, and a realized gold price net of the royalty is estimated for use in the cut-off grade calculation.

Process and overhead costs for the various processing options were estimated along with recovery. Cut-off grades do not include mining costs. Cut-off grades consider the general and

administration (G&A) costs as part of the process cost. Since 0.004 oz/st Au is the lowest limit detectable in the assay laboratory, the heap leach COG was set to 0.004 oz/st Au.

The Crossroads cut-off grades, including G&A, are shown in Table 15-5 at a gold price of \$1,200/oz and an average recovery value. The cut-off grades represent the breakeven input cut-off grade in order to better route material, excluding mining cost.

**TABLE 15-5 CROSSROADS CUT-OFF GRADES
Barrick Gold Corporation-Cortez Operations**

Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,200	1,200	1,200
Gold Selling Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.9%	99.9%	99.9%
Recovery	%	62%	81%	73%
COSTS (US Customary Units)				
Mining Cost	\$/st mined	1.89	1.89	1.89
Process Operating Cost	\$/st processed	1.57	9.87	22.12
G&A Cost	\$/st processed	0.81	5.35	6.09
Sustaining Capital	\$/st processed	0.032	1.14	0.093
Transportation Cost	\$/st processed	-	-	13.8
Sub-Total Operating Cost	\$/st processed	2.412	16.36	42.103
COSTS (Metric Units)				
Mining Cost	\$/t mined	2.08	2.08	2.08
Process Operating Cost	\$/t processed	1.73	10.88	24.38
G&A Cost	\$/t processed	0.89	5.90	6.71
Sustaining Capital	\$/t processed	0.04	1.26	0.10
Transportation Cost	\$/t processed	-	-	15.21
Sub-Total Operating Cost	\$/t processed	2.66	18.03	46.41
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US Customary Units)	oz/st Au	0.004	0.019	0.054
Cut-Off Grade (Metric Units)	g/t Au	0.14	0.65	1.85

The Pipeline cut-off grade estimates are shown in Table 15-6 at a gold price of \$1,200/oz and an average recovery value.

**TABLE 15-6 PIPELINE OPEN PIT CUT-OFF GRADES
Barrick Gold Corporation-Cortez Operations**

Description	Units	Ore Type		
		Oxide	Mill	Refractory
Gold Price	\$/oz	1,200	1,200	1,200
Gold Selling Cost	\$/oz	0.46	0.46	0.17
Gold Payable	%	99.9%	99.9%	99.9%
Recovery	%	62%	74%	76%
COSTS (US Customary Units)				
Mining Cost	\$/st mined	1.89	1.89	1.89
Process Operating Cost	\$/st processed	1.57	9.87	22.12
G&A Cost	\$/st processed	0.81	5.35	6.09
Sustaining Capital	\$/st processed	0.032	1.14	0.093
Transportation Cost	\$/st processed	-	-	13.8
Sub-Total Operating Cost	\$/st processed	2.412	16.36	42.103
COSTS (Metric Units)				
Mining Cost	\$/t mined	2.08	2.08	2.08
Process Operating Cost	\$/t processed	1.73	10.88	24.38
G&A Cost	\$/t processed	0.89	5.90	6.71
Sustaining Capital	\$/t processed	0.04	1.26	0.10
Transportation Cost	\$/t processed	-	-	15.21
Sub-Total Operating Cost	\$/t processed	2.66	18.03	46.41
Royalty	%	10.09%	10.09%	10.09%
Cut-Off Grade (US Customary Units)	Oz/st	0.004	0.020	0.076
Cut-Off Grade (Metric Units)	g/t	0.14	0.69	2.61

UNDERGROUND MINERAL RESERVES

Underground mining is all at the CHUG. The CHUG has three zones, the Middle Zone, the Lower Zone, and the Deep South Zone. A schematic view of the underground workings is shown in Figure 15-5. There are Mineral Reserves in all three zones.

The mine is a mechanized operation with ramp access via the F Canyon twin declines and internal ramps extending to the Middle and Lower zones. All of the ore is hauled to surface by 30 st haulage trucks and the trucks back haul CRF to the stopes. Ground conditions in the upper ore zone are very poor and headings are all supported with shotcrete and Swellex bolts.

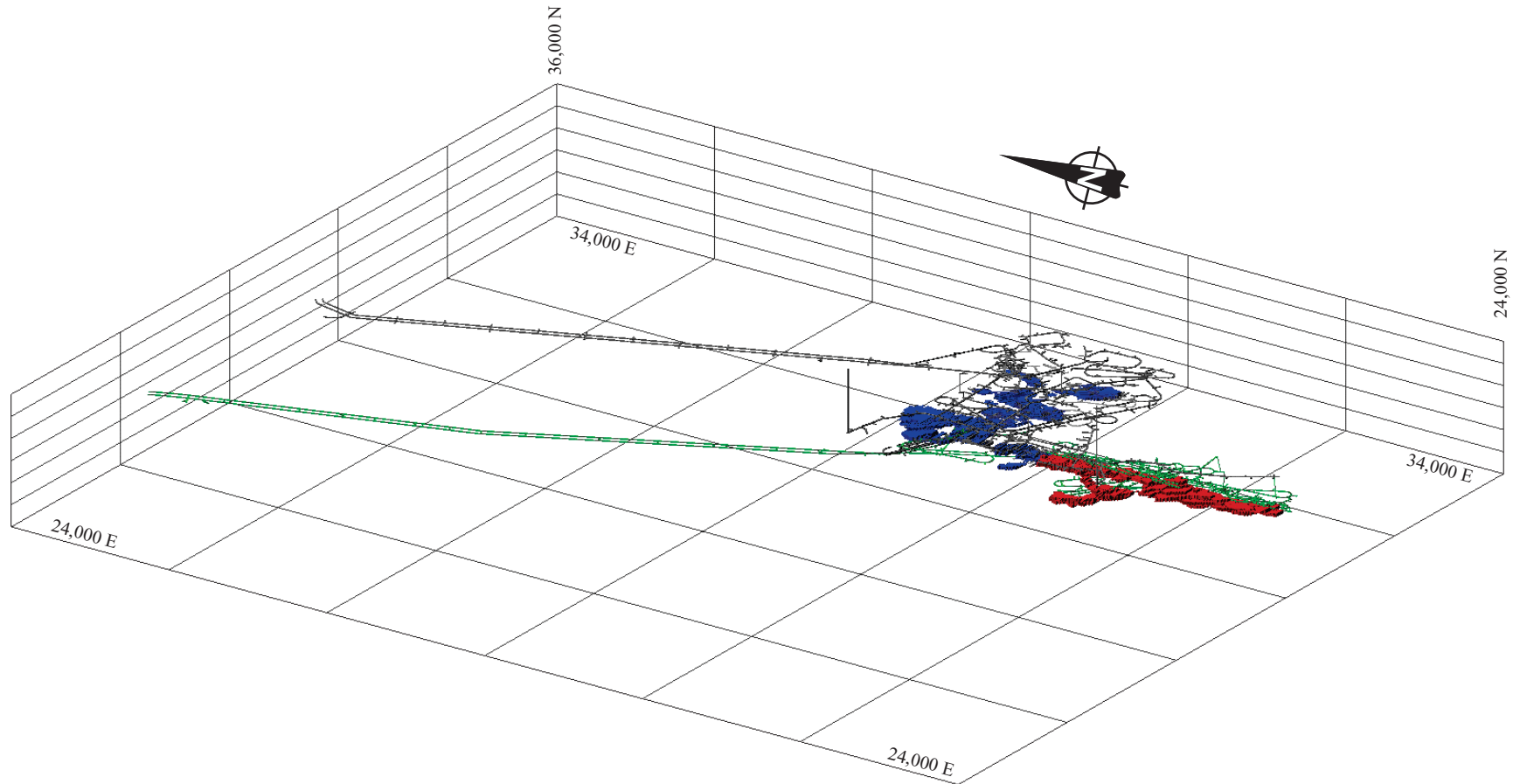
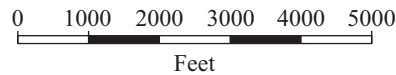


Figure 15-5

Legend:

- Deep South Infrastructure Design
- Deep South Stopes Design
- Underground Stopes Design
- Current Infrastructure



Barrick Gold Corporation

Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.

Underground Infrastructure Layout

Development for the Lower Zone includes two new parallel declines accessing the Lower Zone. The drives have been named the Range Front Declines (RFD) for their location. These new declines will reduce the haulage and access distances, provide additional ventilation and escape ways, and provide a planned conveyor gallery for the movement of rock from the mine to surface. The backfill system will also be improved with a new backfill plant on surface and borehole delivery of the backfill to the mining area. Planning for the Deep South Zone includes extension of the RFDs to connect to the conveyor system for the movement of ore and waste to surface.

Middle Zone production commenced in 2015. The Middle Zone is being mined using cut and fill methods in most areas and some longhole stoping.

The Lower Zone production commenced after permit approval in late 2015 and is planned to be mainly mined by longhole stoping. Previously, the Lower Zone was defined by the permit boundary at the 3,800 ft level. This has been revised and the Lower Zone now extends to the 27687 Northing which cuts the Lower Zone at approximately the 4,070 ft level.

The Deep South Zone is an extension of the Lower Zone defined as that area south of the 27687 Northing. There are portions of the Deep South Zone above the 3,800 ft level that can be mined prior to an amendment to the mining permit. The Deep South Zone extends down to the 3,050 ft level. The Deep South Zone was the subject of a 2017 FS completed by Barrick and Minetech USA, LLC and current mine planning is by the mine staff. The permit approval is expected in 2019. Dewatering wells have been installed and the water level is being lowered towards the 3,800 ft level.

The Deep South Zone has been studied as a standalone expansion of the CHUG which will help to offset the impact of the end of mining in the CHOP. The Deep South Zone is expected to be mined using longhole stoping methods.

UNDERGROUND CUT-OFF GRADE

The cut-off grade estimation for CHUG includes:

- A gold price of \$1,200/oz.
- The applicable Cortez Mine royalty payments.

- The process operating costs and on-site (and off-site) metal recoveries by material type, applicable or selected process method, and mining method.

Gold price assumptions are set by the corporate office. CHUG royalties are estimated as 0.93% Idaho royalty, \$6.82/oz Rio Tinto royalty, and \$1.00/oz for an education fund for a total of \$18.98/oz at the planned \$1,200/oz gold price.

Mining costs, process costs, and process recoveries were estimated for the different stoping methods to determine the cut-off grade. Two different processing options are available for ore from the underground mine. The COG results are summarized in Table 15-7.

TABLE 15-7 UNDERGROUND CUT-OFF GRADE CALCULATIONS
Barrick Gold Corporation – Cortez Operations

	Cut & Fill	
Unit Cost (\$/ore ton)	Oxide	Roaster
Gold Price (US\$/oz)	1,200.00	1,200.00
Recovery (%)	92%	91%
Mining Operating Cost (US\$/st)	92.04	92.04
Process Operating Cost (US\$/st)	11.09	29.01
G&A Operating Cost (US\$/st)	9.86	5.02
Transportation Costs (US\$/st)	-	14.42
Total Operating Cost (US\$/st)	112.99	140.49
Sustaining Capital (Underground) (US\$/st)	11.10	11.10
Sustaining Capital (Process) (US\$/st)	1.40	-
Royalties (\$/oz)	18.98	18.98
BCOG (oz/st Au) US Customary Units	0.116	0.142
BCOG (g/t Au) Metric Units	3.98	4.87
	Longhole Stope	
Unit Cost (\$/ore ton)	Oxide	Roaster
Gold Price (US\$/oz)	1,200.00	1,200.00
Recovery (%)	92%	91%
Mining Operating Cost (US\$/st)	78.82	78.82
Process Operating Cost (US\$/st)	11.09	29.01
G&A Operating Cost (US\$/st)	9.86	5.02
Transportation Costs (US\$/st)	-	14.42
Total Operating Cost (US\$/st)	99.77	127.27
Sustaining Capital (Underground) (US\$/st)	11.10	11.10
Sustaining Capital (Process) (US\$/st)	1.40	-
Royalties (\$/oz)	18.98	18.98
BCOG (oz/st Au) US Customary Units	0.104	0.129
BCOG (g/t Au) Metric Units	3.57	4.42

Ore characterization and ore shape geometry constrains the mining methods that can be used to mine the Middle Zone. To successfully segregate the ore and mine the complex geometry in the Middle Zone a highly selective mining method is being employed. Cut and fill mining provides the required mining selectivity and has been used in the cut-off grade calculations.

Longhole stoping is being applied in the mine planning for those areas where the orebody is amenable to this method.

UNDERGROUND DILUTION AND EXTRACTION

The underground Mineral Reserves for the Middle Zone cut and fill stopes include a dilution tonnage of 5% at zero grade to account for ore handling dilution plus CRF dilution of 3% on primary levels, 5% on secondary levels, and 10% on the bottom levels.

The longhole stope Mineral Reserves include internal dilution consisting of material within the cut-off grade stope shapes which will be mined as part of the stope. In addition, an external dilution tonnage allowance of 11.3% at zero grade has been included in the Mineral Reserve estimate. This value was based upon experience at operations using similar mining methods. RPA is of the opinion that the dilution estimate is appropriate at this stage of the mine development on a global basis, however, local variations (such as differences between primary and secondary stopes) should be incorporated. Stope void surveys and continued reconciliation of production to the Mineral Reserves will demonstrate the accuracy of the dilution estimate.

The Mineral Reserves have an extraction factor of 100%. RPA is of the opinion that the extraction of the longhole stopes is unlikely to be 100% as there will be minor losses expected in primary stopes and larger losses in the wider, backfill walled secondary stopes. RPA is of the opinion that the losses should be estimated as 2% in the primary stopes and 8% in the secondary stopes for an overall extraction of 95%. This estimate should be refined based upon stope survey data and operating experience.

STOPE PLANNING

For the Middle Zone, stope shapes are developed and the tonnes and grade within these shapes are taken from the block model. The Middle Zone Mineral Reserves are based upon a combination of drift and fill mining and longhole stoping.

In the Lower Zone and the Deep South Zone, the Mineral Reserves are based upon the overall design shapes and the planned mining method is mainly longhole stoping.

The Deep South Zone has been interpreted as a -20° SE plunging extension of the Lower Zone. It extends for 2,100 ft along strike and is planned to be mined from the 27,867 North coordinate, down to the 3,050 ft level. The Deep South Zone consists of an upper section that is an average of 180 ft wide and 120 ft thick, a central section that is an average of 200 ft wide and 85 ft thick, and the lower section, known as Renegade, which is 120 ft long by 160 ft wide and 120 ft thick.

Longhole stopes will be mined in a sequence of primary and secondary stopes. The stopes will be 60 ft high from footwall to footwall. Stope dimensions were selected based upon operating assumptions as well as geotechnical considerations.

For the Deep South Zone, Mine Design Engineering, Inc. (MDEng) prepared a pre-feasibility level geotechnical assessment and an update for the FS. These studies provided the parameters for stable stopes for different areas of the Deep South Zone. The analysis used the modified Mathew's stability analysis and the recommendations were to remain in the stable unsupported region of the stability curve. According to the stope stability analysis, it may be necessary to mine the stopes in 27 ft sections to maintain side wall stability.

Where the ore thickness is over 60 ft, there will either be stacked longhole stopes or mining of the balance of the height by drift and fill.

RPA is of the opinion that the stope designs are appropriate, and notes that stope scheduling will be important in view of the potential short panels along the stope length.

RECONCILIATION

An ongoing reconciliation between the Mineral Reserve estimate and the mine production is an important step in assessing the Mineral Reserve estimation and operating parameters at a mine. Cortez maintains a reconciliation between the Mineral Reserve model, the grade control results, and the actual production or Declared Ore Mined (DOM). The stockpiling of ore and the various process streams (mill/leach/autoclave/roaster) complicate the reconciliation between Mineral Reserves and production.

OPEN PIT

The CHOP yearly open pit reconciliation for 2017 and 2018 is shown in Tables 15-8 based on US customary units and Table 15-9 on metric units. Table 15-10 compares the grade control model to the Mineral Reserve model by ore type (heap leaching, oxide mill, and refractory) based on US customary units, and Table 15-11 presents the ore type summary in metric units (heap leaching, oxide mill, and refractory).

The grade control models have reported more tonnage, and the contained gold production has been 5% higher than the Mineral Reserve model. The edges of the Cortez Hills Breccia Zone have been under-drilled and additional ore material at the deposit boundary was not identified. Further edge definition was not possible until very late in the mining cycle.

The grade control results and the Mineral Reserve estimates are being compared monthly.

The Pipeline yearly open pit reconciliation for 2017 and 2018 is shown in Tables 15-12 using US customary units and Table 15-13 based on metric units. Table 15-14 compares the grade control model to the Mineral Reserve model by ore type (heap leaching, oxide mill, and refractory) in US customary units. Table 15-15 presents the ore type summary in metric units.

The grade control models have reported less tonnage in 2017 and more ore tonnage in 2018, and the gold production has been 4% higher than the Mineral Reserve model in 2018. In 2017, tonnage came in lower than the reserve model due to zones of modelled leach material that were re-classified to refractory low grade waste material. In 2018, additional leach tonnage

was encountered. These differences are due to local wide-spaced drilling impacting on inadequately captured material distribution and occurrence of refractory rock material.

The Crossroads yearly open pit reconciliation for 2018 is shown in Table 15-16 in US customary units and Table 15-17 in metric units. Table 15-18 compares the control model to the Mineral Reserve model, by ore type in US customary units and Table 15-19 presents the ore type comparison using metric units. The grade control models have reported more tonnage in 2018, and the gold production has been 18% higher than the Mineral Reserve model in 2018. Additional leach grade material was not captured by local wider-spaced drilling, encountered along the edges of zones. Lower grade leach material (<0.01 opt Au) has often been under-captured by sampling from older RC drilling.

TABLE 15-8 CORTEZ HILLS OPEN PIT RECONCILIATION
Barrick Gold Corporation – Cortez Operations

Year	Grade Control (GC)			Ore Reserve (OR - MI&I)			Declared Ore Mined (DOM)		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	10,699,580	0.096	1,028,814	10,282,690	0.094	970,253	11,691,983	0.088	1,031,288
2018	8,795,209	0.139	1,219,828	8,543,305	0.137	1,171,973	9,256,112	0.139	1,288,831
2017 - 2018	19,494,789	0.115	2,248,642	18,825,995	0.114	2,142,226	20,948,095	0.111	2,320,119

Year	Grade Control vs Ore Reserve			Declared Ore Mined vs Ore Reserve			Declared Ore Mined vs Grade Control		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	4%	2%	6%	14%	-7%	6%	9%	-8%	0%
2018	3%	1%	4%	8%	2%	10%	5%	0%	6%
2017 - 2018	4%	1%	5%	11%	-3%	8%	7%	-4%	3%

TABLE 15-9 CORTEZ HILLS OPEN PIT RECONCILIATION - METRIC UNITS
Barrick Gold Corporation – Cortez Operations

Year	Grade Control (GC)			Ore Reserve (OR - MI&I)			Declared Ore Mined (DOM)		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	9,706,507	3.297	1,028,814	9,328,311	3.235	970,253	10,606,801	3.024	1,031,288
2018	7,978,889	4.755	1,219,828	7,750,365	4.703	1,171,973	8,397,014	4.774	1,288,831
2017 - 2018	17,685,396	3.955	2,248,642	17,078,676	3.901	2,142,226	19,003,815	3.797	2,320,119

Year	Grade Control vs Ore Reserve			Declared Ore Mined vs Ore Reserve			Declared Ore Mined vs Grade Control		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	4%	2%	6%	14%	-7%	6%	9%	-8%	0%
2018	3%	1%	4%	8%	2%	10%	5%	0%	6%
2017 - 2018	4%	1%	5%	11%	-3%	8%	7%	-4%	3%

TABLE 15-10 CORTEZ HILLS OPEN PIT RECONCILIATION BY PROCESS TYPE
Barrick Gold Corporation – Cortez Operations

Grade Control (GC)												
Year	Tons	Leach		Mill			Refractory			Totals - Grade Control		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	5,247,981	0.023	121,721	4,374,556	0.176	771,433	1,077,043	0.126	135,661	10,699,580	0.096	1,028,815
2018 (*)	3,082,551	0.032	98,338	2,413,584	0.177	428,193	3,299,074	0.210	693,297	8,795,209	0.139	1,219,828
2017 - 2018	8,330,532	0.026	220,059	6,788,140	0.177	1,199,626	4,376,117	0.189	828,958	19,494,789	0.115	2,248,643

Ore Reserve Model (OR – MI&I)												
Year	Tons	Leach		Mill			Refractory			Totals- Ore Reserve		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	5,158,955	0.018	93,616	4,313,961	0.182	784,164	809,775	0.114	92,473	10,282,691	0.094	970,253
2018 (*)	2,838,695	0.019	54,153	3,102,566	0.167	519,224	2,602,044	0.230	598,596	8,543,305	0.137	1,171,973
2017 - 2018	7,997,650	0.018	147,769	7,416,527	0.176	1,303,388	3,411,819	0.203	691,069	18,825,996	0.114	2,142,226

Grade Control (GC) vs. Ore Reserve Model (OR)												
Year	Tons	Leach		Mill			Refractory			Totals- % Difference		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	2%	28%	30%	1%	-3%	-2%	33%	10%	47%	4%	2%	6%
2018	9%	67%	82%	-22%	6%	-18%	27%	-9%	16%	3%	1%	4%
2017 - 2018	4%	43%	49%	-8%	1%	-8%	28%	-6%	20%	4%	1%	5%

TABLE 15-11 CORTEZ HILLS OPEN PIT RECONCILIATION BY PROCESS TYPE - METRIC UNITS
Barrick Gold Corporation – Cortez Operations

Year	Grade Control (GC)											
	Tonnes	Leach Grade (g/t Au)	Ounces	Tonnes	Mill Grade (g/t Au)	Ounces	Tonnes	Refractory Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	4,760,894	0.795	121,721	3,968,535	6.046	771,433	977,078	4.319	135,661	9,706,507	3.297	1,028,815
2018 (*)	2,796,446	1.094	98,338	2,189,569	6.083	428,193	2,992,873	7.205	693,297	7,978,889	4.755	1,219,828
2017 - 2018	7,557,340	0.906	220,059	6,158,104	6.059	1,199,626	3,969,952	6.495	828,958	17,685,396	3.955	2,248,643

Year	Ore Reserve Model (OR – MI&I)											
	Tonnes	Leach Grade (g/t Au)	Ounces	Tonnes	Mill Grade (g/t Au)	Ounces	Tonnes	Refractory Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	4,680,131	0.622	93,616	3,913,564	6.232	784,164	734,616	3.915	92,473	9,328,311	3.235	970,253
2018 (*)	2,575,224	0.654	54,153	2,814,604	5.738	519,224	2,360,537	7.887	598,596	7,750,365	4.703	1,171,973
2017 - 2018	7,255,355	0.633	147,769	6,728,168	6.025	1,303,388	3,095,154	6.945	691,069	17,078,677	3.901	2,142,226

Year	Grade Control (GC) vs. Ore Reserve Model (OR)											
	Tonnes	Leach Grade (g/t Au)	Ounces	Tonnes	Mill Grade (g/t Au)	Ounces	Tonnes	Refractory Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	2%	28%	30%	1%	-3%	-2%	33%	10%	47%	4%	2%	6%
2018	9%	67%	82%	-22%	6%	-18%	27%	-9%	16%	3%	1%	4%
2017 - 2018	4%	43%	49%	-8%	1%	-8%	28%	-6%	20%	4%	1%	5%

**TABLE 15-12 PIPELINE OPEN PIT RECONCILIATION
Barrick Gold Corporation – Cortez Operations**

Year	Grade Control (GC)			Ore Reserve (OR – MI&I)			Declared Ore Mined (DOM)		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	3,235,597	0.012	39,912	3,837,378	0.014	53,558	3,535,704	0.011	40,008
2018	2,865,458	0.008	22,341	2,463,461	0.009	21,403	3,015,619	0.008	23,604
2017 - 2018	6,101,055	0.010	62,253	6,300,839	0.012	74,961	6,551,323	0.010	63,612

Year	Grade Control vs Ore Reserve			Declared Ore Mined vs Ore Reserve			Declared Ore Mined vs Grade Control		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-16%	-12%	-25%	-8%	-19%	-25%	9%	-8%	0%
2018	16%	-10%	4%	22%	-10%	10%	5%	0%	6%
2017 - 2018	-3%	-14%	-17%	4%	-18%	-15%	7%	-5%	2%

**TABLE 15-13 PIPELINE OPEN PIT RECONCILIATION - METRIC UNITS
Barrick Gold Corporation – Cortez Operations**

Year	Grade Control (GC)			Ore Reserve (OR – MI&I)			Declared Ore Mined (DOM)		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	2,935,288	0.423	39,912	3,481,215	0.479	53,558	3,207,541	0.388	40,008
2018	2,599,503	0.267	22,341	2,234,817	0.298	21,403	2,735,727	0.268	23,604
2017 - 2018	5,534,791	0.350	62,253	5,716,032	0.408	74,961	5,943,267	0.333	63,612

Year	Grade Control vs Ore Reserve			Declared Ore Mined vs Ore Reserve			Declared Ore Mined vs Grade Control		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-16%	-12%	-25%	-8%	-19%	-25%	9%	-8%	0%
2018	16%	-10%	4%	22%	-10%	10%	5%	0%	6%
2017 - 2018	-3%	-14%	-17%	4%	-18%	-15%	7%	-5%	2%

TABLE 15-14 PIPELINE OPEN PIT RECONCILIATION BY PROCESS TYPE
Barrick Gold Corporation – Cortez Operations

Grade Control (GC)												
Year	Tons	Leach		Mill			Refractory			Totals - Grade Control		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017 (*)	3,235,597	0.012	39,912	-	-	-	-	-	-	3,235,597	0.012	39,912
2018 (*)	2,860,795	0.008	21,845	4,663	0.106	496	-	-	-	2,865,458	0.008	22,341
2017 - 2018	6,096,392	0.010	61,757	4,663	0.106	496	-	-	-	6,101,055	0.010	62,253

Ore Reserve Model (OR MI&I)												
Year	Tons	Leach		Mill			Refractory			Totals -Ore Control		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017 (*)	3,387,378	0.014	53,558	-	-	-	-	-	-	3,387,378	0.014	53,558
2018	2,463,461	0.009	21,403	-	-	-	-	-	-	2,463,461	0.009	21,403
2017 - 2018	6,300,839	0.012	74,961	-	-	-	-	-	-	6,300,839	0.012	74,961

Grade Control (GC) vs. Ore Reserve Model (OR)												
Year	Tons	Leach		Mill			Refractory			Totals - % Difference		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-16%	-12%	-25%	-	-	-	-	-	-	-16%	-12%	-25%
2018	16%	-12%	2%	N/A	N/A	N/A	-	-	-	16%	-10%	4%
2017 - 2018	-3%	-15%	-18%	N/A	N/A	N/A	-	-	-	-3%	-14%	-17%

TABLE 15-15 PIPELINE OPEN PIT RECONCILIATION BY PROCESS TYPE - METRIC UNITS
Barrick Gold Corporation – Cortez Operations

Year	Tonnes	Grade Control (GC)									Totals - Grade Control		
		Leach			Mill			Refractory			Tonnes	Grade (g/t Au)	Ounces
		Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces				
2017 (*)	2,935,288	0.423	39,912	-	-	-	-	-	-	2,935,288	0.423	39,912	
2018 (*)	2,595,273	0.262	21,845	4,230	3.645	496	-	-	-	2,599,503	0.267	22,341	
2017 - 2018	5,530,560	0.347	61,757	4,230	3.645	496	-	-	-	5,534,791	0.350	62,253	

Year	Tonnes	Ore Reserve Model (OR MI&I)									Totals -Ore Control		
		Leach			Mill			Refractory			Tonnes	Grade (g/t Au)	Ounces
		Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces				
2017 (*)	3,481,215	0.479	53,558	-	-	-	-	-	-	3,481,215	0.479	53,558	
2018	2,234,817	0.298	21,403	-	-	-	-	-	-	2,234,817	0.298	21,403	
2017 - 2018	5,716,032	0.408	74,961	-	-	-	-	-	-	5,716,032	0.408	74,961	

Year	Tonnes	Grade Control (GC) vs. Ore Reserve Model (OR)									Totals - % Difference		
		Leach			Mill			Refractory			Tonnes	Grade (g/t Au)	Ounces
		Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces				
2017	-16%	-12%	-25%	-	-	-	-	-	-	-16%	-12%	-25%	
2018	16%	-12%	2%	N/A	N/A	N/A	-	-	-	16%	-10%	4%	
2017 - 2018	-3%	-15%	-18%	N/A	N/A	N/A	-	-	-	-3%	-14%	-17%	

TABLE 15-16 CROSSROADS OPEN PIT RECONCILIATION
Barrick Gold Corporation – Cortez Operations

Year	Grade Control (GC)			Ore Reserve (OR – MI&I)			Declared Ore Mined (DOM)		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-	-	-	-	-	-	-	-	-
2018	5,194,460	0.011	58,126	4,323,964	0.011	49,077	5,466,670	0.011	61,414
2017 - 2018	5,194,460	0.011	58,126	4,323,964	0.011	49,077	5,466,670	0.011	61,414

Year	Grade Control vs Ore Reserve			Declared Ore Mined vs Ore Reserve			Declared Ore Mined vs Grade Control		
	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-	-	-	-	-	-	-	-	-
2018	20%	-1%	18%	26%	-1%	25%	5%	0%	6%
2017 - 2018	20%	-1%	18%	26%	-1%	25%	5%	0%	6%

TABLE 15-17 CROSSROADS OPEN PIT RECONCILIATION - METRIC UNITS
Barrick Gold Corporation – Cortez Operations

Year	Grade Control (GC)			Ore Reserve (OR – MI&I)			Declared Ore Mined (DOM)		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	-	-	-	-	-	-	-	-	-
2018	4,712,340	0.384	58,126	3,922,639	0.389	49,077	4,959,286	0.385	61,414
2017 - 2018	4,712,340	0.384	58,126	3,922,639	0.389	49,077	4,959,286	0.385	61,414

Year	Grade Control vs Ore Reserve			Declared Ore Mined vs Ore Reserve			Declared Ore Mined vs Grade Control		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	-	-	-	-	-	-	-	-	-
2018	20%	-1%	18%	26%	-1%	25%	5%	0%	6%
2017 – 2018	20%	-1%	18%	26%	-1%	25%	5%	0%	6%

TABLE 15-18 CROSSROADS OPEN PIT RECONCILIATION BY PROCESS TYPE
Barrick Gold Corporation – Cortez Operations

Grade Control (GC)												
Year	Tons	Leach		Mill			Tons	Refractory		Totals – Grade Control		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018 (*)	5,120,572	0.010	52,874	73,888	0.071	5,252	-	-	-	5,194,460	0.011	58,126
2017 - 2018	5,120,572	0.010	52,874	73,888	0.071	5,252	-	-	-	5,194,460	0.011	58,126

Ore Reserve Model (OR MI&I)												
Year	Tons	Leach		Mill			Tons	Refractory		Totals -Ore Control		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018 (*)	4,216,654	0.010	42,051	107,310	0.065	7,026	-	-	-	4,323,964	0.011	49,077
2017 - 2018	4,216,654	0.010	42,051	107,310	0.065	7,026	-	-	-	4,323,964	0.011	49,077

Grade Control (GC) vs. Ore Reserve Model (OR)												
Year	Tons	Leach		Mill			Tons	Refractory		Totals - % Difference		
		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces		Grade (oz/st Au)	Ounces	Tons	Grade (oz/st Au)	Ounces
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018	21%	4%	26%	-31%	9%	-25%	-	-	-	20%	-1%	18%
2017 - 2018	21%	4%	26%	-31%	9%	-25%	-	-	-	20%	-1%	18%

TABLE 15-19 CROSSROADS OPEN PIT RECONCILIATION BY PROCESS TYPE - METRIC UNITS
Barrick Gold Corporation – Cortez Operations

Grade Control (GC)												
Year	Leach			Mill			Refractory			Totals - Grade Control		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018 (*)	4,645,311	0.354	52,874	67,030	2.437	5,252	-	-	-	4,712,340	0.384	58,126
2017 - 2018	4,645,311	0.354	52,874	67,030	2.437	5,252	-	-	-	4,712,340	0.384	58,126

Ore Reserve Model (OR MI&I)												
Year	Leach			Mill			Refractory			Totals -Ore Control		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018 (*)	3,825,288	0.342	42,051	97,350	2.245	7,026	-	-	-	3,922,639	0.389	49,077
2017 - 2018	3,825,288	0.342	42,051	97,350	2.245	7,026	-	-	-	3,922,639	0.389	49,077

Grade Control (GC) vs. Ore Reserve Model (OR)												
Year	Leach			Mill			Refractory			Totals - % Difference		
	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces	Tonnes	Grade (g/t Au)	Ounces
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018	21%	4%	26%	-31%	9%	-25%	-	-	-	20%	-1%	18%
2017 - 2018	21%	4%	26%	-31%	9%	-25%	-	-	-	20%	-1%	18%

UNDERGROUND

The underground production reconciliation is shown in Table 15-20.

TABLE 15-20 UNDERGROUND PRODUCTION RECONCILIATION
Barrick Gold Corporation – Cortez Operations

Designation	2016		2017		2018	
	Tons	Ounces	Tons	Ounces	Tons	Ounces
Dilution	0.8%	0.1%	6.8%	0.5%	6.6%	0.5%
Recovery	87.5%	89.0%	90.1%	92.6%	93.2%	96.9%
Overbreak	0.7%	0.0%	6.0%	0.4%	6.0%	0.4%
Unplanned Ore	3.3%	4.1%	7.1%	8.5%	5.8%	9.0%
Ore Left Behind	12.9%	13.4%	14.5%	14.2%	12.6%	12.1%
Recovery (in stope)	84.28%	84.9%	83.0%	84.1%	87.4%	84.1%
Overbreak- Total	3.9%	4.1%	13.1%	8.9%	11.5%	9.6%
Stope Performance	83.1%	82.5%	72.4%	76.9%	75.8%	76.9%

From the summary reconciliation statistics provided, RPA observes that the stope performance is deteriorating over a period where stoping has been changing from drift and fill to longhole stoping methods. Future production is planned to be approximately 85% longhole stoping.

RPA is of the opinion that more detailed stope by stope reconciliation evaluations should be undertaken on an ongoing basis with analysis to determine how to improve stope performance and to provide updated inputs for the stope planning and Mineral Reserve estimation.

16 MINING METHODS

RECENT PRODUCTION HISTORY

The Cortez Mine consists of an operating open pit and underground mine with production from several open pit deposits and one underground mine. Production is currently coming from the CHOP, the Pipeline open pit, and the CHUG as well as material from stockpiles accumulated from previous mining. The operations at Cortez are well established, systems are in place, and the mine is reasonably staffed to the correct levels. The mine production history for the past four years (2015-2018) is summarized in Table 16-1.

TABLE 16-1 MINE OPERATIONS SUMMARY 2015-2018
Barrick Gold Corporation – Cortez Operations

Item	2015	2016	2017	2018
Open Pit				
Tons Mined	166,079,219	136,577,392	146,928,427	132,885,385
Tons Per Day	455,011	374,185	402,544	364,070
Tons of Ore	22,614,007	29,139,617	17,587,749	17,613,555
Grade (oz/st Au)	0.031	0.038	0.077	0.080
Contained Ounces	698,154	1,103,764	1,357,452	1,404,196
Tons Operating Waste	120,786,196	99,213,253	65,755,284	46,806,219
Capitalized Tons Waste	22,679,016	8,224,522	63,585,394	68,465,611
Tons Waste	143,465,212	107,437,775	129,340,678	115,271,830
Underground				
Tons Mined	1,020,966	1,122,414	1,336,352	1,517,926
Tons of Ore	763,320	800,117	867,176	1,100,895
Tons Per Day (total)	2,797	3,075	3,661	4,159
Ore Tons Per Day	2,091	2,192	2,376	3,016
Grade (oz/st Au)	0.627	0.422	0.327	0.313
Contained Ounces	478,336	337,838	335,892	344,463
Tons Waste Tons	257,647	322,297	469,177	417,031
Tons Backfill Tons	641,404	812,597	844,025	915,238
Total Feet Development	42,335	46,486	43,160	40,724

OPEN PIT MINE

MINE OPERATIONS

Open pit ore is mined by a conventional shovel-truck process at the rate of approximately 20 million tons per year with a LOM stripping ratio of 5.1:1 (waste to ore ratio). Mining occurs in two separate areas approximately 12 mi apart; CHOP and Pipeline, composed of the Pipeline and Crossroads open pits. Figure 16-1 illustrates the location of the open pit mines.

CHOP operation is currently limited to the final benches of the CHOP. The Pediment open pit was completely mined and waste from the CHOP was dumped to backfill this pit with a ramp connecting to access the CHOP.

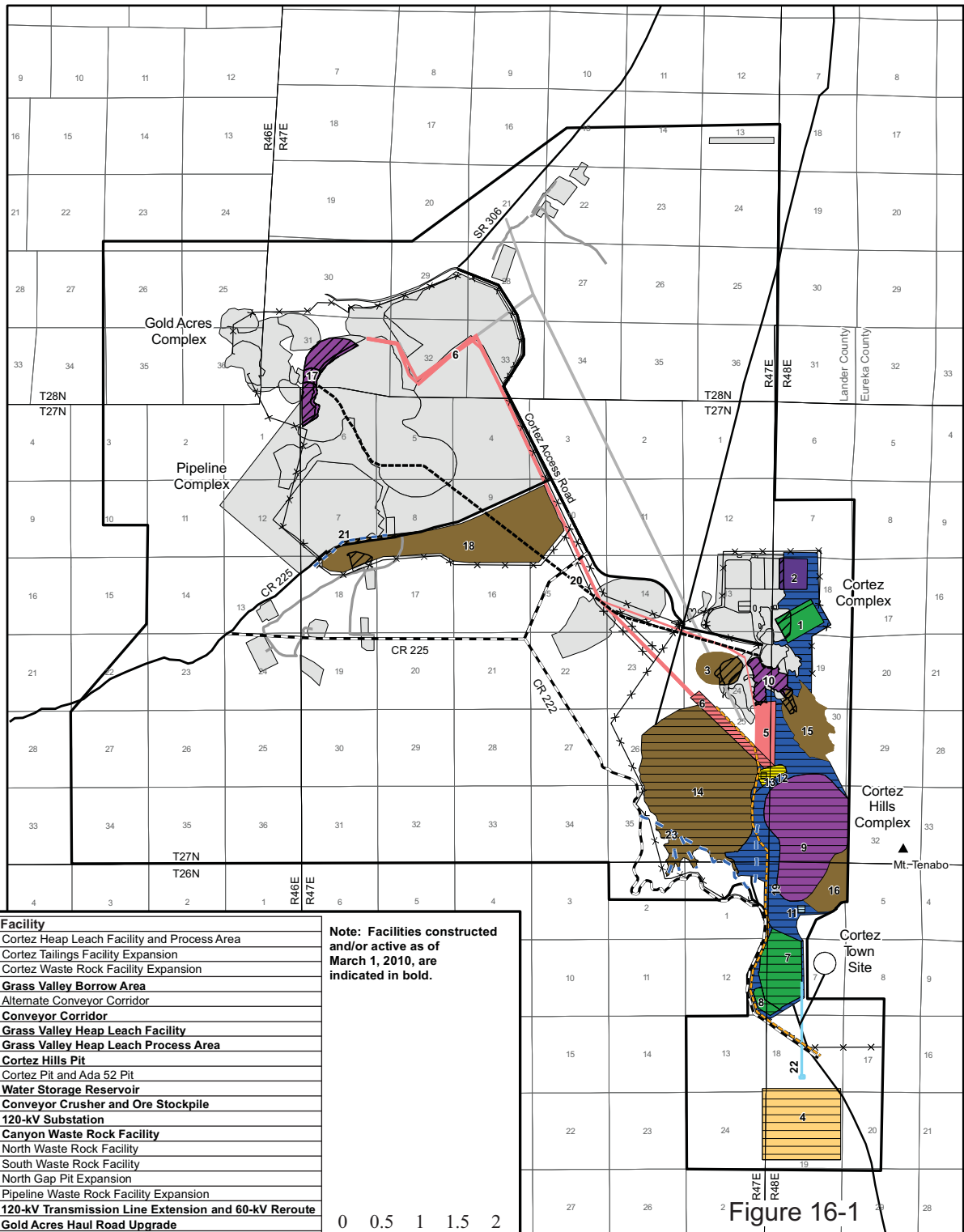
The Pipeline Complex open pit operations include the Pipeline Pit and Crossroads phases. Pipeline ore and waste haul horizontal distances are 10,000 ft and 7,000 ft, respectively.

MINE DESIGN PARAMETERS

The open pit designs include consideration of the dewatering requirements and the different types of waste that may be encountered during stripping. At the CHOP, a protected cultural area was declared on the northeast side of the pit, which has limited the pit expansion on that side.

The following design criteria are used for the Pipeline and Crossroads open pits:

- Pipeline 50 ft bench height;
- Crossroads 40 ft bench height;
- Alluvium inter-ramp wall slope angle varying from 35° to 42°;
- Fresh rock inter-ramp wall slope angles ranging from 37° to 45° depending on material type and wall orientation;
- Bench face angles ranging from 55° to 70° depending on material type;
- 10% maximum haul road grade; and
- 120 ft wide haul roads.



Number	Facility
1	Cortez Heap Leach Facility and Process Area
2	Cortez Tailings Facility Expansion
3	Cortez Waste Rock Facility Expansion
4	Grass Valley Borrow Area
5	Alternate Conveyor Corridor
6	Conveyor Corridor
7	Grass Valley Heap Leach Facility
8	Grass Valley Heap Leach Process Area
9	Cortez Hills Pit
10	Cortez Pit and Ada 52 Pit
11	Water Storage Reservoir
12	Conveyor Crusher and Ore Stockpile
13	120-kV Substation
14	Canyon Waste Rock Facility
15	North Waste Rock Facility
16	South Waste Rock Facility
17	North Gap Pit Expansion
18	Pipeline Waste Rock Facility Expansion
19	120-kV Transmission Line Extension and 60-kV Reroute
20	Gold Acres Haul Road Upgrade
21	Fresh Water Well and Pipeline
22	Freshwater Well and Pipeline
23	Southwest Diversion Ditch

Note: Facilities constructed and/or active as of March 1, 2010, are indicated in bold.

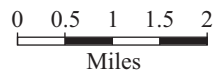


Figure 16-1

Legend:		

Barrick Gold Corporation

Cortez Joint Venture Operation
State of Nevada, U.S.A.

Site Layout

GEOMECHANICS

The geotechnical model is a compilation of information sourced from geotechnical cell mapping, geological mapping, core logging, and supplementary drilling designed to intersect areas of geotechnical interest, material strength, highwall performance, and hydrological data.

Material strength estimates for the Cortez deposits are derived from:

- Historic and current material strength testing programs conducted by various consultants.
- Core logging by Barrick and external consultant geologists and geotechnical engineers from drill holes located in and around the deposits.
- Back-analysis of historical failures in similar rock types.

Piteau Associates Engineering, Ltd. (Piteau) conducted extensive geotechnical studies on the Pipeline, South Pipeline, Crossroads, and Gap deposits. In 2016, Golder prepared an FS level pit slope evaluation for Crossroads, providing the recommendations used in pit optimization analysis and pit design.

Piteau updated geotechnical slope designs for the CHOP Ultimate Pit Plan in a technical memorandum dated October 23, 2018, providing recommendations for the final pit.

Mining operations have been proceeding in these areas since 1998. Cortez undertakes constant monitoring of pit walls through geotechnical cell mapping, geological structure mapping, groundwater monitoring, bench inspections, slope stability, and slope movement analyses.

The Pipeline and Crossroads final pit designs are shown in Figure 16-2. Table 16-2 summarizes the pit slope design parameters for the Pipeline and Crossroads open pits.

**TABLE 16-2 OPEN PIT SLOPE DESIGN PARAMETERS
Barrick Gold Corporation – Cortez Operations**

Region / Parameter	Region 1	Region 2	Region 3
Pipeline			
Rock Type	Rock	N/A	N/A
Bench Height	50 ft	N/A	N/A
Inter Ramp Angle	45°	N/A	N/A
Bench Face Angle	65°	N/A	N/A
Berm Width	26.68 ft	N/A	N/A

Region / Parameter	Region 1	Region 2	Region 3
Step Out Vertical Spacing	300 ft	N/A	N/A
Step Out Width	75 ft	N/A	N/A
Crossroads			
Rock Type	N/A	Rock	Alluvium
Bench Height	N/A	40 ft	40 ft
Inter Ramp Angle	N/A	40°/43.5 °	42°
Bench Face Angle	N/A	65°	70°
Berm Width	N/A	29.02 ft / 23.5 ft	29.87 ft
Step Out Vertical Spacing	N/A	300 ft	300 ft
Step Out Width	N/A	75 ft	75 ft

DEWATERING

Dewatering is a priority for the Pipeline and Crossroads open pit operations. At the Pipeline Pit, there are a series of dewatering wells around the perimeter of the pit. These dewatering wells discharge water, which is used for operations, and are finally discharged to ground infiltration areas called RIBs. There is a permitted limit on the dewatering rate and Cortez has a dewatering model to predict the rate of dewatering and for planning the locations for wells.

Dewatering of the open pits should continue to be an important priority of the Cortez operation. In conjunction with the dewatering, careful highwall slope monitoring is being done and should be continued.

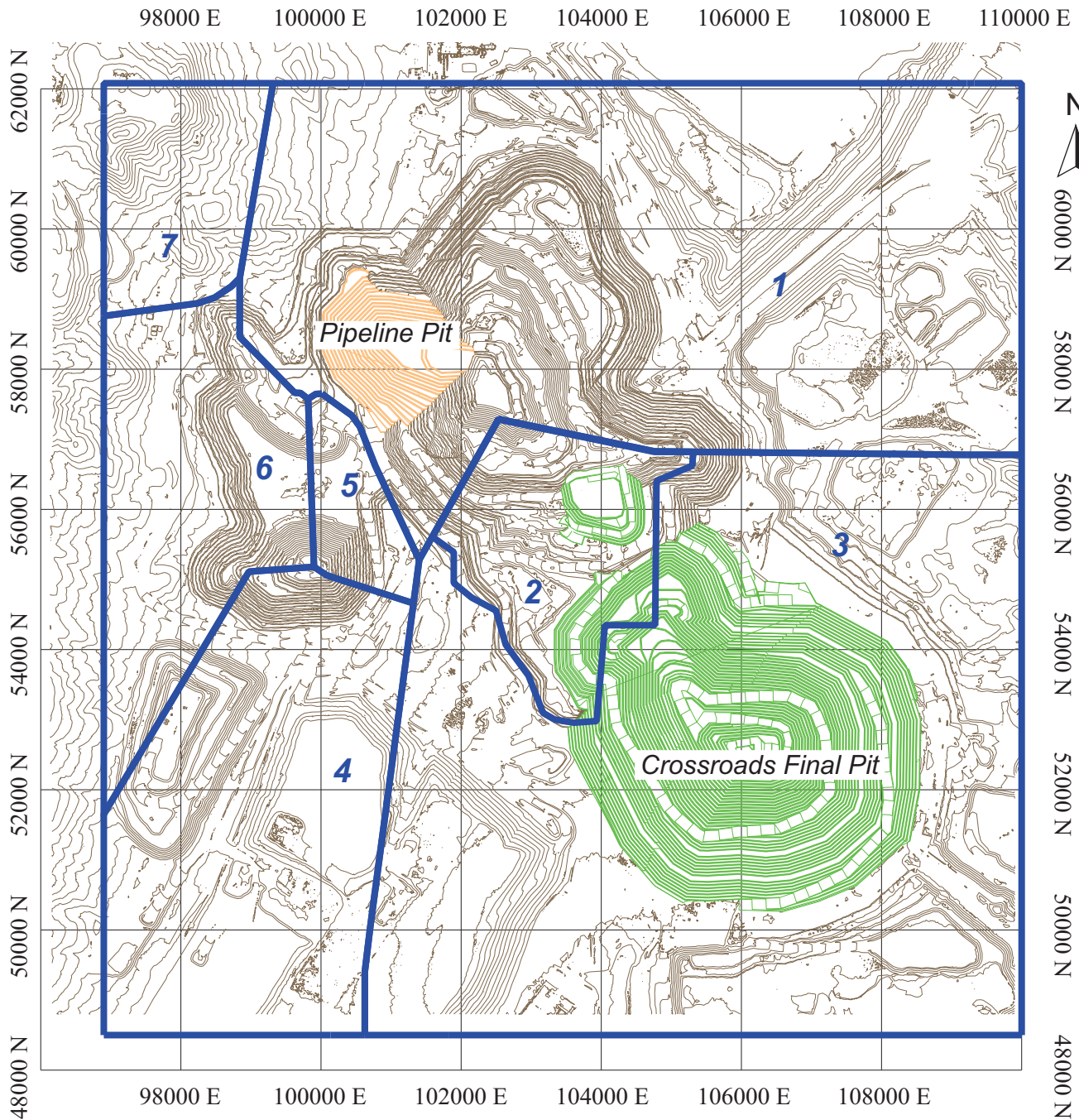


Figure 16-2



Barrick Gold Corporation
Cortez Joint Venture Operations
Lander & Eureka Counties
State of Nevada, U.S.A.
Pipeline and Crossroads
Recommended Pit Slope Design

OPEN PIT PRODUCTION SCHEDULE

The various open pits are scheduled considering the ore and waste quantities, ore grades, and the centralization of activity to the extent possible. The current mine life is estimated to be eight years (2019–2026). Average, total daily open pit mine production from the Cortez operation is estimated to be 400,000 stpd in 2019, an average of 350,000 stpd for the next four years, and 300,000 stpd and 140,000 stpd for the final two years of operation, respectively. There is a reduced mining quantity scheduled for 2026, which represents less than a month of open pit mining operation.

Ore will be sent to the leach ore mill based on cut-off grade and mill capacity to maintain the mill feed. Refractory ore is mined and first stockpiled, then it is shipped to Barrick's Goldstrike operation, which is approximately 70 mi north of Cortez, for processing. Refractory ore trucking is currently subject to permitted tonnage limitations of approximately 1.8 million stpa. The over-the-highway trucks have an approximate capacity of 23 tons per load.

The open pit mining plan for a given pit is developed by setting up haulage strings by pit, by location in the pit, by pit phase, and by delivery point. With the application of truck speeds, Cycle times are estimated based on truck speeds, and truck availability is used to estimate and schedule the total haulage capacity. The same procedure is used to generate the equipment replacement and retirement schedule.

Cortez is currently focused on finalizing production from CHOP in 2019. The Pipeline and Crossroads pits continue production until 2026. Table 16-3 is a LOM mine production summary from all of the Cortez open pit operations.

TABLE 16-3 CORTEZ OPERATION – LOM OPEN PIT PRODUCTION
Barrick Gold Corporation – Cortez Operations

Year	Total Tons Mined (000)	Tons Per Day	Tons of Ore (000)	Grade (oz/st Au)	Contained Gold (oz)	Tons Waste (000)	Stripping Ratio
2019	155,223	425,268	24,716	0.018	442,067	130,507	5.28
2020	146,000	398,907	15,525	0.016	247,183	130,475	8.40
2021	135,723	371,844	23,781	0.020	485,973	111,942	4.71
2022	125,000	342,466	29,670	0.023	691,097	95,330	3.21
2023	113,667	311,416	5,179	0.021	106,710	108,488	20.95
2024	88,000	240,437	19,289	0.030	585,723	68,711	3.56
2025	48,000	131,507	14,438	0.052	756,415	33,562	2.32
2026	10,551	28,907	6,292	0.115	722,699	4,259	0.68
Totals	822,164	281,344	138,890	0.024	4,037,867	683,274	4.92

Table 16-4 is a summary of the CHOP operation.

TABLE 16-4 CORTEZ HILLS – LOM OPEN PIT PRODUCTION
Barrick Gold Corporation – Cortez Operations

Year	Total Tons Mined (000)	Tons of Ore (000)	Grade (oz/st Au)	Contained Gold (oz)	Tons Waste (000)	Stripping Ratio
2019	3,223	1,721	0.059	101,733	1,502	0.87
Totals	3,223	1,721	0.059	101,733	1,502	0.87

Table 16-5 is an open pit mine production summary for the Pipeline and Crossroads pits.

TABLE 16-5 PIPELINE/CROSSROADS – LOM OPEN PIT PRODUCTION
Barrick Gold Corporation – Cortez Operations

Year	Total Tons Mined (000)	Tons Per Day	Tons of Ore (000)	Grade (oz/st Au)	Contained Gold (oz)	Tons Waste (000)	Stripping Ratio
2019	153,756	153,756	22,995	0.015	340,333	130,762	5.69
2020	144,244	144,244	15,525	0.016	247,183	128,719	8.29
2021	135,723	135,723	23,781	0.020	485,973	111,942	4.71
2022	125,000	125,000	29,670	0.023	691,097	95,330	3.21
2023	113,667	113,667	5,179	0.021	106,710	108,489	20.95
2024	88,000	88,000	19,289	0.030	585,723	68,711	3.56
2025	48,000	48,000	14,438	0.052	756,415	33,562	2.32
2026	10,551	10,551	6,292	0.115	722,699	4,259	0.68
Totals	818,942	N/A	137,169	0.029	3,936,133	681,773	4.97

Table 16-6 shows the approximate percentage of each processing category (leach, oxide mill, and refractory) mined for tonnage and contained gold ounces.

**TABLE 16-6 PERCENTAGES OF MINED PROCESSING ORE TYPES
Barrick Gold Corporation – Cortez Operations**

Area/Zone	Mill		Leach		Refractory	
	% of Mill tons	% of oz	% of Leach tons	% of oz	% of Refractory tons	% of oz
Pipeline	1.9%	2.0%	10.9%	10.0%	16.6%	11.6%
Crossroads	93.9%	93.6%	88.1%	88.3%	82.7%	87.6%
Cortez Hills	4.3%	4.4%	1.0%	1.7%	0.7%	0.8%
Open Pit Subtotals	100%	100%	100%	100%	100%	100%

OPEN PIT INFRASTRUCTURE

The open pit infrastructure has been developed at both the CHOP and Pipeline areas. There are shops and offices at the Pipeline mill area to support open pit operations at the Pipeline and Crossroads pits, and there are shops and offices at the CHOP to support operations in that area.

The road network for haulage and for light vehicle access is well developed, and there are multiple stockpile areas with storage based upon the grade and processing type of the material being stockpiled.

OPEN PIT EQUIPMENT AND MAINTENANCE

There is an extensive mobile equipment fleet at the Cortez Operations. The major surface mobile equipment is listed in Table 16-7. Dozers, rubber-tire dozers, graders, blast hole drills, maintenance vehicles, a heavy haul trailer, and other equipment are present to support the operations. The Cortez operation has an adequate number of primary and support equipment, and the equipment is properly maintained.

TABLE 16-7 MAJOR OPEN PIT EQUIPMENT
Barrick Gold Corporation – Cortez Operations

Unit	LOM Number of Units	LOM Average Availability (%)	LOM Average Utilization (%)
Liebherr T282B trucks (400 st)	19	80	70
Caterpillar 795F trucks (345 st)	30	88	70
P&H 4100 XPB shovel	2	87	93
P&H 2800 XPB shovel	3	87	90
EX-5500 excavator	1	85	85
Atlas Copco PV271 drill	6	85	75
DrillTech SP55	1	75	70
DrillTech D75K	1	75	70

In addition, there is a large fleet of light vehicles for crew transportation and supervision. The fleet size is consistent with the needs of this large operation, which is spread over a significant area with outlying facilities.

Cortez’s truck fleet is currently made up of Caterpillar 795Fs (350 st class) and Liebherr T282Bs (400 st class).

The main loading units are two P&H 4100 electric shovels (73 yd³ to 77 yd³ buckets); three P&H 2800 electric shovels (48 yd³ buckets); and one Hitachi EX-5500 hydraulic excavator (35 yd³ bucket). For planning purposes all the shovels are given target availabilities, machine utilizations, and tons per operating hour (tpoh).

UNDERGROUND MINE

The underground mining is all mechanized, with large scale equipment using a combination of cut and fill mining with cemented backfill and primary and secondary longhole stoping with cemented and uncemented backfill.

Mine production was approximately 3,016 stpd of ore (4,159 tpd rock) in 2018. Over the past four years the mine production has risen by 44% from 2,091 stpd to 3,016 stpd. Over the same period the grade has decreased from 0.627 oz/st Au to 0.313 oz/st Au. The Breccia Zone has been depleted and the 2018 production was virtually all from the Middle and Lower zones.

In the cut and fill stopes, headings are cycled using conventional drill/blast/muck/support on a round by round basis. Material is loaded into haul trucks and hauled to surface. Top-cut headings are typically 15 ft by 15 ft and undercut widths vary from 18 ft to 30 ft (depending on ground conditions and ore geometry) with 15 ft heights. Wider ore cuts are being implemented to improve productivity and mine production.

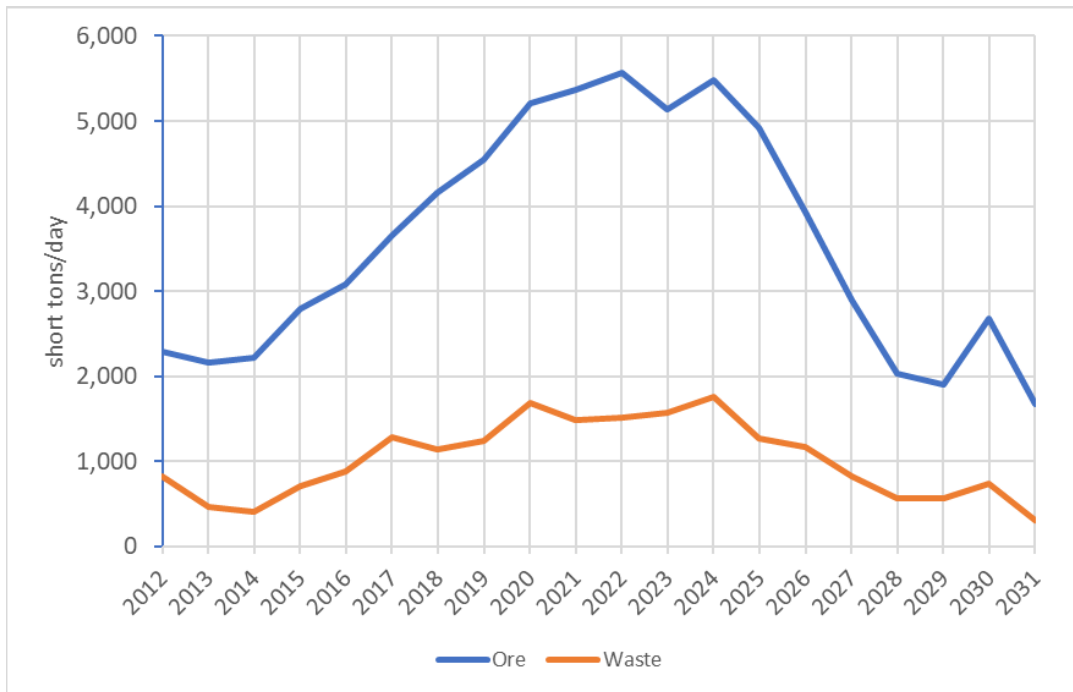
Longhole stopes are planned to be mined using 60 ft sublevels with a series of primary and secondary longhole stopes. Development will typically be 15 ft high and the primary and secondary stopes are planned to be 25 ft wide. Primary stopes will be mined in short sections to maintain stability and each section will be filled with CRF after mining. Secondary stopes will be mined after primary stopes have been completed. Where the ore zone is more than 60 ft high, the stopes will be stacked vertically, as needed, to extract the ore. Long holes are planned to be vertical down holes from the upper sublevel.

MINE DESIGN

The CHUG is accessed by twin declines driven to the upper level of the deposit. Access for the Middle and Lower zones is by a spiral ramp adjacent to the orebody. The twin declines are interconnected at regular intervals and these connections contain air doors to separate the intake and exhaust airways. At the portal area, there are permanent offices and maintenance facilities together with a backfill plant and shotcrete batch plant. An additional set of twin declines (RFD), for access to the Lower Zone and the Deep South Zone are being developed. The declines will provide additional means of egress as well as house a conveyor for ore and waste transport from the Lower and Deep South zones. The mining is all mechanized with large scale equipment.

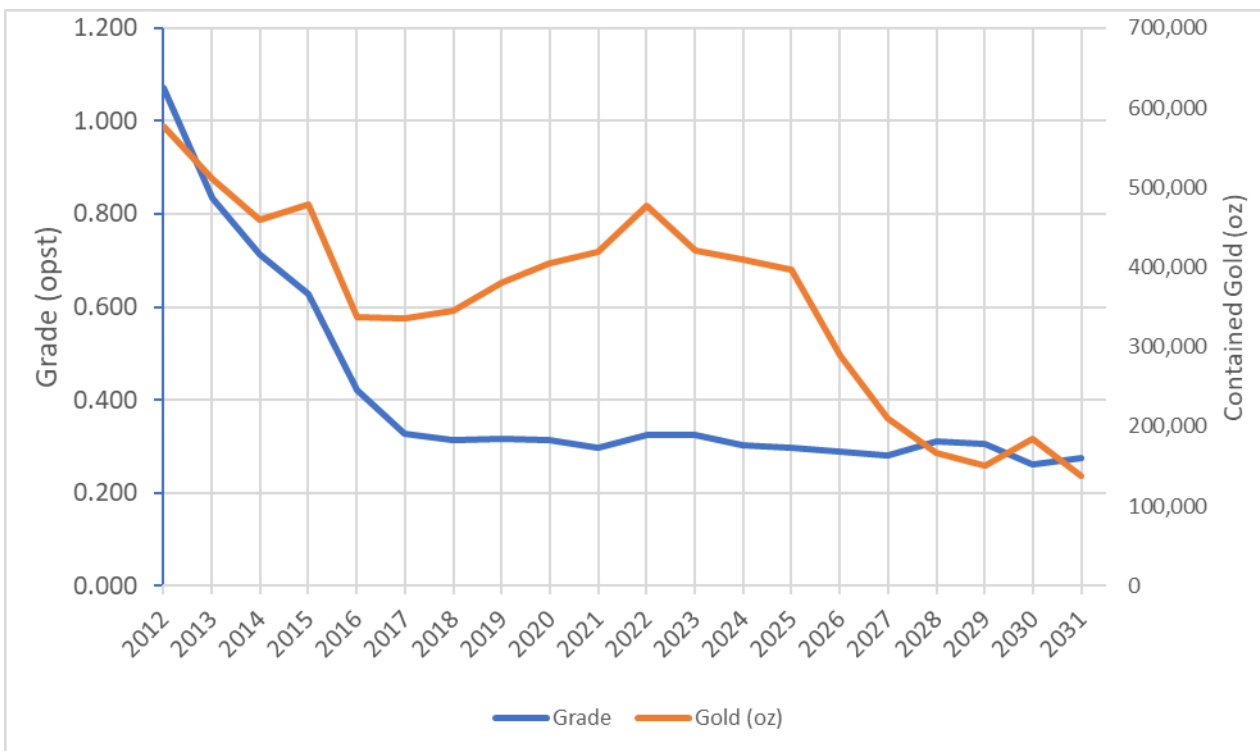
The plan is to expand the production tonnage rate through the mining of the Middle and Lower zones and then to further increase the production rate with the addition of the Deep South Zone as a stand alone mining zone. The increase in production rate over time is shown in Figure 16-3. The gold grade and contained gold in the mine feed are shown in Figure 16-4. Both figures show actual production to the end of 2018 and LOM planned production thereafter.

FIGURE 16-3 CHUG LOM MINE PRODUCTION RATE



Source: RPA 2019

FIGURE 16-4 CHUG LOM GOLD PRODUCTION AND HEAD GRADE



Source: RPA 2019

MIDDLE ZONE

The Middle Zone production plan has changed over time with the goal of using more productive mining methods. After review of the geometry of the Middle Zone the mining method was changed back to cut and fill mining. Where possible more productive methods will be applied.

LOWER ZONE

The Lower Zone Mineral Reserves are based upon planned longhole stoping. The development of the RFDs in the Lower Zone will extend to the 3,800 ft level. One of the declines will be used as a conveyor gallery for the transport of ore and waste. Ore and waste that must be removed to surface will be handled by LHD and truck to bins above the 3,800 ft level. From there the rock will be conveyed to surface.

Other services such as a backfill plant and service area will also be constructed in the Lower Zone area near the declines.

DEEP SOUTH ZONE

The Deep South Zone Mineral Reserves are based upon a planned revision to the PoO to permit dewatering below the 3,800 ft level. With more detailed geological and geotechnical review, the access has been relocated to the footwall on the eastern side of the Deep South Zone to avoid crossing dikes and faults. The Deep South Zone development and mine production are planned to follow the dewatering downwards. There will be a stope access ramp as well as a conveyor gallery. The conveyor will be built progressively with a total of four legs below the Lower Zone. Ore and waste from the Deep South Zone will be handled by truck and LHD on the levels and then fed through feeder breakers before being conveyed to surface via the Deep South and RFD conveyor systems.

The Deep South Zone mining plan is based upon longhole stoping with delayed backfill in a sequence of primary and secondary stopes.

GEOMECHANICS AND GROUND SUPPORT**GEOTECHNICAL INVESTIGATIONS MIDDLE AND LOWER ZONES**

SRK Consulting (Canada) Inc. (SRK) completed a geotechnical assessment of the Middle and Lower zones based on data collected over a period of seven years. The Lower Zone is an elongated, tabular, shallowly dipping body located within the plane of a low-angle thrust complex that is divided into three domains. Ground conditions outside the plane of the thrust

complex are expected to be good to excellent, with rock mass rating (RMR) over 75. Within the complex echelon thrust (known as the Ponderosa Fault), which hosts the bulk of mineralization, geotechnical conditions worsen, with RMRs less than 55.

Complex anastomosing faults with heavy decalcification and volume loss in the ore contribute to poor RMR and rock quality designation (RQD). The clay-altered margins of post-ore dikes have RMRs in the 35 to 45 range and below; however, they are generally narrow (<10.0 ft true thickness). The dikes themselves may create aquitards and small-volume perched aquifers, complicating geotechnical conditions. Complete dewatering of the mineable zones will be critical to successful operations.

The geotechnical conditions in the Middle and Lower zones were evaluated using an assessment of drill core from geologic and geotechnical drilling programs. SRK created a geotechnical block model for the Breccia, Middle, and Lower zones, and attempted a correlation between the drill hole geotechnical data and the observed ground conditions in the Breccia Zone. This correlation was extrapolated to the Middle and Lower zones.

The following points summarize the data review completed for the available geotechnical data at Cortez Hills:

- Good data coverage for the Breccia Zone, moderate-to-good for the Middle Zone, and limited for the Lower Zone.
- No structural orientation data (except for limited mapping) for the Middle and Lower zones.
- Categorization of joint conditions in historic data.
- Uncertainty of RQD and intact rock strength (IRS) conducted through core logging in all areas.
- Limited laboratory strength testing.
- Limited QA and QC systems implemented on geotechnical data collection and database.

SRK believes that the current database is of sufficient quality and density to be used for input to a geotechnical block model.

The geotechnical block model is considered viable for parameter estimation through the Breccia and Middle zones, and northern portions of the Lower Zone (north of approximately 28300N). Confidence level decreases and estimation risk increases in the southern portions of the Lower Zone as drill hole spacing increases.

Given the limited drill hole coverage in the Lower Zone (and therefore risks to confidence levels), the rock mass evaluation considered each pod as an individual entity based solely on the drill holes intersecting each pod. A re-evaluation of the geotechnical data is not considered necessary for the planned cut-and fill mining methods. Man-entry opening span designs were empirically assessed and determined to be 16 ft to 25 ft in fair rock and less than 10 ft in poor rock.

Longhole stoping opportunities were assessed to develop guidelines for longhole stoping mining methods for mining the Lower Zone. The generally weak rock mass, depth, and structure appear to significantly limit longhole stope dimensions. Stability numbers generally plot in the lower range of the database where the stable transition zone is wide, and therefore uncertain. Maximum hydraulic radii (HR) for stope configurations are generally <16.4 ft for most stope surfaces, but still carry significant failure risks, which equates to small stopes.

Stope pillars were analyzed by tributary area methods using the Obert pillar formula (Obert and Duvall 1967). A range of pillar configurations at various extraction ratios was examined, and it can be seen that pillar load/extraction dominates stability more than pillar geometry. Stability issues appear at approximately 50% extraction, regardless of pillar geometry. SRK cautions that in poor rock conditions, the problem appears at even lower extraction, approximately 20% to 25%, and further indicates that a longhole stoping mining method in these ground conditions is unsuitable. While this is the most conservative position, ore bodies with similar rock conditions have been successfully mined using longhole stoping mining methods in northern Nevada.

Ground support requirements were determined empirically and by analytical methods. Empirical methods are general and do not define the mechanisms involved in support mechanics, but do offer a good initial estimate.

Continued geotechnical data collection will provide the greatest benefit to the Lower Zone areas. As infill drilling continues along the strike of the Lower Zone, the geotechnical block model can be updated and geotechnical domains established for the Middle Zone. The 2012 drilling updates improved the integrity of the model and showed no need to downgrade previous assumptions.

The current version of the block model should be calibrated and interrogated against actual rock mass conditions, on an ongoing basis, as the areas are exposed underground.

GEOTECHNICAL INVESTIGATION DEEP SOUTH ZONE

Feasibility level geotechnical characterization and assessments were carried out for the determination of longhole stope dimensions and to predict interaction between active production and the underground infrastructure.

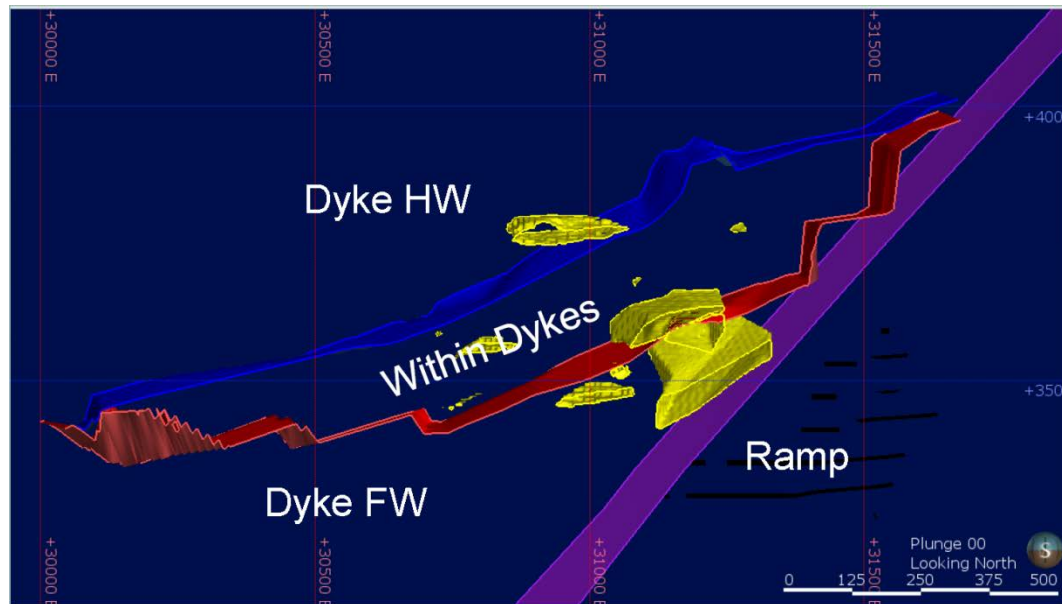
Geotechnical core logging has historically been carried out by Cortez Exploration site wide. In early 2015, MDEng was engaged to provide rock mechanics assessments for determination of stope dimensions and ground support requirements. Geotechnical assessments were completed with the geological interpretations and models provided by Cortez Exploration in Q3 2015, including deposit scale faults and geological contacts. In addition, the geotechnical core logging and oriented core databases developed from the Golder core logging program were also used. In December 2016, MDEng provided its findings and concluded that longhole open stopes are feasible with strict constraints on dimensions and advance rates.

The geotechnical database included approximately 28,000 ft of geotechnical core logging, point load testing and a core sampling and laboratory testing program. A supplementary geotechnical database consisting of over 120,000 ft of core maintained by Cortez Exploration was used to provide additional coverage for context purposes.

MDEng broke down the deposit in three broad geotechnical domains that accounted for the relative distribution of the gold mineralization and the dikes system: the Dike Hanging Wall (Dike HW), imbricated within dikes (within dikes) and the Dike Footwall but in the hanging wall of the Pondex Fault (Dike FW) as depicted in Figure 16-5.

Ground conditions were interpreted to vary from fair to good with mean RMR ranging between 42 and 66. Q' values rate as very good, as a measure of ground condition. A gradual deterioration of ground conditions is observed towards the south into the Dike FW domain.

FIGURE 16-5 GEOTECHNICAL DOMAINS



Source: Barrick 2016

Stope sizing has been assessed for Deep South using the Matthews/Potvin Stability Graph Analysis method (Potvin, 1988). By this method, a Modified Stability Number (N) is plotted against the HR for each stope face to empirically assess the overall stability of the stope.

Assuming 75 ft stope height (60 ft level spacing) stope sizing is recommended as follows:

Primary stopes:

- Width = 25 ft.
- Length = 27 ft for unsupported back, 30 ft for supported backs (this minor increase reflects the fact that the critical stope wall changes from the back to the sidewalls).

Secondary stopes:

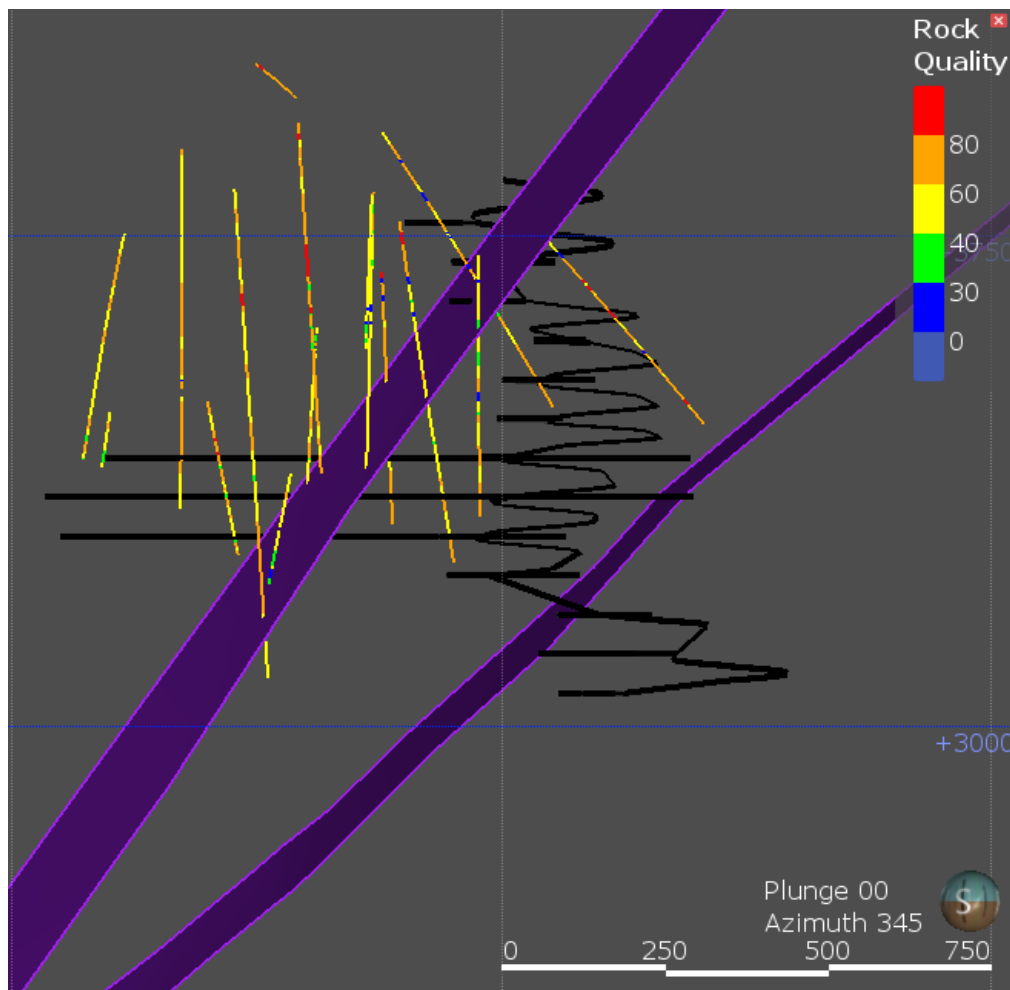
- Width = 25 ft (or 35 ft if end-walls are supported).
- Length = 27 ft for unsupported back, 120 ft for supported backs.

RPA notes that the relatively short panel lengths will increase the scheduling complexity and costs in the planned longhole stoping as each panel will need a slot raise and will need to be filled before successive panels can be mined. RPA recommends that the stope designs be reviewed considering the recommended panel lengths and stope orientations provided by MDEng.

UNDERGROUND DEVELOPMENT

The underground development consists of a main ramp and production level accesses spaced vertically every 60 ft. While the main ramp is located in the footwall of the Pondex Fault, all the secondary development for accessing the stopes in production must cross the Pondex Fault from the east.

FIGURE 16-6 MAIN RAMP LAYOUT RELATIVE TO GEOLOGICAL FEATURES, LOOKING NORTH



Source: Barrick 2016

This infrastructure corresponds to the Ramp domain. The domain is formed by SRM rock units and has been minimally investigated as it has been outside the exploration area of interest. Two geotechnical core holes were drilled and logged into this domain; these core holes showed a fair to very good rock mass, hard limestone, and dikes with RMR between 60 and 80 but with localized fractured intervals in both dikes and limestone and even fewer intervals with altered/soft rock.

For the Pondex Fault itself, a high level inspection of RMR suggests that fair to poor ground conditions can typically be expected.

The area is located in a structurally complex zone, where high and low angles faults and dike filled faults occur. Geological interpretations are limited in this area but are enough to recognize possible splays of the Pondex Fault, such as the Bugsby Fault (Bugsby), near the south end of the Deep South. Conditions of sympathetic features like Bugsby are undetermined. As the ramp is sited between these faults, more drilling throughout the far south is required.

NUMERICAL MODELLING

A three-dimensional, mine-scale numerical stress model has been developed for the estimation of expected redistribution of mine induced stress over the life of mine. The numerical modelling results focus on the impact to permanent infrastructure siting and stope extraction sequencing considerations for the effective management of stress redistribution over the life of mine. The model was developed by MDEng (2016) in FLAC3D.

Permanent infrastructure is located beyond the influence of mine induced stress; however, level development (haulage drives and cross cuts) will be subjected to stress loading and susceptible to difficult mining. It is expected that stress loading will be most commonly recognized as rib squeezing, however failure mechanisms may vary depending on local stress tensors and geological controls (e.g., structural features).

Cross cut development must cross the Pondex Fault on several levels. Numerical models predict that as stopes are extracted, shearing will occur on the Pondex Fault. Development through the fault zone is unavoidable and localized loading of ground support during stope extraction should be expected.

The regions influenced by stress loading will vary over the life of mine, and it is reasonable to expect that the associated risks can be mitigated by strategic sequencing and just-in-time development to minimize rehabilitation needs. Ground support guidelines provided by MDEng provide support strategies specifically suitable for this geotechnical risk.

Ongoing geotechnical work should focus on reducing uncertainty in geotechnical design. The most significant uncertainties known at this time include (1) the spatial distribution of hydrothermal alteration, (2) joint set spacing and persistence, and (3) spatial variability in fault character.

GROUND SUPPORT – MIDDLE ZONE, AND LOWER ZONE

The ground conditions in the ore zones are poor and the CRF is more competent than the ore. This is the reason for the choice of mining method and the use of CRF. Rock conditions in the host rock are fair to good.

All production openings are backfilled with a designed backfill with a 700 psi unconfined compressive strength (UCS) based on minus two inch crushed rock, 35% fines, and 7.5% cement binder. Cylinder tests indicate that the CRF strength consistently exceeds the design strength.

The standard ground support regime includes the use of shotcrete and eight foot long Swellex bolts with 12 ft Swellex bolts used in intersections. Mesh is used as required. Other support designs are specific to areas where additional support is considered necessary.

GROUND SUPPORT – DEEP SOUTH

MDEng recommended ground support for development headings according to rock quality. There were three general categories depending upon ground conditions:

1. Seven foot long resin grouted bolts or inflated bolts with screen mesh
2. Bolts and screen plus three inches of shotcrete over the screen
3. Shotcrete, then bolts and mesh then shotcrete over mesh.

Longhole open stopes may be designed according to the unsupported or supported HR guidelines. “Unsupported” stope backs will require primary ground support for man access during top and bottom cut development and drilling. “Supported” stope backs require added secondary support to maintain stability of larger spans. If it is elected to support stope backs

it may be assumed that double strand bulbed cable bolts on a 6.5 ft by 6.5 ft pattern or Super Swellex on a five foot square pattern will be utilized (with cable or bolt length equal to half the stope span). The bolting pattern will likely vary by formation or alteration domain due to variable ground conditions (to be refined once more details on mine methods and plans are available).

RPA notes that the unsupported stope wall span is 33 ft and, to gain the benefits of larger stopes, it will be necessary to provide support for the stope walls.

MINING METHOD –MIDDLE ZONE AND LOWER ZONE

Originally all of the mining was underhand cut and fill mining with CRF. This method was selected based upon:

- The poor ground conditions in many areas
- The success in Nevada with generating good backs and walls with CRF
- The high grade of the orebody and the desire to minimize losses and dilution
- The selectivity of the method to separate the different ore types
- Experience in other area mines with poor ground conditions

There are disadvantages to the cut and fill mining, most notably:

- It is an expensive method as it is virtually a drift and fill method.
- It is not a highly productive method.

In the early planning stages for the Middle Zone, longhole stoping was considered and was coupled with plans for increased mine production. However, not all areas of the Middle Zone are considered to be thick enough for the application of a longhole stoping method. The Lower Zone is now planned to be mined by longhole stoping.

RPA is of the opinion that longhole stoping may be practical, however, all aspects of such a mining method should be considered. In particular, RPA is of the opinion that there will be higher dilution and ore losses with a longhole method. In higher grade areas, these impacts can quickly offset expected reductions in operating costs.

RPA recommends that Cortez undertake stope by stope reconciliation studies of the longhole stopes to confirm the mining plans and the Mineral Reserve assumptions.

MINING METHOD – DEEP SOUTH

The Deep South Zone is planned to be mined by longhole stoping. The stope dimensions are, in RPA’s opinion, suitable to provide productivity benefits compared to drift and fill mining without being so tall as to increase the risk of excessive dilution due to improper longhole drilling. The geotechnical analysis does indicate that relatively short stope sections will have to be mined to maintain sidewall stability.

Ore will be blasted using vertical down holes and a slot raise to open mining in the stope. RPA recommends the investigation into a small raise drill or a large diameter drill such as the Machine Roger V30 drill. Blasted ore will be mucked using remote control LHDs and hauled by truck or LHD to ore passes. Ore will be sized using a feeder breaker prior to being conveyed to surface.

The LOM ore production schedule by mining method is summarized in Table 16-8. The reliance on drift and fill mining is decreasing and the proportion of longhole stoping is increasing.

**TABLE 16-8 LOM MINING METHOD
Barrick Gold Corporation – Cortez Operations**

	Stope (st 000)	Drift & Fill (st 000)	% Longhole Stoping	% Drift & Fill
2019	908	299	75%	25%
2020	1,040	248	81%	19%
2021	1,075	339	76%	24%
2022	1,192	285	81%	19%
2023	969	330	75%	25%
2024	1,095	265	81%	19%
2025	1,205	128	90%	10%
2026	922	85	92%	8%
2027	677	76	90%	10%
2028	532	1	100%	0%
2029	483	6	99%	1%
2030	699	6	99%	1%
2031	499	1	100%	0%
Total	11,297	2,068	85%	15%

RPA is of the opinion that the proposed mining methods are suitable for the deposit. RPA recommends close monitoring of the longhole stoping performance with respect to the grade

reconciliation, mining dilution, and production rates compared to the plan and to the Mineral Reserve estimates.

GRADE CONTROL

MIDDLE AND LOWER ZONES

Faces are sampled as the development advances and the sample grades are used to estimate the mine production grade and to determine the limits of the ore drives. This area of the mine is planned using a 0.2 oz/st Au contour. Muck piles are sampled by the LHD operator, who is to take a sample from every fifth bucket, while mucking.

Ore is hauled to surface by truck and, if necessary, dumped into separate muck piles for each round. On surface the muck piles can be resampled by the geologist to assess the grade. Ore from the CHUG may be oxide and sent to the mill at Cortez or it may be refractory and sent to Goldstrike. After the muck pile grade sample results are in, the muck is taken to a metal removal plant for the removal of scrap metal. After that step, the ore is either stockpiled for shipment to Goldstrike or hauled to the Cortez mill for processing.

All rock with an AA/FA ratio of 0.5 and greater are treated as oxide and rock with ratios less than 0.5 are treated as refractory. Refractory ore is sent in lots to Goldstrike. Sample assay data and LECO results are sent to Goldstrike to assist in their handling of the ore. CHUG ore may be processed in either the roaster or the autoclaves at Goldstrike. Oxide ore is processed in the Cortez plant.

DEEP SOUTH ZONE

Oxide ore from the Deep South Zone is projected to be processed at the Pipeline Complex mill as long as that plant is in service. After the Pipeline Mill is shut down, the Deep South Zone oxide ore is scheduled to be processed on the heap leach pads. The refractory ore from the Deep South Zone is all forecast to be from the Renegade area, scheduled to be processed in the roaster at Goldstrike.

Grade control and ore segregation methods have measures which will need to be defined for operations. Longhole stoping provides the opportunity to obtain samples from the long holes as they are drilled and this can then be supplemented with bucket sampling as is currently practiced.

INFRASTRUCTURE

ACCESS

The current mine access is via the twin declines. The two declines from the F Canyon extend for approximately 7,000 ft at a -6% grade to the 4,770 ft level. The mine has two spiral ramps giving access to the Middle Zone 3,920 ft level and on to the Lower Zone.

Workings continue on the exploration decline for the Lower Zone. Emergency access is a combination of ladderways in the ventilation system as a supplement to the main spiral ramp as well as an emergency hoist in one of the main ventilation raises.

In the future, the Lower Zone will be accessed with two RFDs to the 3,810 ft level. The declines will be connected at regular intervals for ease of construction. When the declines are complete, a conveyor will be installed in the west decline and the other decline will be used for access and ventilation. The F Canyon declines will continue to be used for ventilation and access.

Access to the Deep South Zone will be by a series of ramps and conveyor galleries to a loading area at the bottom of the Deep South Zone. The plan is to develop the stope access decline in the footwall on the eastern side of the Deep South Zone and to develop a four leg conveying system which can be advanced downwards and put into service in steps as the mine is dewatered.

MINE VENTILATION

The underground mine ventilation is achieved with the air entering the mine in the west decline and proceeding via fresh air raises to each sublevel, and exhaust air travelling up the east decline. The twin declines have connections (with airlock doors) at regular intervals.

Two blind bored ventilation shafts were installed for the mine ventilation circuit. The first was a 12 ft diameter raise and the second was a 14 ft diameter raise. The raises are approximately 1,000 ft long and the ventilation capacity of the mine is approximately 1.2 million cfm.

Deep South ventilation will be fed from the 3,910 ft development drift to the access ramp, through the stoping levels, and exhaust out the haulage ramp. Access points, as well as ventilation raises, will be coordinated with the existing and planned Lower Zone development above the 3,800 ft.

Ventilation and escape raises are designed to connect between the footwall access levels and the haulage ramp. The primary fresh airway is the man and material access ramp and the exhaust airway is the haulage and conveyor ramp. It is envisioned that a two stage regulator door be installed on each level to regulate air flow. One stage of the regulator would be for normal mining operating ventilation and the second stage to allow direct venting of blasting gases.

MINE DEWATERING – UNDERGROUND

There are two mine dewatering lines and a major pump station at the foot of the main declines. The underground mine pumping system in the F Canyon declines has a capacity of 6,000 gpm based upon the initial mine design. The active mining areas of the mine have been dewatered and the mine workings are generally dry.

In the Breccia Zone and Middle Zone, horizontal drain holes are drilled into the planned stope A cuts before mine development to drain water before mining commences.

Pump stations are included in the Deep South Zone design to address any fugitive or perched water that is encountered during operations (contact water). The system is designed to handle a nominal 1,000 gpm with an eight inch schedule 40 steel discharge line in the haulage decline. One mobile pump skid with a receiver tank will support the development as it advances. A similar system without the receiver tank will be placed in the first permanent pump station. The mobile pump will be placed in the second permanent pump station at the completion of the development work. Sump excavations are included in the development estimate.

MINE DEWATERING DEEP SOUTH- FROM SURFACE WELLS

The current mine workings have been dewatered using surface wells. A dewatering plan is in place for the Lower and Deep South Zones using deep wells from surface. At the end of 2017 and 2018 the water elevations were approximately 3,859 ft and 3,790 ft respectively. The surface well pumping rates were 2,890 gpm and 1965 gpm at the end of 2017 and 2018 respectively. The 2018 flow rate is set to maintain the water level at 3,800 ft level.

There are seven wells from surface to the Lower Zone/Deep South Zone aquifer. Upon receipt of the permit revision the pumping rate is to be increased to up to 4,200 gpm. Additional surface wells and underground dewatering wells in the Deep South Zone are planned to dewater the zone before mining. The number of additional wells depends upon the aquifers

intercepted in the wells and the ability to build an underground well drilling rig for the installation of dewatering wells from underground. Work to design a suitable underground drill rig is underway.

Based upon the dewatering plan, the underground needs to produce a total of 1,250 gpm by January 2020 and ramp up to a peak of 4,000 gpm by March 2021. This is addition to what the surface is producing from this aquifer. The number of wells required to meet this rate is a function of the conditions encountered in drilling. If the underground wells do not meet the 4,000 gpm rate by March 2021 it will be necessary to develop additional underground or surface wells. The planned 4,000 gpm rate will be maintained until 2025 after which the pumping rates will decrease.

The Deep South Zone production schedule below the 3,800 ft level follows the dewatering of the mine downwards. The stope designs are based upon the zone being dewatered prior to mining.

BACKFILL AND SHOTCRETE

A dual purpose backfill/shotcrete batch plant is located at the mine portal in F Canyon. Mine trucks are loaded at the portal elevation and the backfill is taken into the mine as a back haul. There is also a shotcrete batch plant located at the portal and there are mix trucks to haul the prepared shotcrete mix to the face.

As part of the development plan for the Middle, Lower and Deep South Zones, a backfill and shotcrete plant is proposed near the base of the RFD. The plant will be set up so that sand rock and concrete can be delivered from surface via boreholes. As the open pit expands, it will be necessary to relocate the backfill crusher to a location consistent with the planned surface area above the planned backfill plant.

In the future, a fleet of underground trucks will still be required to haul ore from stopes and to haul backfill from the new plant to the stoping areas. The LOM backfill requirements are summarized in Table 16-9.

TABLE 16-9 LOM BACKFILL TONNAGE
Barrick Gold Corporation – Cortez Operations

	CRF - D&F	CRF - Stope	Waste - D&F	Waste - Stope
2019	288,141	660,131	38,964	384,596
2020	260,546	562,683	38,335	483,913
2021	308,661	907,469	14,595	252,670
2022	274,429	1,142,060	-	131,675
2023	325,763	967,743	-	241,014
2024	271,443	941,780	-	358,017
2025	105,149	1,224,649	-	165,740
2026	124,224	1,212,062	-	175,252
2027	121,997	812,553	-	165,522
2028	1,598	617,958	-	-
2029	5,255	625,699	-	-
2030	5,544	836,958	-	-
2031	781	664,013	-	-
Total	2,093,532	11,175,759	91,894	2,358,399

ROCK HANDLING

Rock is all hauled by truck up the declines to the F Canyon yard with the exception of some waste rock which can be used as backfill in the course of mining. The rock handling via the F Canyon declines will remain in service until after completion of the RFDs and a new rock handling system. After that time, the F Canyon declines will not be needed for rock haulage.

With the planned conveyor to be installed in the RFD, there will be ore passes for material, where practical, and ore haulage from other areas to a series of five bins to be located at the base of the conveyor system. The five bins will provide a dedicated bin for each of the three ore types plus waste rock with one bin left as a spare for use as required. The bins are planned to be 12 ft in diameter and 60 ft tall to provide approximately 350 ton capacity in each. The bins will be fed by dumping upon grizzlies equipped with rock breakers and designed to provide -12 in. material.

Waste handling for primary development of the Deep South Zone will require LHD and truck haulage until the orepass/conveyor system is established. Once the system is in place, ore and waste handling from the work areas will be by LHD only. Truck traffic in the working areas of the mine will be limited to backfill haulage only.

LHDs will deliver the ore to the level orepass, through a grizzly and onto a feeder breaker at the haulage ramp. The feeder breaker will load the Deep South Zone conveyor for transport to the material storage bins.

Ore will be transferred to the material storage bins at the 3,830 ft level, then enter the RFD conveyor system for transport out of the mine. The Deep South Zone rock will be moved from the mine by extension of the conveyor system in the RFD. The Deep South Zone conveyor system will be installed in legs as dewatering of the Deep South Zone progresses.

MAINTENANCE

All of the underground equipment maintenance is performed at a shop complex located adjacent to portal. There is also a small maintenance bay on the 420 ft level. A shop will be installed at the RFD portals for equipment maintenance.

POWER

Power is supplied to the mine via the F Canyon declines and via a power line installed in the ventilation raise. When the RFDs are in place, another power line will service the mine via the RFD. There will then be three electrical feeds to the mine which will provide good backup and options for the delivery of power to the work places.

The mine is fed by the F Canyon substation, power is then distributed underground to various switch gear at 13.8 kV. From the underground switch gear power is then distributed to various mobile load centres ranging from 750 kVA to 1,250 kVA. The mobile load centres then transform 13.8 kV to 480 V to supply power to the various working faces and infrastructure within the underground for use. A series of three backup generators are located in F Canyon to provide backup power to the underground in the event of power outage at the main substation.

The existing operating average power demand for underground operations is 4.4 MW with an additional 0.7 MW from the North Vent Raise. Lower Zone expansion is expected to add an additional 2 MW to 4 MW of operating load to the existing infrastructure. The Deep South Zone power loads are expected to add 6.7 MW in surface loads (pumps) and 5.6 MW in

underground loads. With an estimated diversity factor of 70% the operating load for the Deep South Zone is estimated to be 8.2 MW.

As part of the Lower Zone expansion, a new underground distribution 4400 substation, will be located below the North Ventilation Raise footprint. Permanent power for the expanded underground will be fed through this substation via two 350 MCM feeders to the underground distribution system. The 4400 substation is fed from two separate circuits originating at Cortez Hills by 13.8 kV overhead power lines. A separate power circuit to the Deep South will come from a 13.8 kV cable feeder originating at the RFD Surface Portal.

COMMUNICATIONS

The underground mine communications system includes radio and fibre-optic cables, and a mine dispatch system which utilizes Jigsaw software. This system provides real time monitoring for all underground equipment and permits the monitoring of activity.

OFFICES

Underground mine offices, and the mine dry are located at a building adjacent to the portal. There is a small office underground for shift supervisors located just below the 4,445 ft level.

MINE EQUIPMENT

The underground mobile equipment fleet consists of large scale LHDs and haulage trucks, two boom jumbos, and ground support jumbos. There are also concrete and shotcrete carriers and shotcrete units. A list of the major underground equipment is shown in Table 16-10. It is RPA’s opinion that the equipment is appropriately sized for the planned operations.

The mine equipment is serviced at a surface shop immediately adjacent to the portal.

**TABLE 16-10 UNDERGROUND EQUIPMENT FLEET
Barrick Gold Corporation – Cortez Operations**

Unit	Number
Rock bolter	5
Drill jumbo	3
Longhole drill	2
Cat R1600 G loader	9
LH517 Loader	1

Unit	Number
Truck AD-30	11
Truck AD-45	2
Shotcrete units	2
Explosives units	3

DEEP SOUTH MINING AND EQUIPMENT

The Deep South Zone FS presents the study as a stand-alone case, but the mine equipment included in the capital costs presents the equipment as if the Deep South Zone was an extension of the CHUG and was relying on replacement of units already in service.

Additional capital may be required for the Deep South Zone if the active units are still in use in the Middle Zone and Lower Zone.

UNDERGROUND PRODUCTION SCHEDULE

The current CHUG production schedule is based upon the mining of up to 4,000 stpd of ore from the Middle, Lower, and Deep South zones as summarized in Table 16-11.

**TABLE 16-11 UNDERGROUND LOM PRODUCTION
Barrick Gold Corporation – Cortez Operations**

	Ore Tons (000)	Grade (oz/st Au)	Contained Ounces (000)	Tons Per Day	Waste Tons (000)	Waste Tons Per Day	Total Backfill Tons (000)
2019	1,199	0.315	377	3,336	462	1,246	1,372
2020	1,269	0.316	401	3,557	634	1,699	1,345
2021	1,355	0.301	408	3,906	603	1,493	1,483
2022	1,417	0.327	464	4,069	615	1,522	1,548
2023	1,263	0.328	414	3,586	610	1,575	1,535
2024	1,268	0.310	393	3,757	733	1,754	1,571
2025	1,242	0.303	377	3,682	555	1,270	1,496
2026	823	0.310	255	2,774	611	1,167	1,512
2027	507	0.333	169	2,080	548	825	1,100
2028	533	0.312	166	1,474	208	567	620
2029	489	0.306	150	1,351	204	564	631
2030	697	0.262	182	1,943	279	746	843
2031	493	0.276	136	1,380	117	307	665
Total	12,554	0.310	3,892	N/A	6,180	N/A	15,720

The underground LOM production, by ore type, is shown in Table 16-12. The split on the refractory ore type varies from year to year, but overall, the underground production is projected to be approximately 31% oxide and 69% refractory. The production split by zone is shown in Table 16-13.

TABLE 16-12 UNDERGROUND LOM ORE TYPES
Barrick Gold Corporation – Cortez Operations

Year	Percent of Tons				Percent of Ounces			
	Ox	Rf1	Rf2	Rf3	OX	Rf1	Rf2	Rf3
2019	10%	49%	41%	0%	10%	47%	47%	0%
2020	10%	48%	39%	3%	12%	42%	42%	1%
2021	17%	49%	30%	4%	20%	34%	34%	1%
2022	24%	41%	32%	3%	28%	33%	33%	1%
2023	35%	28%	33%	3%	38%	31%	31%	1%
2024	33%	31%	34%	3%	35%	37%	37%	1%
2025	55%	20%	21%	3%	59%	20%	20%	1%
2026	65%	21%	12%	2%	73%	10%	10%	1%
2027	57%	33%	7%	3%	71%	7%	7%	1%
2028	61%	24%	11%	4%	65%	7%	7%	2%
2029	39%	39%	19%	3%	44%	13%	13%	1%
2030	13%	59%	18%	10%	17%	13%	13%	4%
2031	1%	85%	2%	12%	1%	1%	1%	5%
Total	31%	39%	26%	3%	35%	27%	27%	1%

TABLE 16-13 UNDERGROUND ORE SOURCE BY ZONE
Barrick Gold Corporation – Cortez Operations

Year	Middle		Lower		Deep South	
	Tons (000)	Ounces	Tons (000)	Ounces	Tons (000)	Ounces
2019	502	188,748	679	182,598	18	6,028
2020	465	164,656	687	197,691	117	39,082
2021	436	143,511	584	161,432	334	103,153
2022	290	100,084	465	139,722	662	223,714
2023	350	113,134	324	92,767	588	207,852
2024	222	78,937	518	145,789	528	168,081
2025	94	33,993	199	53,284	949	289,574
2026	55	17,361	57	12,630	711	225,219
2027	35	11,882	-	-	472	156,672
2028	-	-	-	-	533	166,109

Year	Middle		Lower		Deep South	
	Tons (000)	Ounces	Tons (000)	Ounces	Tons (000)	Ounces
2029	-	-	-	-	489	149,796
2030	-	-	-	-	697	182,258
2031	-	-	-	-	493	136,061
Total	2,450	852,306	3,513	985,912	6,591	2,053,601

CORTEZ LIFE OF MINE PLAN

The Cortez LOM plan includes the open pit mining of the Cortez Hills, Pipeline, and Crossroads open pits as well as the underground mining at Cortez Hills. The ore will be processed at the Pipeline mill, heap leach facilities at Cortez, and at the roaster facilities at the Barrick Goldstrike operations. The LOM plan is developed by site personnel on an annual basis as part of the budgeting process.

In the immediate future, the planned processing rate for refractory ores sent to Goldstrike has been limited to 1.8 million stpa total. This is considered to be a regulatory issue related to the highway transportation of the ore from Cortez to Goldstrike and emissions from the processing facilities.

MINING

The LOM plan for the open pit and underground mining is shown in Table 16-14. Open pit mining continues to 2026, while the CHUG mining continues until 2031.

TABLE 16-14 LOM TOTAL ORE MINING
Barrick Gold Corporation – Cortez Operations

Year	OP Ore Tons (000 st)	Overall Ore Grade (oz/st Au)	Contained OP Gold Ounces (000)	UG Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)	Total Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)
2019	24,716	0.018	442	1,199	0.315	377	25,915	0.032	819
2020	15,525	0.016	247	1,269	0.316	401	16,794	0.039	649
2021	23,781	0.020	486	1,355	0.301	408	25,135	0.036	894
2022	29,670	0.023	691	1,417	0.327	464	31,087	0.037	1,155
2023	5,179	0.021	107	1,263	0.328	414	6,441	0.081	520
2024	19,289	0.030	586	1,268	0.310	393	20,557	0.048	979
2025	14,438	0.052	756	1,242	0.303	377	15,681	0.072	1,133

Year	OP Ore Tons (000 st)	Overall Ore Grade (oz/st Au)	Contained OP Gold Ounces (000)	UG Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)	Total Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)
2026	6,292	0.115	723	823	0.310	255	7,115	0.137	978
2027	-	-	-	507	0.333	169	507	0.333	169
2028	-	-	-	533	0.312	166	533	0.312	166
2029	-	-	-	489	0.306	150	489	0.306	150
2030	-	-	-	697	0.262	182	697	0.262	182
2031	-	-	-	493	0.276	136	493	0.276	136
Totals	138,890	0.029	4,038	12,554	0.310	3,892	151,444	0.052	7,930

The underground mine production is 8% of the total tonnage mined, but the contained gold is 49% of the total gold mined at Cortez. Tables 16-15, 16-16, and 16-17 present the mine production schedules for Roaster, Mill, and Leach ore types.

TABLE 16-15 ROASTER ORE TYPE - LOM MINING
Barrick Gold Corporation – Cortez Operations

Year	OP Ore Tons (000 st)	Overall Ore Grade (oz/st Au)	Contained OP Gold Ounces 0	UG Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000 oz Au)	Total Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000 oz Au)
2019	61	0.018	7	1,078	0.315	338	1,139	0.303	345
2020	0	0.016	0	1,137	0.316	353	1,137	0.310	353
2021	895	0.020	84	1,113	0.301	326	2,008	0.204	409
2022	5	0.023	1	1,070	0.327	332	1,075	0.309	332
2023	9	0.021	1	808	0.328	252	817	0.310	253
2024	0	0.030	0	829	0.310	249	829	0.300	249
2025	1,234	0.052	130	523	0.303	147	1,756	0.158	277
2026	3,163	0.115	496	208	0.310	51	3,371	0.162	547
2027	-	-	-	80	0.333	20	80	0.253	20
2028	-	-	-	208	0.312	58	208	0.280	58
2029	-	-	-	299	0.306	85	299	0.283	85
2030	-	-	-	604	0.262	151	604	0.249	151
2031	-	-	-	489	0.276	135	489	0.276	135
Totals	5,366	0.134	719	8,447	0.296	2,497	13,813	0.233	3,216

TABLE 16-16 LEACH ORE TYPE LOM MINING
Barrick Gold Corporation – Cortez Operations

Year	OP Ore Tons (000 st)	Overall Ore Grade (oz/st Au)	Contained OP Gold Ounces (000)	UG Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)	Total Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)
2019	23,835	0.018	341	-	-	-	23,835	0.014	341
2020	15,258	0.016	213	-	-	-	15,258	0.014	213
2021	22,201	0.020	329	-	-	-	22,201	0.015	329
2022	27,546	0.023	455	-	-	-	27,546	0.017	455
2023	4,903	0.021	77	-	-	-	4,903	0.016	77
2024	16,921	0.030	239	-	-	-	16,921	0.014	239
2025	10,364	0.052	190	-	-	-	10,364	0.018	190
2026	1,815	0.115	51	-	-	-	1,815	0.028	51
2027	-	-	-	-	-	-	-	-	0
2028	-	-	-	-	-	-	-	-	0
2029	-	-	-	-	-	-	-	-	0
2030	-	-	-	-	-	-	-	-	0
2031	-	-	-	-	-	-	-	-	0
Totals	122,843	0.015	1,894	-	-	-	122,843	0.015	1,894

TABLE 16-17 MILL ORE TYPE LOM MINING
Barrick Gold Corporation – Cortez Operations

Year	OP Ore Tons (000 st)	Overall Ore Grade (oz/st Au)	Contained OP Gold Ounces (000)	UG Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)	Total Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)
2019	819	0.018	94	121	0.315	39	941	0.141	133
2020	267	0.016	35	132	0.316	49	399	0.208	83
2021	685	0.020	74	242	0.301	83	926	0.169	156
2022	2,119	0.023	236	347	0.327	132	2,466	0.149	368
2023	267	0.021	29	455	0.328	161	722	0.264	190
2024	2,368	0.030	347	439	0.310	144	2,807	0.175	491
2025	2,841	0.052	436	720	0.303	230	3,560	0.187	666
2026	1,315	0.115	175	615	0.310	204	1,929	0.197	379
2027	-	-	-	426	0.333	148	426	0.348	148
2028	-	-	-	325	0.312	108	325	0.332	108
2029	-	-	-	189	0.306	65	189	0.344	65
2030	-	-	-	93	0.262	32	93	0.340	32
2031	-	-	-	3	0.276	1	3	0.271	1
Totals	10,681	0.133	1,425	4,107	0.340	1,395	14,788	0.191	2,820

PROCESSING

The processing LOM plan is shown in Tables 16-18 to 16-21 based on a LOM plan including Measured and Indicated Mineral Resources converted to Proven and Probable Mineral Reserves. Ore is treated in the oxide mill at the Pipeline complex until the end of 2026. The LOM plan generally treats high grade material sooner than lower grade material and the large amount of heap leach ore results in high tonnage and relatively low grade overall. Refractory ore is hauled to Goldstrike with the highest grade ore available always shipped first. At Cortez; the plan is to reduce stockpiling of ore to the extent practical, so that lower grade material, planned for the leach pad, may be diverted to fill excess capacity at the Pipeline mill. Mining dilution and mining recovery factors applied are presented in Section 15.

TABLE 16-18 LOM TOTAL ORE PROCESSED
Barrick Gold Corporation – Cortez Operations

Year	Tons Processed (000)	Grade (oz/st Au)	Contained Ounces (000)
2019	27,909	0.036	1,015
2020	18,139	0.046	837
2021	25,612	0.038	961
2022	31,087	0.037	1,155
2023	7,790	0.091	709
2024	20,701	0.048	999
2025	15,681	0.072	1,133
2026	9,335	0.107	997
2027	844	0.256	216
2028	816	0.252	206
2029	700	0.256	179
2030	697	0.262	182
2031	489	0.276	135
2032	89	0.140	12
Totals	159,889	0.055	8,736

TABLE 16-19 LOM ORE PROCESSED - ROASTER
Barrick Gold Corporation – Cortez Operations

Year	Mine	Grade (oz/st Au)	Contained Ounces (000)	Stock	Grade (oz/st Au)	Contained Ounces (000)	TOTAL	Grade (oz/st Au)	Contained Ounces (000)
2019	1,139	0.30	345	857	0.140	120	1,996	0.233	465
2020	1,137	0.31	353	1,345	0.140	188	2,482	0.218	541
2021	2,008	0.20	409	477	0.140	67	2,485	0.192	476
2022	1,075	0.31	332	-	-	-	1,075	0.309	332

Year	Mine	Grade (oz/st Au)	Contained Ounces (000)	Stock	Grade (oz/st Au)	Contained Ounces (000)	TOTAL	Grade (oz/st Au)	Contained Ounces (000)
2023	817	0.31	253	1,348	0.140	189	2,165	0.204	442
2024	829	0.30	249	144	0.140	20	973	0.277	269
2025	1,756	0.16	277	-	-	-	1,756	0.158	277
2026	3,371	0.16	547	-	-	-	3,371	0.162	547
2027	80	0.25	20	337	0.140	47	418	0.162	68
2028	208	0.28	58	283	0.140	40	491	0.199	98
2029	299	0.28	85	212	0.140	30	511	0.224	114
2030	604	0.25	151	-	-	-	604	0.249	151
2031	489	0.28	135	-	-	-	489	0.276	135
2032	-	-	-	89.01	0.140	12	89	0.140	12
Total	13,813	0.23	3,216	5,092	0.140	713	18,905	0.208	3,929

TABLE 16-20 LOM ORE PROCESSED – MILL
Barrick Gold Corporation – Cortez Operations

Year	Mill	Grade (oz/st Au)	Contained Ounces (000)	Leach	Grade (oz/st Au)	Contained Ounces (000)	Stock	Grade (oz/st Au)	Contained Ounces (000)	Total Ore Tons (000 st)	Ore Grade (oz/st Au)	Contained UG Gold Ounces (000)
2019	941	0.141	133	2,475	0.014	35	1,137	0.066	75	4,553	0.054	244
2020	399	0.208	83	3,984	0.014	55	-	-	-	4,383	0.032	139
2021	926	0.169	156	3,455	0.015	51	-	-	-	4,381	0.047	207
2022	2,466	0.149	368	2,030	0.017	33	-	-	-	4,496	0.089	401
2023	722	0.264	190	3,793	0.016	60	-	-	-	4,515	0.055	250
2024	2,807	0.175	491	1,592	0.014	22	-	-	-	4,399	0.117	513
2025	3,560	0.187	666	744	0.018	14	-	-	-	4,304	0.158	680
2026	1,929	0.197	379	1,815	0.028	51	-	-	-	3,744	0.115	431
2027	-	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	-	-	-	-	-	-	-
2030	-	-	-	-	-	-	-	-	-	-	-	-
2031	-	-	-	-	-	-	-	-	-	-	-	-
Totals	13,751	0.179	2,466	19,887	0.016	323	1,137	0.066	75	34,776	0.082	2,864

TABLE 16-21 LOM ORE PROCESSED – HEAP LEACH
Barrick Gold Corporation – Cortez Operations

Year	Leach	Grade (oz/st Au)	Contained Ounces (000)	Mill	Grade (oz/st Au)	Contained Ounces (000)	STOCK	Grade (oz/st Au)	Contained Ounces (000)	Total	Grade (oz/st Au)	Contained Ounces (000)
2019	21,360	0.014	306	-	-	-	-	-	-	21,360	0.014	306
2020	11,274	0.014	157	-	-	-	-	-	-	11,274	0.014	157
2021	18,746	0.015	278	-	-	-	-	-	-	18,746	0.015	278
2022	25,517	0.017	421	-	-	-	-	-	-	25,517	0.017	421
2023	1,109	0.016	17	-	-	-	-	-	-	1,109	0.016	17
2024	15,329	0.014	216	-	-	-	-	-	-	15,329	0.014	216
2025	9,620	0.018	176	-	-	-	-	-	-	9,620	0.018	176
2026	-	-	-	-	-	-	2,219	0.009	19	2,219	0.009	19
2027	-	-	-	426	0.348	148	-	-	-	426	0.348	148
2028	-	-	-	325	0.332	108	-	-	-	325	0.332	108
2029	-	-	-	189	0.344	65	-	-	-	189	0.344	65
2030	-	-	-	93	0.340	32	-	-	-	93	0.340	32
2031	-	-	-	3	0.271	1	-	-	-	3	0.271	1
Total	102,955	0.015	1,571	1,037	0.341	354	2,219	0.01	19	106,212	0.018	1,945

17 RECOVERY METHODS

INTRODUCTION

Historically, Cortez ore was processed in a 1,800 stpd CIL plant called Mill No. 1, as crushed ore on heap leach pads, and refractory ore was pre-oxidized in a circulating fluid bed roaster. The crushing and leaching circuits were built in 1969; the roasting circuit was completed in 1990. The Mill No. 1 processing facilities were placed on care and maintenance in 1999.

Ore from Cortez can either be processed on site in the oxide processing facilities or transported to the Goldstrike operation for refractory ore treatment.

OXIDE ORE MILLING

Mill No. 2, or the Pipeline mill, was commissioned in 1997 to process oxide ore from the Pipeline open pit mine. The treatment plant currently includes crushing, SAG mill, ball mill, grind thickener, carbon-in-column (CIC) circuit for the grind thickener overflow solution, CIL circuit, tailings counter-current-decantation (CCD) wash thickener circuit, carbon stripping and reactivation circuits, and a refinery to produce gold doré. Plant throughput is up to 16,000 stpd depending on the hardness of the ore being processed. The plant is permitted for an annual average of 15,000 stpd and the average for 2018 was approximately 12,620 tpd. Figure 17-1 provides the simplified process flow sheet for Mill No. 2.

To accommodate the incoming ore feed from Cortez Hills, a primary gyratory crusher was installed adjacent to the CHOP. The crusher discharges onto a series of overland conveyors that transport the ore to the coarse ore stockpile at Mill No. 2.

ROM ore from South Pipeline is dumped into the crusher dump pocket at the mill and discharges onto a vibrating grizzly. Grizzly oversize material is crushed in a jaw crusher. Grizzly undersize material and the jaw crusher discharge are conveyed to the coarse ore stockpile. The grinding circuit includes one SAG mill and one overflow ball mill. Discharge from the SAG mill is screened on one of two vibrating screens.

Screen oversize is conveyed to a cone crusher where it is crushed prior to being recycled to the SAG mill feed. Screen undersize and ball mill discharge flow by gravity to the hydrocyclone feed pump box. The slurry is pumped from the pump box to the hydrocyclones. The ball mill is operated in closed circuit with the hydrocyclones to produce the target grind size for the CIL circuit, which is nominally 110 μm . The underflow from the hydrocyclones is recycled to the ball mill feed; the overflow from the hydrocyclones discharges into an agitated surge tank, which feeds the grind thickener.

An appreciable amount of gold is dissolved in the grinding circuit, so a CIC circuit is used to recover gold from the grind thickener overflow solution. The grind thickener underflow is pumped to the CIL circuit, which consists of eight CIL tanks, sixteen screens, and eight carbon-forwarding pumps. The slurry overflows by gravity from the first tank to the eighth. Carbon that has been stripped and reactivated is added to the last tank and is advanced counter current to the slurry flow. Cyanide and milk-of-lime are added stage-wise to maintain optimum leaching conditions. The nominal retention time is 44 hours. This is increased to 54 hours when milling harder ore at a lower plant throughput. The discharge from the CIL circuit flows by gravity to the tailings CCD thickener circuit. The CIL tailings are washed in two high-capacity thickeners. The wash solution from the CCD circuit is pumped to the process water tank for reuse in the grinding and CIL circuits.

Loaded carbon from the CIL and CIC circuits is washed with dilute (3%) hydrochloric acid before elution. The acid is removed from the carbon by washing with fresh water. The washed carbon is transferred to the elution column by pressure reduction. Three columns provide for acid washing and three for gold elution. The pressurized Zadra process is used for gold elution. Hot strip solution containing approximately two percent sodium hydroxide is circulated through the elution column. Elevated temperature and pressure are maintained in the elution column. Pregnant strip solution is stored in the preg tank before being pumped to the electro-winning (EW) cells.

Electro-winning takes place in six EW cells. After loading with gold, the stainless steel cathodes are washed with high pressure water. The gold sludge from the EW cells is dewatered in a filter press. The stripped cathodes are returned to the EW cells. The filter cake is dried, melted in an induction furnace, and poured into doré bars. The stripped carbon is

transferred from the elution column over a screen and into the reactivation furnace feed tanks. Carbon reactivation is accomplished in two propane-fired kiln-type furnaces.

Tailings are stored in a zero-discharge tailings storage facility (TSF). A double liner covers the entire tailings area, extending completely under the dam embankment. A two foot thick blanket drain of crushed rock covers the liner to permit seepage from the tailings to be collected in a lined ditch outside the dam embankment. All tailings solutions return to the mill.

OXIDE ORE HEAP LEACHING

Low-grade oxide material is leached as ROM ore on three prepared double-lined leach pads. Pregnant solution from the leach pads is fed to CIC columns for gold recovery. The loaded carbon from the heap leach operation is transported to the mill for gold recovery in the carbon elution and EW circuits and the refinery. The carbon is also acid washed and regenerated at the mill. Make-up solutions come from the mill or mine dewatering wells to account for evaporative losses and ore saturation requirements. A simplified flow sheet for the heap leach operation is shown as Figure 17-2.

Area 28 heap leach circuit has a water balance that is interlinked with the Pipeline mill circuit since it uses the tailings pond under-drain solution as leach solution and excess pad effluent is processed in the mill CIC circuit. Area 28 is at maximum capacity for ore stacking and is no longer an operating leach pad. The Area 30 heap leach circuit is independent of the Pipeline mill. Ore delivery to the pad recommenced in 2013. An expansion of seven million square feet is planned for 2019 with ore deliveries extending through 2031. Area 34 heap leach is a third pad that was designed to treat CHOP ore. The first cells were placed under leach during March 2011 and ore deliveries are scheduled to continue through June 2019 based on the current LOM plan.

REFRACTORY ORE TREATMENT

Ores that have an CNA/FA ratio of less than 50% are transported to Goldstrike for processing in the roaster. Haulage of refractory ore to Goldstrike is currently limited by permit to 1.8 million stpa. At Goldstrike, the ore will be processed in the roaster followed by a CIL circuit. Goldstrike also has the opportunity to process refractory ore using the TCM process, which includes

pressure oxidation (POX) followed by resin-in-leach (RIL) with calcium thio-sulphate (CaTS), however, this option is not contemplated for Cortez ore at this time.

Fluid bed roasters were constructed at Goldstrike in 1999 to treat carbonaceous refractory ores that could not be treated effectively by the POX circuit that existed at Goldstrike at that time. The roasters process double refractory (i.e., sulphide refractory and total organic carbon refractory) feed with a moderate carbonate content to help fix the sulphur dioxide that is generated by the oxidation reactions. Minimum sulphide sulphur levels are required to maintain sufficient bed temperatures. When the ore does not contain the minimum required sulphide sulphur content, sulphur prills are used as a supplement to provide the energy necessary to operate the roasters. The flow sheet for the Goldstrike roasters is shown in Figure 17-3.

The roasters use oxygen to oxidize organic carbon and sulphide sulphur prior to processing the neutralized slurry in a conventional CIL circuit. There are two circuits, each include crushing and dry grinding followed by a two stage roaster, a calcine quenching tank, and dust and gas handling operations. The quenched gas goes to the gas cleaning stage, which is common to both roaster circuits, and the calcine is processed in common neutralization and CIL circuits. The loaded carbon is sent to the main refinery for elution, regeneration, and production of the gold doré.

Ore routing from Cortez to Goldstrike is optimized to provide maximum value to the Cortez operation.

HAULAGE CAPACITY INCREASE

The Cortez Hills operation currently ships mined refractory ores via over-the-highway haul trucks to the Goldstrike operation for processing. Haulage is currently limited by permit to 1.8 million stpa. Deep South permitting approval is anticipated for late 2019. A shipping expansion to 2.5 million stpa is included in the permit application.

The increased shipping rate will allow advancing the current LOM production stream of refractory material.

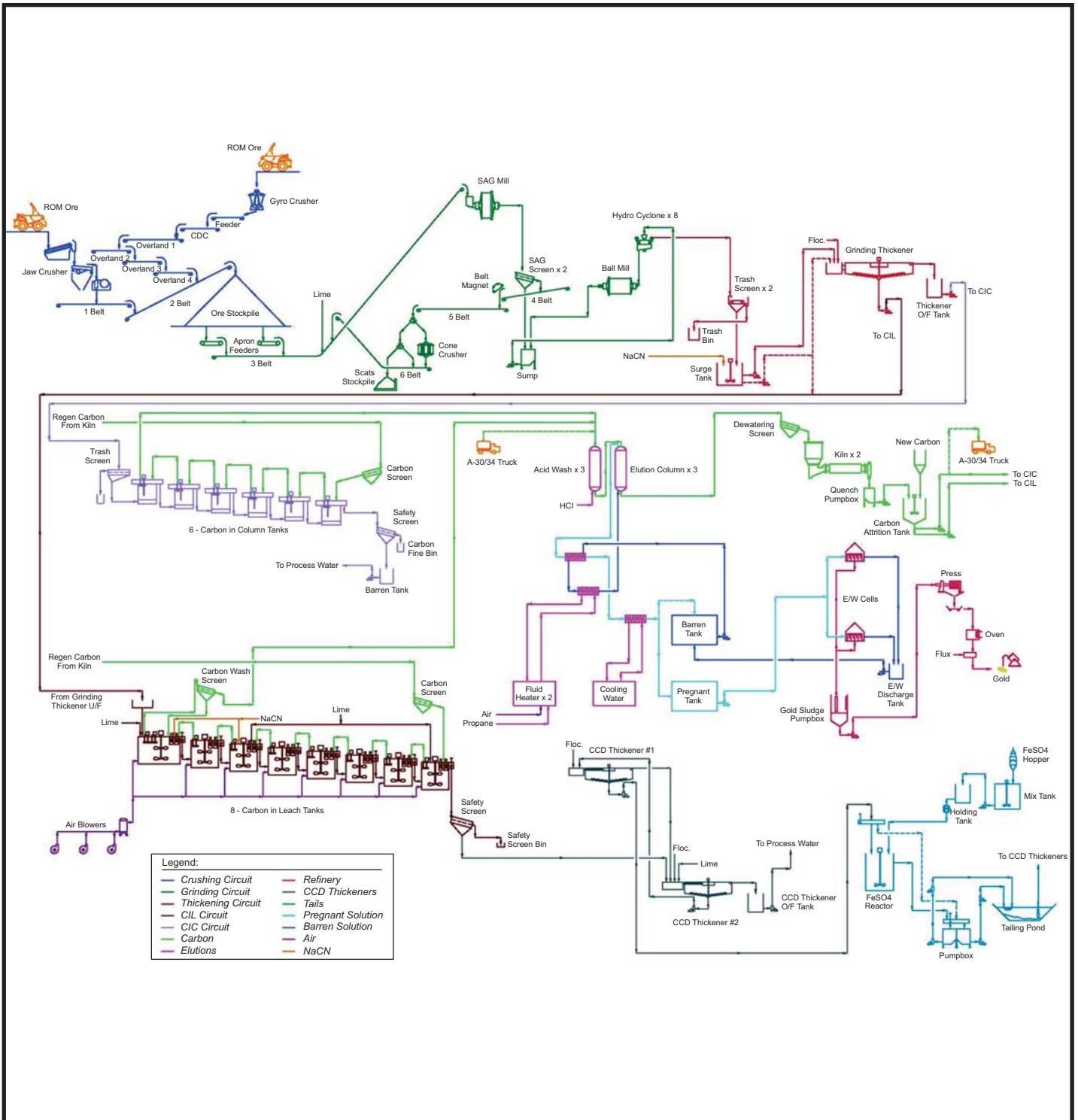


Figure 17-1

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Pipeline Mill Process
Flow Sheet

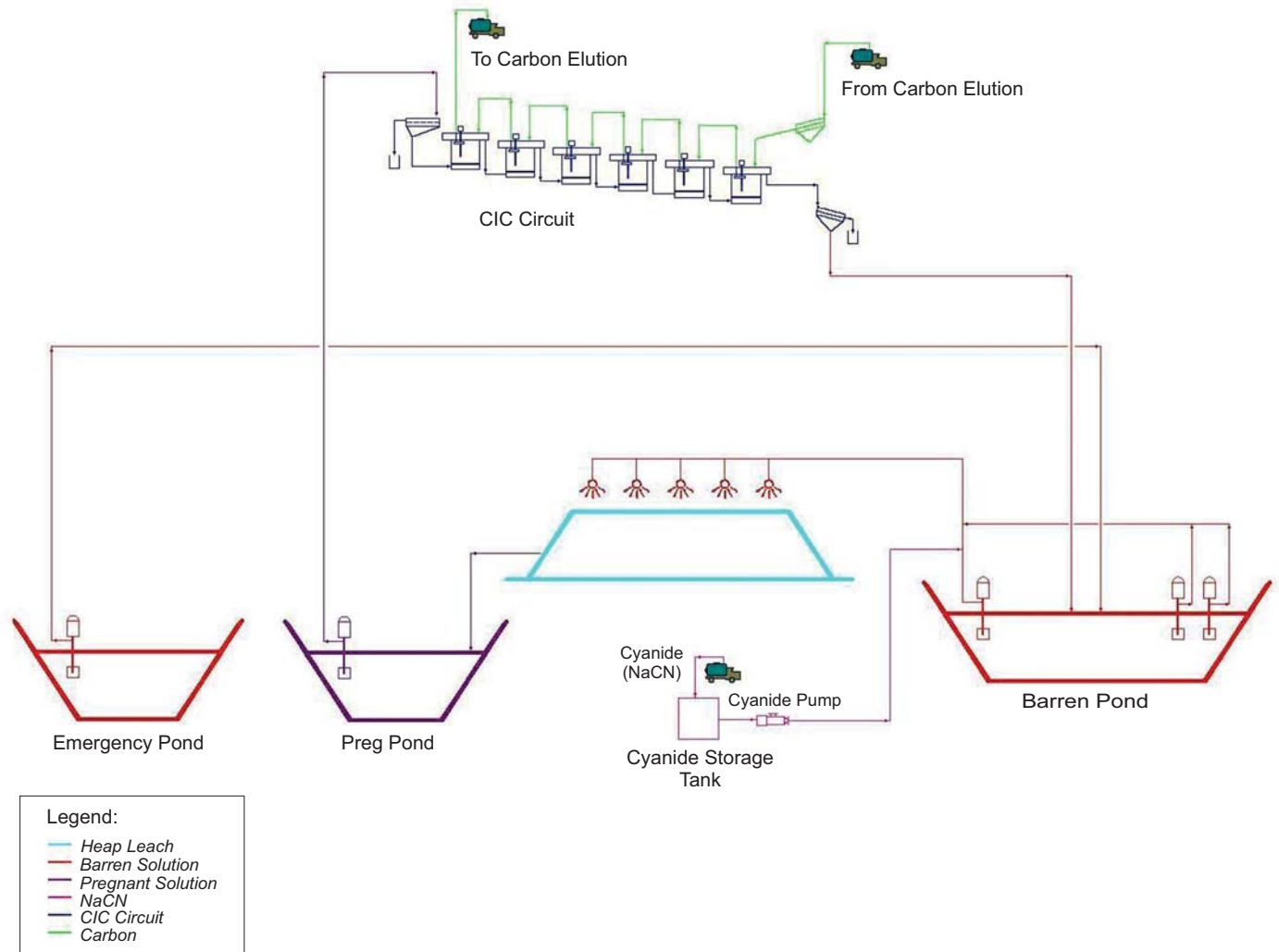


Figure 17-2

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Simplified Heap Leach
Flow Sheet

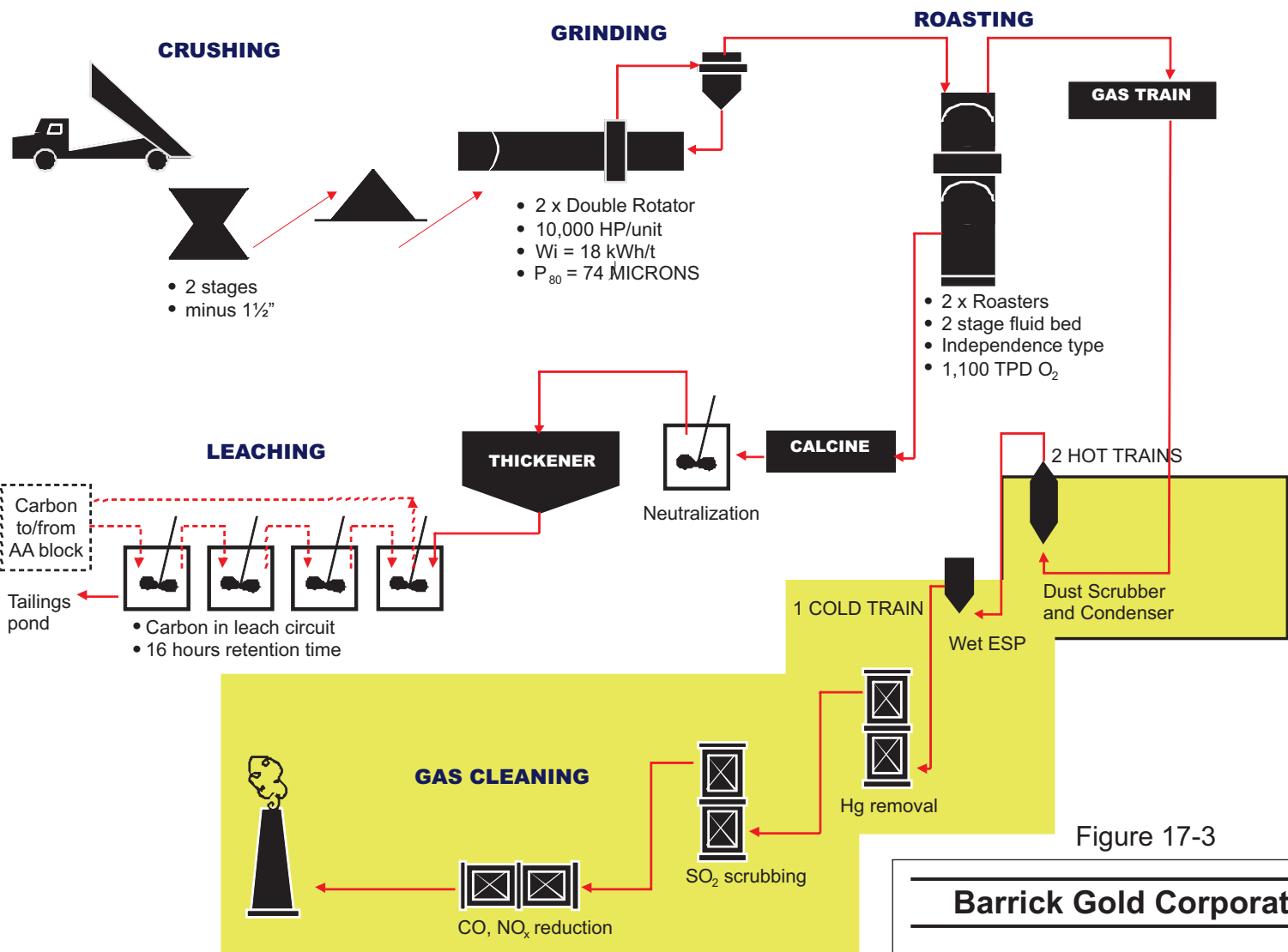


Figure 17-3

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Goldstrike Roaster Flow Sheet

17-7

18 PROJECT INFRASTRUCTURE

The infrastructure for the Cortez Operations is developed and in service. The facilities and infrastructure in the vicinity of the Pipeline and Cortez Hills Complex are shown in Figures 18-1 to 18-3.

ROADS

The Cortez Operations are accessed by paved public roads. The Mine has a number of private roads for access to the various facilities. The private roads include small vehicle roads as well as a network of haul roads. The haul roads are built to a width suitable for the haul trucks.

The development of the CHOP included the construction of a new public road to replace the original public road, which has now become part of the CHOP waste dump.

TAILINGS STORAGE FACILITY

Currently, Cortez has two active TSFs, Cells 1-2 and Cell 4. The Cell 1-2 facility has been operational since 1997 and stores approximately 61 million dry tons of tailings. The Phase IV Interim Raise on the Cell 1-2 facility was designed to provide storage until Cell 4 could be permitted, constructed, and placed into operation. Construction of the Phase IV Interim Raise was completed in 2012 and provided approximately 3 Mt of tailings storage. The facility was filled to near capacity in mid-2013 and is now currently only used for emergency deposition. Cell 4 Phase I was designed in 2011 and construction completed in April 2013. Deposition began in July 2013. It is hydraulically independent of the existing Cells 1-2 facility with a continuous 80 ml high density polyethylene (HDPE) geomembrane liner incorporated on the upstream slope of the embankments. The supernatant pool area lining system includes an 80 ml HDPE primary liner above a geosynthetic clay liner (GCL). Outside the pool area, geomembrane is underlain with a non-woven geotextile. Cell 4 Phase II construction was completed in November 2015 and provided for an estimated storage capacity of 25.7 million tons. Phase III construction was completed in October 2018 and provides an extra 17 million tons of storage capacity. The Phase III decant pool configuration was changed to a centre pool decant. Phase V was designed in 2017 and construction is expected to start in summer

2019 (clearing and grubbing). The downstream embankment will be constructed and raised to the ultimate crest elevation of 5,146 ft. At full build-out, the facility will encompass approximately 10.4 million ft² with a maximum embankment height of 226 ft providing an ultimate storage capacity of 62 million tons of tailings.

DUMPS

There are permitted waste dumps at the CHOP, Pipeline, and Pipeline/Gap pits for the storage of waste.

STOCKPILES

The open pit production schedules have significant variation in ore delivery over time and there is a high proportion of the ore that is stockpiled after mining and before processing. There are several oxide stockpile options all based upon the grade of material and varying from leach ore to mill ore. Leach material is generally delivered directly to the leach pad.

There are five stockpiles associated with the open pit and five stockpiles for underground ore. Table 18-1 presents the end of 2018 stockpile inventory by stockpile.

TABLE 18-1 MINE STOCKPILE INVENTORY END OF 2018
Barrick Gold Corporation – Cortez Operations

Item	Ore Tons	Grade (oz/st Au)	Gold Ounces
Open Pit Stockpile			
OP PLOR Oxide	61,924	0.070	4,335
Pipeline Refractory Ore	1,539,713	0.110	169,595
Area 34- Stockpile	2,219,272	0.009	19,472
Cortez Hills Oxide (CHOR, CROX)	1,066,570	0.065	68,832
Cortez Hills Refractory	3,398,607	0.148	502,053
Underground Stockpile			
UG_Oxide (Fcanyon)	6,876	0.217	1,491
UG_Refractory (Fcanyon)	16,592	0.226	3,742
UG_Refractory (Lvl 5-Pipe)	124,523	0.255	31,705
UG_PLOR Oxide	1,819	0.321	584
UG_Refractory* GS Roaster	13,000	0.330	4,284

Production scheduling for the oxide mill is based upon material available from the mine and the stockpiles. The refractory material to be processed at Barrick's Goldstrike facility is based upon the highest grade stockpiles available limited by the shipping quotas.

LEACH PADS

The LOM capital plan allows for the required expansion of heap leach pads.

POWER

Electrical power is obtained from the grid and from the Western 102 power plant with transmission by NV Energy. Power is purchased on a wholesale basis using dedicated buyers. The load is predicted on an hourly basis and the Western 102 supply is used to balance the load. The Western 102 plant delivers power to Barrick operations at Cortez, Goldstrike, and Turquoise Ridge.

Electric power is provided to the Cortez site by NV Energy via an approximately 50-mile long radial transmission line originating at their Falcon substation. The incoming NV Energy line terminates at the Barrick-owned Pipeline Substation. Two 120 kV taps onto the NV Energy power line feed the Barrick-owned 120 kV power lines as follow:

- Approximately nine miles of extension to serve the Cortez Hills development; and
- Approximately three miles of extension to serve the South Pipeline and Crossroads pits.

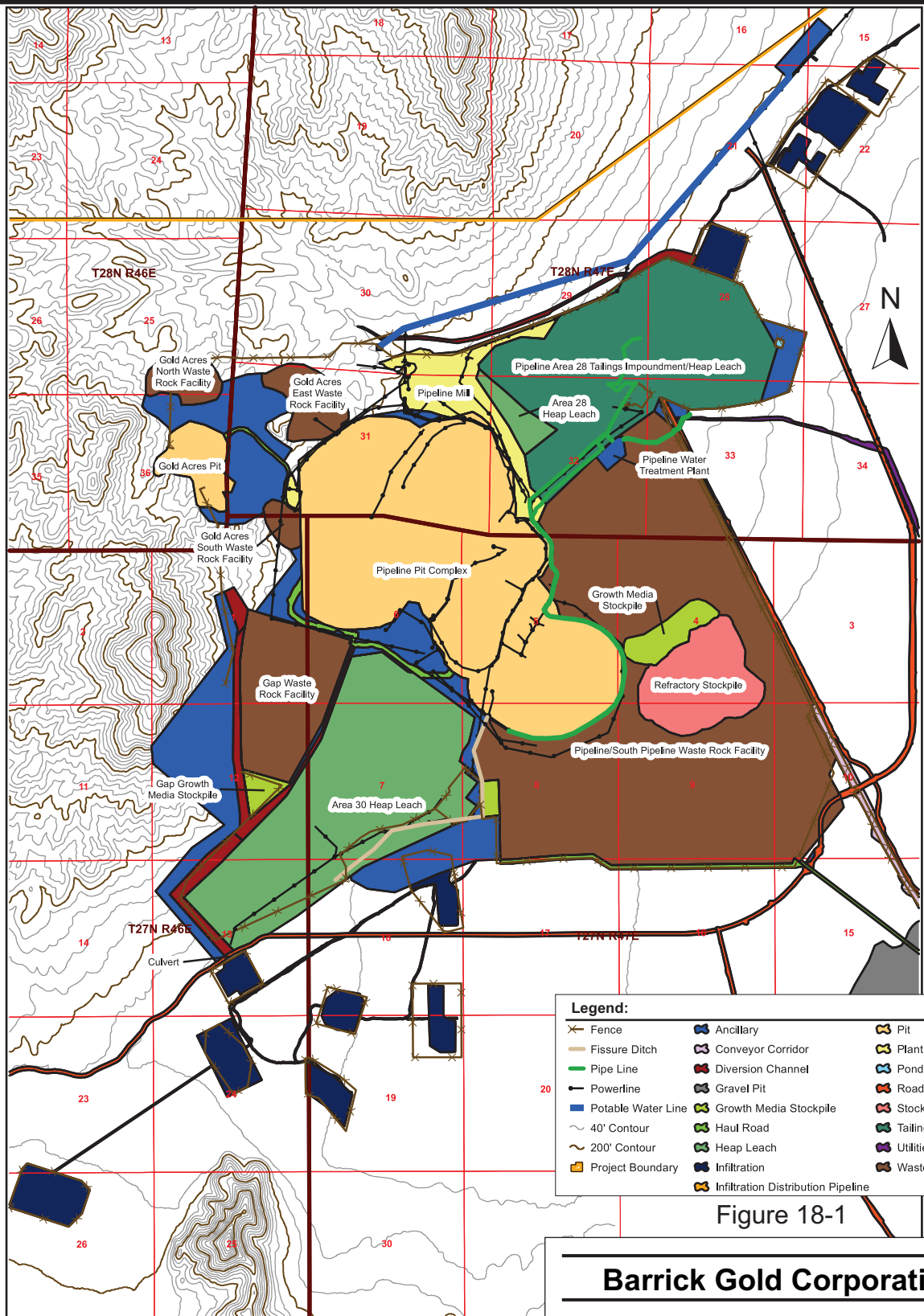
The current load at Cortez has a peak of 36 MW. The current transmission lines have the capacity for 44 MW, and with the addition of capacitors, the capacity of the line could be increased to 56 MW. Further improvements could increase the capacity to 70 MW to 80 MW, but for any expansion beyond 80 MW, additional transmission capacity will be required.

The Mine currently has 54 MW of Network Integrated Transmission Service from NV Energy for the delivery of capacity and energy from the Midpoint 345 kV and Dove 120 kV points of receipt. The Mine also has a Distribution Service agreement with NV Energy to a level of 31 MW. Barrick purchases power from the western electric grid for delivery to Midpoint 345 kV

and/or generates power at Barrick's Western 102 power plant for delivery to the Dove 120 kV bus.

Electric demand at the Cortez Mine was estimated in 2014 to approach 50 MW through the LOM. NV Energy has completed a preliminary study that concluded that the existing average power is 30 MW, with a peak of 33 MW. The Mine has expressed interest to NV Energy to match the Transmission Service and Distribution Service agreements at 54 MW. NV Energy has instructed Mine that modifying the Distribution Service agreement to 54 MW based on projected LOM power demand will require that two 10 MVAR capacitor banks be installed at the Mine.

The radial 120 kV transmission line serving the Mine is thermally limited to approximately 100 MVA of capacity; however, the real capacity restriction is related to the line voltage drop that occurs between Falcon substation and the Mine. NV Energy is required to limit this voltage drop to 5% per their regulators, the North American Electric Reliability Corporation. The ultimate power delivery capacity of this existing line is likely between 60 MW and 70 MW with the addition of voltage support capacitors. A series capacitor and/or a static VAR compensator may result in additional capacity. Barrick will be contracting with a transmission consultant to identify the actual ultimate capacity of this existing line. The consultant will also identify options to construct transmission infrastructure to increase the transmission capacity to Cortez beyond the limits of the existing line.

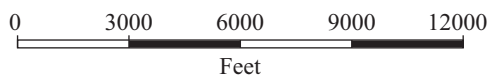


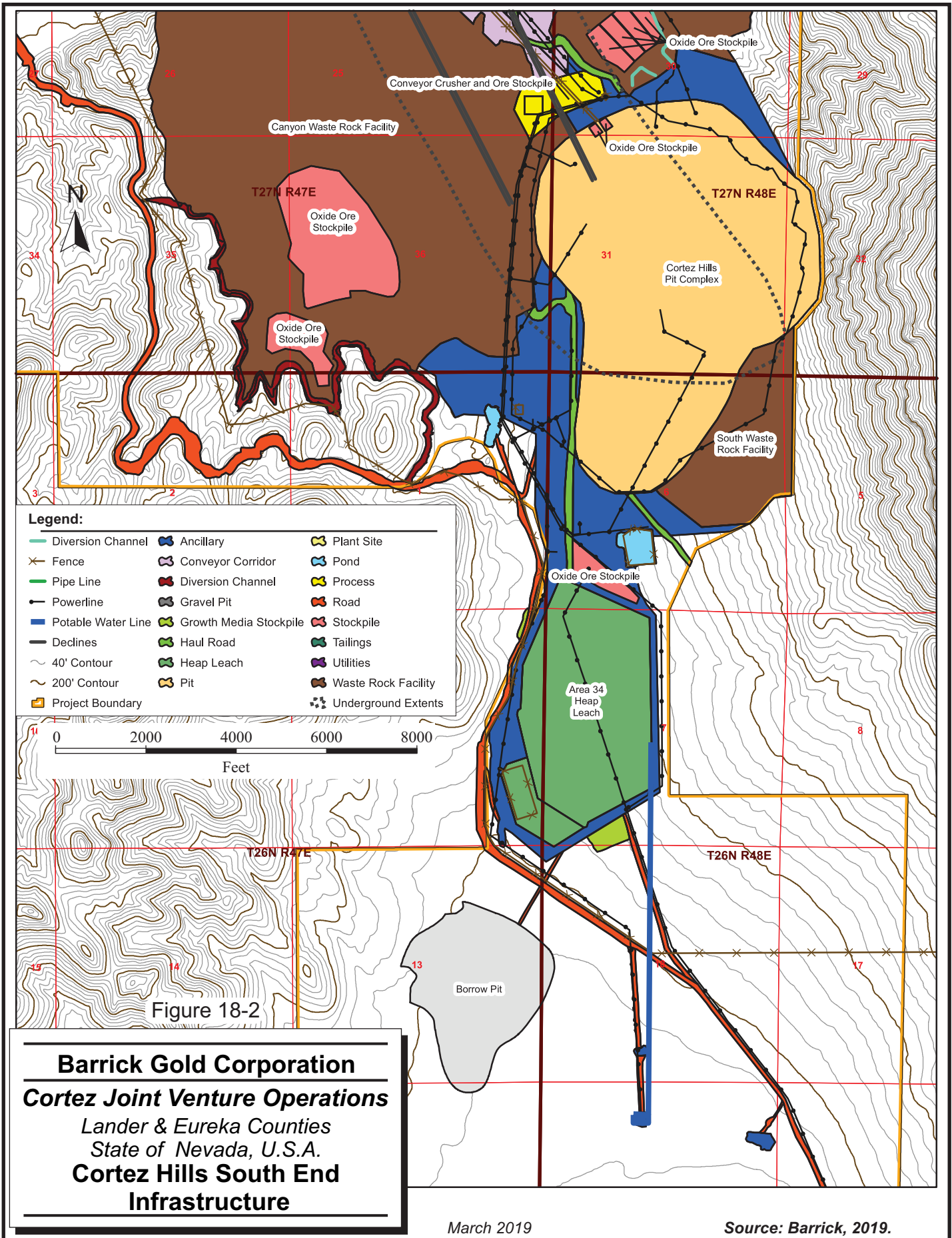
Legend:

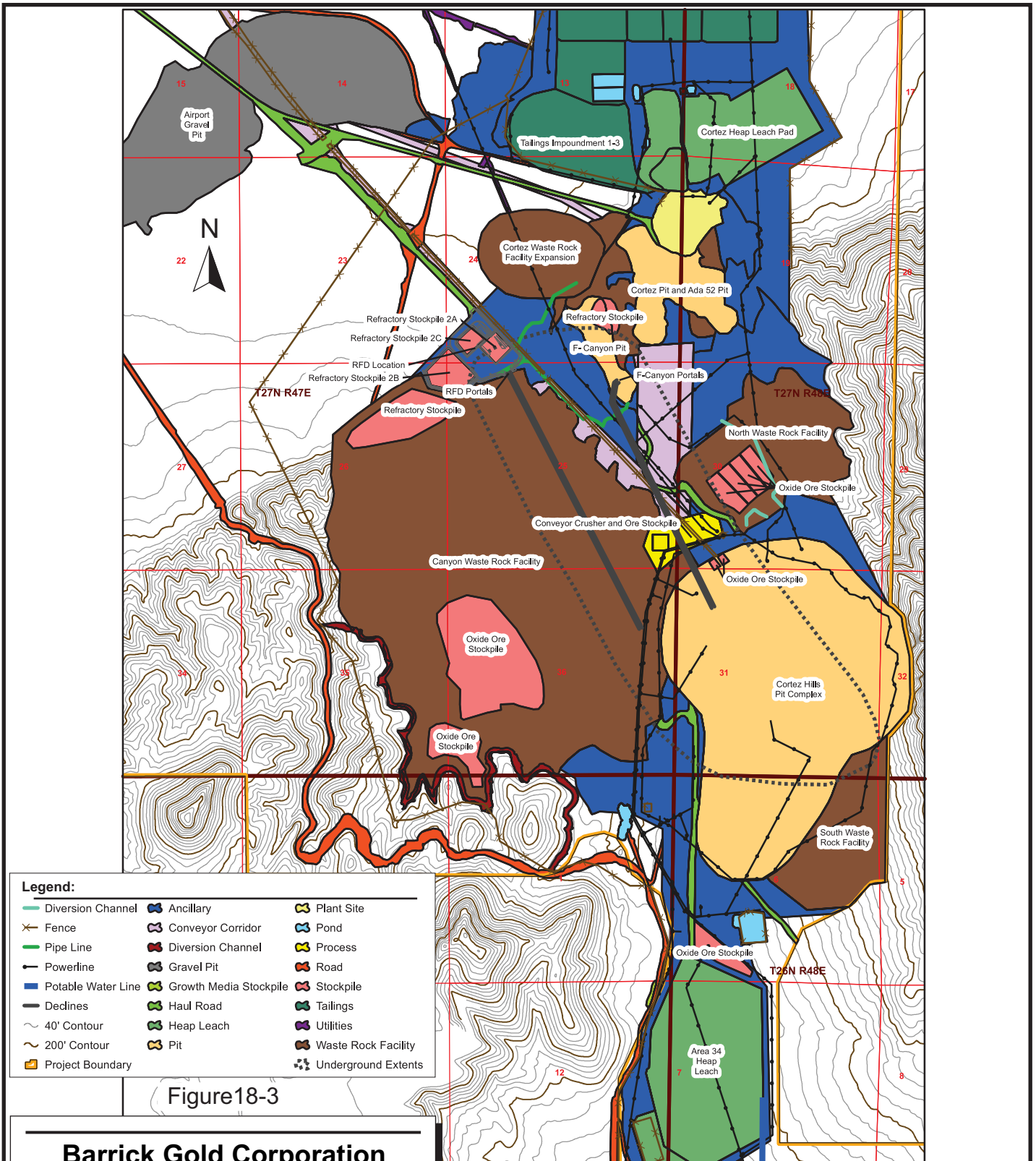
✕ Fence	🔵 Ancillary	🟡 Pit
— Fissure Ditch	🟡 Conveyor Corridor	🟡 Plant Site
— Pipe Line	🟡 Diversion Channel	🟡 Pond
— Powerline	🟡 Gravel Pit	🟡 Road
— Potable Water Line	🟡 Growth Media Stockpile	🟡 Stockpile
~ 40' Contour	🟡 Haul Road	🟡 Tailings
~ 200' Contour	🟡 Heap Leach	🟡 Utilities
🟡 Project Boundary	🟡 Infiltration	🟡 Waste Rock Facility
	🟡 Infiltration Distribution Pipeline	

Figure 18-1

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Pipeline and Gold Acres Infrastructure







Legend:

- | | | |
|--------------------|------------------------|---------------------|
| Diversion Channel | Ancillary | Plant Site |
| Fence | Conveyor Corridor | Pond |
| Pipe Line | Diversion Channel | Process |
| Powerline | Gravel Pit | Road |
| Potable Water Line | Growth Media Stockpile | Stockpile |
| Declines | Haul Road | Tailings |
| 40' Contour | Heap Leach | Utilities |
| 200' Contour | Pit | Waste Rock Facility |
| Project Boundary | Underground Extents | |

Figure18-3

Barrick Gold Corporation
Cortez Joint Venture Operations
 Lander & Eureka Counties
 State of Nevada, U.S.A.
Cortez Hills North End
Infrastructure

0 2000 4000 6000 8000
 Feet

March 2019

Source: Barrick, 2019.

19 MARKET STUDIES AND CONTRACTS

MARKETS

Gold is the principal commodity at Cortez and is freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured. Prices are usually quoted in US dollars per troy ounce.

CONTRACTS

Cortez is a large modern operation and the owner is a major international firm with policies and procedures for the letting of contracts. These policies and procedures would lead to contracts that are normal for this scale of operation. The contracts for smelting and refining are normal contracts for a large producer.

The joint venture agreement remains in place though it is now between two wholly owned subsidiaries of Barrick.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

ENVIRONMENTAL STUDIES

Due to the size of the various projects, environmental studies are on-going at the Mine to ensure that the required monitoring is completed and reported and that best practices are utilized to meet the environmental requirements. The following two studies were completed to support the Cortez Northwest Deeps Project: Sub-Surface Investigation: Soil Sampling – Mill Canyon Alluvial Fan and Adjacent Area, and Prefeasibility Study: Tailings Storage Facility Siting Assessment, Nevada Roaster Project.

The Cortez Operations are also conducting Groundwater and Attenuation Studies for the Crescent, Grass, and Pine Valley Basins to evaluate the attenuation capacity in an effort to reduce or remove the need for water treatment for the LOM dewatering water.

MINE PERMITTING

The Cortez Operations are predominantly located on public lands administered by the BLM with a small portion on private lands owned by Barrick Cortez Inc. The operations are located in Eureka and Lander Counties with BLM jurisdiction from the Battle Mountain and Elko field offices. No facilities are located in Eureka County, however, the Mine boundary extends onto BLM-administered lands in Eureka County to accommodate a portion of the CHOP and ancillary facilities. The boundaries and permit areas are shown in Figure 20-1.

Cortez has established, documented, and implemented an Environmental Management System (EMS) in accordance with the ISO 14001:2015 Standard and the Barrick Environmental Policy (the Policy). Cortez utilizes Intelex, a web-based software platform, as a primary tool for establishing, implementing, and maintaining various elements of the EMS.

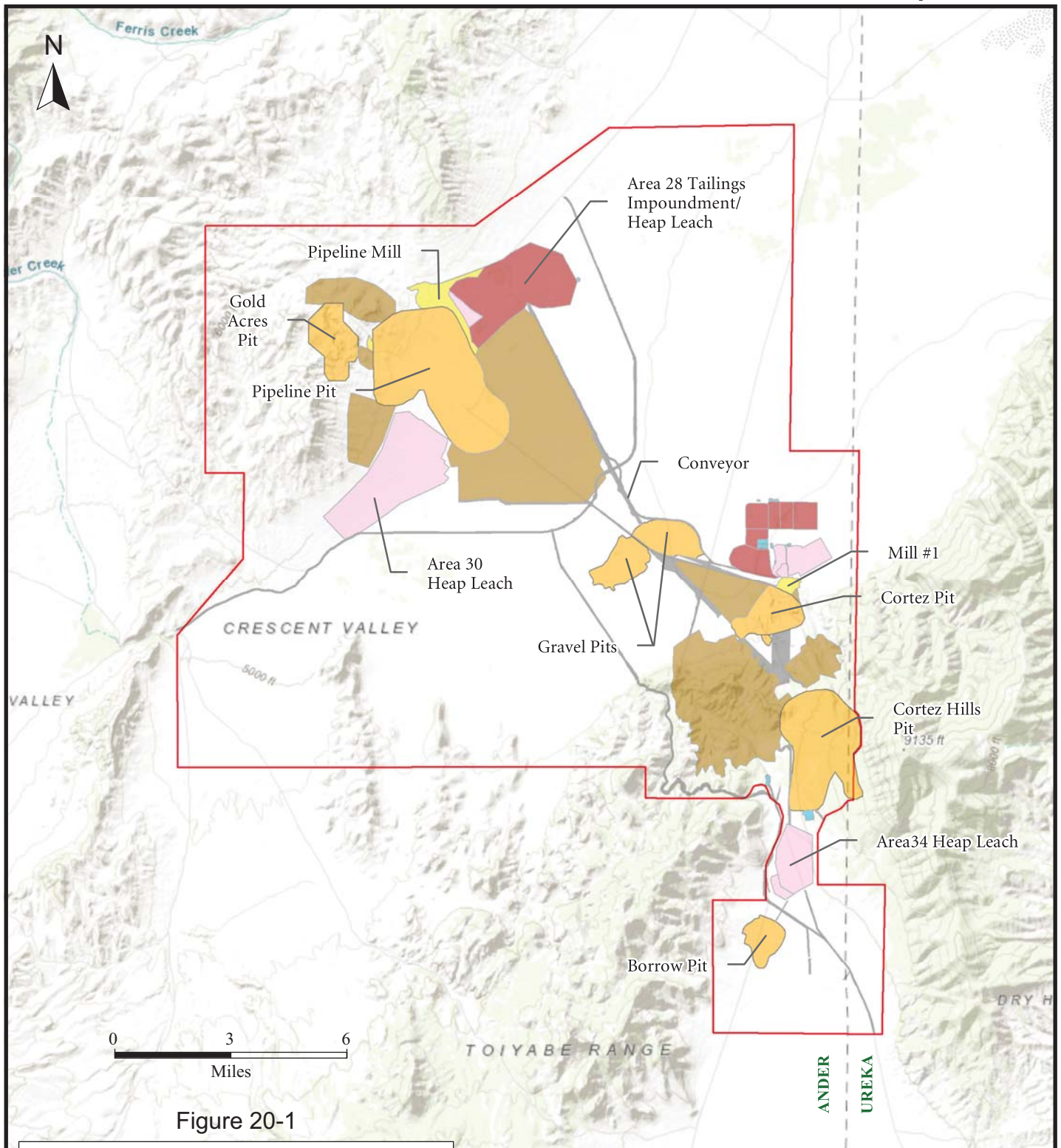


Figure 20-1

Barrick Gold Corporation

Cortez Joint Venture Operations

Lander & Eureka Counties
State of Nevada, U.S.A.

Boundaries and Permit Areas

Legend:

- Plan of Operations Boundary
- Roads
- Pits
- Leach
- Plant Site
- Pond
- Tailings
- Waste

March 2019

Source: Barrick, 2019.

MAJOR PERMIT REQUIREMENTS

The major permits required for operating on public lands are the approval of the PoO by the BLM and a Reclamation Permit from the BLM and Nevada Division of Environmental Protection (NDEP). The Cortez property has received approval for a number of PoOs and reclamation permits since the early 1980s. Permits were issued to allow mining and processing of ore from the East Pit, Horse Canyon Pit, Gold Acres, South Extension Pit, Cortez Canyon, and other areas that are no longer actively mined. Table 20-1 lists the major environmental analysis documents (e.g. Environmental Assessment (EA), Environmental Impact Statement (EIS), Supplemental Environmental Impact Statement (SEIS), Record of Decision (ROD), FONSI and PoOs that have been issued for the currently active areas of the Mine (i.e., Cortez, Pipeline, and Cortez Hills).

**TABLE 20-1 IMPORTANT ENVIRONMENTAL DOCUMENTS AND PLANS OF OPERATIONS FOR PIPELINE AND CORTEZ HILLS
Barrick Gold Corporation – Cortez Operations**

Dates	Description
January 1996	Cortez Pipeline Gold Deposit Final EIS
January 2000	South Pipeline Project Final EIS
December 2003	Pipeline/South Pipeline Pit Expansion Project Final EIS
November 2008	Cortez Hills Expansion Project Final EIS
November 2008	ROD and PoO Amendment Approval
January 2011	Cortez Hills Expansion Project Supplemental Final EIS
March 2011	Cortez Hills Expansion Project ROD and PoO Amendment Approval
October 2012	2012 Amendment to Plan of Operations (APO2) and Reclamation Permit Application
February 2014	2012 Amendment to PoO (APO2) and ROD Approval
October 2014	Revised Amendment 3 to PoO (APO3) and Reclamation Permit Application
September 2015	Revised Amendment 3 to PoO (APO3) ROD Approval
January 2018	Amendment to the PoO and Reclamation Permit Application for Temporary Refractory Ore Haulage
April 2018	Temporary Refractory Ore Haulage Final EA
June 2018	Amendment to the PoO and Reclamation Permit Application for Temporary Refractory Ore Haulage FONSI and Approval
March 2016	Deep South Expansion Project Amendment to PoO and Reclamation Permit Application
In Progress	Deep South Expansion Project Final EIS

CORTEZ HILLS EXPANSION PROJECT (APO1)

In August 2005, Cortez submitted an Amendment to the Pipeline/Pipeline South Plan of Operations for the Cortez Hills Expansion Project and associated Modification to Reclamation Plan Permit Application to the BLM. The BLM prepared a Draft EIS in 2007. In 2008, the Final

EIS and a ROD and Plan of Operations Amendment Approval were issued by the BLM. BLM's decision to approve the expansion project was challenged in federal court. The US Court of Appeals for the Ninth Circuit found that the plaintiffs were likely to succeed on the merits of their challenge with respect to the environmental analysis in the EIS for shipping of refractory ore to Goldstrike for processing and increased pumping of groundwater. Following the finding of the Court of Appeals, the BLM prepared an SEIS to address those areas and issued a new ROD (BLM, 2008).

While the SEIS was prepared, on remand from the US Circuit Court, the Nevada US District Court granted BLM's motion for summary judgement for the areas of the EIS that were considered adequate, but they entered a limited injunction against shipping of refractory ore from Cortez Hills and pumping volumes of groundwater that were higher than previously approved rates. Following the completion of the SEIS, the BLM issued a second ROD and Plan of Operations Amendment Approval. A summary of the proposed activities (BLM, 2011) included:

Cortez Hills Complex:

- New open pit (CHOP) for development of Cortez Hills ore zones
- Development of underground operation
- Underground mining
- New groundwater dewatering system to include inpit, perimeters, and underground facilities
- New Grass Valley Heap Leach Facility with associated solutions ponds, new CIC facility, and reagent storage area
- New stockpiles for ore, subgrade ore, and growth media
- New waste rock facilities (WRF) (Canyon, North, and South)
- New ancillary facilities (maintenance shop, safety, security, and administrative facilities, 90 day temporary waste storage area, and fuel and lubricant storage facilities)
- New primary crusher, conveyor offload stockpiles, and a conveyor system that is approximately 12 mi long
- Two new water supply wells and associated power distribution, water pipelines, and water reservoir or head tank

- Construction and upgrade of haul roads
- Relocation of portions of an existing county road and 60 kV power transmission line within the Mine boundary
- Installation of a new 120 kV power transmission line segment and substation
- Construction of a new Class III waived landfill
- Development of a new borrow source in Grass Valley
- Modification of the existing Horse Canyon/Cortez Unified Exploration Project (HC/CUEP) boundary to remove overlap with the Cortez Gold Mines PoO boundary

Cortez Complex:

- Deepening of the existing Cortez Mine open pit
- Expansion of the existing Cortez WRF
- Expansion of the existing F-Canyon backfill
- New Cortez Heap Leach Facility with associated solution ponds, CIC facility, and reagent storage area
- Expansion of the existing tailings facility
- Expansion of the diesel fuel storage facilities
- Ancillary facilities for underground support (backfill crushing, additional ore stockpiles, shotcrete plant, conveyor onload area, and haul road)

Pipeline Complex:

- Expansion of the existing Pipeline Pit (North Gap Pit Expansion)
- Expansion of the existing Pipeline WRF
- New North Gap backfill
- Relocation of existing county road around the WRF expansion area
- Expansion of the existing Pipeline Mill to facilitate an increase in throughput from currently permitted 13,500 stpd to an average of 15,000 stpd
- Modification of the existing Pipeline/South Pipeline/Gold Acres exploration permit boundary to remove overlap with the Cortez Gold Mines PoO boundary

2012 AMENDMENT TO PLAN OF OPERATIONS AND RECLAMATION PERMIT APPLICATION (APO2)

In October 2012, Cortez submitted a second proposed amendment to the existing PoO. The proposed modifications were (Barrick Cortez, 2012):

- Reconfiguring the North (WRF) footprint and storm water diversions within an area previously authorized for waste rock, ancillary, and conveyor corridor disturbance
- Incorporating an ore stockpile on the surface of the North WRF footprint
- Relocating a six million ton stockpile of ore to Goldstrike at the rate of 800,000 stpa for approximately eight years
- Adding ancillary facilities including a potable water well and associated distribution pipeline, and a bank of capacitors
- Constructing approximately ten miles of rangeland fence to the perimeter of the relocated County Road 225

All components of the APO2 application were approved by the BLM on February 24, 2014.

AMENDMENT 3 TO PLAN OF OPERATIONS AND RECLAMATION PERMIT APPLICATION (APO3)

In August 2014 and revised in October 2014, Cortez submitted additional proposed modifications to the PoO (Barrick Cortez, 2014). The proposed modifications included:

- Deepen the Gap Pit from 4,400 ft amsl to 4,360 ft amsl
- Construct the Range Front Declines and associated infrastructure
 - Construct twin declines and associated surface infrastructure on the range front north of the Canyon WRF
 - Establish additional surface facilities to support the CHUG
- Expand the Area 30 heap leach facilities by 240 acres
- Modify mining rate between the Cortez Hills and Pipeline areas to optimize surface mining activities
- Add a water treatment plant and infrastructure to reduce naturally occurring arsenic concentrations in the dewatering water
- Allow off-site ore haulage up to approximately 1.2 million tons per year site wide (i.e., no longer limit the haulage from the stockpiles to 800,000 stpa).
- Reconfigure the Pipeline, Canyon, and Gap WRFs
 - Expand the Gap waste rock facility by 220 acres and increase the height by 200 ft
 - Increase the height of the Pipeline WRF by 300 ft
 - Increase the height of the Canyon WRF by 160 ft

- Infrastructure addition
 - Administration building, maintenance shop, fuel skid in the ancillary facility area
 - Reconfigure the LOM power line locations

All components of the APO3 application were approved by the BLM on September 28, 2015.

AMENDMENT TO PLAN OF OPERATIONS AND RECLAMATION PERMIT APPLICATION FOR TEMPORARY REFRACTORY ORE HAULAGE

In January 2018, Cortez submitted an amendment to the PoO. The amendment included changes for:

- Transport for additional ore to the Goldstrike Mine for processing in an 18 month period beginning immediately after approval to bring the total transport limit to 1.8 million stpa
- Additional trucks to haul the additional ore

DEEP SOUTH EXPANSION PROJECT AMENDMENT TO PLAN OF OPERATIONS AND RECLAMATION PERMIT APPLICATION

In March 2016, Cortez submitted additional proposed modifications to the PoO. Major elements of the expansion include:

- Deepen the Crossroads Pit (Pipeline Complex) by 200 ft and reconfigure the backfill
- Add Stage 11 to the Pipeline Pit
- Expand the existing Gold Acres Pit and expand the WRF
- Expansion of the existing CHUG mine by increasing the depth of mining to 2,500 ft
- Revise dewatering rates and continue dewatering to allow underground mining at Cortez Hills beneath the currently authorized floor
- Expand the Pediment portion of the Cortez Hills Pit and shift the PoO boundary to the east by 800 ft
- Potentially backfill the Cortez Hills Pit
- Construct an additional water treatment plant in the Cortez Hills Complex
- Expand the existing Cortez Pit and WRF
- The maximum dewatering rate will remain below the authorized rate of 36,100 gpm
- Add Rapid Infiltration Basins (RIBs) and surface pipeline on private land outside of the PoO boundary in Crescent Valley
- Construct additional RIBs and surface pipelines in Grass Valley and Pine Valley

- Change the Grass Valley production wells to injections wells and add monitoring wells
- Construct, if necessary, a water reservoir and pipelines for dewatering water management at Rocky Pass and construct a water line from the reservoir to the Dean Ranch and construct a bypass road for public access
- Additions/revisions to facilities and disturbance
 - Expand the PoO boundary to capture proposed facilities
 - Increase off-site ore haulage to 2.5 million stpa
 - Modify the surface mining rate to allow up to 600,000 stpd
 - Expand the existing Pipeline oxide ore stockpile
 - Additional ore stockpiles
 - Add ancillary disturbance around existing and proposed facilities
 - Powerlines, pipelines, buildings, communication sites, haul and access roads
 - Underground surface infrastructure (vent raises, boreholes, surface plants (e.g., shotcrete, etc.)

The ROD for the Deep South Expansion is expected in Q3 2019.

OTHER PERMIT REQUIREMENTS

A number of federal and state permits are required to operate the Cortez Mine. Cortez adheres to permitting guidelines from the BLM, the Nevada Revised Statutes (NRS), the Nevada Administrative Code (NAC), and additional federal government requirements. A summary of the major environmental permits for the Cortez Operations is provided in Table 20-2.

**TABLE 20-2 MAJOR ENVIRONMENTAL PERMITS
Barrick Gold Corporation – Cortez Operations**

Activity or Permit	Jurisdiction	Agency	Permit Name	Number	Issued	Expires
Integrated Monitoring Plan	Federal	BLM	Integrated Monitoring Plan		09-01-95	NA
Water Pollution Control Permit	State	NDEP - BMRR	Pipeline Infiltration	NEV0095111	11-02-95	10-20-21
			Pipeline Project	NEV0093109	05-01-93	01-23-22
			Cortez Hills Project	NEV2007106	07-30-07	07-20-23

Activity or Permit	Jurisdiction	Agency	Permit Name	Number	Issued	Expires
			Cortez Gold Mine	NEV0000023	04-13-90	07-22-22
Water rights/reallocation/diversion changes	State	NDWR		On-going		
Dam storage permits	State	NDWR	Pipeline Tails Dam Buttress	J-553	03-23-10	NA
			Pipeline Tails Dam Phase III Raise	J-647	07-26-10	NA
			Cortez Hills Fresh Water Reservoir	J-626	06-01-09	NA
			Cortez Hills Storm Water Retention Pond #1, #2 Dams	J-656 & J657	06-08-11	NA
			Cortez Area 28 TSF Cell 4 Dam	J-659	01-05-12	NA
			Cortez Area 28 TSF Phase IV Raise	J-663	08-09-11	NA
Reclamation Permit	State	NDEP - BMRR	Pipeline/Cortez Hills Expansion Reclamation Permit	0093	07-13-00	NA
Air Quality Permits	State	NDEP - BAPC	Class I Air Quality Operating Permit	AP1041-2141	01-28-08	01-28-13 ¹
			Mercury Operating Permit to Construct (Phase 2)	AP1041-2220	06-19-2017	NA
Discharge/Underground Injection Permit	State	NDEP - BWPC	Mill #1 UIC	GU07RL-51036	05-07-13	NA
Industrial Artificial Pond Permits	State	NDOW	Pipeline Mill	S-491363	11-14-11	10-24-21
			Pipeline Heap Leach Facilities	S-491368	11-14-11	10-24-21
			Cortez Hills Process Facility	S-376891	04-20-14	04-21-19
			Cortez Mill No. 1 Facility	S-369358	04-01-11	04-24-21
Potable Water Permit	State	NDEP - BSDW	Barrick Cortez Gold Mines Pipeline NV0000892	LA-0892-12NTNC	04-09-15	04-30-19
			Cortez Mill No. 1 Potable Water System NV0002570	LA-2570-12NTNC	04-09-15	04-30-19

Activity or Permit	Jurisdiction	Agency	Permit Name	Number	Issued	Expires
			Barrick Cortez Hills	LA-1097-NTNC	04-09-15	04-30-19
Storm Water Permit	State	NDEP - BWPC	Storm Water General Permit	NVR300000	03-01-13	02-28-18 ²
Hazardous Materials Storage	State	Nevada State Fire Marshall	Cortez Gold Mines	75458 & 75460	03-01-15	02-28-19
Jurisdiction Determination	Federal	Army Corps of Engineers	Cortez Mining Area South of Crescent Valley	JD	02-25-10	06-16-20
Landfill	State	NDEP - BWM	Class III Waivered Landfill		03-31-14	03-31-19

Notes:

1. Five year renewal permit application is under review by NDEP-BAPC; Cortez continues to operate under existing permit
2. General permit has expired, NDEP has not reissued; Cortez continues to operate under expired general permit per NDEP guidance

NDEP – Nevada Division of Environment Protection
 BMRR – Bureau of Mining Regulation and Reclamation
 BAPC – Bureau of Air Pollution Control

NDWR – Nevada Division of Water Resources
 BSDW – Bureau of Safe Drinking Water
 BWM – Bureau of Waste Management
 NDOW – Nevada Division of Wildlife

SOCIAL AND COMMUNITY REQUIREMENTS

The Cortez Operations are a prominent local business and applies industry best practice social and community engagement standards at its operation. The Cortez Operations operate on lands traditionally used by the Western Shoshone tribes and bands, and operations make great efforts to demonstrate respect for indigenous cultural resources, environmental stewardship, and shared benefits to receive support from Western Shoshone communities. These efforts are reflected in the 2014 Collaborative Agreement between Barrick and the Western Shoshone tribes and bands, and the 2018 Programmatic Agreement governing the consultation process for exploration and mining activities potentially impacting cultural or historic resources.

MINE CLOSURE REQUIREMENTS

Reclamation of disturbed areas resulting from mining activities will follow the approved Reclamation Plan and will be completed in accordance with BLM and NDEP regulations that are intended to prevent unnecessary or undue degradation of public lands by operators authorized by the mining laws.

The authorized surface disturbance for the Cortez areas is summarized in Table 20-3.

**TABLE 20-3 SURFACE DISTURBANCE AUTHORIZATION
Barrick Gold Corporation – Cortez Operations**

Complex	Public (acres)	Private (acres)	Total (acres)
Open Pits	2,669	83	2,752
Waste Rock Facilities	5,267	126	5,393
Heap Leach Facilities	1,513	88	1,601
Tailings Impoundments	1,118	298	1,416
Process Areas	276	56	332
Haul Roads	207	8	215
Support Facilities	4,389	211	4,600
Exploration	391	0	391
Total	15,830	870	16,700

The state of Nevada requires a reclamation bond based on the disturbed areas. The current bond is \$224,246,354. The surety amount is reviewed every three years or whenever a PoO amendment is submitted for review and approval to determine if the current bond is still adequate to execute the approved Reclamation Plan. The permit is valid for the life of the Mine unless it is modified, suspended, or revoked by NDEP.

To the best of RPA's knowledge, there are no environmental issues that could materially impact Barrick's ability to extract the mineral resources or mineral reserves at this time.

21 CAPITAL AND OPERATING COSTS

CAPITAL COSTS

The total capital expenditure in the 2018 LOM plan is US\$1,393 million. The capital costs for Cortez are developed and revised on an annual basis as part of the budget cycle. The 2018 LOM capital plan as developed at the site for approval by the corporation is shown below in Table 21-1.

The capital costs include ongoing sustaining capital as well as capital for the expansion of some of the facilities. The scope of the capital costs for the Mine is appropriate.

TABLE 21-1 CAPITAL COSTS
Barrick Gold Corporation – Cortez Operations

Year	Capitalized Stripping Expenses MUS\$	Sustaining Improvements MUS\$	Sustaining Engineered Facilities MUS\$	Sustaining Other MUS\$	Sustaining Capitalized Maintenance MUS\$	Expansion MUS\$	Capitalized Drilling MUS\$	Capitalized Underground Development MUS\$	Total MUS\$
2019	93	14	4	52	6	105	4	10	288
2020	125	12	34	48	12	8	10	10	259
2021	154	11	3	54	15	12	13	6	268
2022	149	-	-	28	12	-	6	19	213
2023	121	-	2	17	7	9	7	15	177
2024	-	-	19	12	4	9	4	18	66
2025	44	-	-	7	4	-	2	7	64
2026	-	-	-	9	1	-	2	7	20
2027	-	-	-	8	-	-	1	0	9
2028	-	-	-	16	-	-	-	4	19
2029	-	-	-	10	-	-	-	-	10
Total	686	37	62	261	61	143	47	95	1,393

The following is excluded from the capital cost estimate:

- Project financing and interest charges
- Taxes
- Import duties and custom fees
- Working capital
- Sunk costs

OPERATING COSTS

The operating costs for Cortez are developed annually as part of the site budget process. In the mine area, the costs are developed incorporating experience from previous periods. The LOM operating costs are shown in Table 21-2. In RPA's opinion, the operating costs for the Mine are reasonable.

TABLE 21-2 OPERATING COSTS
Barrick Gold Corporation – Cortez Operations

Area	Unit	OP	UG Longhole	UG Cut & Fill
Mining	\$/st mined	1.83	-	-
Mining	\$/st ore	8.44	78.82	92.04
Process Oxide	\$/st ore	6.55	11.09	11.09
Process Roaster	\$/st ore	29.01	29.01	29.01
Admin Oxide	\$/st ore	2.19	9.86	9.86
Admin Roaster	\$/st ore	2.19	5.02	5.02
Refining & Freight	\$/st ore	0.02	-	14.42
Total Cost Oxide	\$/st ore	17.20	99.77	127.41
Total Cost Roaster	\$/st ore	39.66	112.85	140.49
Royalties	\$/oz	18.98	18.98	18.98

MANPOWER

The Cortez manpower for the 2018 LOM is presented by area in Table 21-3.

TABLE 21-3 LOM MANPOWER
Barrick Gold Corporation – Cortez Operations

Year	Open Pit	Underground	Processing	G&A	Total
2019	675	370	189	110	1,344
2020	576	356	191	110	1,233
2021	487	355	191	0	1,033
2022	494	355	187	0	1,036
2023	483	355	187	0	1,025
2024	329	355	187	0	871
2025	205	355	179	0	739
2026	201	355	176	0	732

Year	Open Pit	Underground	Processing	G&A	Total
2027	116	353	163	0	632
2028	9	344	163	0	516
2029	9	220	163	0	392
2030	0	141	154	0	295
2031	0	0	154	0	154

22 ECONOMIC ANALYSIS

Under NI 43-101 rules, producing issuers may exclude the information required for Section 22 Economic Analysis on properties currently in production, unless the technical report includes a material expansion of current production. RPA notes that Barrick is a producing issuer, the Cortez Mine is currently in production, and a material expansion is not being planned. RPA has performed an economic analysis of the Cortez Operations using the estimates presented in this report and confirms that the outcome is a positive cash flow that supports the statement of Mineral Reserves.

23 ADJACENT PROPERTIES

RPA has not independently verified this information and this information is not necessarily indicative of the mineralization at the Cortez Operations.

In 2011 the discovery of the Red Hill and Goldrush deposits was announced by Barrick. The two deposits are located four miles southeast of the Cortez Hills mine and 15 mi southeast of the Pipeline mine.

Based on the results of wide spaced drilling, Barrick originally outlined two zones of gold mineralization along a seven kilometre long trend. The mineralization is primarily hosted in a favorable carbonate unit and has a tabular geometry. Host rocks are similar to those found at Barrick's Cortez Hills and Goldstrike mines. The majority of the mineralization intersected to date is refractory and occurs at depths between 150 m and 500 m. Continued drilling of the mineralization has shown that the two deposits are in fact joined. As a result, the deposit has been renamed Goldrush, which includes both Red Hill and the original Goldrush deposits.

At December 31, 2018, Barrick reported (2018 Full Year Report and Fourth Quarter Results) Measured and Indicated Mineral Resources for Goldrush to be 30.9 million tons grading 0.274 oz/st Au and containing 9.4 million ounces of gold, plus an Inferred Mineral Resource of 11.9 million tons grading 0.272 oz/st Au and containing 3.56 million ounces of gold (which includes an initial Inferred Mineral Resource discovered at the Fourmile deposit, located one to three kilometres north of the Goldrush discovery).

RPA has not independently verified this information and this information is not necessarily indicative of the mineralization at Cortez.

24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

Based on the site visit and review of the documentation available, RPA offers the following interpretation and conclusions:

GEOLOGY AND MINERAL RESOURCES

- The Cortez deposits are Carlin-type deposits hosted by sedimentary rocks.
- The drilling, sampling, sample preparation, analyses, security, and data verification meet industry standards and are appropriate for Mineral Resource estimation.
- The parameters, assumptions, and methodology used for Mineral Resource estimation are appropriate for the style of mineralization.
- Mineral Resource estimates have been prepared using acceptable interpolation strategies. The classification of Measured, Indicated, and Inferred Resources conform to CIM (2014) definitions.
- The documentation for the Mineral Resource models meets or exceeds industry standards.
- The Mineral Resource estimates were completed by the Cortez Mine Technical Group and were reviewed and accepted by RPA.
- Mineral Resources are reported exclusive of Mineral Reserves and are estimated effective December 31, 2018.
- Total Mineral Resources at the Cortez Operations are:
 - Measured - 3.70 million tons, grading 0.054 oz/st Au, containing 198,000 ounces of gold.
 - Indicated – 58.83 million tons, grading 0.051 oz/st Au, containing 2,971,000 ounces of gold.
 - Measured + Indicated – 62.53 million tons, grading 0.051 oz/st Au, containing 3,169,000 ounces of gold.
 - Inferred – 14.5 million tons, grading 0.049 oz/st Au, containing 705,000 ounces of gold.
- Open Pit Mineral Resources at the Cortez Operations are:
 - Measured – 3.51 million tons, grading 0.039 oz/st Au, containing 137,000 ounces of gold.
 - Indicated – 55.68 million tons, grading 0.037 oz/st Au, containing 2,075,000 ounces of gold.
 - Measured + Indicated – 59.19 million tons, grading 0.037 oz/st Au, containing 2,212,000 ounces of gold.
 - Inferred – 12.1 million tons, grading 0.019 oz/st Au, containing 229,000 ounces of gold.

- Underground Mineral Resources at the Cortez Operations are:
 - Measured – 0.19 million tons, grading 0.319 oz/st Au, containing 61,000 ounces of gold.
 - Indicated – 3.15 million tons, grading 0.284 oz/st Au, containing 896,000 ounces of gold.
 - Measured + Indicated – 3.34 million tons, grading 0.286 oz/st Au, containing 957,000 ounces of gold.
 - Inferred – 2.4 million tons, grading 0.197 oz/st Au, containing 477,000 ounces of gold.
- RPA is of the opinion that the Mineral Resource estimate has been completed to industry standard and is suitable to support the disclosure of Mineral Resources and Mineral Reserves.
- RPA concurs with the new dynamic anisotropy modelling approach at Cortez and recommends its application across all deposits at Cortez where appropriate.
- RPA agrees with Barrick's ongoing review and modification of classification criteria at the Pipeline Complex, and is of the opinion that in general, classification of blocks is acceptable.

MINING AND MINERAL RESERVES

- The Mineral Reserves are contained within three open pit deposits, three zones in one underground deposit, and surface stockpiles.
- EOY2018 Mineral Reserves as stated by Cortez are estimated in a manner consistent with industry practices.
- Total Mineral Reserves at the Cortez Operations are:
 - Proven: 19.4 million tons, grading 0.059 oz/st Au, containing 1.14 million ounces of gold.
 - Probable: 140.4 million tons, grading 0.054 oz/st Au, containing 7.60 million ounces of gold.
- Open Pit Mineral Reserves at the Cortez Operations are:
 - Proven: 11.00 million tons, grading 0.030 oz/st Au, containing 0.33 million ounces of gold.
 - Probable: 127.9 million tons, grading 0.029 oz/st Au, containing 3.71 million ounces of gold.
- Underground Mineral Reserves at the Cortez Operations are:
 - Probable: 12.55 million tons, grading 0.310 oz/st Au, containing 3.89 million ounces of gold.
- The open pit mine is a conventional operation that currently has 400 st and 345 st class off-highway haul trucks which are loaded by one 35 yd³ hydraulic shovel and five 48 yd³ to 77 yd³ size electric shovels.

- CHUG is a mechanized decline access underground mine operating at approximately 5,000 stpd of ore and waste.
- The Middle Zone of the underground mine is being exploited using drift and fill mining methods and minor amounts of longhole stoping.
- The Lower and Deep South Zones are planned to be mined by longhole stoping.
- Longhole stope design for the Mineral Reserves is based upon stope optimizer software and may benefit from further detailed planning.
- The external and backfill dilution estimates for the longhole stoping do not include material beyond the stope limits, nor do the dilution estimates incorporate the differences between primary and secondary stopes.
- The extraction of the longhole stopes is unlikely to be 100%.
- The stope reconciliation data is based on annual production from the underground as opposed to a stope by stope reconciliation to the Mineral Reserve estimate.
- Development of the RFD for access to the Lower and Deep South Zones is underway. After completion of the RFDs, rock will be transported to surface by conveyor.
- Mining below the 3,800 ft level (the bulk of the Deep South Zone) requires approval of APO 4.
- The mining methods and equipment are considered to be suitable for the deposits.
- The Deep South Zone has the potential to be a standalone expansion of the CHUG.

PROCESS

- RPA is of the opinion that the metallurgical accounting and evaluation of operating data by the technical staff are consistent with industry standards.
- RPA is of the opinion that metallurgical test work completed for the Mine and areas of potential production in the future has been appropriate to establish optimal processing routes for the different mineralization styles encountered in the deposits and that the gold recovery estimates for the processing options are currently appropriate to estimate the amount of gold that will be recovered over the LOM.
- A team has been established to develop a more detailed geometallurgical understanding of the deposits at Cortez. RPA is of the opinion that continuing to understand more details about the geology and the metallurgy and their relationships will result in better predictions for mill throughput and gold recovery as well as ultimate improvements in the operation.

- The mill and heap leach operations at Cortez are well run, cost effective processing facilities for oxide ore.
- There are no appropriate processes for single and double refractory ore at Cortez. Therefore, these ore types are shipped to Goldstrike for processing. Current limits to the transportation rates imposed by environmental permits restrict the amount of ore that can be shipped to 1.8 million stpa. If additional refractory ore is mined, it must be stockpiled.

ENVIRONMENTAL CONSIDERATIONS

- Cortez is diligent in managing its permitting and all environmental requirements for the property.
- Receipt of approval to increase haulage of refractory ore from Cortez to Goldstrike in 2018 facilitated an increase in refractory ore processing from 1.2 million stpa to 1.8 million stpa.
- Submission of the proposed modifications to the PoO and anticipated approval of the proposal in Q3 2019 will allow an additional increase in ore haulage to significantly expand the operation at Cortez, including:
 - Increase haulage from Cortez to Goldstrike to 2.5 million stpa
 - Deepen the Crossroads Pit at the Pipeline Complex
 - Add Stage 11 to the Pipeline Pit
 - Expand the existing Gold Acres Pit and expand the WRF
 - Expand the CHUG mine by increasing the depth of mining to 2,500 ft
 - Revise dewatering rates and continue dewatering to allow underground mining at CHUG to beneath the currently authorized floor
 - Expand the Pediment portion of the CHOP and shift the plan boundary to the east by 800 ft
 - Potentially backfill the CHOP
 - Construct an additional water treatment plant in the Cortez Hills Complex
 - Expand the existing CHOP and WRF
 - Add RIBs and surface pipeline on private land outside of the Plan boundary in Crescent Valley
 - Construct additional RIBs and surface pipeline in Grass Valley and Pine Valley
 - Change the Grass Valley production wells to injection wells and add monitoring wells
 - Construct additional water management facilities, if necessary, including a water reservoir and pipelines
 - Add and/or revise existing facilities and disturbances
- RPA is not aware of any environmental issues that could materially impact Barrick's ability to extract the Mineral Resources or Mineral Reserves at this time.

26 RECOMMENDATIONS

Based upon its work, RPA provides the following recommendations.

GEOLOGY AND MINERAL RESOURCES

- The reason for the high failure rate of CRMs in 2017 should be investigated and explained.
- The duplicate sample and outside check assay protocols should be implemented.
- The screen checks should be re-implemented in new areas with atypical mineralization or coarse gold.
- For the Pipeline Complex, a strong northeastern mineralization trend was visually observed by RPA in the composites and resultant block model. RPA is of the opinion that this trend may be discernible using directional variography in unfolded space, which would yield more precise variogram models to inform search ellipse dimensions in future updates. RPA also recommends updating the variogram models to fit with raw data.
- Perform validation by ordinary kriging as part of the next model update at the Cortez Hills Complex.
- To streamline workflow and simplify reporting, RPA recommends updating all of the models at year-end, each year, with one drill hole and sample database export from Acquire. Models with no new information should be re-run for year end against the new database export and checked for changes.
- To augment communication of key modelling information and procedures, facilitate correct and up to date information transfer, and improve on the clarity of the information to third parties, RPA recommends the following:
 - Add a tab to the master spreadsheet for each model which summarizes the contextual information usually included in Technical Reports e.g. database cut-off dates, software and version, cut-off grades for mineralized domain wireframes, reporting cut-off grades, etc.
 - Add supporting documentation describing the Mineral Resource procedures, workflows and checks in the master spreadsheets.
 - Develop a standard procedure where final data and documentation supporting the final Mineral Resource and Mineral Reserve estimates are always archived to a separate, isolated set of folders containing only those files used in the estimates .

MINING AND MINERAL RESERVES

- Prepare and evaluate the stope by stope reconciliation between the stope production and the Mineral Reserve estimate to identify and report the causes of any large changes on a monthly basis.
- Present the reconciliation results showing the percentage differences and not the absolute differences.
- Use the reconciliation results to assess and revise the stope planning parameters.
- Undertake more detailed stope planning for the stopes in the three to five year time frame.
- Review the dilution assumptions related to external and backfill dilution in the longhole stoping including consideration of the primary and secondary stopes.
- Review the stope extraction estimates for the longhole stopes.
- Review the small amounts of Inferred material within stope designs with a view to changing the classification of these small areas so that Inferred Mineral Resources are not included in the stope plans.

PROCESSING

- Continue to evaluate new ore types and to optimize the processes to increase recovery and/or to decrease costs as related to improved geometallurgical understanding of the deposits.
- Continue to work collaboratively with the Goldstrike staff to maintain and improve the metallurgical accounting for treatment of Cortez ore in the roaster.

ENVIRONMENTAL CONSIDERATIONS

- Continue to proactively manage environmental permits and continue to maintain a strategy of anticipating major changes in permitting as far in advance as possible.

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28 DATE AND SIGNATURE PAGE

This report titled “Technical Report on the Cortez Joint Venture Operations, Lander and Eureka Counties, State of Nevada U.S.A.” and dated March 22, 2019 was prepared and signed by the following authors:

(Signed and Sealed) “Hugo M. Miranda”

Dated at Denver, CO
March 22, 2019

Hugo M. Miranda, ChMC(RM)
Principal Mining Engineer

(Signed and Sealed) “Wayne W. Valliant”

Dated at Toronto, ON
March 22, 2019

Wayne W. Valliant, P.Geo.
Principal Geologist

(Signed and Sealed) “Kathleen Ann Altman”

Dated at Denver, CO
March 22, 2019

Kathleen Ann Altman, P.E., Ph.D.
Principal Metallurgist

(Signed and Sealed) “Philip Geusebroek”

Dated at Toronto, ON
March 22, 2019

Philip Geusebroek, P.Geo.
Senior Geologist

(Signed and Sealed) “R. Dennis Bergen”

Dated at Vancouver, BC
March 22, 2019

R. Dennis Bergen, P.Eng.
Associate Principal Mining Engineer

29 CERTIFICATE OF QUALIFIED PERSON

HUGO M. MIRANDA

I, Hugo M. Miranda, ChMC(RM), as an author of this report entitled “Technical Report on the Cortez Joint Venture Operations, Lander and Eureka Counties, State of Nevada U.S.A.”, prepared for Barrick Gold Corporation, and dated March 22, 2019, do hereby certify that:

1. I am a Principal Mining Engineer with RPA (USA) Ltd. of 143 Union Boulevard, Suite 505, Lakewood, Colorado, USA 80228.
2. I am a graduate of the Santiago University of Chile, with a B.Sc. degree in Mining Engineering in 1993, and Santiago University, with a Masters of Business Administration degree in 2004.
3. I am registered as a Competent Person of the Chilean Mining Commission (Registered Member #0031). I have worked as a mining engineer for a total of 24 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Principal Mining Engineer - RPA in Colorado. Review and report as a consultant on mining operations and mining projects. Mine engineering including mine plan and pit optimization, pit design and economic evaluation.
 - Principal Mining Consultant – Pincock, Allen and Holt in Colorado, USA. Review and report as a consultant on numerous development and production mining projects.
 - Mine Planning Chief, El Tesoro Open Pit Mine - Antofagasta Minerals in Chile.
 - Open Pit Planning Engineer, Radomiro Tomic Mine, CODELCO – Chile.
 - Open Pit Planning Engineer, Andina Mine, CODELCO - Chile.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cortez property on January 14 to 16, 2019.
6. I am responsible for the overall preparation of the Technical Report and, in particular, for Sections 19 and 22, portions of Sections 15 (open pit Mineral Reserves), 16 (open pit mining), 18, and 21, and relevant disclosure in Sections 1, 25, 26, and 27.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 22nd day of March, 2019

(Signed and Sealed) “Hugo M. Miranda”

Hugo M. Miranda, ChMC(RM)

WAYNE W. VALLIANT

I, Wayne W. Valliant, P.Geo., as an author of this report entitled “Technical Report on the Cortez Joint Venture Operations, Lander and Eureka Counties, State of Nevada U.S.A.”, prepared for Barrick Gold Corporation, and dated March 22, 2019, do hereby certify that:

1. I am Principal Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.
2. I am a graduate of Carleton University, Ottawa, Ontario, Canada in 1973 with a Bachelor of Science degree in Geology.
3. I am registered as a Geologist in the Province of Ontario (Reg. #1175). I have worked as a geologist for a total of 44 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Review and report as a consultant on more than fifty mining operations and projects around the world for due diligence and resource/reserve estimation
 - General Manager of Technical Services for corporation with operations and mine development projects in Canada and Latin America
 - Superintendent of Technical Services at three mines in Canada and Mexico
 - Chief Geologist at three Canadian mines, including two gold mines
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cortez property on January 14 to 16, 2019.
6. I am responsible for Sections 2 to 11, 23, and 24 and relevant disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have prepared a previous Technical Report on the Cortez property dated March 21, 2016.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 22nd day of March, 2019

(Signed and Sealed) “Wayne W. Valliant”

Wayne W. Valliant, P. Geo.

KATHLEEN ANN ALTMAN

I Kathleen Ann Altman, Ph.D., P.E., as an author of this report entitled “Technical Report on the Cortez Joint Venture Operations, Lander and Eureka Counties, State of Nevada U.S.A.”, prepared for Barrick Gold Corporation, and dated March 22, 2019, do hereby certify that:

1. I am Principal Metallurgist with RPA (USA) Ltd. of Suite 505, 143 Union Boulevard, Lakewood, Co., USA 80228.
2. I am a graduate of the Colorado School of Mines in 1980 with a B.S. in Metallurgical Engineering. I am a graduate of the University of Nevada, Reno Mackay School of Mines with an M.S. in Metallurgical Engineering in 1994 and a Ph.D. in Metallurgical Engineering in 1999.
3. I am registered as a Professional Engineer in the State of Colorado (Reg. #37556). I have worked as a metallurgical engineer for a total of 38 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Review and report as a metallurgical consultant on numerous mining operations and projects around the world for due diligence and regulatory requirements.
 - I have worked for operating companies, including the Climax Molybdenum Company, Barrick Goldstrike, and FMC Gold in a series of positions of increasing responsibility.
 - I have worked as a consulting engineer on mining projects for approximately 20 years in roles such a process engineer, process manager, project engineer, area manager, study manager, and project manager. Projects have included scoping, prefeasibility and feasibility studies, basic engineering, detailed engineering and start-up and commissioning of new projects.
 - I was the Newmont Professor for Extractive Mineral Process Engineering in the Mining Engineering Department of the Mackay School of Earth Sciences and Engineering at the University of Nevada, Reno from 2005 to 2009.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cortez property on January 14 to 16, 2019.
6. I am responsible for Sections 13, 17, 20, portions of Section 18, and relevant disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have prepared previous Technical Reports on the Cortez property dated March 16, 2012 and March 21, 2016.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 22nd day of March, 2019

(Signed and Sealed) "Kathleen Ann Altman"

Kathleen Ann Altman, Ph.D., P.E.

PHILIP GEUSEBROEK

I, Philip Geusebroek, P.Geo., as an author of this report entitled “Technical Report on the Cortez Joint Venture Operations, Lander and Eureka Counties, State of Nevada U.S.A.”, prepared for Barrick Gold Corporation, and dated March 22, 2019, do hereby certify that:

1. I am Senior Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.
2. I am a graduate of the University of Alberta, Canada in 1995 with a B.Sc. degree in Geology, and the University of Western Ontario in 2008 with a M.Sc. in Economic Geology.
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #1938). I have worked as a geologist for a total of 23 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Resource estimation, geological modelling, and QA/QC experience.
 - Review and report as a consultant on numerous exploration, development, and production mining projects around the world for due diligence and regulatory requirements
 - Exploration and mine geologist with Echo Bay Mines Ltd., Kinross Gold Corporation, Western Mining Company, etc.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cortez property on January 14 to 16, 2019.
6. I am responsible for Sections 12 and 14 and relevant disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 22nd day of March, 2019

(Signed and Sealed) “Philip Geusebroek”

Philip Geusebroek, P.Geo.

R. DENNIS BERGEN

I, R. Dennis Bergen, P.Eng., as an author of this report entitled "Technical Report on the Cortez Joint Venture Operations, Lander and Eureka Counties, State of Nevada U.S.A.", prepared for Barrick Gold Corporation, and dated March 22, 2019, do hereby certify that:

1. I am an Associate Principal Mining Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave. Toronto, ON, M5J 2H7.
2. I am a graduate of the University of British Columbia, Vancouver, B.C., Canada, in 1979 with a Bachelor of Applied Science degree in Mineral Engineering. I am a graduate of the British Columbia Institute of Technology in Burnaby, B.C., Canada, in 1972 with a Diploma in Mining Technology.
3. I am registered as a Professional Engineer in the Province of British Columbia (Reg. #16064) and as a Licensee with the Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories (Licence L1660). I have worked as an engineer for a total of 38 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Practice as a mining engineer, production superintendent, mine manager, Vice President Operations and a consultant in the design, operation, and review of mining operations.
 - Review and report, as an employee and as a consultant, on numerous mining operations and projects around the world for due diligence and operational review related to project acquisition and Technical Report preparation.
 - Engineering and operating superintendent at the Con gold mine, a deep underground gold mine, Yellowknife, NWT, Canada
 - General Manager of the Ketza River Mine, Yukon, Canada
 - Vice President Operations in charge of the restart of the Golden Bear Mine, BC, Canada
 - General Manager in Charge of the Reopening of the Cantung Mine, NWT, Canada
 - Mine Manager at three different mines with open pit and underground operations.
 - Consulting engineer (RPA Associate Principal Mining Engineer) for over ten years working on project reviews, engineering studies, Mineral Reserve audits, Technical Report preparation, and other studies for a wide range of worldwide projects.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cortez property in November 2011 and May 2015.
6. I am responsible for portions of Sections 15 (underground Mineral Reserves), 16 (underground mining), and 21, and related disclosure in Sections 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have prepared previous Technical Reports on the Cortez property dated March 16, 2012 and March 21, 2016.

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 22nd day of March, 2019

(Signed and Sealed) "R. Dennis Bergen"

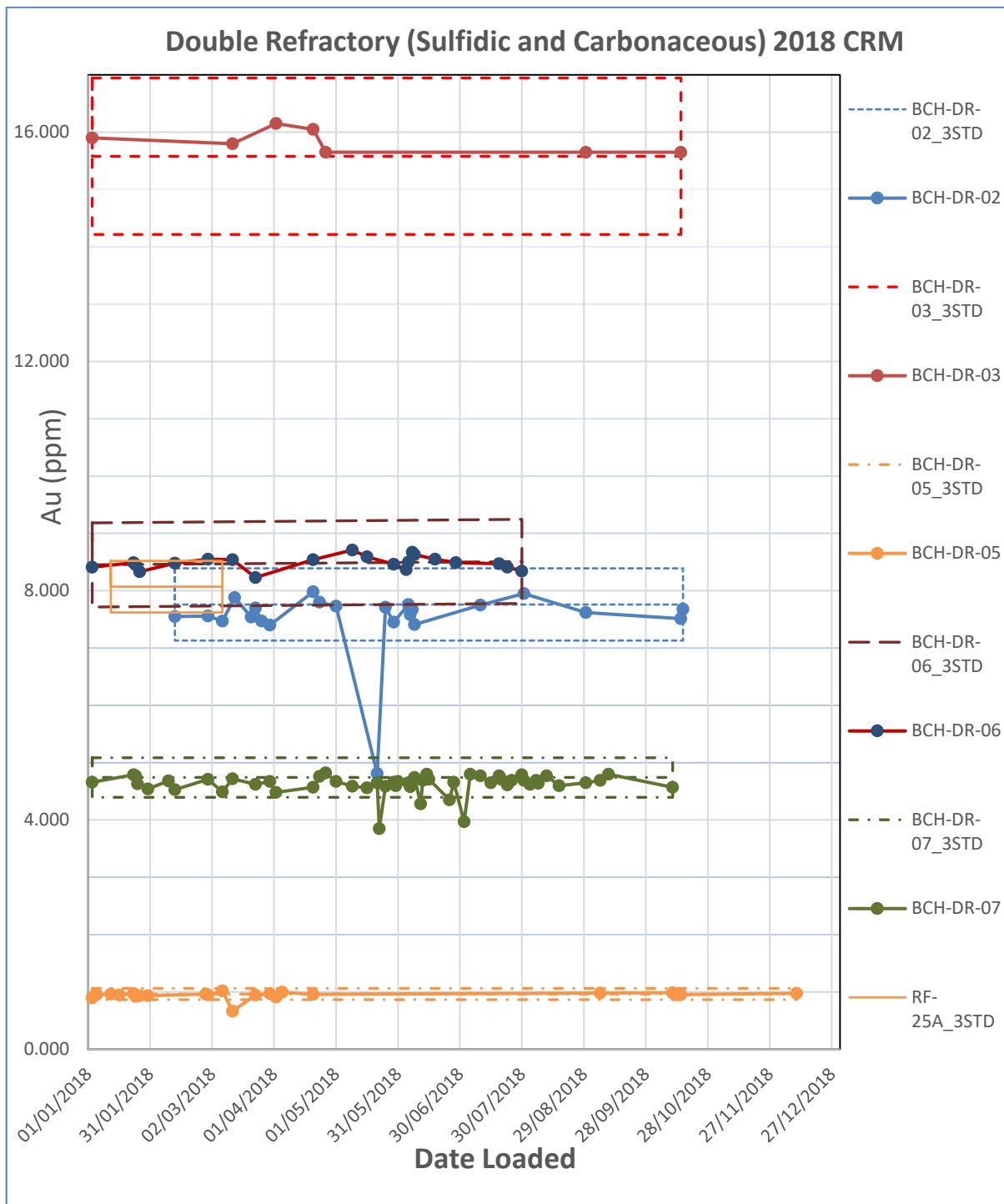
R. Dennis Bergen, P.Eng.

30 APPENDIX

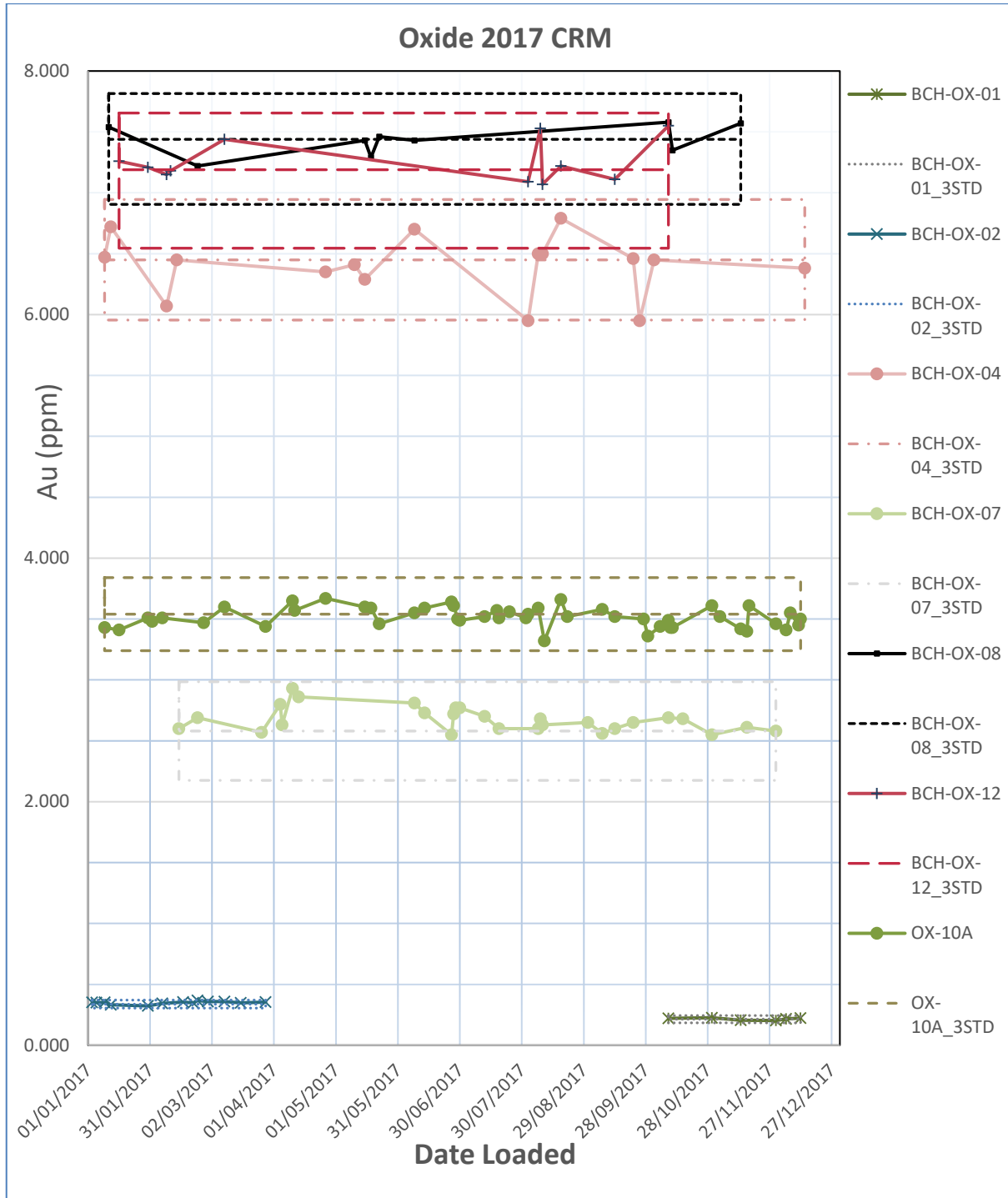
CRM PERFORMANCE

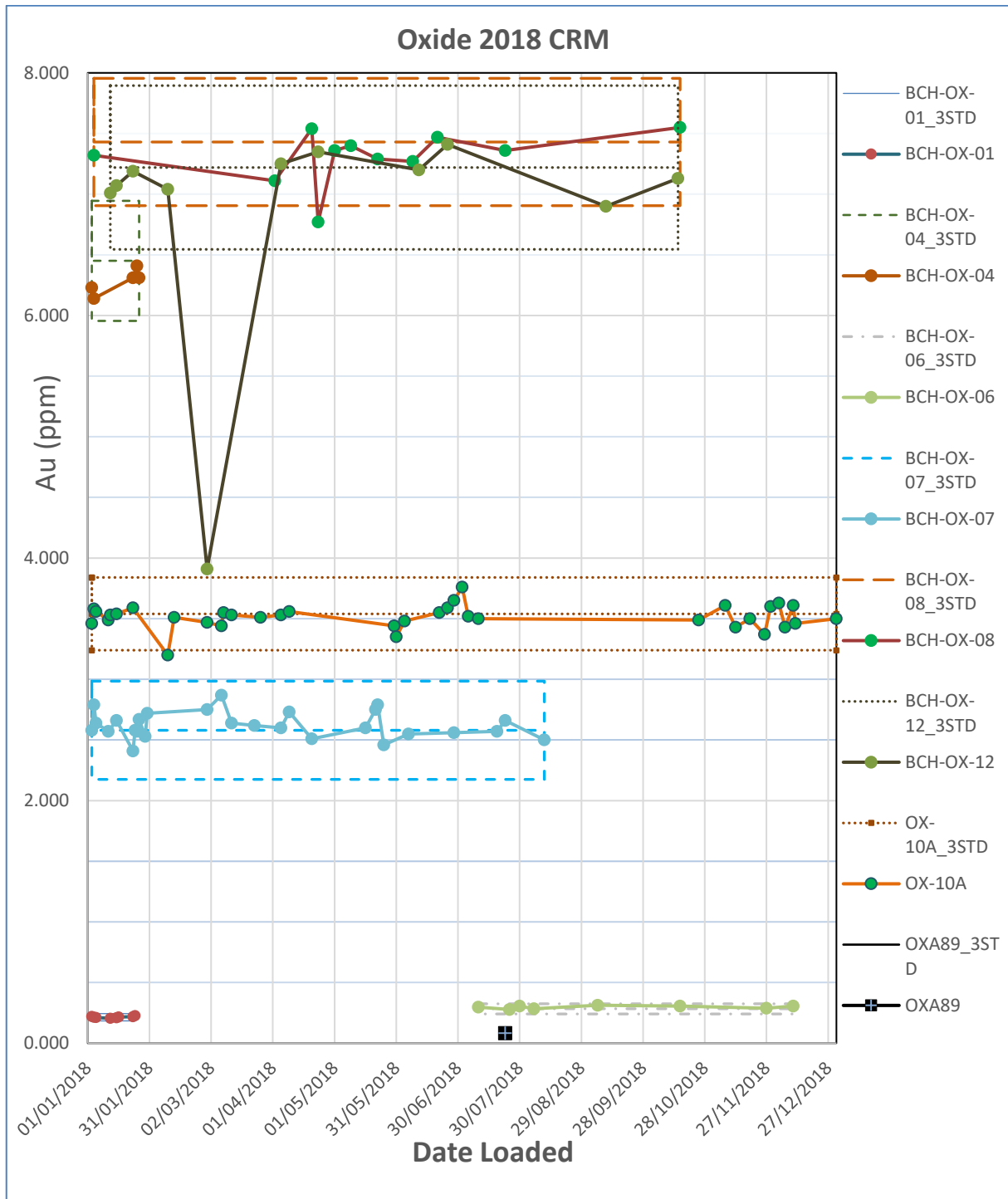
DOUBLE REFRACTORY CRM PERFORMANCE





OXIDE CRM PERFORMANCE





SULPHIDIC CRM PERFORMANCE

